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Accident Prevention Plan, Appendix 4
Site Safety and Health Plan

Phase III Field Investigation
Vasquez Boulevard and I-70 Site
Denver, Colorado

Prepared for:

U.S. Army Corps of Engineers
Omaha District Rapid Response
Building 525 Castle Hall
Offutt AFB, NE 68113

Prepared by:

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Contract No. W9128F-12-D0003
Task Order No. 002
Interagency Agreement DW96953911

July 2013

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Final

July 2013

SITE SAFETY AND HEALTH PLAN

VB/I-70 Denver Colorado
Remedial Action

I have read and approve this Site Safety and Health Plan for activities associated with the VB/I-70 soil investigations and remediation, with respect to project hazards, regulatory requirements, and Shaw Environmental, Inc. procedures.

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A Incident Notification, Reporting, and Management Procedure

LIST OF ACRONYMS AND ABBREVIATIONS

ACGIH.....American Conference of Governmental Industrial Hygienists
AHA.....Activity Hazard Analysis
APP .....Accident Prevention Plan
CCoD.....City and County of Denver
CFR.....Code of Federal Regulations
COI.....Contaminant of Interest
CPR.....Cardiopulmonary Resuscitation
CRZ.....Contamination Reduction Zone
db .....decibels
EM.....Engineer Manual
ER .....Engineer Regulation
EZ.....Exclusion Zone
ft .....feet
H&S.....Health and Safety
HAZCOM.....Hazard Communication
HAZWOPER ....Hazardous Waste Operations and Emergency Response
HSM .....Health and Safety Manager
IDLH .....Immediately Dangerous to Life or Health
JSA.....Job Safety Analysis
LEL.....Lower Explosive Limit
mg/m^3.....milligrams per cubic meter
mg/kg.....milligrams per kilogram
MSDS.....Material Safety Data Sheet
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Level
PPE .....Personal Protective Equipment
ppm .....parts per million
Shaw .....Shaw Environmental & Infrastructure
SOP.....Standard Operating Procedure
SOW.....Scope of Work
SS .....Site Supervisor
SSHO .....Site Safety and Health Officer
SSHP.....Site Safety and Health Plan
TLV.....Threshold Limit Value
TWA .....Time-Weighted Average
USACE.....U.S. Army Corps of Engineers
WNV.....West Nile Virus

SITE SAFETY AND HEALTH PLAN

This Site Safety and Health Plan (SSHP) addresses safety and health procedures and requirements for environmental remediation related activities planned for VB/I-70 at Denver, Colorado. This SSHP was developed by Shaw Environmental, Inc. (Shaw) using guidelines described in the U.S. Army Corps of Engineers (USACE) Engineer Manual (EM) 385-1-1. This SSHP does not repeat safety, health and environmental controls specified in the Work Plan and Accident Prevention Plan (APP). All personnel shall be instructed as to the contents of the Work Plan in addition to the APP/SSHP.

The safety and health procedures and requirements are established based on preliminary analysis of potential hazards at VB/I-70. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified. Specific requirements may be revised if new information is received or conditions change. A written amendment will document all changes made to the plan. This SSHP meets such requirements:

- Shaw Corporate Health and Safety (H&S) Policies and Procedures.
- Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) Parts 1910 and 1926.
- EM 385-1-1*. Safety and Health Requirements Manual* (USACE, 2008a).
- Engineer Regulation (ER) 385-1-92. *Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste Activities* (USACE, 2007).

This SSHP in combination with the Shaw Corporate H&S Policy and Procedures Manual (**Table 1-1**) serve as the company's Injury and Illness Prevention Plan as presented in Standard Operating Procedure (SOP) H&S (HS019).

Shaw fully acknowledges its responsibility to provide a safe and healthful work place for its employees, clients, and the general public. Shaw's mission is to provide our clients with safe and economical solutions to achieve the mission. Shaw's safety and health program has been carefully designed to thoroughly address safety and health issues arising from all phase of operations.

Authorized USACE representatives have the right to notify Shaw of any condition that poses a serious or imminent danger to H&S. Upon such notification, Shaw shall immediately take corrective action. Furthermore, any authorized USACE representative or Shaw employee may issue a stop work order suspending all or part of the work until satisfactory corrective action has been taken.

Table 1-1 Corporate Health and Safety Policies and Procedures

Standard Operating Procedure Number	Title
EIG-HS001	Safety
EIG-HS003	Philosophy for Corporate Procedures
EIG-HS009	New Employee Health and Safety Orientation Requirements
EIG-HS010	Employee Health and Safety Manual
EIG-HS011	Health and Safety Rules for Contractors
EIG-HS012	Chemical Hygiene Plan
EIG-HS013	Health and Safety Procedure Variance
EIG-HS014	Severe Weather Policies and Procedures
EIG-HS018	Safety Councils
EIG-HS019	Injury and Illness Prevention Program
EIG-HS020	Accident Prevention Program: Reporting, Investigation, and Review
EIG-HS021a	Tier 1, SR. Management, Leadership Safety Assessments
EIG-HS021b	Tier 2 Management Safety Inspections
EIG-HS021c	Accident Prevention Program: Management Safety Inspections
EIG-HS022	Accident Prevention Program: Review of New Proposals and Projects
EIG-HS023	Accident Prevention Program: Employee Safety Incentives and Team Safety Award Program
EIG-HS024	Prevention of Repetitive Motion Injuries (applies to California only)
EIG-HS025	Workplace Anti-Violence Policy
EIG-HS026	Safety Observation Program
EIG-HS040	Stop Work Authority
EIG-HS041	Embryo-Fetus Protection Program
EIG-HS045	Job Safety Analysis (JSA)
EIG-HS050	Employee and Subcontractor Training Requirements
EIG-HS051	Tailgate Safety Meetings
EIG-HS052	Health and Safety Plans
EIG-HS060	Hazard Communication (HAZCOM) Program
EIG-HS062	Hazardous Waste Operations [Resource Conservation and Recovery Act (RCRA)]
EIG-HS090	OSHA Regulatory Inspections
EIG-HS091	Reporting of Fatality or Multiple Hospitalization Incidents to OSHA
EIG-HS100	Medical Policies and Procedures
EIG-HS101	Drug and Alcohol Testing
EIG-HS102	Management of Employee Exposure and Medical Records
EIG-HS104	Employee Notification of Industrial Hygiene Monitoring Results
EIG-HS106	Medical Services and First Aid Kits
EIG-HS300	Confined Spaces
EIG-HS301	Fall Protection
EIG-HS302	Ladder Safety
EIG-HS303	Pressurized Water Cleaning and Cutting Equipment
EIG-HS304	Compressed Gas Cylinders
EIG-HS306	Handling Compressed Gas Cylinders with Unknown Contents

Table 1-1 Corporate Health and Safety Policies and Procedures (continued)

Standard Operating Procedure Number	Title
EIG-HS307	Excavation and Trenching
EIG-HS308	Underground/Overhead Utility Contact Prevention
EIG-HS309	Underground Storage Tank Removal
EIG-HS312	Electrical Safety
EIG-HS313	Fire Protection
EIG-HS314	Hot Work
EIG-HS315	Control of Hazardous Energy Sources and Hazardous Material Sources
EIG-HS316	Drill Rig Operations
EIG-HS317	Munitions and Explosives of Concern
EIG-HS400	Heat Stress
EIG-HS401	Cold Stress
EIG-HS402	Hearing Conservation Program
EIG-HS500	OSHA Regulated Toxic and Hazardous Substances
EIG-HS501	Cadmium Compliance Plan
EIG-HS502	Lead Compliance Plan
EIG-HS503	Benzene Compliance Plan
EIG-HS504	Asbestos Compliance Plan
EIG-HS505	Hexavalent Chromium Protection
EIG-HS512	Handling of Blood or Other Potentially Infectious Material
EIG-HS600	Personal Protective Equipment
EIG-HS601	Respiratory Protection Program
EIG-HS700	Policy and Guidance for Developing Radiation Protection Plans
EIG-HS800	Motor Vehicle Operation: General Requirements
EIG-HS810	Commercial Motor Vehicle Operation and Maintenance
EIG-HS811	Compliance Requirements for U.S. Department of Transportation's Emergency Response Information Telephone Number
EIG-HS820	Forklift Operation
EIG-HS822	Crane Operations
EIG-HS823	Rigging and Lifting

1.0 PERSONNEL ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The overall project organization and reporting structure is presented in Section 4.0 of the APP.

2.0 SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION

The Vasquez Boulevard and Interstate 70 (VB/I-70) Superfund Site is an approximately four square mile area located in the north-central portion of Denver, Colorado near the intersections of Interstate 70 and Interstate 25. The VB/I-70 Superfund Site is located in the vicinity of the Globe Smelter. The Globe Smelter is not part of the Site, but rather has been evaluated and remediated as part of a separate cleanup conducted by ASARCO, Inc. and overseen by the Colorado Department of Public Health and the Environment (CDPHE).

The original Omaha & Grant Smelter facility was built on approximately 50 acres bordering the South Platte River. The Omaha & Grant Smelter got its start from the Grant Smelter located in Leadville, Colorado. The Grant Smelter operated in Leadville from 1878 until 1882 and was owned by the Grant Smelting Company, an unincorporated company. When the Grant Smelter was destroyed by fire in 1882, a replacement smelter was built in Denver. The Grant Smelter shipped bullion to the Omaha Smelting Works located in Omaha, Nebraska. On July 5, 1883, the Grant Smelter merged with the Omaha Smelting Works and on July 18, 1892 the corporation was renamed the Omaha & Grant Smelting and Refining Company.

In 1899, the Omaha & Grant Smelting and Refining Company joined other smelting companies to form the American Smelting and Refining Company. The American Smelting and Refining Company continued to operate the Omaha & Grant Smelter until 1903. The American Smelting and Refining Company changed its name to ASARCO Incorporated (ASARCO) on May 15, 1975.

The Omaha and Grant Smelter facility commenced operations at the Site in October 1882. In 1887, the facility was expanded. In 1892, the facility expanded again and a 352 foot tall smelter stack was built. The smelter operated for approximately 21 years and was closed in 1903.

The smelter buildings were subsequently demolished. Sometime later, all of the slag, with the exception of any residual that could be buried under modern parking lots, was removed. Based on historic aerial photographs, all of the visible slag was removed by 1949. Between 1920 and 1940, various portions of the facility were deeded to the city and county of Denver (CCoD) and other portions of the facility have been, and continue to be, owned or operated by the Union Pacific Railroad, the Pepsi Bottling Company and various other corporate entities or individuals.

The properties still owned and used by CCoD are the Globeville Landing Park and the Denver Coliseum, which opened in 1952. The CCoD constructed the Denver Stadium and Coliseum circa 1950 which encompassed part of the northeast portion of the former Omaha and Grant smelter facility. The approximately 10-acre Globeville Landing Park is located along the east side of the South Platte River. The park, constructed in the 1970s encompasses part of the southwest portion of the former Omaha and Grant smelter facility.

The Omaha & Grant Smelter facility employed a lead smelting process to produce gold, silver, copper, and lead. The smelting process involved the fusing of ore, fuel, and lime to form a melted product. As a result of this process, lead and silver would sink to the bottom of an iron chamber and the slag would float on the surface of the liquid metals.

Although detailed information about the wastes from the smelting operations is not well documented, it is known that blast furnace slag was produced from the smelting operations. Ores, fuel and flux were delivered by rail car directly to the furnace charging doors on the upper levels of the smelter. As the smelting operations proceeded, the intermediate products flowed downhill to a lower level. Smelter workers would run slag onto a dump and load bullion onto rail cars. An 1890 Sanborn Fire Insurance Map identifies a slag dump to the north of the Omaha & Grant Smelter property.

Prior to constructing the Coliseum and associated parking lot, portions of the Site were used as a landfill for disposal or municipal solid wastes. The presence of the landfill materials beneath the Coliseum parking lot area is evidenced by the undulating nature of the parking lot pavement owing to differential compaction and decomposition of the underlying solid waste materials. No specific information or documentation of the time periods when the landfill occurred, the nature of the landfill activities, or the nature of wastes disposed in the landfill could be located.

Previous investigations by USEPA identified the presence of levels of arsenic and lead in soil at concentrations above human health screening levels. Therefore, the focus of the investigation is on assessment of arsenic and lead occurrences in surface and subsurface residential soil. Previous groundwater sampling conducted by the City and County of Denver (CCoD) reported the presence of arsenic in one monitoring well at levels above state and federal drinking water standards. As it was only reported to be present in one well and there is no use of groundwater at or in the vicinity of the Site, EPA concluded that groundwater was not significant exposure pathway and therefore did not require additional investigations of groundwater conditions.

Properties that have access agreements in place with arsenic and/or lead concentrations equal to or exceeding 70 mg/kg arsenic or 400 mg/kg lead will be recommended to the property owner for removal and replacement. The properties will be remediated by excavating and removing accessible surface soils to a depth of 12 inches and gardens to a depth of 24 inches. Accessible excavation areas mean grass-covered and bare yard areas, gravel-covered driveways and parking areas, flower gardens and vegetable gardens (except where exempted based on pre-remediation sampling) and beneath sheds that may be moved without causing structural damage to them. Excavation will not be performed in areas that are covered by brick or pavement surfaces (such as concrete pads, patios, paths, and driveways), areas where permanent structures are present (such as houses, garages, and crawl spaces), or areas covered by large landscaping items (such as retaining walls, water features, etc.).

The duration of planned activities is 3 months based on seasonal construction in the Denver area. Based on existing Site data extrapolated to account for unsampled properties, it is estimated that a total of 20 properties will require remediation for action levels of 70 mg/kg arsenic and 400 mg/kg lead. For this number of properties, it is estimated that the remediation activities will produce approximately 4,800 loose cubic yards (cy) of material for disposal. This volume is based on an average property loose soil volume of 240 cy, as determined from the previous removals at Globeville and the time critical removal actions at VB/I70.

Soil will be excavated to a depth of 4 inches and removed from beneath decks that are located 18 inches or higher above the ground surface. Soil will not be excavated from beneath decks lower than 18 inches.

Soil remediation will also be performed in road apron areas (soil areas between sidewalks and streets) adjacent to properties being remediated. Access to these areas will be obtained from the City of Denver before beginning remediation.

3.0 HAZARD ANALYSIS AND RISK ASSESSMENT

Personnel and project visitors will be familiar with site hazards and strictly adhere to the appropriate safety procedures prescribed in this SSHP including the Activity Hazard Analysis (AHA) presented in **Table 3-1** through **Table 3-3**. The AHA identifies potential safety, health, biological, and environmental hazards associated with specific tasks, and provides for the protection of personnel, the community, and the environment. Additional AHAs will be developed for new tasks that may have not been anticipated and added to this SSHP.

Because of the complexity and constant change of project activities for VB/I-70, the site must be continually inspected to identify new hazards. Changes to the AHA may be originated by the Site Safety Officer (SSHO), but must be approved by the Project Manager (PM) and Health and Safety Manager (HSM).

Buddy System: The buddy system will be employed by all personnel during operations. This system requires that a partner, or buddy, accompany each worker. The buddy provides the co-worker/partner with assistance, observes the partner for signs of potential exposure and illness, periodically checks the integrity of the partner's Personal Protective Equipment (PPE), and notifies the SSHO if help is needed. The buddy must be within a line of sight or hearing of the partner and be prepared to enter any area the partner enters. The buddy must be fully certified to work in the level of protection that the employee is working in, and must have the appropriate PPE available.

3.1 STANDARD OPERATING SAFETY PRECAUTIONS

Shaw maintains SOPs for a variety of occupational safety hazards, as listed in **Table 1-1**. These SOPs provide standard operating safety precautions used to develop this SSHP. Pertinent SOPs are provided in the APP, Appendix 3. The remainder of the SOPs is available on site on compact disc, binder, or through a secure intranet connection.

Table 3-1 Activity Hazard Analysis – Site Mobilization/Preparation

ACTIVITY: SITE MOBILIZATION/PREPARATION ANALYZED BY/DATE: Winston Russell, HSM/June 2013

Summary: Prior to intrusive operations, mobilization and site preparation activities will be required. These activities include travel to and from the sites on a daily basis, unloading of equipment, and general site preparation.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Mobilization/ Preparation Hazards	Unfamiliarity with site and potential hazards, emergency procedures and key personnel	Personnel shall attend initial briefing covering safety and health aspects outlined in the approved APP/SSHP. Employees shall be familiar with the location of the closest hospital and approved occupational clinic.
	Biological hazards	Competent person Erica Koch will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Sun radiation	Employees are encouraged to use sunscreen with an SPF of 30 or higher on any exposed skin. Long-sleeved shirts must be utilized. Use safety eyewear that provides UVA and UVB protection.
	Cold and heat stress injuries	SSHO Erica Koch will implement heat stress/cold injury control program per HS400 and HS401, respectfully (when daily temperature is predicted to be greater than 80°F or less than 40°F). SSHO will monitor weather conditions and thermal stress symptoms in workers.
	Tripping hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform SSHO of any observed potential slip, trip, or fall hazards. Avoid stepping on downed trees; when possible step over them.
	Sloped, uneven or hazardous terrain	Traverse terrain carefully. Use footwear that provides ample grip to the terrain. Consider alternative work locations when terrain becomes hazardous from weather or other conditions. Apply appropriate PPE to the task suitable for worker protection. Flag or cover inconspicuous holes to protect against falls. Be cognizant of potential sink holes or manholes that may have compromised covering.
	Thunderstorms, tornadoes, or hazardous weather	Listen to radio or TV announcements for pending weather information. Cease field activities during thunderstorm, tornado warnings, or hazardous weather. Seek shelter. Do not try to outrun a tornado. A 30-minute waiting period will be enforced after the last observed lightning strike, prior to the resumption of work.
	Fire	Fire extinguishers shall be readily available. Spark or flame producing activities shall require the completion of a Shaw Hot Work Permit. Appropriate site-specific authorities shall be notified in advance of hot work operations.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Mobilization/ Preparation Hazards/ (cont.)	Emergency situations	Be familiar with the emergency procedures established on site. Contact the local emergency responders and offer to participate in coordination meeting. Keep emergency numbers posted or readily available where phones are located.
	Operation of motor vehicles and trucks – general	All company owned, leased, or rented vehicle operations shall comply with the requirements of Shaw Procedure HS800, "Motor Vehicle Operation: General Requirements." All company owned, leased, or rented commercial vehicle operations shall comply with the requirements of Shaw Procedure HS810, "Commercial Motor Vehicle Operation And Maintenance." Subcontractors operating motor vehicles shall comply with all federal, state, and local traffic regulations. Subcontractors shall only use vehicles, which are in good condition and safe to operate. Subcontractors shall inspect vehicles routinely used on a weekly basis and submit the inspection documentation to the SSHO. All personnel shall drive defensively, take adequate rest breaks, and wear seatbelts while vehicles are in motion. Use a spotter to help guide vehicles through tight areas. Follow all Installation rules for vehicle operation.
	Operation of motor vehicles and trucks – backing	Back into parking spaces upon arrival, whenever possible. Walk around the vehicle before backing to identify any new conditions or obstructions. Set out orange cone system to require truck operator to walk around truck and collect cone(s) prompting area inspection prior to moving truck. Use a spotter when backing whenever possible. Understand hand signals. Sound horn prior to backing. Check the rear-view and side mirrors prior to backing. (Note: All vehicles, other than automobiles, should have small convex mirrors attached to the side mirrors.) Back slowly in areas of obstructed vision. Anticipate others who may be backing out into your pathway and adjust accordingly.
	Operation of motor vehicles and trucks – speeding	Obey all posted speed limits. Radar detectors are prohibited in all Shaw company owned, leased, or rented vehicles. Reduce travel speed during hazardous conditions (e.g., rain, fog, and snow). Maintain 2 seconds between vehicles under normal conditions; maintain 3 seconds behind motorcycle; 7 seconds pulling a trailer behind a semi-truck; and 6 seconds behind a semi-truck, no trailer; add additional seconds for rain, fog, etc. Determine whether your vehicle has anti-lock brakes. If it does, read the operators manual to determine how to use them properly. Test the brakes on a wet roadway so that you will know how they perform under emergency conditions. Always leave yourself an "out" during travel. When stopping, make sure that you leave enough distance between you and the car in front of you. You should be able to see the rear tires of the vehicle in front, when stopped. When at a red light, and it turns green, use the "delayed start" technique, by counting to three before you take your foot off the brake. DO NOT TAILGATE.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Mobilization/ Preparation Hazards/ (cont.)	Operation of motor vehicles and trucks – blind spots	Become familiar with any blind spots associated with your vehicle. Adjust mirrors properly. Make sure you use your directional signals. Always look over your shoulder to ensure that the lane is clear when changing lanes. Become extra cautious when approaching other drivers' blind spots.
	Operation of motor vehicles and trucks – vehicle loading	Do not overload the vehicle. Secure all equipment within the body of the vehicle. Do not block side-view mirrors with load. Do not transport U.S. Department of Transportation manifested hazardous materials without a commercial driver's license with appropriate endorsements. All hazardous material shipments must have prior approval from the Project Manager and HSM. Vehicles carrying loads that project beyond the sides of rear of the vehicle shall carry a red flag not less than 144 square inches at or near the end of the projection. Dispatch all equipment and personnel with proper forms and identification.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting will be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).

Equipment To Be Used	Inspection Requirements	Training Requirements
PPE (Level D) hard hat, safety glasses and foot protection Common hand tools Vehicles	Competent person Erica Koch will inspect the entire work area daily. Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced. All construction vehicles in use will be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects will be corrected before the vehicle is placed in service. If during inspection or during use, equipment fails to function properly, the equipment will be turned in for repair/ replacement.	All on-site personnel (except LBP abatement workers will be current in OSHA training in accordance with 29 CFR 1910.120 [Hazardous Waste Operations and Emergency Response (HAZWOPER)] and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f) see Exhibit in APP. Additionally, site personnel will receive site-specific and HAZCOM training in accordance with Section 4 of the Site-Wide SSHP. A minimum of two people trained in First Aid and cardiopulmonary resuscitation (CPR) will be on site during operations.

Table 3-2 Activity Hazard Analysis – Residential Reconnaissance & Remediation

ACTIVITY: RESIDENTIAL RECONNAISSANCE & REMEDIATION ANALYZED BY/DATE: Winston Russell, HSM/June 2013
Summary: Residential property sampling, mapping, remediation

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Reconnaissance & Remediation	Biological hazards	Competent person and SSHO Erica Koch will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Poisonous plant oils or resins	Workers shall be trained to identify poisonous plants native to the area. Appropriate PPE, Tyvek and Nitrile gloves shall be used when exposure to poisonous plant material is possible. Equipment or tools shall be cleaned as often as necessary to prevent transfer of poisonous plant oils or resins. Wash clothing that may be contaminated separately for non-contaminated clothing. Evaluate use of plastic bags or visqueen to cover equipment for protection from poisonous plants. Poisonous plant oils or resins can persist in the environment for many years and persist in stems and roots even in dormant growing seasons.
	Stings from bees, wasp or ants	Identify infested areas to the site supervisor. Workers who are allergic or capable of allergic reactions to bee, wasp, or ant stings or bites shall notify their supervisor(s). Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Animals	Avoid petting or feeding animals. If encountering a domesticated dog that appears to become aggressive, do not run or make loud noise. Attempt to remain calm. Ask residents to keep pets indoors if possible.
	Repetitive motion	Use of ergonomically designed handles on equipment is suggested.
	Sloped, uneven or hazardous terrain	Traverse terrain carefully. Use footwear that provides ample grip to the terrain. Consider alternative work locations when terrain becomes hazardous from weather or other conditions. Apply appropriate PPE to the task suitable for worker protection. Appropriate composite toe/shank work boots shall be utilized when personnel are exposed to potential foot hazards. Footwear shall provide appropriate ankle stability and protection. Flag or cover inconspicuous holes to protect against falls. Be cognizant of potential sink holes or manholes that may have compromised covering.
	Extended periods of walking and standing	Schedule routine breaks as necessary to help mitigate worker fatigue. Choose clothing that will aid in minimizing worker fatigue. Carry only essential items when working in remote locations. Eat healthy and get necessary rest/sleep periods to combat worker fatigue.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General Reconnaissance & Remediation (cont.)	Cold and heat stress injuries	SSHO Erica Koch will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80°F or less than 40°F). Beverages will be available on site. SSHO will monitor weather conditions and stress symptoms in workers.
	Sun radiation	Employees are encouraged to use sunscreen with an SPF of 30 or higher on any exposed skin. Long-sleeved shirts can be utilized unless such use increases thermal loads and heat stress concern. Use safety eyewear that provides UVA and UVB protection.
	Thunderstorms, tornadoes or hazardous weather	Listen to radio or TV announcements for pending weather information. Cease field activities during thunderstorm, tornado warnings, or hazardous weather. Seek shelter. Do not try to outrun a tornado. A 30-minute waiting period will be enforced after the last observed lightning strike, prior to the resumption of work.
	Emergency situations	Be familiar with the emergency procedures established on site. Contact the local emergency responders and offer to participate in coordination meeting. Keep emergency numbers posted or readily available in site vehicles. Make sure emergency numbers to local utility providers are available and up to date.
Excavation and backfill	Contact with utilities	The CO One-Call shall be notified at least 7 days prior to intrusive remediation activities. The FTL shall perform a site reconnaissance focusing on utilities that could be present and unmarked by utility locate personnel. A magnetometer shall be available onsite to assist in pinpointing ferrous underground utilities. Utilities shall be initially exposed by hand digging to confirm location, type and direction. Use of earth moving machinery to excavate within 2 feet of utilities is prohibited. Spotters shall be present during excavations to help identify potential utilities missed during initial markings. All excavation shall shall comply with Shaw procedure HS307, Excavation and Trenching and HS308, Overhead/Underground Utility Contact Prevention. All conductive equipment shall maintain a minimum separation distance from overhead electric lines in accordance with EM-385-1-1 Table 11-1.
	Contact or exposure to lead or arsenic contamination	It is very unlikely COC could be present above OSHA PELs during remediation based on their concentration in soil. Personnel shall avoid physical contact with soils being remediated. Stay upwind of all excavation activities when possible. Water shall be used to maintain dust suppression below established action limits specified in the dust control plan and air sampling requirements. Personnel shall don Modified Level D PPE when dermal soil contact is absolutely necessary. Wash hands and face before eating or drinking.
	Cross contamination	Equipment shall be gross decontaminated before being moved into clean areas. Trucks shall not be overloaded where spillage is possible during transport. Dump bodies shall be covered with standard dump truck tarps when hauling soil.
	Unauthorized personnel in remediation area	If residents enter the immediate exclusion zone during excavation stop work until only authorized personnel are present. All personnel shall be extra diligent and aware of children possibly entering work areas.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Excavation and backfill(cont.)	Spills or leaks	Equipment exhibiting signs of hydraulic of fuel leaks shall be taken out of service immediately and replaced or repaired. Sorbent material and shovels shall be available in event of small spills. All spills shall be immediately reported to the Site Manager and Project Manager.
	Excavation adjacent to structures	Yards will be excavated to a depth of 12 inches and vegetable gardens 24 inches. If at any time it is questionable if these shallow excavations may compromise structures, STOP WORK and contact the Project Manager. Spotter shall be used to help the operator navigate in close proximity to obstacles. Hand signals will be established between the spotted and operator.
	Temporary structure relocation to facilitate remediation	Temporary structures i.e., storage sheds that may have to be relocated temporarily shall be emptied of their contents before moving. No awkward lifting is permitted and appropriate equipment shall be available to safely complete the task. No one shall individually lift more than 60 pounds without the assistance of additional personnel or equipment.
	Noise	Equipment shall be monitored for noise levels using a dB weighting noise dosimeter. Equipment shall not be operated at speeds or under conditions that exceed 80 dBA at 25 feet. Noise levels within 25 feet that exceed 85 dBA require personnel working in this radius to wear hearing protection.
	Struck by or caught between	Personnel in close proximity to moving equipment shall not position themselves between the equipment and stationary objects. Stay out of the swing radius of operation equipment. Back-up personnel are required to direct all earthmoving equipment being operated in reverse motion. Personnel shall wear ANSI/ISEA Class III reflective/high visibility vests when working.
	Cuts and lacerations during material handling	Personnel shall wear at minimum heavy cotton or leather work gloves when handling materials that could result in abrasions or lacerations. If glass is broken or encountered use shovels or scoops to collect it and do not pick glass up with hands.
	Improper use of hand tools	Tools designed for the task at hand shall be available and used at all times. Follow manufacturer's recommendations for use, care, maintenance and inspection. Damaged tools shall be removed immediately from service.
	Resident access and excavated egress points	In cases where excavation occurs in a home's egress points means shall be provided to keep residents off excavated soil. This shall be accomplished by laying down clean fill or placing a geotextile fabric or equivalent material walkway until final backfill is complete.
	Hazard recognition	Daily tailgate safety meetings shall occur to discuss the plan of action and appropriate safety controls prior to start of work. The HARP process shall be encouraged by all site workers. Personnel engaged in soil removal shall be HAZWOPER qualified. Personnel engaged in lead based paint assessment and possible abatement shall be trained in the requirements of the OSHA Construction Lead Standards and be medically monitored.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Excavation and backfill(cont.)	Traffic	Equipment and personnel will be placed away from traffic as much as possible. Construction and trucks entering signage shall be placed as necessary at the entrances to construction zones in accordance with CO DOT and MUTC requirements.
	Dump truck operation	Beds of dump trucks shall not be raised until the operator verifies no overhead hazards/obstacles exist. Beds shall be fully lowered before pulling away from the dumping area. Trucks shall be equipped with a visible or audible meant to indicate the dump bed is not fully lowered. Gates shall be fully locked in closed position when truck is in transit. Personnel shall use the 3 point rule when entering and exiting dump trucks or other heavy equipment. Remove any mud or debris from boots before entering trucks.
	Falls	Any work being performed at unguarded heights of 6 feet or greater require 100 percent tie-off using acceptable fall protection equipment.
	Fire	Fire extinguishers shall be readily available on all earthmoving equipment and site trucks. Spark or flame producing activities shall require the completion of a Shaw Hot Work Permit. Appropriate site-specific authorities shall be notified in advance of hot work operations. A 20 pound minimal fire extinguisher shall be provided for refueling of equipment.

Equipment To Be Used	Inspection Requirements	Training Requirements
PPE – Level D PPE, safety glasses and foot protection, Nitrile exam gloves for sampling Handheld sampling equipment	Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced.	All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), enrolled in a medical monitoring program, and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). A minimum of two people trained in First Aid and CPR will be on site during operations. All personnel on site will receive site-specific and HAZCOM training in accordance with the APP.
Excavator, loader, dump trucks, compactor, water truck, site vehicles	All equipment used onsite shall undergo a thorough initial equipment use inspection. Thereafter, a daily inspection of safety and operational critical components shall be inspected by competent operators.	Only Shaw qualified/trained personnel shall operate Shaw owned, leased or rented equipment.

Table 3-3 Activity Hazard Analysis – LBP Assessment or Remediation

ACTIVITY: LBP ASSESSMENT OR REMEDIATION ANALYZED BY/DATE: Winston Russell, HSM/June 2013
Summary: Residential property paint assessment, sampling, remediation

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General assessment and removal	Biological hazards	Perform a thorough inspection around the residence for bees, wasp, spiders and other insects that could cause physical harm.
	Stings from bees, wasp or ants	Identify infested areas to the site supervisor. Workers who are allergic or capable of allergic reactions to bee, wasp, or ant stings or bites shall notify their supervisor(s). Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Animals	Avoid petting or feeding animals. If encountering a domesticated dog that appears to become aggressive, do not run or make loud noise. Attempt to remain calm. Ask residents to keep pets indoors if possible.
	Falls	100 percent tie off is required when working from unprotected elevations 6 feet or greater. Fall protection is required when working from portable ladders at 6 feet elevation or greater. Ladders shall be erected in accordance with manufacturers recommendations. Ladders shall be stabilized at the base by a coworker.
	Electrical	Only electrically rated ladders shall be used when working in proximity to overhead electric. All portable electrical equipment shall be GFCI protected. Hard or extra hard usage cords shall be used for temporary electric. Cords shall be equipped with ground prong conductors. Damaged cords shall be removed from service use.
	Sloped, uneven or hazardous terrain	Traverse terrain carefully. Use footwear that provides ample grip to the terrain. Consider alternative work locations when terrain becomes hazardous from weather or other conditions. Apply appropriate PPE to the task suitable for worker protection. Appropriate composite toe/shank work boots shall be utilized when personnel are exposed to potential foot hazards. Footwear shall provide appropriate ankle stability and protection. Flag or cover inconspicuous holes to protect against falls. Be cognizant of potential sink holes or manholes that may have compromised covering.
	Scraper blades breaking	Safety glasses with side shields shall be worn at all times.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General assessment and removal (cont.)	Inhalation of lead particles	All personnel in involved with the lead removal activities will be instructed to follow the lead abatement contractor's compliance plan. This plan must meet the requirements outlined in OSHA Lead Compliance Standard. This plan is to be reviewed at the preparatory meeting. The use of respiratory protection will be used if a negative exposure determination is not current. Hepa cartridges on half mask respirators must be donned at all times for this work. All unnecessary personnel will be kept out of the work area and in an upwind location. The entire area will be posted with barricade tape and signs that read; WARNING LEAD WORK AREA / POISON, NO SMOKING OR EATING. Lead workers shall be medically monitored, pre and post biological monitoring for lead.
	Cold and heat stress injuries	SSHO Erica Koch will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80°F or less than 40°F). Beverages will be available on site. SSHO will monitor weather conditions and stress symptoms in workers.
	Sun radiation	Employees are encouraged to use sunscreen with an SPF of 30 or higher on any exposed skin. Long-sleeved shirts can be utilized unless such use increases thermal loads and heat stress concern. Use safety eyewear that provides UVA and UVB protection.
	Thunderstorms, tornadoes or hazardous weather	Listen to radio or TV announcements for pending weather information. Cease field activities during thunderstorm, tornado warnings, or hazardous weather. Seek shelter. Do not try to outrun a tornado. A 30-minute waiting period will be enforced after the last observed lightning strike, prior to the resumption of work.
	Emergency situations	Be familiar with the emergency procedures established on site. Contact the local emergency responders and offer to participate in coordination meeting. Keep emergency numbers posted or readily available in site vehicles. Make sure emergency numbers to local utility providers are available and up to date.
	Lead dust contamination	Lead abatement workers will wear Tyvek or equivalent coveralls, gloves, and booties to protect their clothing. Potentially contaminated clothing shall be placed in labeled bags and disposed in accordance with Federal and State requirements.
	Cross contamination	Drop cloths, tarps or plastic will be used to contain any paint flakes. Use of HEPA vacuum cleaners will be used to mitigate spread of potential lead particulate.
Using chemical stripper to remove lead paint	Eye and Skin contact	All personnel will wear the proper PPE for this activity. Chemical suit, chemical resistant coveralls, gloves, safety glasses, and face shield. The MSDS for this chemical will provided and will be discussed and reviewed prior to this work activity.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
General assessment and removal (cont.)	Unauthorized personnel in remediation area	If residents enter the immediate exclusion zone during abatement stop work until only authorized personnel are present. All personnel shall be extra diligent and aware of children possibly entering work areas.
	Noise	Equipment shall be monitored for noise levels using a dBA weighting nosie dosimeter. Equipment shall no be operated at speeds or under conditions that exceed 80 dBA at 25 feet. Noise levels within 25 feet that exceed 85 dBA require personnel working in this radius to wear hearing protection.
	Cuts and lacerations during material handling	Personnel shall wear at a minimum heavy cotton or leather work gloves when handling materials that couls result in abrasions or lacerations. If glass is broken or encountered use shovels or scoops to collect it and do not pick glass up with hands.
	Improper use of hand tools	Tools designed for the task at hand shall be available and used at al times. Follow manufacturers recommendations for use, care, maintenance and inspection. Damaged tools shall be removed immediately from service.
	Hazard recognition	Daily tailgate safety meetings shall occur to discuss the plan of action and appropriate safety controls prior to start of work. The HARP process shall be encouraged by all site workers. Personnel engaged in soil removal shall be HAZWOPER qualified. Personnel engaged in lead based paint assessment and possible abatement shall be trained in the requirements of the OSHA Construction Lead Standards and be medically monitored.

Equipment To Be Used	Inspection Requirements	Training Requirements
PPE –Modified Level D PPE and Level C, safety glasses and foot protection, Nitrile gloves, Tyvek, half face APR and booties for abatement. Hand tools, HEPA vacuum, ladders	Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced. All equipment used onsite shall undergo a thorough initial equipment use inspection. Thereafter, a daily inspection of safety and operational critical components shall be inspected by competent operators.	All abatement personnel shall have received Lead awareness and abatement training in accordance with the OSHA Lead Standard. A minimum of two people trained in First Aid and CPR will be on site during operations. All personnel on site will receive site-specific and HAZCOM training in accordance with the APP. Only Shaw qualified/trained personnel shall operate Shaw owned, leased or rented equipment.

3.2 OTHER POTENTIAL CONTAMINANTS

The main contaminants of interest (COIs) in soil are low levels of the inorganic metals arsenic and lead.

Should a nonstandard event occur (e.g., discovery of leaking drums or paint cans, soil with abnormal consistency and discoloration, buried waste, or unknown and unidentified materials), fieldwork will be stopped and the USACE, Project Manager, and HSM will be notified. The SSHO in consultation with the HSM will identify potential concerns and implement appropriate requirements before field activities continue. This may require and upgrade in PPE or additional real-time air monitoring to evaluate potential worker exposure.

Biological Hazards

Biological hazards include ticks, poisonous plants, snakes, bird excrement, Hantavirus, stinging insects, spiders, wild animals, and bloodborne pathogens.

Mosquitos. Mosquitos are vectors for West Nile Virus (WNV) Infection, a condition that can vary in presentation in different individuals. Most persons who become infected with WNV develop no clinical illness or symptoms.

West Nile Fever – Of the approximately 20 percent of infected people who develop symptoms, most develop what has been termed West Nile Fever. Symptoms include fever, headache, fatigue, skin rash on the trunk of the body (occasionally), swollen lymph glands (occasionally) and eye pain (occasionally). The incubation period for the development of these symptoms is between 2 to 14 days.

West Nile Meningitis/Encephalitis. Severe infections involve the central nervous system resulting in aseptic meningitis and encephalitis. Characteristic symptoms for meningitis include fever, headache, stiff neck, and changes in the white cells of the spinal fluids (Pleocytosis) with a predominance of lymphocytes. Characteristic symptoms for encephalitis include fever, headache, alteration of consciousness, lethargy, confusion, coma, limb paralysis, and cranial nerve palsies and tremors.

West Nile Poliomyelitis is a flaccid paralysis syndrome associated with WNV infection and is less common than meningitis or encephalitis. This syndrome is generally characterized by the acute onset of asymmetric limb weakness or paralysis in the absence of sensory loss. The paralysis can occur in the absence of fever, headache, or other common symptoms associated with WNV. Paralysis of the respiratory muscles leading to respiratory failure can sometimes occur (fatal).

WNV infection can be suspected in a person based on geographical location, clinical symptoms, and patient history, but laboratory testing is required for a confirmed diagnosis. The most efficient diagnostic method is the detection of specific antibodies to WNV in serum collected within 8 to 14 days of illness onset or cerebral spinal fluid collected within 8 days of illness onset.

WNV Treatment – There is no specific treatment for WNV infection. The more severe infections may require hospitalization and supportive care to prevent secondary infections.

Ticks. Ticks are vectors of many different diseases, including Rocky Mountain Spotted Fever, Q Fever, Tularemia, Colorado Tick Fever, and Lyme Disease. Ticks attach to their host's skin and intravenously feed on its blood creating an opportunity for disease transmission. The first symptoms of either disease are flu-like chills, fever, headache, dizziness, fatigue, stiff neck, and bone pain. If immediately treated by a physician, most individuals recover fully in a short period of time. If not treated, more serious symptoms can occur. Recently, Lyme disease has been the most prevalent type of disease transmitted by ticks in the United States.

If a site employee believes they have been bitten by a tick, or if any of the signs and symptoms appears, the employee will contact the SSHO and HSM who will authorize the employee to visit a physician for an examination and possible treatment.

Such precautions should be taken when working in areas that might be infested with ticks:

- Cover your body as much as possible. Wear long pants and long-sleeved shirts. Light color clothing makes spotting of ticks easier.
- Try to eliminate possible paths by which the tick may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves (duct tape may be used to help seal cuffs and ankles). If heavy concentrations of ticks or insects are anticipated or encountered, Tyvek® coveralls may be used for added protection.
- Conduct periodic and frequent (e.g., hourly) surveys of your clothing for the presence of ticks. Remove any ticks and insects that become attached to clothing.
- Spray outer clothing, particularly your pant legs and socks, but not your skin, with an insect repellent that contains permethrin or permanone, or use a repellent with N,N-diethyl-m-tuluomide, which can be applied to the skin.
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Tuck pant legs into boot tops or tape pants to boot tops to prevent ticks from crawling up the pant leg (this may not be an option at sites where extreme heat stress is anticipated).

If a tick is discovered, such procedures should be used to remove it:

- Do not detach a tick with your bare fingers; bacteria from a crushed tick may be able to penetrate even unbroken skin. Fine-tipped tweezers should be used.
- Grip the tick as close to your skin as possible and gently pull it straight away from you until it releases its hold.
- Do not twist the tick as you pull and do not squeeze its bloated body. That may actually inject bacteria into your skin.
- If the tick resists, cover the tick with salad oil for about 15 minutes to asphyxiate it, and then remove it with tweezers.
- Do not use matches, a lit cigarette, nail polish or any other type of chemical to “coax” the tick out.
- Be sure to remove all parts of the tick’s body, thoroughly wash your hands and the bite area with soap and water, and disinfect the area with alcohol or a similar antiseptic after removal.
- For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme Disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area.
- Look for the signs of the onset of Rocky Mountain Spotted Fever, such as a rash-like inflammation consisting of red spots under the skin that appear 3 to 10 days after the tick bite.
- Notify the SSHO of any tick bites as soon as possible.

Poisonous Plants. Poison ivy (*Rhus radicans*), poison oak (*Rhus diversiloba*), and poison sumac (*Rhus vernex*) are identified by three or five leaves radiating from a stem. The plant tissues have an oleoresin, which is active in live, dead, and dried parts and produces a delayed allergic

hypersensitivity. The oleoresin may be carried through smoke, dust, contaminated articles, and the hair of animals. The best antidote for poisonous plants is recognition and avoidance.

Poison Ivy has three almond-shaped leaflets ranging from light green (usually the younger leaves) to dark green (mature leaves), turning bright red in fall. The leaflets of mature leaves are somewhat shiny. The leaflets are 3 to 12 centimeters (cm) long, rarely up to 30 cm. Each leaflet has a few or no teeth along its edge, and the leaf surface is smooth. Leaflet clusters are alternate on the vine, and the plant has no thorns. Vines growing on the trunk of a tree become firmly attached through numerous aerial rootlets. Flowering occurs from May to July. The yellowish- or greenish-white flowers are typically inconspicuous and are located in clusters up to 8 cm above the leaves. The berry-like fruit, a drupe, mature by August to November with a grayish-white color.

Poison Oak is an upright shrub that can grow to 1 meter (3 ft) tall. The leaves are 15 cm (6 inches) long, alternate, with three leaflets on each. The leaflets are usually hairy, and are variable in size and shape, but most often resembling white oak leaves; they usually turn yellow or orange in autumn. The fruit is small, round, and yellowish or greenish.

Poison Sumac is a shrub or small tree, up to 20 ft in height, with 7-13 leaflets per leaf. These are oval to oblong; acuminate (tapering to a sharp point); cuneate (wedge-shaped) at the base; undulate (wavy-edged); underside is glabrous (hair-less) or slightly pubescent (down-like hair) beneath, and are usually 2-4 inches long. Its flowers are greenish, in loose axillary panicles (clusters) 3-8 inches long. The fruits are subglobose (not quite spherical), gray, flattened, and about 0.2 inches across.

COMMON POISON IVY
(RHUS RADICANS)

- Grows as a small plant, vine, and shrub.
- Grows everywhere in the United States except California and parts of adjacent states. Eastern oak leaf poison ivy is one of its varieties.
- Leaves always consist of three glossy leaflets.
- Also known as three-leaf ivy, poison, creeper, climbing sumac, poison oak, markweed, picry, and mercury.

Spring

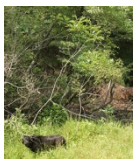
Summer

Fall

Winter

POISON SUMAC
(RHUS VERNIX)

- Grows as woody shrub or small tree from 5 to 25 ft tall.
- Grows in most of eastern third of United States.
- Also known as swamp sumac, poison elder, poison ash, poison dogwood, and thunderwood.



The allergic reaction associated with exposure to these plants will generally cause such signs and symptoms:

- Blistering at the site of contact, usually occurring within 12 to 48 hours after contact;
- Reddening, swelling, itching, and burning at the site of contact;
- Pain, if the reaction is severe; and/or,
- Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin.

Crusting and scaling occurs within a few days. Symptoms usually disappear in 1 to 2 weeks in cases of mild exposure and up to 3 weeks when exposure is severe.

Reaction to poisonous plants can be prevented if the exposed skin is washed with mild soap and water within 10 minutes of contact. Contact can be prevented by site workers wearing appropriate clothing. Preventive measures which can prove effective for most site personnel are:

- Avoid contact with any poisonous plants and keep a steady watch to identify, report, and mark poisonous plants found outside.
- Clean tools suspected of being in contact with poisonous plants.
- Wash hands, face, or other exposed areas at the beginning of each break period and at the end of each workday.
- Avoid contact with, and wash on a daily basis, contaminated tools, equipment, and clothing.
- Barrier creams, detoxification and wash solutions, may prove effective and should be tried to find the best preventive solution.
- Avoid spreading oils from these plants to hands, other parts of the body, and onto surfaces where other personnel without proper PPE may become affected.

Snakes. There are various types of venomous snakes indigenous to Colorado. The degree of toxicity resulting from snake bites depends on the potency of the venom, the amount of venom injected, and the size of the person bitten. Poisoning may occur from injection or absorption of venom through cuts or scratches. About 8,000 people are bitten by venomous snakes a year in the United States; however, only 5-10 people die. In contrast, 15,000 to 20,000 die every year from the side effects of aspirin. Venomous snake bites are medical emergencies and they can be deadly if not treated quickly. However, the chances of being envenomed are extremely low. Getting the victim to an emergency room as soon as possible is the very best treatment.

The most effective way to prevent snake bites is to avoid snakes in the first place. To minimize the threat of snake bites, all personnel will be aware of the potential for encountering snakes and will avoid actions that increase the likelihood of encounters (e.g., turning over logs). Personnel should avoid walking at night or in high grass and underbrush. Visual inspection of work areas should be performed prior to activities taking place. The use of leather boots and long pants will be required since more than half of all bites are on the lower part of the leg. Use of snake chaps is also recommended when working in areas where it is difficult to see the ground terrain due to dense vegetation. No attempt at killing snakes should be made; many people are bitten in such an attempt.

If someone is bitten by a potentially poisonous snake, treatment should be initiated:

- Keep the patient calm.
- Notify emergency medical services.

- Mark the place of the bite and write the time of the bite on the person with a marker. Wash the wound and keep the affected body part still, if time permits. Wear nitrile or rubber gloves when rendering first aid to minimize potential contact with venom and bodily fluid.
- Follow Universal Precautions as outlined in Shaw Procedure HS512, Handling of Blood or Other Potentially Infectious Material (Appendix 3 of APP).
- Apply direct pressure to the site of the bite if bleeding is extreme.
- Keep the affected area lower than the heart.
- Carry or have him/her walk slowly to the nearest vehicle and immediately transport to the nearest medical facility or hospital.

Hantavirus. Rodents, such as deer mice, can potentially carry hantavirus. Deer mice usually live at higher elevations, like mesas, and can be distinguished from other rodents by their small size (2-4/5 to 4 inches long) and by their bi-colored tail. However, the Center for Disease Control believes that other rodents also have the potential to carry the virus, so precautions must be taken when dealing with any species of rodent. It is not possible to distinguish by observation whether a rodent carries the hantavirus.

Hantavirus affects the respiratory system in humans. The first symptoms of infection can occur at any time up to 45 days after exposure and include one or more: fever, muscle aches, headache, or coughing. These symptoms progress rapidly into a severe lung disease that often requires intensive-care treatment. Hantavirus can be transferred to humans, primarily from breathing infected rodent excreta particles that have become airborne or ingesting excreta particles that have clung to hands or clothing. It can also be contacted from rodent bites or transferred through broken skin. Though the illness caused by hantavirus is severe, it is a relatively rare illness that can be prevented by simple precautions and common sense.

The best way to avoid contact with hantavirus is to avoid contact with rodents and their excreta. Do not leave food or garbage where rodents have access to them; this includes leaving food items and wrappers in vehicles. When possible, seal any opening greater than 1/4-inch diameter in vehicles or structure with steel wool to prevent rodent access.

Stinging Insects. Contact with stinging insects like bees, yellow jackets, hornets, and wasps may result in site personnel experiencing adverse health effects that range from being mild discomfort to life threatening. Therefore, stinging insects present a serious hazard to site personnel, and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects.

Nests and hives for bees, wasps, hornets, and yellow jackets often occur in ground, trees, and brush. The area will be checked for obvious nests and hives before it is cleared. If a nest or hive is found, the SSHO will be contacted before the nest is disturbed or removed. Bites and stings can be painful and may elicit an allergic reaction.

Individuals with life threatening allergies will not work in areas where there is a great potential for insect stings. If simple first-aid measures do not alleviate the symptoms, the victim will be taken to the nearest medical center. An attempt will be made to kill the offending insect and take it to the emergency room with the victim if this can be done quickly and without endangering personnel.

Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are:

- The nests for these insects are frequently found in remote, wooded, grassy areas.

- The nests can be situated in trees, rocks, bushes, or in the ground, and are usually difficult to see.
- Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active.
- If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention.
- Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock.
- Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth, and respiratory passages.
- The hypersensitivity needed to cause anaphylactic shock, can in some people, accumulate over time and exposure; therefore, even if someone has been stung previously, and has not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction upon receipt of another sting.

With these things in mind and with the high probability of contact with stinging insects, all site personnel shall comply with safe work practices:

- If a worker knows that he is hypersensitive to bee, wasp, or hornet stings, they must inform the SSHO of this condition prior to participation in site activities. The SSHO will question all site personnel concerning allergies or sensitivities prior to initiating work on site.
- All site personnel will be watchful for the presence of stinging insects and their nests, and shall advise the SSHO if a stinging insect nest is located or suspected in the area.
- Any nests located on site shall be flagged off and site personnel shall be notified of its presence.
- If stung, site personnel shall immediately notify the SSHO to obtain treatment and allow the SSHO to observe them for signs of allergic reaction.
- Site personnel with a known hypersensitivity to stinging insects shall keep required emergency medication on or near their person at all times.

Stings of bees, wasps, and hornets are responsible for more deaths in the United States than bites and stings of all venomous creatures. This is due to the sensitization by the victim to the venom from repeated stings, which can result in anaphylactic reactions. The stinger may remain in the skin and should be removed by teasing or scraping rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic-corticosteroid lotion is often used. People with known hypersensitivity to such stings should carry a kit containing antihistamine and epinephrine. Acquisition and maintenance of these kits is the responsibility of the individual.

Spiders. The biting insects of greatest concern are spiders, especially the black widow and the brown recluse. These spiders are of special concern due to the significant adverse health effects that can be caused by their bite.

- **Black Widow** – The black widow is a coal-black, bulbous spider 3/4 to 1-1/2 inches in length, with a bright red hourglass on the underside of the abdomen. The black widow is usually found in dark moist locations, especially under rocks and rotting logs and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:
  - Sensation of pinprick or minor burning at the time of the bite.
  - Appearance of small punctures (sometimes none are visible).

- After 15 to 60 minutes, intense pain is felt at the site of the bite which spreads quickly and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities.

- **Brown Recluse** – The brown recluse is brownish to tan in color, rather flat, 1/2 to 5/8 inches long with a dark brown "violin" shape on the underside. It may be found in trees or in dark locations. Victims of a brown recluse bite may exhibit the following signs or symptoms:

  -Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite.

  -Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance.

  -Systemic effects may include a generalized rash, joint pain, chills, fever, nausea, and vomiting.

  -Pain may become severe after 8 hours with the onset of tissue necrosis.

There is no effective first-aid treatment for either of these bites. Except for very young, very old, or weak victims, these spider bites are not considered to be life threatening; however, medical treatment must be sought to reduce the extent of damage caused by the injected toxins. If either of these spiders is confirmed to be on site, the SSHO shall brief the site personnel as to the identification and avoidance of the spiders. Site personnel should notify the SSHO if they locate either of these spiders.

Wild Animals. Normally, animals avoid people and areas where activities are ongoing. Small animals, such as raccoons, infected with rabies or when cornered, may become aggressive. When working, remain alert for likely locations that animals inhabit. Avoid nests, dens, and holes in the ground that may be the animal's home.

The only effective measure to preclude animal bites is avoidance. Contact with all wild animals will be avoided at all times. Persons bitten by an animal should seek medical assistance immediately, especially if it is suspected that the animal is rabid. Aggressive or disoriented behavior, as well as foaming of the mouth can be signs of rabid animals. Until medical assistance can be reached, persons should watch for symptoms of severe swelling, nausea, and shock.

Bloodborne Pathogens. OSHA has issued a Standard for Protection of Workers Potentially Exposed to Bloodborne Pathogens (29 CFR 1910.1030) which primarily involves medical and research personnel. Bloodborne pathogens are pathogenic microorganisms that may be present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus and human immunodeficiency virus.

Potential exposure during site activities results from workers who are infected. The OSHA Standard specifically includes first-aid providers and is enforceable on site subject to the Hazardous Waste Site Work and Emergency Response Standard (29 CFR 1910.120). The basic concept of this standard is that medical care workers and first-aiders must take the "Universal Precaution" of assuming that any blood-containing fluid or person bleeding or contaminated with blood-containing fluid is positive (infected) with both viruses.

Protection involves the use of personal protection such as gloves, eye shields, one-way valve rescue breather devices, and training. In order to effectively protect against any hazards, workers must have a basic understanding of the hazard. This is particularly true for personnel expected to administer first aid if necessary.

4.0 TRAINING REQUIREMENTS

4.1 GENERAL TRAINING

The SSHO will be responsible for informing all personnel performing on-site activities and all visitors of the contents of this SSHP and ensuring that each person signs the SSHP acknowledgment form (**Form 4-1**) before entering an Exclusion Zone (EZ). By signing this form, individuals recognize the hazards present on the site and the policies and procedures required to minimize exposure to hazards or adverse effects caused by hazards. Documentation of training certification and the training acknowledgment form (**Form 4-2**) will be reviewed by the SSHO, provided to the Site Supervisor, and filed on site. Untrained employees may be restricted from sites where the potential for exposure exists as determined by the SSHO. SOP HS050 contains a discussion on training requirements.

Shaw trains all field personnel according to Title 29 CFR 1926.65 (e) (3), 40-hour general site worker training before their initial assignment to any HAZWOPER project.

Form 4-1
Site Safety and Health Plan Acknowledgment Form

The contract for the above project requires that you be provided with complete formal and site-specific training; be supplied with proper personal protective equipment (PPE), be trained in its use; and receive a medical examination to evaluate your physical capacity to perform your assigned work tasks under the environmental conditions expected while wearing the required PPE. These provisions are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE REVIEWED, UNDERSTAND, AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR VB/I-70.

Printed Name	Signature	Representing	Date

Form 4-2
Training Acknowledgment Form

By signing this certificate, you are acknowledging that you have completed the following formal training courses that meet Occupational Health and Safety Administration (OSHA) requirements:

SITE-SPECIFIC TRAINING: I have been provided and have completed the site-specific training required by this Contract. The SSHO conducted the training._____
Employee/Visitor Initials

MEDICAL EXAMINATION: I have had a medical examination within the last 12 months, which was paid for by my employer. The examination included health history and pulmonary function tests and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment. I was personally provided a copy and informed of the results of that examination. My employer's SSHO evaluated the medical certification provided by the physician and signed the appropriate blank below. The physician determined that there were: no limitations to performing the required work tasks: _____
Employee/Visitor Initials

identified physical limitations to performing the required work tasks._____
Employee/Visitor Initials

[Employee's] [Visitor's] Signature_____

Date_____

Printed Name_____

Employer_____

Date_____

Printed Name_____

4.2 40-HOUR HAZWOPER TRAINING

The general list of topics covered in the 40-hour course:

- General site safety.
- Physical hazards (fall protection, noise, heat stress, and cold stress).
- Key management positions responsible for site H&S.
- Safety, health, and other hazards.
- Use of PPE.
- Work practices by which employees can minimize risks from hazards.
- Safe use of engineering controls and equipment on site.
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate over exposure to hazards.
- Worker Right-to-Know (HAZCOM).
- Engineering controls and safe work practices.
- Components of the site H&S program.
- Decontamination practices for personnel and equipment.
- Confined space entry procedures.
- Emergency Response procedures.

4.3 HAZWOPER SUPERVISORY TRAINING

Site supervisory personnel shall receive 8 additional hours of specialized training on program supervision. The topics discussed:

- Overall H&S Program.
- PPE Program.
- Spill Containment Program.
- Air-monitoring techniques.

4.4 HAZWOPER REFRESHER TRAINING

Personnel are required to complete 8 hours of refresher training annually on such topics:

- Safe work practices.
- Chemical hazard awareness.
- PPE.
- Hearing conservation.
- HAZCOM.
- Respirator refresher.
- Confined-space entry procedures update.

4.5 SUPERVISED FIELD EXPERIENCE

Personnel will receive a minimum of 3 days actual field experience under the direct supervision of a trained, experienced supervisor. This supervised field experience will be documented.

4.6 VISITOR TRAINING

Site access by personnel making deliveries or performing repairs to utilities, public or government officials, visitors, or local residents will be limited to support areas only. These persons will not be required to comply with the medical and training requirements as previously defined. Authorized visitors will be briefed on the hazards present at that location by the SSHO. Visitors will be responsible for compliance with the requirements specified in this SSHP.

4.7 TAILGATE SAFETY MEETINGS

The SSHO will conduct a tailgate safety meeting for all personnel at the beginning of each work shift or whenever new employees arrive at the job site once the job commences. The topics discussed at the tailgate safety meeting include H&S considerations for the day's activities, necessary PPE, problems encountered, and new operations. Attendance records and meeting notes are maintained with the project files. At the conclusion of each shift, a debriefing for site employees will be held, if necessary. SOP HS051 will be adhered to at all times.

4.8 SITE-SPECIFIC TRAINING

Shaw provides site-specific training for all personnel assigned to projects falling within the scope and application of 29 CFR 1926.65. The content of the training will be derived from information contained within this SSHP. All workers must also read and sign the SSHP acknowledging acceptance of site rules and understanding of site hazards before being permitted to enter an EZ. Emergency procedures will be reviewed during this training.

4.9 HAZARD COMMUNICATION

All personnel performing field activities shall receive basic HAZCOM training, which involves a review of the Shaw written HAZCOM program, container labeling, and chemical health hazards.

In order to comply with the OSHA HAZCOM Standard 29 CFR 1910.1200 and to ensure that site personnel are informed of the hazards associated with the materials with which they work, such requirements will apply to all commercial products containing hazardous substances that are brought on site:

- MSDSs will be maintained by the SSHO for each product containing a hazardous substance that will be used on site.
- All containers not supplied with adequate hazard labeling will have a HAZCOM label affixed to the container providing the health and physical hazards associated with the material.
- All personnel, including subcontractors who work with products containing hazardous substances, will be trained in accordance with the requirements of 29 CFR 1910.1200. This training will be performed and documented by the SSHO.
- An inventory of all products containing hazardous substances used on site will be maintained.

All personnel performing field activities shall receive basic HAZCOM training, which involves a review of the Shaw written HAZCOM program, container labeling, and chemical health hazards. SOP HS060 will be adhered to at all times.

4.10 FIRST-AID AND CARDIOPULMONARY RESUSCITATION

At least two persons trained in a minimum of both American Red Cross first-aid techniques and CPR will be on site whenever activities occur. The SSHO, Erica Koch and a sampling team partner (TBD) at a minimum will have current training. Refresher training in CPR is required every 2 years and every 3 years for first-aid. These two employees will meet both the training and vaccination requirements of Shaw's Bloodborne Pathogen Exposure Control Plan.

4.11 LEAD AWARENESS

Employees subject to exposure to lead at or above the OSHA action level (30 µg/m^3) will undergo additional lead awareness training. Lead is not anticipated to be present in concentrations where site activity could approach the action level based on results from former soil sampling. Therefore, it was concluded that lead awareness training is not required for this Scope of Work (SOW). In the event subsequent lead sampling indicates high levels of lead in soil, the concentrations will be evaluated in relation to occupational exposure potential and relevant standards applied for remedial action phase of VB/I-70.

4.12 LEAD BASED PAINT ABATEMENT TRAINING

Lead abatement personnel shall be trained in accordance with the OSHA 1910.1025 Standard.

At the minimum, the following elements should be included in the employer's worker protection program for employees exposed to lead:

- Hazard determination, including exposure assessment;
- Engineering and work practice controls;
- Respiratory protection;
- Protective clothing and equipment;
- Housekeeping;
- Hygiene facilities and practices;
- Medical surveillance and provisions for medical removal;
- Training;
- Signs; and
- Recordkeeping.

5.0 PERSONAL PROTECTIVE EQUIPMENT

This section provides guidelines for selection of appropriate PPE in accordance with 29 CFR 1910.120 (g) (5), 1910.134, and 1910.132. Environmental and personal monitoring will be conducted to identify health hazards to determine appropriate level of employee protection needed. Environmental and personal monitoring requirements are presented in Section 7.0.

5.1 RESPIRATORY PROTECTION

Respiratory protection is not anticipated for soil removal based on the maximum levels of lead, 744 ppm and arsenic, 86 ppm, identified from recent sampling activities. The levels of metals present in soil are not at concentrations where they could be expected present in workers breathing zone from remedial activities. Additionally, wetting techniques will be utilized during soil disturbance work to reduce particulate exposure, hence, lead well below the action level and arsenic well below the TWA.

Hearing Conservation

A hearing conservation program will be implemented at the site when exposures equal or exceed an 8-hour time-weighted average (TWA) of 85 A-weighted decibels (db). Hearing loss caused by high sound levels is a problem that can be prevented. Sound-level dosimetry has been performed on similar site operations and the results indicated a TWA below the 85 db A-weighted action level.

Engineering controls, such as mufflers and baffles, will be utilized when feasible to reduce noise. Hearing protection, such as E-A-R™ plugs (Noise Reduction Rating of 29), is required to be worn by personnel working with or around loud equipment. SOP HS402 will be adhered to.

5.2 LEVELS OF PROTECTION

The following is a brief description of the PPE that will be required during the sampling and excavation activities. The OSHA terminology for protective equipment will be used: Levels A, B, C, and D. Use of Levels A and B protection is not anticipated during this project. Level D PPE will be utilized for shallow intrusive soil sampling and removal activities as described below:

Where foot traffic and proximity to moving equipment or vehicular traffic is required, all personnel will be required to wear Class II or Class III reflective traffic vests or as specified by the SSHO.

5.3 LEVEL D PROTECTION

Level D PPE at a minimum shall consist of:

- Street clothes or coveralls.
- Steel or composite-toed work boots
- Safety glasses.
- Hard hats.
- Hearing protection (if necessary).
- Splash shield (if necessary).
- Hardhat.
- Leather gloves.
- Face shield over safety glasses and safety chaps (chain saw or brush trimmer use).

Modified Level D PPE will be required when personnel have direct contact with soils or lead based paint. Modified Level D will include the addition of Tyvek, Nitrile gloves and rubber boot covers.

Level C PPE with half-face APR equipped with HEPA filters may be required for LBP abatement once an initial determination of the LBP has been established and mitigation methods evaluated.

Emergency and first aid equipment will be available at all times. The team support vehicle will be designated as an emergency vehicle. **Table 5-1** presents a list of emergency and first aid equipment needed on site.

Table 5-1 Emergency Equipment Requirements

Emergency Equipment	Number per Location	Location Stored
First-Aid/Burn Kit*	1 each	Team Support Vehicle
Eye Wash	1 each	All First Aid Kits
CPR Pocket Mask	1 each	All First Aid Kits
Disposable Latex Gloves	5 each	All First Aid Kits
Bloodborne Pathogen Kit	1 each	All First Aid Kits
Fire Extinguisher (10 BC Rated)	1 each	Team Support Vehicle

*First aid kit contents should be consistent with the requirements presented in SOP HS106.

5.4 ACTIVITY-SPECIFIC LEVELS OF PROTECTION

The required level of protection is specific to the activity being conducted. For VB/I-70 sampling and abatement, the initial levels of PPE have been identified as outlined above and in the AHAs, and JSA approved by the SSHO and HSM.

PPE consistent with Shaw Procedure HS600 will be required during field work. **Table 5-2** presents the PPE requirements for remediation planned at VB/I-70. The SSHO will review the required level of protection and safety equipment with each work crew. The ultimate decision on which protective level is most appropriate will be made by the SSHO. The level of protection selected will be based on:

- The type and measured concentration of the chemical substance having the lowest permissible exposure level (PEL), threshold limit value (TLV), and/or immediately dangerous to life or health (IDLH) concentration in the ambient atmosphere, its range of toxic properties and LEL, and the evaluated degree of hazard.
- Potential for exposure to substances in the air, liquid splashes, or other direct contact with hazardous materials.
- Hazardous materials.

Table 5-2 Personal Protective Equipment Requirements

Activity/Location	PPE Level	Comment
Site Setup and Restoration	Level D	Level D when no contact with contaminated material exists.
Soil Sampling	Level D	Level D when no contact with contaminated material exists.
Soil Removal	Level D	Level D when no contact with contaminated material exists.
LBP Abatement	Modified Level D	Upgrade to Level C pending nature and extent of LBP.

In situations where the chemical identity, concentrations, and possibility of contact are not well-characterized, the appropriate level of protection will be one level higher than the suspected level of protection, based on professional experience and judgment, until the hazards can be better identified.

6.0 MEDICAL SURVEILLANCE

Shaw will utilize the services of a Board-Certified Occupational Medicine physician for the medical surveillance requirements of this project. Dr. William Nassetta (below) will review all medical examinations and will be available for medical consultation on an as-needed basis.

Dr. William Nassetta, MD, MPH
CORE Health Services
12091 Bricksome Avenue, Suite B
Baton Rouge, Louisiana 70816
(225) 756-2673 (office)
(225) 295-4846 (fax)

6.1 MEDICAL EXAMINATION

As required by SOP HS100, all personnel working Hazardous, Toxic, and Radioactive Waste or HAZWOPER projects will have successfully completed a pre-placement or periodic/updated physical examination. The SOP HS102, Management of Employee Exposure and Medical Records, will be followed. The contents of this examination were determined by the Occupational Medical Physician. The HSM may consult with the physician and recommend additional testing of employees or subcontractors.

6.2 PRE-PLACEMENT EXAMINATION

This examination was designed to meet the requirements of 29 CFR 1926.65 and 29 CFR 1910.120. The Shaw medical surveillance program examination, at a minimum, consists of:

- Medical and occupational history questionnaire that includes information on past gastrointestinal, hematologic, renal cardiovascular, reproductive, immunological, and neurologic problems.
- Physical examination.
- Blood pressure measurements.
- Complete blood count and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology.
- Blood urea nitrogen and serum creatinine.
- Pulmonary function test.
- Audiogram.
- Drug screening.
- Visual acuity.

Such information is, or has been, provided to the examining physician:

- Copy of 29 CFR 1910.120 (g) (5), 1910.134, and 1910.132.
- Description of employee's duties.
- Contaminants of potential exposure.
- Description of the PPE to be used.
- Information from previous medical exams.

The employee will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

6.3 ANNUAL EXAMINATION

Shaw field employees receive an annual update examination meeting the requirements of 29 CFR 1926.65. The results of these exams are compared to previous results and the baseline physical to determine if any effects due to exposure have occurred. Appropriate actions are taken as recommended by the physician should the results indicate an exposure; otherwise, employees are cleared for continued work.

6.4 EXIT EXAMINATION

Shaw offers exit physical examinations for all employees involved in the medical surveillance program who are leaving the company for any reason to ensure they are in good health.

6.5 LEAD STANDARD MONITORING

Biological pre and post exposure monitoring for blood lead levels will also be performed. Lead hazards above OSHA action levels are not expected to occur during VB/I-70 remediation based on actual arsenic and lead concentrations identified in soil. However, biological monitoring will be conducted for worker protection.

6.6 SUBCONTRACTOR REQUIREMENTS

Subcontractors that fall within HAZWOPER guidelines will certify that all their employees have successfully completed a physical examination by a qualified physician on the Training Acknowledgment Form (**Form 4-2**). The physical examinations will meet the requirements of 29 CFR 1926.65 and 1926.62. Subcontractors will also supply copies of the medical examination certificate for each employee they have on site. Subcontractors performing surveying and utility locate services at VB/I-70 are not required to be HAZWOPER certified.

6.7 MEDICAL RECORDS

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR 1926.65 and will be kept for the duration of employment plus 30 years. Confidentiality of employee medical records will be maintained. The written medical opinion from the occupational physician will be made available upon request to the USACE representative for any site worker.

6.8 MEDICAL RESTRICTIONS

When a medical care provider identifies a need to restrict work activity, the employee's home office will communicate the restriction to the employee, SSHO, and HSM. The terms of the restriction will be discussed with the employee and the SSHO. Every attempt will be made to keep the employee working while not violating the terms of the medical restriction.

7.0 ENVIRONMENTAL AND PERSONAL MONITORING

Environmental and personal monitoring will be conducted as appropriate to identify health hazards in order to determine the appropriate level of employee protection needed on site and to monitor potential worker exposure to hazardous substances. Air monitoring will consist of aerosol particulate monitoring using direct reading instruments and integrated air sampling equipment. Additional information on air monitoring is outlined in the Dust Control Plan. The following sections may be amended in event unanticipated materials are encountered.

Table 7-1 Air Monitoring Requirements

Activity/Location	Air Monitoring Instrument Required
Soil removal	PDR-1000 Aerosol Monitor and Personal Sampling Pumps. MINIVOL TSP Sampler, PM 2.5 and PM 10 Samplers

The MiniRAM PDR-1000 or equivalent monitor will be used to measure any generation of dust during remediation activities that disturb yard soils (i.e., soil removal and excavation) to determine the immediate effectiveness of dust control measures and potential worker exposure. The action levels below were derived using the maximum lead (744 ppm) and arsenic (86 ppm) concentrations identified in soil and applying a protection factor of four times the respective TLV for arsenic and OSHA action level (0.03 ug/m^3) for lead.

Instrument	Action Level	Controls
PDR-1000	> 7.48 mg/m^3	Wet soil with water

Personal air monitoring will be performed during the first three days of residential remediation to confirm the initial negative exposure determination based on the above action level. Personal samples will ne collected and analized in accordance with NIOSH Mathod 7300. All personal exposure samples shall be analized by an AIHA PAT laboratory.

7.1 VOC MONITORING

Monitoring for VOCs will not be required unless an indication of VOC hazards are identified that cannot be avoided.

7.2 CALIBRATION OF AIR MONITORING EQUIPMENT

All air monitoring equipment if deemed necessary during the course of the remedial investigation will be maintained and calibrated according to the manufacturer's recommendations, which will be available and maintained by the SSHO. Calibration will be done before and after use each day and under the approximate environmental conditions the instrument will be used. All air monitoring activities will be documented on the equipment calibration log.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSHO shall be responsible for immediately removing the instrument from service and obtaining a replacement unit. The specific Shaw or subcontractor operation for which this equipment is essential shall cease until an appropriate replacement unit is obtained. The SSHO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

When applicable, only manufacturer-trained and/or authorized Shaw personnel will be allowed to perform instrument repairs or preventive maintenance.

7.3 RECORDKEEPING

The SSHO or his designee will be responsible for establishing and maintaining records of all required monitoring described below:

- Date, time, location, pertinent task, and exposure information.
- Description of the analytical methods, equipment used and calibration data.
- Type of PPE worn.
- Engineering controls used to reduce exposure.
- Sampling location.
- Work operations taking place during monitoring.
- Meteorological data.
- Signature of analyst/sample collector.
- Daily Quality Control/Safety Report.

8.0 SITE CONTROL

The SSHO will designate and coordinate access and security on site to prevent access to potentially hazardous conditions by unauthorized personnel. An EZ will be established around a work site. The EZ will be large enough to prevent personal injuries from physical hazards. The limits of the EZ will be marked with hazard tape or other suitable marking material or site personnel will establish perimeter surveillance. It is anticipated the existing fencing around some properties will be used as an access control barrier during sample collection and subsequent remediation.

Eating, drinking, and smoking are prohibited except in designated support areas.

In case of emergency, personnel will exit the site and move to the designated safe area as determined in advance for the specific site condition.

8.1 PERIMETER POSTINGS

Appropriate warning signs will be strategically placed where people enter the EZ. Signs should read or be similar to:

"NOTICE – DO NOT ENTER. AUTHORIZED PERSONNEL ONLY."

Signs may be more hazard-specific as necessary in event lead is determined above action levels.

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

Additional signs may be posted at the perimeter of the site to alert passersby of potential dangers. Additionally, signage required to identify construction ahead or trucks enrering roadway will be erected in accordance with CO and MUTC regulations.

8.2 COMMUNICATIONS

Cellular telephones will be the primary means of communication.

8.3 SECURITY

This section describes the procedures for controlling access by personnel and vehicles into potentially dangerous or hazardous working areas within the site. Security fencing and warning signs will control access to each area. Entrance to each area will be restricted to specific points that will be controlled and monitored by project personnel. Only project personnel, subcontractor personnel, and authorized visitors with proper identification will be allowed access to the site. Security measures described in the sections below include:

- Security operations.
- General security.
- Site-specific areas.

8.4 SECURITY OPERATIONS

The primary mission of security operations is the control of personnel and vehicles entering and leaving the sites. Control will be provided by installing barricades across the intrusive investigation areas, depending on site-specific conditions, with specific points established to gain access. As work progresses, the barriers will be relocated, as required.

8.5 GENERAL SECURITY

Security operations will include:

- Maintaining a visitor log at the project reception desk and work sites.
- Escorting visitors to the site(s) by project personnel. Visitors will receive an abbreviated site orientation briefing in accordance with this SSHP.
- Notifying law enforcement in the event of vandalism, trespassing, or breaking and entering. It is not intended that project personnel assume a confrontational role.
- Locking site facilities containing items of value, or which are subject to vandalism, when unoccupied.

8.6 SITE-SPECIFIC AREAS

Site security for the remediation activities will consist of one or all measures:

- Materials and supplies will be placed in locked boxes.
- Signs stating "Authorized Personnel Only" will be installed around areas of work activity.
- Warning signs will be erected at specific areas to provide warning of hazardous conditions in accordance with the requirements of this SSHP.

9.0 PERSONNEL DECONTAMINATION

Personnel decontamination facilities [Contamination Reduction Zone (CRZ)] will be established on site to ensure that personnel maintain a high degree of personal hygiene and minimize exposure to chemical hazards. The personnel decontamination area will be established immediately outside the EZ to facilitate decontamination and PPE removal. All disposable PPE as applicable will be placed into trash receptacles at the CRZ. Just beyond the CRZ, employees will wash their hands and faces using disposable towelettes or by a hand and face wash station.

Decontamination procedures are not typically required for Level D protection, however, personnel will be required maintain a high degree of clean hygiene during the course of remedial actions.

10.0 SPILL CONTAINMENT

There are no hazardous substances or materials expected to be on site that would potentially pose a spill concern. If a spill occurs, preventive measures will be implemented in accordance with Section 11 of the APP.

11.0 RECORDKEEPING AND DATA MANAGEMENT

Proper recordkeeping and data management are essential in the implementation of this SSHP. The forms associated with recordkeeping and data management requirements must be completed in an accurate, timely fashion and filed with the appropriate entities. It is the responsibility of the SSHO to ensure that the forms are properly completed. Completed forms will be kept and maintained by Shaw. These records shall be maintained for a 5-year period. Subcontractors will also be responsible for keeping a copy of the forms pertaining to their personnel.

11.1 LOGS

The SSHO will maintain and complete a daily log for each day's work. The daily log will document chronologically each day's H&S activities in sufficient detail for future reference as needed. Other relevant data and field information will be recorded on separate log forms for air monitoring, sampling, equipment calibration inspections, and incident reporting.

An EZ sign-in log or daily log will be maintained that will provide a project record of the following information for each work shift's activities:

- Worker's name.
- Work area.
- Duties performed.
- Level of protection.
- Time in/time out.

A visitors' sign-in log will be maintained. Visitors requesting access to field activities must have appropriate project approval.

An OSHA 2203 Job Safety and Health Protection poster and other required Shaw, Federal, and State postings will be maintained on site.

11.2 SAFETY INSPECTIONS

Shaw's Accident Prevention Program is centered around key procedures:

- Project reporting, investigation, and review of all near misses, incidents, and accidents.
- Management reviews of all incident/accident reports, corrective action, and project safety concerns.
- Review of project, operations, and construction activities by H&S professionals.

Safety reviews and inspections are conducted by all tiers of the management structure and are documented. A list of all corrective action items is required to be maintained showing the corrective action, responsible person, and the date action is to be completed. Follow-up inspections are conducted by H&S personnel to ensure that corrective actions or measures were implemented.

The Shaw Site Supervisor and Project Manager will both inspect the site at least monthly and interview one or two site workers regarding areas of safety concerns or ideas for safety improvement. Site supervisory personnel will inspect site conditions and activities daily to identify changing conditions or potential hazards. Identified safety and occupational health deficiencies and suggested corrective measures will be brought to the attention of the SSHO and HSM. Safety review inspections will be recorded and filed for reference by Shaw project management and USACE personnel.

12.0 REFERENCES

U.S. Army Corps of Engineers (USACE). 2007. Engineer Regulation (ER) 385-1-92, *Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste Activities*. 1 May.

U.S. Army Corps of Engineers (USACE). 2008a. Engineer Manual (EM) 385-1-1, *Safety and Health Requirements Manual.* 15 September 2008.

Attachment A

Incident Notification, Reporting, and Management Procedure

Incident Notification, Reporting, and Management Procedure – VB/I-70 Project

Directions, Notes, and Reminders

- **Follow this procedure step-by-step for all incidents.**
- **This procedure has limited application to subcontractors. Assist subcontractors with medical emergencies (as applicable) and then immediately notify the Program H&S Manager for guidance.**
- **Periodically review this procedure in order to be familiar with the steps - prior to an incident occurring.**
- **For injuries and vehicle accidents, secure the scene to prevent additional injury/incident, administer on-site first aid, and arrange for emergency assistance prior to making any other notifications.**
- **The Site Supervisor is responsible for making all other notifications to:**
  - **CORE Health Networks (must be notified while employee is en route to medical care facility): 877-347-7429 or 225-614-9561**
  - **Shaw Help Desk / Hot Line: 866-299-3445 or 225-215-5056**
  - **Project Manager: Morey Engle: 303-741-7007(office), 720-480-3204 (mobile)**
  - **Marcia Musgrave: 419-425-6160**
- **The Site Supervisor (or SSHO) is responsible for notifying the Program H&S Manager or Alternate H&S Manager by telephone prior to making any other notifications (other than calling 911 and CORE Health).**
- **The Site Supervisor or SSHO shall accompany all injured personnel to the CORE clinic or to the hospital emergency room.**
- **The Project Manager shall notify the Program Manager in person or by telephone no later than two hours after the incident.**
- **All incident reports shall be completed by typing (when feasible and applicable).**
- **All incident reports shall be submitted (email or fax) to the Program H&S Manager or Alternate H&S Manager for review and distribution.**
- **Complete all the blanks on the INCIDENT NOTIFICATION AND COMMUNICATION CONTACT LIST (page 6) and post near all site telephones.**

Incident Notification, Reporting, and Management Procedure

Action	Who / When	Under what circumstances	How	Notes
1. Notify Site Supervisor for all incidents (no matter how minor)	Injured person, first person recognizing incident, driver/passenger, or employee causing damage *Immediately*	All incidents no matter how minor (including minor cuts, scratches, minor strains/sprains, and insect bites)	In person or by telephone	Site Supervisor to make note of very minor incidents (such as band-aid over scratch) in field logbook
2. For *life-threatening injuries / illnesses* - make scene safe, contact local emergency personnel For *non life-threatening injuries / illnesses* - make scene safe, transport injured person to doctor at an occupational medical facility For *vehicle accidents* – make scene safe, notify police, aid injured parties For *equipment / property damage* - make scene safe, prevent further damage or injuries	Site Supervisor *Immediately (concurrently with next step if injury or illness)* Site Supervisor *Immediately (concurrently with next step if injury or illness)* Driver/passenger *Immediately* Employee causing damage *Immediately*	In case of serious injury or illness requiring off-site medical care	Via ambulance Via vehicle	Site Supervisor or Site Safety Officer must immediately go to emergency care facility. Follow HS101 post accident alcohol and drug testing procedure. Site Supervisor or Site Safety and Health Officer must transport and stay with injured person until released from care. Make medical personnel aware of Shaw's "restricted work will be provided" and "no prescriptions if possible" policies. CORE clinics are the preferred urgent care facilities when possible, unless injury is severe and victim is transported by ambulance.
3. Notify CORE Health Services (for injuries / illnesses to Shaw employees only)	Site Supervisor *Immediately, prior to transporting the injured employee, unless injuries are life threatening*	• Serious injury requiring off-site medical care • If employee states that he/she has been exposed to any chemical or biological substance • If illness is work related	**CORE Health 877-347-7429** **Note: Outside Continental US: call 225-614-9561**	Not required for temporary agency and subcontractor labor Provide name of injured employee, name and phone # of treating medical facility, description of the incident CORE will help with medical facility coordination and follow-up care
4. Notify Program H&S Manager (if unsure, see contact list) Notify Alternate H&S Manager if Program H&S Manager cannot be contacted. (if unsure, see contact list)	Site Supervisor *Immediately (concurrently with providing transportation to occupational medical facility or EMS transport to hospital)*	All incidents except on-site first aid cases	See Incident Notification and Communication Contact List (attached)	Program H&S Manager will notify H&S Director

Incident Notification, Reporting, and Management Procedure

Action	Who / *When*	Under what circumstances	How	Notes
5. Notify Shaw Notification Hotline / Help Desk	Site Supervisor *As soon as possible. Prior to sending an individual for medical treatment*	• Illness and/or injury (doctors cases and above) • Any utility damage • Property damage (damage > $2,500.00) • Vehicle accidents (All) • Criminal activity (i.e. bomb threat, theft) • Natural disaster (all) • Explosion and/or fires (damage > $2,500.00 or result in injury) • Environmental spills/releases (incidents that requires regulatory notification or have an offsite impact) • Regulatory agency visit • Fatalities	Shaw Notification Hotline / Help Desk Phone Number: 866-299-3445 Note Outside Continental US : 225-215-5056	Request name of Hotline / Help Desk operator for future reference and note date/time of notification
6. Complete forms: *Injuries and illnesses*: • Authorization for Release of Protected Medical Information • Authorization for Treatment of Occupational Injury/Illness • Return-To-Work Examination Form *and* fax to CORE *and* email or fax to Program H&S Manager	Injured employee and medical facility personnel (Site Supervisor or Site Safety and Health Officer is responsible for verifying forms are completed) *Prior to leaving medical facility*	• Serious injury requiring off-site medical care • If employee states that he/she has been exposed to any chemical or biological substance	Fax to CORE: 225.292.8986 Email or fax to Program H&S Manager	Site Supervisor or Site Safety and Health Officer must take these forms with him/her to occupational medical facility or hospital (Contained in HS 020) Contact Program H&S Manager for blank electronic forms or obtain forms from: http://shawnet3.shawgrp.com/sites/eihs/federal/Lists/Announcements/DispForm.aspx?ID=8
7. Call Project Manager and notify of incident (Remind Project Manager of notification responsibilities to Program Manager)	Site Supervisor *As soon as reasonably possible*	If Hot Line / Help Desk notification is required (see # 5 above)	See Incident Notification and Communication Contact List	Project Manager will verbally report incident to upper level of Operations/Business Line Management *As soon as reasonably possible*
8. Notify Marcia Musgrave	Site Supervisor	All incidents involving personnel (injuries, illnesses, vehicle accidents)	419-425-6160	

Incident Notification, Reporting, and Management Procedure

Action	Who / When	Under what circumstances	How	Notes
9. Call back Program H&S Manager to report on status of *injured / ill employee*	Site Supervisor *Prior to employee leaving medical facility*	All injuries and illnesses requiring off-site medical care	See Incident Notification and Communication Contact List (attached)	
10. Complete forms (typed electronically): *OSHA Recordable Cases* • Supervisor's Employee Injury/Illness Report Form • Injured Employee Statement • Witness Statement Form(s) *First Aid Cases (Doctor's)* • Supervisor's Employee Injury/Illness Report • Injured Employee Statement • Witness Statement Form(s) Email or Fax completed forms to Program H&S Manager and CORE	• Site Supervisor • Witnesses *As soon as possible – no later than 24 hours*	All injuries, illnesses, and first aide cases	Email or fax to Program H&S Manager See Incident Notification and Communication Contact List (attached) Fax to CORE 225.292.8986	Site Supervisor should have these forms with him/her at all times (Contained in HS 020) Contact Program H&S Manager for blank electronic forms or obtain forms from: http://shawnet3.shawgrp.com/sites/eihs/federal/Lists/Announcements/DispForm.aspx?ID=8
11. Complete forms (typed electronically): *Chargeable Vehicle Accidents* • Vehicle Accident Report • Witness Statement Form(s) • Driving Record Certification (Procedure HS800) *Non-Chargeable Vehicle Accidents* • Vehicle Accident Report • Witness Statement Form(s) *Equipment, Property Damage and General Liability Incidents* • Equipment, Property Damage and General Liability Loss Report • Witness Statement Form(s) Email or Fax completed forms to Program H&S Manager	• Site Supervisor • Witnesses *As soon as possible – no later than 24 hours*	All vehicle accidents and /or all property damage	Email or fax to Program H&S Manager Health See Incident Notification and Communication Contact List (attached)	Supervisor should have these forms with him/her at all times (Contained in HS 020) Contact Program H&S Manager for blank electronic forms or obtain forms from: http://shawnet3.shawgrp.com/sites/eihs/federal/Lists/Announcements/DispForm.aspx?ID=8

Incident Notification, Reporting, and Management Procedure

Action	Who / When	Under what circumstances	How	Notes
12. Complete these additional forms (typed electronically): *OSHA Recordable Cases* • Incident Investigation Report *First Aid Cases (Doctor's)* • Incident Investigation Report *Chargeable Vehicle Accidents* • Incident Investigation Report *Non-Chargeable Vehicle Accidents* • Incident Investigation Report *Equipment, Property Damage and General Liability Incidents* • Incident Investigation Report	Site Supervisor *As soon as possible – no later than 72 hours of incident*		Email or fax to Program H&S Manager See Incident Notification and Communication Contact List (attached)	Supervisor should have these forms with him/her at all times (Contained in HS 020) Contact Program H&S Manager for blank electronic forms or obtain forms from: http://shawnet3.shawgrp.com/sites/eihs/federal/Lists/Announcements/DispForm.aspx?ID=8
Near Miss • Incident Investigation Report		Near Misses as defined by HS020		
• SharePoint electronic Near Miss Report	*As soon as possible – no later than 96 hours of incident*	All other Near Misses	Contact Program H&S Manager	
Email or Fax completed forms to Program H&S Manager				Do not include any employee or project identification information – *these reports are anonymous*
13. Perform "Accident Review Board" (ARB) as required by HS020 - Coordinate through Program H&S Manager	Program H&S Manager *Within 10 days of incident*	OSHA Recordable Cases Chargeable Vehicle Accidents		
Perform "Incident Review Board" (IRB) to extract lessons learned - Coordinate through Program H&S Manager		Doctor's First Aid Cases Utility damage or significant property damage		An IRB is outside of the HS020 requirements for an ARB.

INCIDENT NOTIFICATION AND COMMUNICATION CONTACT LIST

NAVFAC ESC - Fuels Projects

Project Number: **146543** Project Name / Location: **VB/I-70 Denver, Colorado**

Name	Phone Number(s)	Fax Number	E-mail
Shaw Notification Hotline/Helpdesk	866-299-3445 **225-215-5056 (Outside Continental US)**	N/A	N/A
CORE Health Services (Must be notified prior to or during transport to medical treatment center)	877-347-7429 **225-614-9561 (Outside Continental US)**	225-292-8986	
Program H&S Manager Winston D. Russell	865-692-3584 (office) 865-414-9545 (cell)	865-690-3626	winston.russell@shawgrp.com
H&S Director, Federal ERC Business Line Dave Mummert, CIH	419-425-6129 (office) 419-348-1544 (cell)	419-425-6039	david.mummert@shawgrp.com
SSHO Erica Koch	303-915-8455 (cell)	NA	Erica.koch@shawgrp.com
Project Manager Morey Engle	303-741-7007 (office) 720-480-3204 (cell)	303-741-7703	Morey.engle@shawgrp.com
Project Manager Thomas P. Mathison, PMP	412-380-6207 (office) 412-401-1309 (cell)	412-374-1486	Tom.Mathison@shawgrp.com
Sr. Director, Health & Safety, Shaw E&I Andrew Johnson, CIH	513-782-4972 (office) 859-393-4346 (cell)		andrew.johnson@shawgrp.com

Note: Incident reports shall be faxed or emailed only to the Program H&S Manager (or Alternate H&S Manager) for review and proper distribution.

Updated June 26, 2012