HEALTH AND SAFETY PLAN (HASP)

This plan summarizes health and safety hazard information for the project described below. This plan delineates procedures that will allow personnel to work safely and respond swiftly and appropriately to site emergencies. The objective of the HASP is to identify the hazards present on site to adequately protect personnel from these hazards. This health and safety plan will be amended and updated as further information regarding the site is obtained or as site specific tasks change. In addition, audits will be conducted to ensure that the contents of this plan are being appropriately implemented for the duration of this project.

Individuals working on this project must have completed 40-hour training and the subsequent refresher training as specified in 29 CFR 1910.120 (e).

Note: **All personnel who work on this site must understand this plan and sign the attached employee acknowledgment form.** Field operations will conform to all applicable standards, regulations, and URS Safety Management Standards. **In addition, a site briefing will be conducted prior to the initiation of operations, and on a daily basis prior to the commencement of each day's work. Documentation of these safety briefings will be logged in the field log book.**

Site Name: Upper Animas Mining District **Project Number:** 36548996.00000

Site Location: San Juan County, CO

Effective dates: From 10/07/2010 **To** 11/01/2010

1. Key Personnel

TITLE	NAME
Project Manager	Megan Adamczyk
Field Team Leader	Andrew Longworth
Health and Safety Team Member	Nate Williams
Other Members	Bryan Willaims

2. Training and Medical Monitoring Requirements

All personnel will be required to have completed training as specified in 29 CFR 1910.120. In addition, individuals involved in this project must be enrolled in a medical monitoring program as specified in 29 CFR 1910.120 (f). This plan will be amended as necessary to accommodate additional training and/or medical monitoring that may become necessary due to unforeseen site conditions. Documentation of these changes in required training or medical monitoring will be maintained in the field log book.

3. General Scope of the Project

Conduct sampling in Cement Creek, Mineral Creek, and the Animas River to collect data for HRS scoring purposes.

4. Specific Scope of Work

Collection of 61 co-located surface and sediment samples from the Animas River and Cement Creek. Collection of 11 surface soil samples. Collection of 8 adit water samples. Opportunity samples may be added as appropriate.

5. Task Hazard Analysis

TASK	HAZARD	CONTROL MEASURES
Driving to and from site in San Juan County, CO	Other drivers, pedestrians, weather and road conditions	Obey speed limits, watch out for other drivers, monitor weather and road conditions, slow down for adverse conditions, be aware of and yield to pedestrian traffic
Surface water and sediment sampling	Steep terrain to access surface water and sediment; slips, trips, and falls; weather conditions; sample preservative-Nitric Acid	Be aware of your surroundings and look for easiest access to surface water; wear appropriate clothing for weather and footwear (rubber boots or hip waders) for slick and wet banks; wear gloves and safety glasses when adding Nitric Acid to water sample.
Sampling	Cold weather	Monitor weather conditions. Take warming breaks when needed. Wear appropriate clothing and footwear.

6. Chemical Hazards

The following table lists the potential chemical hazards that may be encountered on this project either found at the site or brought on site by START personnel. The manufacturer's specific Material Safety Data Sheets or National Institute for Occupational Safety and Health (NIOSH) Chemical Safety Data Sheets for these chemical hazards are included as Attachment A.

Chemical Compound	PEL or TLV	Photo Ionization Potential	Odor Threshold	Physical Properties at 70 degrees F.	Routes of Exposure	Acute Symptoms
Lead	0.05 mg/m3	NA	NA	White to grey metal, solid	Inhalation, ingestion, skin, eye	Irritated eyes, weakness, insomnia
Arsenic	0.01 mg/m3	NA	NA	Silver grey metal, solid	Inhalation, ingestion, skin, eye	Irritated skin and eyes, GI disturbances

* Physical Properties may include phase, odor, reactivity, incompatibilities, etc. Example: Methanol would be listed as a clear, volatile liquid with a characteristic odor.

7. Physical Hazards

- ☒ Slip, Trip, and Fall
- ☒ Heat or Cold Stress
- ☒ Weather
- ☐ Automotive Traffic
- ☒ Surface Water
- ☐ Aggressive Individuals
- ☐ Laceration Hazards
- ☐ Radiation Hazards
- ☐ Thermal Hazards
- ☐ Overhead/Underground Utilities
- ☐ Other: _____

8. Confined Space

A confined space is a space that is large enough for personnel entry with limited or restricted means for entry or exit, and is not designed for continuous human occupancy.

Permit-required confined space hazards include risks of asphyxiation; fire or explosion; chemical exposure; engulfment or drowning; electrocution; or dismemberment. Examples include, but are not limited to, sewers, utility vaults, tanks, sump pits, and excavations where there is the potential for atmospheric hazards.

A non-permit-required space is a confined space that does not present any potential hazards, nor will the work performed therein create a hazardous condition.

Confined space present: ☐ Yes ☒ No

Confined spaces on this project consist of the following:

Work performed in the previously listed confined spaces must be conducted according to Safety Management Standard for confined spaces. See Attachment B.

9. Personal Protective Equipment (PPE) Required

LEVEL A:

☐ **Applicable** ☐ **Possible** ☒ **Not Applicable**

☐ Self contained Breathing Apparatus (SCBA) ☐ Air Line Respirator (ALR)

Impermeable Outer/Inner Suit, Gloves, Boots
Inner Glove Type: _____

☐ Hearing Protection ☐ Steel Toed Boots
☐ Other: _____

LEVEL B:

☐ **Applicable** ☐ **Possible** ☒ **Not Applicable**

☐ SCBA ☐ ALR

Inner/Outer Suit Type: _____
Inner/Outer Glove Type: _____
Outer Protective Boot Type: _____
Steel Toed Boots

☐ Hearing Protection ☐ Face Shield ☐ Hard Hat
☐ Other: _____

LEVEL C:

☐ **Applicable** ☐ **Possible** ☒ **Not Applicable**

Air Purifying Respirator (APR) with _____ Cartridges

Inner/Outer Suit Type: _____
Inner/Outer Glove Type: _____
Outer Protective Boot Covers: _____
Steel Toed Boots

☐ Hearing Protection ☐ Face Shield ☐ Hard Hat
☐ Other: _____

LEVEL D:

Coveralls, Hard Hat, Steel Toed Boots, Eye/Face Protection, Work Gloves, Hearing Protection (as needed).

Action Levels for Upgrade of PPE

Level C: There are **unknown** organic vapors in the breathing zone that range between one to five parts per million above the ambient background concentration.
or
A specific airborne contaminant is in excess of its Permissible Exposure Limit (PEL), Threshold Limit Value (TLV), or Short Term Exposure Limits (STEL).

Level B: The oxygen concentration is 19.5% or less.
or
There are **unknown** organic vapors in the breathing zone that are at a concentration at least five parts per million above the ambient background concentration.
or
A specific airborne contaminant is in excess of its Immediately Dangerous to Life or Health (IDLH) level.

Level A: There are **unknown** organic vapors in the breathing zone that are at a concentration greater than 500 parts per million above the ambient background concentration.
or
IDLH conditions through skin exposure are possible.

BE SURE A UTILITY LOCATE HAS BEEN COMPLETED BEFORE STARTING ANY GROUND INTRUSIVE WORK!

Other Comments:

Heat Stress or Cold Stress Comments:
Personnel will dress appropriately for hot or cold weather.

10. Real Time Air Monitoring

All instrumentation must be calibrated in accordance with manufacturer's recommendations. Readings must be taken with sufficient frequency to ensure the safety of on-site personnel. At a minimum, monitoring must be conducted when work begins in a different area of the site or when site conditions change.

INSTRUMENT	ACTION LEVELS	ACTIONS

Air sampling may be performed to document site conditions instead of monitoring if there is no real time direct reading instrumentation technology available for the chemical(s) of concern.

11. Decontamination Procedures

ALL EQUIPMENT AND PERSONNEL MUST BE DECONTAMINATED PRIOR TO LEAVING THE SITE.

Equipment such as air monitors will be bagged whenever feasible to prevent contamination.

Decontamination procedures for this site include:

12. Emergency Procedures/Site Control Information

a. Local Resources (List each telephone number; not all areas use 911).

Ambulance: 911

Fire Department: San Juan County Fire Department; 970-387-5523

Police: Silverton Police Deparment, 970-387-5531

Poison Control: 1-800-222-1222

Hospital: Mercy Regional Medical Center

Address: 1010 Three Springs Ave, Durango, Co 81301

Directions to the Hospital from the Site: Take US-550 S; turn right at US-550 S/W 14th St/S Camino Del Rio, Continue on US-160 E, Turn left at Co Rd 233, At the traffic circle, take the 2nd exit and turn left.

b. Other Information

Decon Water Supply Source:
On-site Telephone Location and Number, if applicable:

Base Radio Location and Channel Number:

Emergency Equipment: **First Aid Kit is available in all START vehicles**

EMERGENCY CONTACTS

Name	Cell Number	Home Number	Office Number
Chuck Baker	720-810-0753	970-330-0559	303-291-8301
Rebecca Laramie	720-810-0769	303-561-1831	303-291-8229
Henry Schmelzer	720-810-0781	303-766-2276	303-291-8241

If an injury occurs also notify URS Health and Safety representative (Jeanette Schrimsher at 1-866-326-7321) for potential workers compensation claims and fill out an injury incident report. This form is available from the Health, Safety, and Environment (HSE) web page on the Sourse.

c. Site Control

Site entry procedure:

All personnel must complete the attached control log entry and exit of the site. All persons must provide documentation of training, respirator fit test, and medical eligibility to gain access to the Exclusion Zone.

An on-site command post and access corridor will be established at the site vehicle, unless a more efficient area is identified upon arrival to the site. (ALTERNATE LOCATION: _____)

This location is upwind of the Exclusion Zone. No unauthorized personnel will be allowed on site.

Control boundaries will be established, and the Exclusion Zone, Contamination Reduction Zone, and Support Zone will be identified and designated. These will be site specific and based on local conditions, prevailing wind direction, and physical conditions, as well as any other hazards present, and are shown on Figure 1 and/or are as follows:

(TO BE ADDED ON SITE WHEN ZONES ARE SET UP) (Describe boundaries and/or attach map of controlled area).

_____

_____

Personnel in the Exclusion Zone should remain in constant communication with personnel outside the Exclusion Zone. **Radios are required if visual contact is not possible. The "Buddy System" will be used at all times.**

Three blasts on the car horn is the emergency signal for all personnel to leave the Exclusion Zone.

The following hand signals will be used in case of radio communications failure:

Hand gripping throat: ..... Out of air/can't breathe
Grip partner's wrist or both hands around waist: ..... Leave area immediately
Hands on top of head: ..... Need assistance
Thumbs up: ..... Okay; I am all right; I understand
Thumbs down: ..... No; not okay

- Employee Acknowledgment -

I hereby certify that I have read and understand the safety and health guidelines contained in this Site Specific Safety and Health Plan for this project:

Name	Signature	Date
Megan Adamczyk		10/7/2010
Nathan DWilla		10/7/2010

Plan Reviewed and Authorized By:

_____ **Date:** 3/22/12
Health and Safety Representative

Site Control Log

Project Name: _____

Date	Name	Signature	Affiliation	Time In	Time Out

Figure 1 Site Location Map

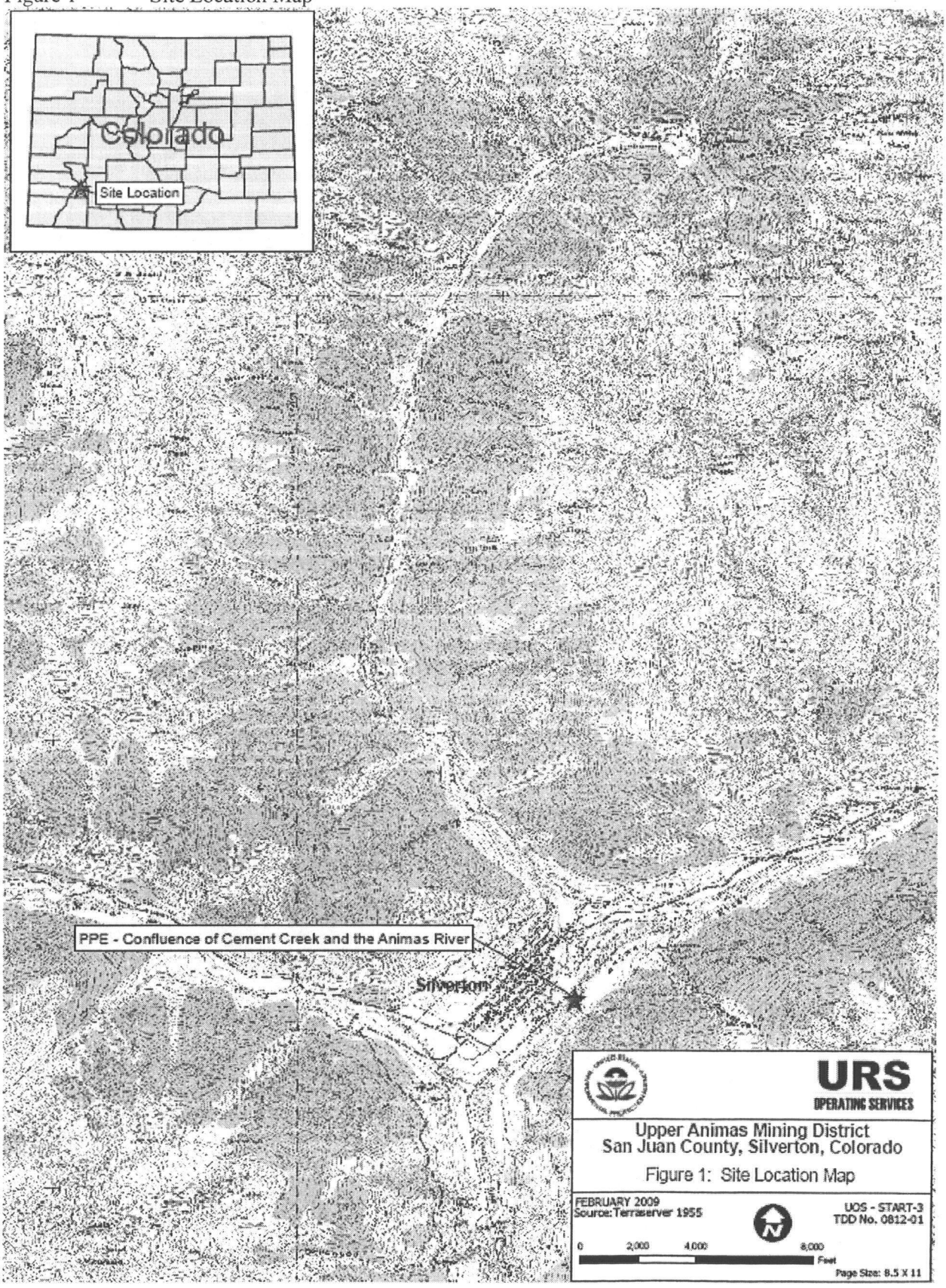
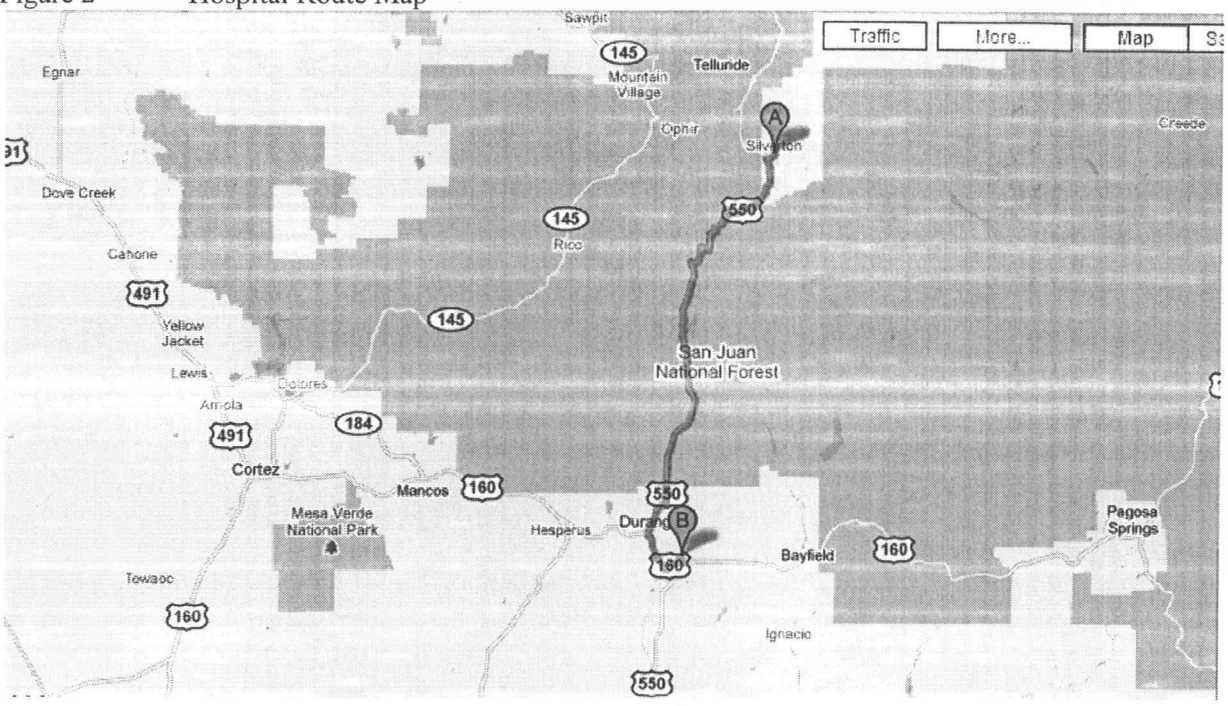


Figure 2 Hospital Route Map



ATTACHMENT A

Material Safety Data Sheets
and/or
NIOSH Chemical Safety Data Sheets

ATTACHMENT B

Applicable Safety Management Standards

ATTACHMENT C

Summary Site-Specific Respiratory Protection Program Worksheet for Field Activities

ATTACHMENT C

Summary Site-Specific Respiratory Protection Program Worksheet for Field Activities

Use this worksheet to consolidate information and augment the HASP to meet the OSHA Respiratory Protection standard requirements. Complete one worksheet for each field worksite and incorporate into the site-specific Health and Safety Plan (HASP) for that site.

Action Items

Step 1: Designate the person responsible for the Respiratory Protection Plan (RPP) on this site. The following qualified individual has been designated by the SHEMP Manager as responsible for coordinating the RPP on this site:

☒ On-site Safety Managers ☐ Other_____[insert name and job title]

Step 2: Identify location of the hazard evaluation within START HASP for this site. Available site characterization and information on airborne hazards are provided in the following section of the START HASP: Section 9.

As new information becomes available, it is added to the appropriate section of the HASP.

The site hazard evaluation identifies the airborne hazard(s) listed below, for which respiratory protection is required.

Step 3: Select respirators. Emergency responders primarily use standard issue full-face piece respirators configured as Air Purifying Respirator (APR), Powered Air Purifying Respirator (PAPR), Self-Contained Breathing Apparatus (SCBA), or airline equipment. Other respiratory protection is permitted with approval from the Safety, Health, and Environmental Management Plan (SHEMP) Manager. At this site, employees may use only the respirators 1) that are either part of the standard issue equipment or alternate equipment authorized by the SHEMP Manager, 2) for which the employees are medically qualified, 3) for which they have been successfully fit tested, and 4) that provide at least the level of protection indicated by EPA/NIOSH decision logic, the calculated maximum use concentration (MUC), the host organization, or the incident commander (which ever is more protective). Based on the HASP hazard evaluation, the required minimum levels of respiratory protection for activities at this site are:

Activity	Location	Hazard	Respirator Type/Face piece/Air Source or Filter/Cartridge
NA			

Step 4: Identify respirators that will be used on the site: In addition to the standard issue brand/model/configurations, certain employees working at this site have been authorized by the SHEMP Manager to wear the following respirators: NA

Alternate brand/model/configuration: _____ Approximate # of users: ____ . ☐-used as APR?
Alternate brand/model/configuration: _____ Approximate # of users: ____ . ☐-used as APR?

Step 5: Describe filter/cartridge change schedules. Filters will be changed if breathing resistance increases substantially or at the end of each work shift (whichever is sooner). Chemical cartridges will be changed at the end of each work shift, or sooner when indicated by an end-of-service-life-indicator (ESLI), or as determined by the SHEMP Manager in consultation with the cartridge manufacturer (based on cartridge capacity, chemical(s), exposure level(s), and environmental and workplace/work rate conditions).

Is a special change schedule in effect at this site? ☐-No ☐-Yes, describe: Cartridges will be disposed of during personnel decontamination procedures.

Documentation of Additional Required Respiratory Protection Program Elements

- **Medical evaluation.** Respirator users complete periodic medical evaluations (as part of the routine medical surveillance program), which include an evaluation of the employee's ability to wear the respirators that the employee is qualified to use. These medical exams are scheduled to maintain emergency responders in a state of readiness for field work.

If an employee's medical qualifications expire while the employee is in the field, the employee must rotate out. Prior to re-entering an area where respiratory protection is required, the employee must receive an evaluation that includes the elements of the respirator medical questionnaire, performed by a physician or other licensed health care professional (PLHCP).

- **Fit testing.** Respirator users are fit tested annually with the tight-fitting respirators they wear. Emergency responders must be fit tested before arriving in the field. Employees who have not been fit tested are not eligible to go to a field site where respiratory protection is required.

Employees with facial hair are not permitted to wear tight-fitting respirators. Repeat fit testing is required for employees who experience changes in facial features.

In the event that employees unexpectedly find that they must wear tight-fitting respirators for which they have not been previously fit tested, an emergency qualitative fit test may be completed (using irritant gas) using accepted OSHA testing methods. After an emergency fit test, assume that a full-face piece APR will have a lower assigned protection factor (APF) of 10 (rather than 50) until a quantitative fit test is performed.

- **Respirator use.** Respirators must be used correctly in routine and reasonably foreseeable emergency situations, including under conditions potentially immediately hazardous to life and health (IDLH), for which escape respirators or SCBAs and OSHA-prescribed special entry precautions will be used. Emergency responders must use respirators in accordance with their training and any additional site-specific instructions from the SHEMP Manager or designated alternate. Specifically, emergency responders must inspect respirators before use, use only with compatible NIOSH-approved equipment, avoid conditions that impair the face-to-face piece seal (including facial hair, dirt, or inappropriate corrective eyewear), and perform user seal checks each time they don a respirator. The SHEMP Manager or designated alternate must ensure that employees use respirators as intended and leave the work area as necessary to ensure that the respirator functions properly (i.e., to wash or change filters) or if conditions change in a way that limits respirator effectiveness. Contact lenses are permitted with a full-face piece respirator.

- **Respirator care.** Emergency responders must clean, disinfect, inspect, and store their personally issued respirators at the end of each day of use, following the methods in which they have been trained (dependant on the type of respirator(s) issued and based on the manufacturers' recommendations). Additionally, employees must inspect their respirators monthly, document this inspection, and tag/turn in equipment needing repair.

- **Employee training.** Only emergency responders whose training is up-to-date are eligible to work at sites that require respiratory protection. Respiratory protection training must be included as part of standard annual training for these employees and complies with OSHA requirements for this training.

- **Evaluate the effectiveness of the program.** Emergency responders must notify the SHEMP Manager or designated alternate if employees experience adverse health effects so the level of protection can be adjusted. The SHEMP Manager or designate alternate periodically consult emergency responders to determine respiratory protection program effectiveness and inspect a sample of respirators for signs of proper maintenance, cleaning, storage, inspection, and documentation of inspections.

Supplemental Information for Users of Breathing Air Tanks and Air Compressors

- **Breathing air quality and tank care.** Breathing air obtained from outside sources must be documented in writing to meet at least ANSI/CGA G-7.1-1997 "Grade D" quality standards and contain low moisture. Breathing air tanks must be inspected monthly to ensure that each is properly marked, has met hydrostatic test criteria, and that tanks stored full retain 90 percent of full charge pressure or are recharged. All tanks must be appropriately marked and empty tanks must be stored separately from filled tanks.

- **Air compressor location and care.** Air compressors used to supply breathing air must be maintained and located in accordance with OSHA requirements to prevent breathing air contamination, minimize moisture, and incorporate air purification devices (changed as needed, with change documented on a tag with date and signature). All compressor installation and maintenance must be documented.

- **Carbon monoxide controls.** For breathing air, emergency responders must use only compressors designed or alarmed to ensure that carbon monoxide levels do not exceed 10 ppm.

- **Preventing cross-contamination.** Breathing air tanks must be labeled as described in NIOSH standards (42 CFR Part 84). Couplings on breathing air equipment are incompatible with non-respirable gas systems and asphyxiates. Emergency responders must avoid using oxygen concentrations greater than 23 percent in breathing air systems not specially designated or prepared for that purpose.

ATTACHMENT D

On-Site Medical Monitoring Tracking Form

RESPONDER FIELD MEDICAL STATUS			
Incident Location: **Date:**	**Hazard: CHEM, BIO, RAD**	**PPE Used:**	**Vital signs within 10% of entry level?**
RESPONDER NAME:		**Age:**	
Monitored Signs and Conditions:	**ENTRY** Perform tests within one hour before donning PPE; Exclude individual from entry if indicated levels are exceeded.	**EXIT** After removing PPE; Repeat tests every 5 to 10 minutes. Perform other tests or treatment if not within 10% of baseline (entry levels) after 10 minutes, or if criteria are exceeded.*	
Monitored By: (Name)			✓
BLOOD PRESSURE (systolic/diastolic mm-Hg)	**BP =** _____/_____ (Not to exceed 105 diastolic) **Time** _____	**BP =** _____/_____ **Time** _____ **BP =** _____/_____ **Time** _____	
RESPIRATION RATE (breaths/minute)	**Respiration rate =** _____ (Not to exceed 24/minute.) **Time** _____	**Resp =** _____ **Time** _____ **Resp =** _____ **Time** _____	
HEART RATE (beats/minute) Calculate 70% max = _____ (See next page) 70% maximum = 220-age) x 0.70	**HR =** _____ **Time** _____ (Not to exceed 70% of maximum heart rate. Additionally if HR exceeds 110 beats/minute, shorten the work period.)	**HR =** _____ **Time** _____ **HR =** _____ **Time** _____	
TEMPERATURE (°F, oral)	**Temp =** _____ **Time** _____ 97.0°F minimum 99.5°F maximum at entry	**Temp =** _____ **Time** _____ **Temp =** _____ **Time** _____ If over 99.7°F, shorten next work cycle by one-third. If over 101°F, further medical evaluation is required.	
GENERAL HEALTH (history, "How do you feel?")			
WEIGHT (Calculate fluid loss – see next page)	**Pounds =** _____	**Pounds =** _____ >3% change? __ Loss of 3% or more requires further medical evaluation.	
***OTHER:** _____ (Orthostatic (postural) vital signs, etc.)	**Notes:**	**Notes:**	
SCBA USE	**On air time** _____ **psi** _____	**Off air time** _____ **psi** _____	

HEART RATE (beats/minute)

Quick Look-up		
Age	70% MHR	85%
20-25	140	170
25-30	136	165
30-35	132	160
35-40	128	155
40-45	125	152
45-50	122	148

Calculate Responder MHR

(220 - _____) x 0.70 = _____ beats/minute
[age]

ESTIMATE FLUID LOSS

Quick Look-up	
Worker weight	Fluid loss 3%
100 lb	3 lb
130 lb	4 lb
170 lb	5 lb
200 lb	6 lb
230 lb	7 lb
270 lb	8 lb

A. ***Calculate responder fluid loss:***

[entry weight] – [exit weight] = _____ loss

_____ - _____ = _____ lbs
[entry weight] [exit weight] [fluid loss]

A

B. ***Calculate 3% of responder's weight:***

(weight) x (3/100) = 3% of total weight

_____ x 0.03= _____ lbs
[entry weight] **B**

Is responder fluid loss (A) greater than calculated 3% of entry weight (B)?

Vital sign or Condition	Scenarios Where Monitoring is Warranted	Evaluation Procedures	Decision Criteria/Course of Action
Orthostatic (postural) vital signs	This specialty test is performed when exit heart rate and/or blood pressure do not return to within 10% of entry levels within 10 minutes or if fluid loss is greater than 3%.	Contact the medical advisor for further guidance when these conditions occur. Orthostatic testing (postural vital signs) can help medical personnel differentiate between certain causes of elevated heart rate and blood pressure. Specifically, a dehydrated person may not have adequate blood volume in the circulatory system to maintain a steady blood pressure with changes in position (supine, sitting, and standing). Obtain orthostatic vital signs by first having the individual lie down for several minutes. Then test the person's heart rate and blood pressure while he or she is lying down and again within 2 minutes of sitting or standing up. Provide support and encourage the person to lie down again if he or she becomes dizzy during the test.	Follow-up medical attention should be considered (1) if the blood pressure remains elevated or (2) if the following occurs 2 minutes after the person sits or stands up: • The pulse increases 20 beats/minute or more, or • Systolic pressure (upper number) decreases by 20 mm/Hg (compare to the systolic pressure lying down). Increased heart rate and/or decreased systolic blood pressure suggest circulatory fluid levels are not adequate to maintain blood pressure in the standing position (due to the effect of gravity) and the heart may beat faster to compensate. The medical advisor will determine the appropriate treatment or action. The On-Site Safety Officer must be notified of the worker's condition.

LEAD

0052
October 2002

CAS No: 7439-92-1
RTECS No: OF7525000

Lead metal
Plumbum
(powder)
Pb
Atomic mass: 207.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	**See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.**	**PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!**	
Inhalation		Local exhaust or breathing protection.	Fresh air, rest.
Skin		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	

EMERGENCY RESPONSE	SAFE STORAGE
	Separated from food and feedstuffs and incompatible materials. See Chemical Dangers.

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SEE IMPORTANT INFORMATION ON THE BACK.

IMPORTANT DATA

Physical State; Appearance
BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.

Physical dangers
Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers
On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.

Occupational exposure limits
TLV: 0.05 mg/m^3 as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004).
EU OEL: as TWA 0.15 mg/m^3; (EU 2002).

Routes of exposure
The substance can be absorbed into the body by inhalation and by ingestion.

Inhalation risk
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

Effects of long-term or repeated exposure
The substance may have effects on the blood, bone marrow, central nervous system, peripheral nervous system and kidneys, resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 1740°C
Melting point: 327.5°C
Density: 11.34 g/cm^3
Solubility in water: none

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
Do NOT take working clothes home.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

LEGAL NOTICE Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

©IPCS 2005

CAS No: 7440-38-2
RTECS No: CG0525000
UN No: 1558
EC No: 033-001-00-X

Grey arsenic
As
Atomic mass: 74.9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		**PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!**	**IN ALL CASES CONSULT A DOCTOR!**
Inhalation	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
Skin	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Eyes	Redness.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING	
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	T Symbol N Symbol R: 23/25-50/53 S: (1/2-)20/21-28-45-60-61 UN Hazard Class: 6.1 UN Pack Group: II	Do not transport with food and feedstuffs. Marine pollutant.

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-61GT5-II	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.

Prepared in the context of cooperation between the International Programme on Chemical Safety and the European Commission © IPCS 2005

SEE IMPORTANT INFORMATION ON THE BACK

IMPORTANT DATA

Physical State; Appearance
ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.

Chemical dangers
Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce toxic arsine gas (see: ICSC 0222).

Occupational exposure limits
TLV: 0.01 mg/m^3 as TWA; A1 (confirmed human carcinogen); BEI issued; (ACGIH 2004).
MAK: Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).

Routes of exposure
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

Inhalation risk
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.

Effects of short-term exposure
The substance is irritating to the eyes, the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract, cardiovascular system, central nervous system and kidneys, resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders, shock, convulsions and kidney impairment. Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system, liver and bone marrow, resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment, anaemia. This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Sublimation point: 613°C
Density: 5.7 g/cm^3

Solubility in water: none

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.

NOTES

The substance is combustible but no flash point is available in literature.
Depending on the degree of exposure, periodic medical examination is suggested.
Do NOT take working clothes home.
Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC 0377), Arsenic trichloride (ICSC 0221), Arsenic trioxide (ICSC 0378), Arsine (ICSC 0222).
Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.
Card has been partly updated in October 2005 in section Effects of long-term or repeated exposure.

ADDITIONAL INFORMATION

LEGAL NOTICE Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

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URS SAFETY MANAGEMENT STANDARD
Work Over Water

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies. Refer to SMS 053 – Marine Safety and Boat Operations and SMS 095 – Barge Operations for more information on marine-related hazards.

2. Purpose and Scope

The purpose of this standard is to protect employees from drowning while working above or adjacent to water.

3. Procedures

The associated implementing regional procedures for this standard are included as attachments:

SMS 027 NA – North America

SMS 027 EU – UK and Ireland, Europe, and Middle East

SMS 027 AP7 – Asia Pacific

URS SAFETY MANAGEMENT STANDARD
Biological Hazards

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to reduce or eliminate illnesses and injuries transmitted by plants, insects, animals, and pathogenic agents.

3. Procedures

The associated implementing regional procedures for this standard are included as attachments:

SMS 047 NA – North America

SMS 047 EU – UK and Ireland, Europe, and Middle East

SMS 047 AP7 – Asia Pacific

URS SAFETY MANAGEMENT STANDARD

Vehicle Safety Program

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

This standard applies to employees operating motor vehicles that are owned, rented or leased by the Company, and the use of personal or government supplied vehicles while on Company business.

This SMS does not apply to heavy equipment operations.

2. Purpose and Scope

This standard defines the policies that help URS minimize losses, injuries, and legal liabilities associated with improper vehicle use.

3. Procedures

The associated implementing procedures for this standard are included as attachments:

Infrastructure & Environment

SMS 057 NA – North America

SMS 057 EU – UK and Ireland, Europe, and Middle East

SMS 057 AP7 – Asia Pacific

Energy & Construction

SMS 057 EC

Federal Services

SMS 057 FS

URS SAFETY MANAGEMENT STANDARD
Toxic and Hazardous Substances

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide guidance in controlling potential employee exposures to toxic and hazardous substances specifically regulated by the U.S. Occupational Safety and Health Administration (OSHA). These substances include:

Acrylonitrile	**13 Carcinogens:**
Asbestos	4-Nitrobiphenyl
Benzene	alpha-Napthylamine
Cadmium	Methyl chloromethyl ether
Chromium (VI)	3,3'-Dichlorobenzidine
Coke Oven Emissions	bis-Chloromethyl ether
Cotton Dust	beta-Napthylamine
Ethylene Oxide	Benzidine
Formaldehyde	4-Aminodiphenyl
Hydrogen Sulfide	Ethyleneimine
Inorganic Arsenic	beta-Propiolactone
Lead	2-Acetylaminofluorene
Methylene Chloride	4-Dimethylaminoazobenzene
Methylenedianiline	N-Nitrosodimethylamine
Vinyl Chloride	
1,2-dibromo-3-chloropropane	
1,3-Butadiene	

Note: Hexavalent Chromium is covered in SMS 083.
Lead in construction activities is covered in SMS 022.
Bloodborne pathogens is covered in SMS 051.
Ionizing radiation is covered in SMS 052.

3. Procedures

The associated implementing regional procedures for this standard are included as attachments:

SMS 050 NA – North America, UK and Ireland, Europe, and Middle East

SMS 050 AP5 – Asia Pacific