Site Safety and Health Plan

Restoration of Abandoned Mines (RAMS) Project

North Fork of Clear Creek Mine Waste Sampling

Drilling of Soil Borings, Monitoring Well Installation and Development,
Soil and Groundwater Sampling, Waste Rock Sampling,
Global Positioning Satellite (GPS), Surface Water Monitoring,
Installation of Mechanical, Hydrogeologic and Climatic instrumentation
and Topographic and Geophysical Surveys for

PREPARED FOR:
U.S. Army Corps of Engineers, Albuquerque District
4101 Jefferson Plaza, NE
Albuquerque, New Mexico 87109

PREPARED BY:
David M. Willett, CIH
US Army Corps of Engineers, Albuquerque District
HTRW/Geotechnical Section

July 2002

Site Safety and Health Plan Disclaimer

The following Site Safety and Health Plan (SSHP) has been designed for the methods presently contemplated by the Army Corps of Engineers, Albuquerque District for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified.

Table of Contents

North Fork of Clear Creek Mine Waste Sampling 1
1.0 Location and approximate size of site: 1
2.0 Duration of planned employee activity: 1
3.0 Site elevation and topography: 1
4.0 Site accessibility (by road): ..... **Error! Bookmark not defined.**
5.0 Emergency Information 2
6.0 List of Personnel and training/medical requirements 2
7.0 Site-specific Job Hazard Assessments 3
8.0 Action Levels 4
9.0 Site Surveillance/Monitoring 5

1.0 Introduction 8-1
1.1 Objective 8-1
1.2 References 8-1
2.0 Responsibilities 2-1
2.1 All Personnel 2-1
2.2 Health and Safety Manager 2-1
2.3 Project Manager 2-1
2.4 Site Supervisor 2-1
2.5 Site Health and Safety Officer 2-2
2.6 Subcontractors 2-2
2.7 On-Site Personnel and Visitors 2-2
3.0 Project Hazards and Control Procedures 3-1
3.1 Scope of Work 3-1
3.1.1 General Overview 3-1
3.1.2 Supporting Tasks 3-1
3.1.3 Job Hazard Assessment 3-2
3.2 Field Activities, Hazards, Control Procedures 3-2
3.2.1 Mobilization/Site Preparation/Demobilization 3-2
3.2.2 Decontamination Activities 3-3
3.2.3 Drilling Activities 3-3
3.2.4 Soil/Groundwater/Surface Sampling Activities/Hazards 3-9
3.2.5 Well Development Activities/Hazards 3-10

3.2.6 Geophysical, Global Positioning Satellite (GPS) and topographic survey activities/Hazards 3-10
3.2.7 Installation of Mechanical, hydrogeologic, and climatic instrumentation 3-11
3.2.8 Demobilization 3-11
3.3 Chemical Hazards 3-11
4.0 Hazards and Control Procedures 4-1
4.1 General Practices 4-1
4.1.1 Buddy System 4-2
4.2 Sunburn/Ultraviolet Exposure 4-2
4.2.1 Sunburn/Ultraviolet Exposure Prevention 4-3
4.3 Heat Stress 4-3
4.3.1 Heat Stress Prevention 4-3
4.4 Cold Stress 4-5
4.4.1 Cold Stress Prevention 4-5
4.5 High Altitude stress 4-6
4.6 Biological Hazards 4-6
4.6.1 Venomous Snakes and Arthropods 4-6
4.6.2 Pathogens 4-9
4.7 Noise 4-11
4.7.1 Hearing Conservation 4-11
4.8 Spill Control Plan 4-11
4.9 Lockout/Tagout Procedures 4-11
4.10 Sanitation 4-12
4.10.1 Break Area 4-12
4.10.2 Potable Water 4-12
4.10.3 Sanitary Facilities 4-12
4.10.4 Lavatory 4-12
4.10.5 Trash Collection 4-13
4.11 Electrical Hazards 4-13
4.12 Lifting Hazards 4-14
4.13 Dust Control 4-14
4.14 Construction Equipment Safety Procedures 4-15
4.15 Chemical Hazards 4-15
5.0 Personal Protective Equipment 5-1
5.1 Levels of Protection 5-1

5.1.1 Level D Protection 5-1
5.1.2 Modified Level D Protection 5-1
5.1.3 Selection of PPE 5-2
5.2 Using PPE 5-2
6.0 Site Control 6-1
6.1 Authorization to Enter 6-1
6.2 Hazard Briefing 6-1
6.3 Certification Documents 6-1
6.4 Field Activity Daily Log 6-1
6.5 Entry Requirements 6-1
6.6 Emergency Entry and Exit 6-2
7.0 Decontamination 7-1
7.1 Contamination Control Zones 7-1
7.1.1 Exclusion Zone 7-1
7.1.2 Contamination Reduction Zone 7-1
7.1.3 Support Zone 7-1
7.2 Posting 7-1
7.3 Decontamination General Rules 7-1
7.4 Equipment Decontamination 7-2
7.5 Personal Protective Equipment Decontamination 7-2
8.0 Site Monitoring 8-1
8.1 Air Monitoring 8-1
8.2 Noise Monitoring 8-1
8.3 Monitoring Equipment Maintenance and Calibration (if required) 8-1
9.0 Employee Training 9-2
9.1 Site-Specific Training 9-2
9.2 First Aid and CPR 9-2
10.0 Medical Surveillance 10-1
10.1 First Aid and Medical Treatment 10-1
10.2 Medical Restriction 10-1
11.0 Emergency Procedures 11-1
11.1 General 11-1
11.2 Emergency Response 11-1
11.2.1 Fire 11-1
11.2.2 Spill 11-2
11.3 Safety Signals 11-2

11.4 Medical Emergency 11-2
11.4.1 First Aid—General 11-2
11.4.2 First Aid—Inhalation 11-3
11.4.3 First Aid—Ingestion 11-3
11.4.4 First Aid—Skin Contact 11-3
11.4.5 First Aid—Eye Contact 11-3
11.5 Reporting Injuries and Illnesses 11-4
11.6 Emergency Information 11-4

List of Appendices

Appendix	*Title*
A	Material Safety Data Sheets
B	ENG 3394 Accident Reporting Form
C	Information on Bats and Rabies

List of Figures

Figure	*Title*
1	Site Map
2	Hospital Route Map

Site Safety and Health Plan Approvals And Acknowledgments

I have read and approved this Site Safety and Health Plan (SSHP) with respect to project hazards, regulatory requirements, and the following Standard Operating procedures (located in the RAMS General Work Plan):

A1	Surface Soil/Rock Sampling Equipment and Procedures
A2	Drilling Equipment and Procedures
A3	Subsurface Soil/Rock Sampling Equipment and Procedures
A4	Soil/Rock Homogenization Equipment and Procedures
A5	Lithologic Description of Surface and Subsurface Soil Samples
A6	Boring Log Completion
A7	Investigative Derived Waste Procedures
A8	Monitoring Well Design, Installation, and Abandonment Procedures
A9	Monitoring Well Development Equipment and Procedures
A10	Groundwater Sampling Equipment and Procedures
A11	Surface Water and Sediment Sampling Equipment and Procedures
A12	Equipment Decontamination Procedures
A13	Sample Handling, Documentation, and Tracking Procedures
A14	Field Documentation
A15	Geophysical Survey Equipment and Procedures
A16	Geotechnical Sampling Equipment and Procedures
A17	Percolation Test Equipment and Procedures
A18	Pumping Test Equipment and Procedures
A19	Slug Test Equipment and Procedures

Project Name:	Project Number:

Prepared by:_____
Marc D. Anderson, Project Industrial Hygienist
David M. Willett, CIH, Health and Safety Manager

Reviewed by:_____
Chief, HTRW/Geotechnical Section, Omaha District/Date

Reviewed by:_____
Project Manager/Date

Reviewed by:_____
Site Supervisor/Date

Site Safety and Health Plan Acknowledgments

I have read this Site Safety and Health Plan, I understand the contents, and I agree to abide by its requirements I also have been properly trained, medically monitored, for the work that I am to perform and those dates are provided below. Documentation will be placed in the Project Records.

Date	Printed Name	Signature	Company Represented

North Fork of Clear Creek Mine Waste Sampling

1.0 Location and approximate size of site:

The North Fork of Clear Creek encompasses approximately 90% of Gilpin County in north-central Colorado near Central City, Colorado. Gilpin County is one of the most intensely mined counties in Colorado, particularly from Central City south to the county line. Three major tributaries to the North Fork of Clear Creek drain this heavily mined area, which are Chase Gulch, Nevada/Gregory Gulch, and Russell Gulch. Within these three drainages, there are an estimated 2,000 mine waste piles.

The North Fork of Clear Creek is within the Clear Creek Superfund study area. Superfund characterization activities within this basin have focused on mine drainages. Very few of the mine waste rock and mill tailing piles have been characterized. The numerous waste rock and mill tailing piles contain highly acid forming materials and contain high levels of leachable zinc, copper, manganese, lead, and iron.

2.0 Duration of planned employee activity:

Flow measurements and sampling will be performed beginning the week of 19 August 2002. Work shifts will consist of no more than 5 consecutive 10-hour days followed by a day off. The field effort will be completed before 30 August.

3.0 Site elevation and topography:

The site is located in a setting of steep mountain slopes, precipitous peaks, and glacially carved valley floors.

4.0 Emergency Information

Agency	Telephone Number
Ambulance Hospital Emergency Care Poison Control Center Fire Police Explosives	911
CHEMTREC	800-424-9300
TSCA Hotline	202-554-1404
CDC	404-452-4100 or 404-329-2888
National Response Center	800-424-8802
Pesticide Information Center	800-845-7633
EPA ERT Emergency	201-321-6660
RCRA Hotline	800-424-9346
Bureau of Explosives	202-835-9500
Other Phone Numbers: Project Manager: Kim Mulhern Site Supervisor: Marc Anderson Safety and Health Coordinator: David M. Willett, CIH Project Industrial Hygienist	 (402) 221-7735 (402) 221-7692 (505) 342-3477 (402) 221-7692
Site Resources: Drinking water supply Mobile telephone Radio First aid kit Spill response materials Fire extinguisher(s)	 Keep readily available Locations noted prior to work and covered in the Tailgate Safety Meeting
Hospital: Medical Ctr Evergreen 30940 Stagecoach Blvd # W100 Evergreen, CO 80439	(303) 674-1122

5.0 List of Personnel and training/medical requirements

	Office	Mobile	Emergency
Senior Geologist: Carl Nardin	(402) 221-7774		

Site Health/Safety Officer Carl Nardin	(402) 221-7774		
Health Safety Manager: David M. Willett, CIH			
Site Supervisor Carl Nardin	(402) 221-7774		
Chief, Safety and Occupational Health, Omaha District: Melissa Johnson	(402) 221-4054		
Samplers			

6.0 Site-specific Job Hazard Assessments

Task 1: Mobilization and demobilization analyzed by Marc Anderson, 23 July 2002

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference
1. Traveling to and from site	• Collision with other motorist or deer or other wildlife	• Drive defensively • All vehicle occupants must wear seat belts • Drive only on established roads • Properly stow cargo • Avoid distracters such as beverages, mobile telephones, or radios	Section 3.2.1
2. Hiking to and from sample locations	• Slips/trips/falls • Biological hazards • Heat injuries	• Wear over-the-ankle boots • Carry equipment in boxes or bags • Wear sunscreen and insect repellent and avoid contact with foliage • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately, including a hat with a sun visor	Section 4.2 Section 4.3 Section 4.5 Section 4.13

Equipment to be used	Inspection requirements	Training requirements

Commercial automobile	• Check fluid levels in engine, transmission, and coolant reservoir daily • Check operation of accessories such as windshield wipers, four-wheel drive, and driving lights before operation daily.	Valid driver's license

Task 2: Surface water and sediment sampling analyzed by Marc Anderson, 23 July 2002

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference
1. Flow rate measurement 2. Water sample collection 3. Sample packaging 4. Decontamination	• Slips/trips/falls • Biological hazards • Heat injuries • Exposure to toxic chemicals in water	• Obtain solid footing when standing next to a stream, avoid standing on loose gravel or mud • Wear over-the-ankle boots • Wear sunscreen and insect repellent • Avoid contact with foliage • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately, including a hat with a sun visor • Wear PPE • Do not eat, drink, or use tobacco products during these steps	Section 4.2 Section 4.3 Section 4.5 Section 4.13 Section 5.3 Section 7.0

Equipment to be used	Inspection requirements	Training requirements
Flow Probe Hand-held Flowmeter	Follow manufacturer's recommendations	None
Horiba U-10 water quality checker	Follow manufacturer's recommendations	None
GPS unit	Follow manufacturer's recommendations	None

7.0 Action Levels

Parameter	Value	Action
Organic Vapors	Not required	
Noise	Not required	
Heat	Not required	
Flammable vapors	Not required	
Other (specify)		

8.0 Site Surveillance/Monitoring

Instrument	Surveillance Frequency	Monitoring Location and Tasks	Calibration
Not required			

NOTES:

1. Personnel performing safety inspections and conducting monitoring for chemical and physical exposures shall be qualified through education, training, experience or any combination of these and with authorization from their respective company.
2. All monitoring equipment will be maintained in accordance with manufacturer's written instructions. Factory maintenance and calibration will be accomplished per the manufacturer's specifications. Field calibrations and source checks will be accomplished per the manufacturer's written instructions and/or company operating procedures. All maintenance and calibrations will be formally documented and included in the project files

1.0 Introduction

1.1 Objective

This project involves proposed tasks at various locations associated with the Restoration of Abandoned Mines (RAMS) project. The site activities include: drilling and installation of groundwater monitoring wells; collection of soil/sediment/water samples for chemical analysis, collection of waste rock samples for chemical and physical parameter analysis, installation of instrumentation devices and conducting geophysical and topographical surveys. U.S. Army Corps of Engineers Personnel from Albuquerque and Omaha Districts will perform the work. [NOTE: The document title and disclaimer information on p. 1 both indicate that document is developed for Albuquerque District only.]

The objective of this Site Safety and Health Plan (SSHP) is to provide a mechanism for establishing safe working conditions at the sites. The safety organization, procedures, and protective equipment have been established based upon an analysis of potential hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

This SSHP will serve as a general guidance document for use at all of the sites. Specific addendum will be developed for each site and will include site-specific information where applicable. Information to be included in the addenda will include site/hospital maps, and features, planned activities and hazards unique to each site. Specific personnel assigned to work at each site will also be included.

This SSHP prescribes the procedures that must be followed during referenced site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager.

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan.

1.2 References

This SSHP complies with applicable Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and US Army Corps of Engineers policies and procedures. This plan follows the guidelines established in the following:

Standard Operating Safety Guides, EPA (Publication 9285.1-03, June 1992).

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), OSHA, U.S. Coast Guard (USCG), EP A (86-116, October 1985).

Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER).

Title 29 of the CFR, Parts 1910 *Construction Industry Standards* and 1926 *General Industry Standards*.

Pocket Guide to Chemical Hazards, Department of Health and Human Services, U.S. Public Health Service, Centers for Disease Control, NIOSH.

Quick Selection Guide to Chemical Protective Clothing, Forsberg, K. and S.Z. Mansdorf, 3rd Ed.

Army Regulation (AR) 385-40, Accident Reporting and Records, 1 November 1994 (http://www.usapa.army.mil/pdffiles/r385_40.pdf) and USACE Supplement to AR 385-40 (http://www.usace.army.mil/inet/usace-docs/oce/ar385-40/toc.htm).

Engineer Manual (EM) 385-1-1 *Safety and Health Requirements Manual*

Engineer Regulation (ER) 385-1-92 *Safety and Occupational Health Requirements for HTRW Activities*

2.0 Responsibilities

2.1 All Personnel

All personnel must adhere to these health and safety procedures during the performance of their work. Each person is responsible for completing tasks safely, and reporting any unsafe acts or conditions to his or her immediate supervisor, the Site Health and Safety Officer (SHSO), or to the Site Supervisor. No person may work in a manner that conflicts with the letter or the intent of, or the safety and environmental precautions expressed in these procedures. After due warnings, the Project Manager will dismiss from the site any person who violates safety procedures.

All on-site personnel will receive training in accordance with 29 CFR 1910.120 and will be familiar with the requirements and procedures contained in this document.

2.2 Health and Safety Manager

The Health and Safety Manager (HSM) is responsible for technical health and safety aspects of the project, including preparation of this SSHP. Inquiries regarding project procedures, and other technical or regulatory issues related to health and safety should be addressed to this individual. The HSM for this project is David M. Willett, CIH.

2.3 Project Manager

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with the requirements and procedures in this plan. The Project Manager for this site is: to be determined (TBD)

2.4 Site Supervisor

The Site Supervisor is also the on-site geologist. The Site Supervisor is responsible for implementation of the SSHP, including communication of site requirements to all on-site project personnel (including subcontractors) and consultation with the SHSO. The Site Supervisor will be responsible for informing the SHSO of any changes in the work plan or procedures so that those changes may be addressed in the SSHP. Other responsibilities include:

Stopping work, as required, to ensure personal safety and protection of property, or in cases of life or property-threatening safety noncompliance

Determining and posting routes to medical facilities and emergency telephone numbers, and arranging emergency transportation to medical facilities

Notifying local public emergency officers of the nature of the site operations, and posting of their telephone numbers in an appropriate location

Observing on-site project personnel for signs of chemical or physical trauma

Ensuring that all site personnel have the proper medical clearance, have met applicable training requirements, and have training documentation available.

2.5 Site Health and Safety Officer

The SHSO will assist the Site Supervisor in carrying out the requirements of this SSHP. The SHSO is responsible for and modifying this SSHP if necessary based on field conditions. The Health and Safety Manager or his designee must approve any changes to the SSHP. The SHSO shall ensure all personnel on-site provide copies of certification for the successful completion of an OSHA Hazardous Waste Operations 40-hour training class, certification of a current 8-hour update, if appropriate, and a medical doctor's letter of approval for work at hazardous waste sites. The SHSO will ensure the conduct of a daily tailgate safety meeting to include all personnel on site at the time agreed to by the SHSO. The SHSO is the primary site contact on occupational health and safety.

2.6 Subcontractors

On-site subcontractors and their personnel must understand and comply with the site requirements established in this SSHP. Subcontractors must attend and participate in the daily Tailgate Safety Meetings and all other site safety meetings.

2.7 On-Site Personnel and Visitors

All personnel must read and acknowledge their understanding of this SSHP, abide by the requirements of the plan, and cooperate with site supervision in ensuring a safe and healthful work site. Site personnel will immediately report any of the following to the Site Supervisor or Site Safety Officer:

Accidents and injuries, no matter how minor

Unexpected or uncontrolled release of chemical substances

Symptoms of chemical exposure

Unsafe or malfunctioning equipment

Changes in site conditions that may affect the health and safety of project personnel.

3.0 Project Hazards and Control Procedures

3.1 Scope of Work

3.1.1 General Overview

The scope of work varies for each of the proposed sites associated with the Restoration of Abandoned Mines (RAMS) project. A specific site description and scope will be included with the SSHP addendum for each site. Site activities are expected to include monitoring well installation and development (with associated drilling activities), soil/sediment/ water sampling, installation of mechanical, hydrological and climatic instrumentation and performance of hydrogeologic, geophysical and Global Positioning (GPS) surveys. The chief materials of interest include: (a) whole rock or tailings resulting from prior mining operations. Tailings represent residue from milling processes. (b) Waste rock from prior mining operations, (c) soils affected by prior mining operations and (d) waters potentially affected by prior mining. Excessive concentrations of metals, including various EPA and state-regulated metals, and other related contaminants have been reported in surface waters at some of the sites. It is suspected that waste rock, tailings, and underground exposures of sulfide mineral-bearing rocks may provide contaminants to a groundwater plume that may enter and degrade the surface or ground water quality at some of these sites. Tasks include the installation, development and sampling of monitoring wells. Soil and/or groundwater samples will be collected for chemical analyses of metals suspected to be in the groundwater. Known toxic heavy metals regulated by OSHA such as mercury, arsenic and lead are known to be present at some of the sites. Volatile Organic Compounds (VOCs) Semi-volatile organic compounds, (SVOCs) total petroleum hydrocarbons (TPH), herbicides, pesticides, Polychlorinated biphenyls (PCBs,) and high explosives (HE) are not known to be present. The investigation- derived waste (IDW) may also be sampled.

3.1.2 Supporting Tasks

The following supporting tasks are expected to be included at one or more of these sites:

Task 1. Mobilization/Demobilization

Mobilize heavy equipment, drill rig, and personnel to the two sites. Decontaminate equipment as necessary. Demobilize from sites.

Task 2. Site Preparation

Prepare drilling locations at the site, if necessary, and rigging up drill rig.

Task 3. Drilling/Installation/Development of Monitoring Wells

Drill using 6/25 ID hollow stem auger and install specified number of monitoring wells to depth not to exceed 50 ft.

Task 4. Collect Soil//Waste Rock/Groundwater Samples

Collect surface, subsurface soil and rock samples during drilling of soil borings and monitoring wells. Collect groundwater samples from monitoring wells.

Task 5. Collection of Surface Water Samples

Task 6. Conduct Global Positioning Satellite (GPS) Survey

Task 7. Installation of mechanical, hydrogeologic, and climatic instrumentation

Task 8 Monitor mechanical, hydrologic and climatic data

Task 9 Complete topographic and geophysical surveys

3.1.3 Job Hazard Assessment

A job hazard assessment is necessary to identify potential safety, health, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the work site to identify hazards that may harm site personnel, the community, or the environment. The Site Supervisor and Site Health and Safety Officer must be aware of these changing conditions and discuss them with the HSM whenever these changes impact the health, safety, or performance of the project. The Site Supervisor will keep subcontractors informed of the changing conditions and the SHSO will write addenda to change Job Hazard Analyses and associated hazard controls as necessary. Site-specific Job Hazard Assessments are in section 12.3.

3.2 Field Activities, Hazards, Control Procedures

3.2.1 Mobilization/Site Preparation/Demobilization

Site mobilization will include establishing exclusion, contamination reduction, and support zones. A break area will be set up in the support zone area. Mobilization may involve clearing areas for the support zones and access road preparation. During this initial phase, project

personnel will walk the site to identify safety issues that may have arisen since the writing of this plan.

The hazards of this phase of activity are associated with heavy equipment movement, manual materials handling, and manual site preparation. Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion and laceration hazards. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces including open shafts, and the potential for cavernous ground from mine subsidence. Freezing-weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces and unstable soil at the excavation.

Potential environmental hazards include venomous snakes and arthropods (i.e., insects, spiders, ticks, scorpions, and centipedes) and other pests such as ants, fleas, mosquitoes, and wasps; weather, such as sunburn, lightning, rain, snow, ice, heat and cold; pathogens, such as bubonic plague and Hantavirus, and rabies from bats who inhabit many abandoned mines.

3.2.2 Decontamination Activities

Before project commencement, all drilling and sampling equipment to include rigs, support vehicles, water tanks (inside and out), augers, rods, samplers, tools, etc., shall be cleaned with steam or pressurized hot water, using water that is contaminant free and has been approved by the Corps of Engineers on-site technical representative. Vehicles and equipment will be decontaminated before leaving the site. Personnel involved in decontamination activities may be exposed to skin contact with water spray or steam, contaminated soil, volatile emissions from heavily contaminated vehicles and equipment, and noise. The source of decontamination water will be documented.

3.2.3 Drilling Activities

3.2.3.1 Drilling Hazards

The primary physical hazards for this project are associated with the use of the drilling rig and supporting vehicles. Rig accidents can occur as a result of improperly placing the rig on uneven or unstable terrain, or failing to adequately secure the rig prior to the start of operations. Underground and overhead utility lines can create hazardous conditions if contacted by drilling equipment. Tools such as slips and tongs, and equipment such as elevators, cat lines, and wire rope have the potential striking, pinning, or cutting personnel.

Slips: Slips are toothed wedges positioned between the drill pipe and the master bushing/rotary table, to suspend the drill string in the well bore when the hoist does not support it. Most accidents associated with slip operations are related to manual materials handling; strained backs and shoulders are common.

Tongs: Tongs are large, counter-weighted wrenches used to break out the torqued couplings on drill pipe. Both sets of tongs have safety lines; when breakout force is put on the tongs, the tongs or the safety lines could break and injure an employee standing close to them. Another likely accident can occur when the driller actuates the wrong tong lever and an unsecured tong swings across the rig floor at uncontrolled velocity. A common accident attributable to tongs can occur when an employee has his hand or finger in the wrong place as he attempts to swing and latch the tong onto the drill pipe, resulting in crushing injuries or amputation of the fingers.

Elevators: Elevators are a set of clamps affixed to the bails on the swivel below the traveling block. They are used to clamp each side of a drill pipe and hold the pipe as it is pulled from the well bore. Accidents and injuries can occur during the latching and unlatching tasks; fingers and hands can get caught and crushed in the elevator latch mechanism. If the pipe is overhead when the latching mechanism fails, then the pipe may fall on employees working on the drill floor.

Wire Rope: Worn or frayed wire rope presents a laceration hazard if loose wires protrude from the main bundle.

Cat Lines: Cat lines are used on drilling rigs to hoist material. Accidents that occur during cat line operations may injure the employee doing the rigging as well as injure the operator. Minimal hoisting control causes sudden and erratic load movements, which may result in hand and foot injuries.

Working Surfaces: Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls.

Derrick Operations: The derrick man on a well drilling operation performs his tasks from various elevated work platforms in the mast. He is exposed to falls when not utilizing fall protection equipment while climbing the derrick ladder, while working with the pipe stands, and while moving from the ladder to his platform station.

Materials Handling: The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a finger or toe gets caught between two objects. Rolling stock can shift and/or fall from a pipe rack or truck bed.

Noise: Mechanical drill rigs normally generate hazardous levels of noise when in operation. Hearing protection is required when noise levels exceed 85 decibels (A-weighted) (dBA) or when normal speech is impeded between two individuals approximately 3 feet apart.

3.2.3.2 Drilling Safety Procedures

Drill Crews: All drillers performing work must possess required state or local licenses to perform such work. All members of the drill crew shall receive site-specific training prior to beginning work.

The driller shall be responsible for the safe operation of the drill rig as well as the crew's adherence to the requirements of this SSHP. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the crew shall follow all instructions of the driller, wear all personal protective equipment, and be aware of all hazards and control procedures. The drill crews shall participate in the Daily Safety Meetings and be aware of all emergency procedures.

Rig Inspection: each day, prior to the start of work, the driller and/or drill crew shall inspect the drill rig and associated equipment as described in this section. The following items shall be inspected:

- Vehicle condition
- Proper storage and operating condition of equipment as described below.
- Condition of all wire rope
- Fire extinguisher-to be used by trained personnel only
- First Aid Kit-to be used by trained personnel only

Drill Rig Set-Up: The drill rig shall be properly blocked and leveled prior to raising the derrick. The wheels that remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

Site Drilling Rules:

Before drilling, the existence and location of underground pipe, electrical equipment and gas lines will be determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. If the client's knowledge of the area is incomplete, an appropriate device, such as a magnetometer will be used to locate the line. Documentation that nearby utilities have been marked on the ground, and that the drill site has been cleared shall be in the possession of the Field Operations Manager prior to commencement of the intrusive investigation at that point of the site.

Under no circumstances will personnel be permitted to ride the traveling block or elevators, nor will the catline be used as a personnel carrier.

Overhead Electrical Clearances: If drilling is conducted in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables can come within the minimum clearances as follows:

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

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least 4 feet for voltages less than 50 kiloelectron volts (kV), 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Rig Set-Up:

All well sites will be inspected by the driller prior to locating the rig to ensure a stable surface exists. This is especially important along the riverbank where soft, unstable terrain is common.

All rigs will be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

Wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Hoisting Operations:

Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the draw works is equipped with an automatic feed control, do not leave the brake unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly.

Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrick man has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor, and no one should be on the rig or derrick.

The brakes on the draw works of every drilling rig should be tested by each driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Do not stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations:

Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline.

The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Do not stand near, step over, or go under a cable or catline, which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load,
- Keep fingers and feet where they will not be crushed,
- Be sure to signal clearly when the load is being picked,
- Use standard visual signals only and not depend on shouting to coworkers,
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope:

When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or resocketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less that five full tucks.

Wire rope shall not be secured by knots except on haul back lines on scrapers.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Wire rope clips shall not be used to splice rope.

Pipe/Auger Handling:

Pipe and auger sections shall be transported by cart or carried by two persons. Do not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Do not kick slips into position.

When pipe is being hoisted, do not stand where the bottom end of the pipe could whip and strike you.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be chocked or otherwise secured to prevent rolling.

Derrick Operations:

The derrick climber should be used whenever climbing the derrick. Personnel on the derrick should be tied off, or otherwise protected from falling when working in an unguarded, elevated position.

All stands of pipe and drill collars racked in a derrick will be secured with rope or otherwise adequately secured.

Do not throw tools, derrick parts, or materials of any kind from the derrick.

The elevators must be properly clamped onto all pipe joints prior to the driller engaging the load.

3.2.4 Soil/Groundwater/Surface Sampling Activities/Hazards

Field sampling operations will consist of the collection of soil and groundwater samples for subsequent analysis and evaluation of potential site contamination. The physical hazards of this operation are primarily associated with the sample collection methods and procedures utilized.

During the course of this project, several different sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hollow-stem auger drilling, surface sampling/spoons, and backhoe trenching. The primary hazards associated with these specific soil sampling procedures are not potentially

serious; however, other operations in the area, or the conditions under which samples must be collected, may present certain chemical and physical hazards. The hazards of these types of sampling procedures are generally limited to strains/sprains resulting from rough terrain or carrying heavy sample coolers. Groundwater sampling methods may include hand bailing of wells, or purging of wells with a submersible pump. Primary hazards associated with groundwater sampling are back strains/sprains, chemical hazards (sample preservatives), and refueling of portable generators used to power pumps. In some cases, acid mine drainage migrates through wetlands, peat bogs or other organic rich deposits and in those areas sulfur gas can build up as sulfate reducing bacteria reduce sulfate to sulfide. Monitor wells installed in these settings can accumulate sulfur gases that could be toxic to well samplers who might breathe the gases after uncapping such wells. Where such conditions may exist, samplers should be advised of such hazards, trained in the detection of such materials, and precautions should be taken to preclude inhalation of well gases. Noise from the portable generators may also constitute a hazard.

In addition to the safety hazards specific to soil and groundwater sampling operations, hazards associated with the operation of vehicles, particularly large vehicles, in a small area will be a concern. Of particular concern will be the backing up of trucks and other support vehicles.

3.2.5 Well Development Activities/Hazards

Well development operations will consist of purging the wells of water. Primary hazards associated with well development activities include operation of vehicles in a small area. Of particular concern will be backing up of trucks and other support vehicles. Other hazards include refueling of portable generators used to power the submersible pumps, noise from the portable generator, and back strains/sprains from hand bailing

3.2.6 Geophysical, Global Positioning Satellite (GPS) and topographic survey activities/Hazards

The primary hazards associated with the geophysical surveys include slip/trip/fall; operation of vehicles in the area, particularly backing up of support vehicles; sharp objects and spiny plants (if removal of these objects is necessary) and contact with rodents, snakes and other poisonous plants or animals. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces. Freezing weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces.

3.2.7 Installation of Mechanical, hydrogeologic, and climatic instrumentation

The hazards of this phase of activity are associated with manual materials handling and manually working with soils. Manual materials handling and manually working with soils may cause blisters, sore muscles joint and skeletal injuries. The work area presents slip, trip and fall hazards from scattered debris, the instability of the terrain and irregular walking surfaces. Freezing weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces. This task may involve manual digging but it is not anticipated that excavations requiring protective systems (greater than five feet in depth) will be necessary.

3.2.8 Demobilization

Demobilization will involve the removal of all tools, equipment, supplies, and vehicles brought to the site.

The physical hazards of this phase of activity are associated with heavy equipment operation, manual materials handling and manually working with soils. Heavy equipment operation presents noise and vibration hazards and hot surfaces. Manual materials handling and manually working with soils may cause blisters, sore muscles joint and skeletal injuries. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces. Freezing weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces.

Environmental hazards include venomous arthropods (i.e., insects, spiders, ticks scorpions, and centipedes) and other pests such as ants, fleas, mosquitoes, and wasps; weather, such as sunburn, lightning, rain, heat and cold; and pathogens, such as bubonic plague, hantavirus from deer mouse feces/urine and rabies from bats which inhabit many abandoned mines.
Such hazards will be of concern during all phases of this project at all sites. There is also the potential for ergonomic hazards i.e. strains, sprains during all phases of work.

3.3 Chemical Hazards

No significant inhalation health hazards from chemical contaminants or radiation are anticipated for any of the phases or sites. The chemical hazards associated with site operations are related to skin contact to potential site contaminants and chemicals associated with site operations. These site operations include hollow-stem auger/ODEX drilling; the excavation and collection of surface and subsurface soil, rock and water samples; monitoring well installation and well development, groundwater sample collection and the installation and interpretation of

mechanical, hydrological and climatic instrumentation. The chief site contaminant materials of interest include tailings resulting from prior mining operations. Excessive concentrations of metals, including various metal sulfides, iron and manganese have been reported in surface waters at some of the sites. It is suspected that the tailings may provide contaminants to a groundwater plume that may enter and degrade the water quality at some of these sites. This may result in surface and groundwater with low pH and high dissolved metals concentration. Skin contact with highly acidic water or other materials containing sulfuric acid, nitric acid or other material may cause skin irritation or dermatitis. Caustic materials such as lime and sodium hydroxide may be encountered at former mine sites. Known toxic heavy metals regulated by OSHA such as mercury, arsenic and lead may be present at some of the sites although employee exposure to these substances in excess of OSHA exposure limits is unlikely. Exposure avoidance, air monitoring, and personal protective equipment for specific hazardous materials will be discussed in the site-specific supplements if warranted. VOCs, SVOCs, TPH, herbicides, pesticides, PCBs, and HE are not known to be present.

In some cases, acid mine drainage migrates through wetlands, peat bogs or other organic rich deposits and in those areas sulfur gas can build up as sulfate reducing bacteria reduce sulfate to sulfide. Monitor wells installed in these settings can accumulate sulfur gases that could be toxic to well samplers who might breathe the gases after uncapping such wells. Where such conditions may exist, samplers should be advised of such hazards, trained in the recognition and detection of such materials, and take precautions to preclude inhalation of well gases.

GENERAL NOTE: While none of the sites proposed for work this year are known to contain cyanide, cyanide might be expected at some abandoned mine sites of future activity. Procedures for recognition, exposure avoidance, and air monitoring for cyanide will be included in the site-specific supplements, where applicable.

The operational materials that may be on site to conduct site operations are diesel fuel, gasoline (including benzene component), lubricants, hydraulic and motor oils, laboratory glassware cleaners such as Alconox, and distilled/deionized water. Small quantities of sample preservatives (including hydrochloric acid) and reagents will be used. Decontamination of non-disposable sampling equipment (i.e., hand augers and split-spoon samplers) will include a wire brush and Alconox solution. None of the materials listed in this section are expected to pose a significant health hazard. Silica sand and bentonite will be used during the well installation process. However no significant dust inhalation exposure is anticipated.

The Material Safety Data Sheets (MSDS) for materials used on site are included in Appendix B to satisfy the requirements of the Hazard Communication Standard, OSHA 29 CFR 1910.1200.

4.0 Hazards and Control Procedures

4.1 General Practices

At least one copy of this plan must be at the project site, in a location readily available to all personnel. All personnel must read and understand the requirements in this plan before beginning work.

All site personnel must use the buddy system (working in pairs or teams).

Contaminated protective equipment, such as hoses, boots, etc., must not be removed from the regulated area before being cleaned or properly packaged and labeled.

Legible and understandable precautionary labels that comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200) must be affixed prominently to tightly closed containers of contaminated waste, debris, and clothing. Current Material Safety Data Sheets (MSDS) must be maintained for all hazardous materials brought on to the site such as gasoline, diesel fuel, decontamination solutions, and preservatives.

Removing contaminated soil from protective clothing or equipment by blowing, shaking, or any other means that disperses contaminants into the air is prohibited.

Food, beverages, or tobacco products must not be present or consumed in the regulated area.

Cosmetics must not be applied within the designated exclusion zone for each site.

Containers must be moved only with the proper equipment, and must be secured to prevent dropping or loss of control during transport.

Emergency equipment must be removed from storage areas and staged in readily-accessible locations. This includes such items as the first aid kit, fire extinguishers, and eye wash station.

Employees must inform their partners or fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:

Headaches

Dizziness

Nausea

Blurred vision

Cramps

Irritation of eyes, skin, or respiratory tract.

Visitors to the site must abide by the following:

- All visitors must be instructed to stay outside the contaminated zones (exclusion and contamination reduction zone) and remain within the support zone during the extent of their stay. Visitors must be cautioned to avoid skin contact with surfaces that are or suspected to be contaminated.

- Visitors requesting to observe work in the exclusion zone must don all appropriate PPE prior to entry into that zone, and must be cleared for hazardous waste work as evidenced by a complete physical examination; have 40-hours of hazardous waste operations training; and have 8-hours of refresher training within the past 12 months.

4.1.1 Buddy System

All on-site personnel must use the buddy system. Visual contact must be maintained between crewmembers at all times, and crewmembers must observe each other for signs of chemical exposure. Indication of adverse effects includes, but are not limited to:

- Changes in complexion and skin coloration
- Changes in coordination
- Changes in demeanor
- Excessive salivation and pupillary response
- Changes in speech pattern.

Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

4.2 Sunburn/Ultraviolet Exposure

Overexposure to ultraviolet (UV) radiation may damage the skin and cause sunburn. Chronic exposure to sunlight, especially the UV-B component, accelerates skin aging and increases the risk of skin cancer. Fair-skinned individuals are very prone to this effect; however, increased skin pigmentation reduces the skin sensitivity by as much as a factor of 10.

Sunburn also increases an individual's susceptibility to other forms of heat stress. Any worker with sunburn must pay extra attention to the prevention of heat cramps, heat exhaustion, and/or heat stroke.

4.2.1 Sunburn/Ultraviolet Exposure Prevention

The following methods can be used to avoid overexposure to UV rays from the sun:

Minimize exposure to the sun between 10:00 a.m. and 2:00 p.m. because rays are the most powerful during this period.

Wear protective clothing (long sleeves, hats with protective brims, long pants) that provides the most coverage, consistent with the job to be performed.

Protect eyes during sun exposure with UV-absorbing sunglasses or tinted safety glasses. Ophthalmologists recommend lenses that have UV absorption of at least 90 percent.

Use a commercial sun screen (minimum SPF-15)

Sunscreen should be applied 15 to 30 minutes before exposure to the sun and reapplied often (every 60 to 90 minutes). It is best to use a sunscreen that claims to protect against both UV-B and UV-A rays (some offer only UV-B protection).

4.3 Heat Stress

Wearing PPE may put site personnel at increased risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is one of the most common and potentially serious illnesses during field operations, alertness to the symptoms and knowledge of preventive measures are vital.

Heat stress monitoring should commence when personnel are wearing impermeable PPE and the ambient temperature exceeds 78 degrees Fahrenheit (°F). If impermeable garments are not worn, heat stress monitoring should commence at 90 F. Table 2 should be used to determine protective measures during heat stress monitoring.

4.3.1 Heat Stress Prevention

One or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure as early as possible during rest period) exceeding 75 percent of the calculated maximum heart rate (MHR = 200 - age) or an oral temperature of 99.6 °F:

Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.

On-site drinking water will be kept cool (50 to 60 °F) to encourage personnel to drink frequently.

A work regimen that will provide adequate rest periods for cooling down will be established, as required, but generally a one-third-work shift reduction until sustained heart rate is below 75 percent of their calculated maximum heart rate and oral temperatures are kept at or below 99.6 °F. Workers shall not be allowed to return to work if their sustained heart rate is above the 75 percent calculated maximum OR if their oral temperature exceeds 100.4 °F.

All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.

Cooling devices such as vortex tubes or cooling vests should be used when personnel must wear impermeable clothing in conditions of extreme heat.

Employees should be instructed to monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.

A shaded rest area must be provided. All breaks should take place in the shaded rest area.

Employees must not be assigned to other tasks during breaks.

Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

Heat Cramps: heavy sweating and inadequate electrolyte replacement cause Heat cramps. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat Exhaustion: Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness, nausea; and fainting.

Stroke: Heat stroke is the most serious form of heat stress and should always be treated as a medical emergency. The body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include: red, hot, usually dry skin;

lack of, or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse and confusion; and coma.

4.4 Cold Stress

Cold and/or wet environmental conditions can place workers at risk of a cold-related illness. Hypothermia can occur whenever temperatures are below 45 °F, and is most common during wet, windy conditions, with temperatures between 30 to 40 °F. The principal cause of hypothermia in these conditions is loss of insulating properties of clothing due to moisture, coupled with heat loss due to wind and evaporation of moisture on the skin.

Frostbite, the other illness associated with cold exposure, is the freezing of body tissue, which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when ambient temperatures are below 32 °F. The risk of frostbite increases as the temperature drops and wind speed increases.

4.4.1 Cold Stress Prevention

Most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a fall in the deep core temperature of the body.

Site workers should be protected from exposure to cold so that the deep core temperature does not fall below 96.8 °F. Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision-making, or loss of consciousness with the threat of fatal consequences. To prevent such occurrence, the following measures will be implemented:

Site workers must wear warm clothing such as mittens, heavy socks, etc., when the air temperature is below 45 °F. Protective clothing, such as Tyvek or other disposable coveralls, may be used to shield employees from the wind.

When the air temperature is below 35 °F, employees must wear clothing for warmth, in addition to chemical protective clothing. This will include:

Insulated suits, such as whole body thermal underwear

Wool socks or polypropylene socks to keep moisture off the feet

Insulated gloves

Insulated boots

Insulated head cover such as hard hat, winter liner, or knit cap

Insulated jacket, with wind and water-resistant outer layer.

At air temperatures below 35 °F, the following work practices must be implemented:

- If the clothing of a site worker might become wet on the job site, the outer layer of clothing must be water impermeable.
- If a site worker's underclothing becomes wet in any way, the worker must change into dry clothing immediately. If the clothing becomes wet from sweating (and the employee is not uncomfortable), the employee may finish the task at hand prior to changing into dry clothing.
- Site workers must have a warm (65 °F or above) break area.
- Hot liquids such as soups or warm, sweet drinks must be provided in the break area. The intake of coffee and tea should be limited, due to their circulatory and diuretic effects.
- The buddy system must be practiced at all times on site. Any site worker observed with severe shivering must leave the work area immediately.
- Site workers should dress in layers, with thinner lighter clothing worn next to the body.
- Site workers should avoid overdressing when going into warm areas or when performing strenuous activities.

4.5 High Altitude stress

Most sites are above 5000 feet elevation, some are greater than 7000 feet, and a few lie above 9000 feet.

Drink extra water.

Acclimate at mid level elevations.

4.6 Biological Hazards

Biological hazards may include venomous arthropods (i.e., insects, spiders, ticks scorpions, and centipedes) and other pests such as ants, fleas, mosquitoes, and wasps; pathogens such as bubonic plague and Hantavirus and rabies from bats that may frequent abandoned mines. Exposure to blood-borne pathogens may result from contact with blood or other fluids during administration of first-aid.

4.6.1 Venomous Snakes and Arthropods

Venomous snakes and arthropods, including insects, spiders, ticks, scorpions, centipedes, and others, create a hazard when their habitats are disturbed. Wasp and bee stings account for a number of fatalities each year. In the United States, snakebites rarely kill because effective treatments have been developed. The best defense is to understand where these creatures may be found and to avoid them before they can cause harm. Should a bite or sting occur, first aid should be applied immediately and medical treatment sought as follows:

Black Widow Spider (Latrodectus spp.) is a sedentary web spider found in most warm parts of the world. Only the females bite and then only if threatened or molested. The spider's perception of a threat may be different from your intent. The bite may go unnoticed and may not hurt, but the subsequent severe abdominal pain from a black widow's bite resembles appendicitis. There is pain also in muscles and in the soles of the feet but usually no swelling at the site of the bite. Alternately, the saliva flows freely, then the mouth is dry. The bite victim sweats profusely. The eyelids are swollen. The patient usually recovers after several days of agony. Physicians can relieve the severe pain by injection of calcium gluconate. Antivenin is available; however, there is no first-aid treatment for any spider bite. Black widows are common throughout New Mexico, except perhaps at high altitudes.

Brown Spider (also known as brown recluse spider, violin spider) (Loxosceles spp.) commonly lives in houses or on the floor or behind furniture. Bites occur when a spider rests in clothing or in a towel. There may be no harm at all. In very severe cases, a red zone appears around the bite, then a crust forms and falls off. The wound grows deeper and does not heal for several months. The spider's venom may cause destruction of red blood cells and other blood changes. The victim may develop chills, fever, joint pains, nausea, and vomiting. In some cases, a generalized rash develops one to two days after the bite. A victim should consult a physician as soon as signs of illness appear. Brown recluse bites and suspected bites have been reported from various parts of New Mexico, especially the southeastern part of the state. However, a specimen of the spider has yet to be collected from the state.

Scorpions of the family Vejovidae are common throughout the desert regions of the southwestern United States and southern California. Vejovid scorpions rarely exceed 3 inches in length. Scorpions feed at night on insects and spiders, catching them with their pincers and sometimes stinging them. The stinger is in the tip of the tail. Vejovid scorpions burrow in the earth and are sometimes found under rocks and other objects lying on the ground. Scorpions sting in self-defense. Most stings are not serious but may produce excruciating pain at the site of

the sting. The victim may develop nausea, vomiting, and severe abdominal pain. First aid consists of applying cold to the site of the sting and possibly a soothing lotion, such as calamine.

Black Scorpions, Centruroides exilacauda (once known as Centruroides sculpturatus) of the Buthidae family, is found along the Colorado River and the pine forests in Arizona and southwestern New Mexico. It is the only dangerous scorpion found in the continental United States. They are typically only an inch in length and their color is similar to translucent straw. Its poison affects the nerves, causing severe pain. The sting from this scorpion has been responsible for deaths of small children.

Ticks (suborder Ioxdides) are external parasites of reptiles, birds, and mammals. Most drop off their host after feeding. They molt and then wait on the tips of leaves, forelegs outstretched, ready to attach to any animal brushing past. The bites of some soft-bodied ticks may cause mild paralysis to man. Ticks transmit many diseases, most important, Rocky Mountain spotted fever and Lyme Disease. Ticks attach themselves to the host only with their mouth parts and feed on blood. In removing a tick, take care not to leave mouth parts behind. Ticks are best removed by pulling them off with steady, gentle pressure. The pull must be light enough to not injure the tick. It may take more than 10 minutes of pulling to remove the tick. Be patient! After tick is removed, wash area thoroughly with soap and water, gently scrubbing the area of the tick bite.

Fleas (order Siphonaptera) can be carriers of bubonic plague. The plague is usually limited to rodent populations, including squirrels and various species of wild mice and rats. The fleas that parasitize rodents will rarely parasitize people; however, contact with freshly dead or ill animals should be avoided.

Ants, bees, wasps, hornets, and yellow jackets (order Hymenoptera) occasionally cause death. Death from the sting of such creatures is almost always due to acute allergic reaction. The stinging apparatus and venom sac sometimes remain at the site of the sting and must be removed. Some relief from the pain can be obtained by applying cold. Soothing lotions, such as calamine, may reduce itching.

IMPORTANT NOTE: If an individual has a history of allergic reactions to insect bites or is subject to attacks of hay fever or asthma, or if they are not promptly relieved of symptoms, call a physician or seek immediate emergency medical treatment. In a highly sensitive person, do not wait for symptoms to appear, since delay can be fatal. Any individual with a known allergy to wasps and bees must notify the SHSO and/or Project Manager/Leader prior to working at the project site.

Rattlesnakes are common in the wilder parts of the United States. Rattlesnakes belong to the family of pit vipers (Crotalinae). These snakes have a pit between the eye and nostril on each side of the head, elliptical pupils, from one to six fangs (but usually two well-developed fangs), and one row of plates beneath the tail. The head is wider than the neck and body. The venom of these snakes affects the circulatory system. All reactions from snakebite are aggravated by acute fear and anxiety. Nonpoisonous snakes have two round pupils, no fangs or pit, a double row of plates beneath the tail, and the head is not wider than the neck and body. The pit viper rattlesnakes are the primary poisonous snakes found in New Mexico. The Arizona coral snake is found only in the area immediately adjacent to the western border.

Controlling Exposure to Venomous Snakes and Arthropods. To minimize the threat of snakebites and insect hazards, all on-site personnel must be made aware (during training) of the potential for encountering snakes and will avoid actions potentiating encounters, such as turning over logs, etc. If snakebite occurs, an attempt should be made to kill the snake for identification. The victim should be transported to the nearest hospital within 30 minutes. First aid consists of applying a constriction band, washing the area around the wound to remove any unabsorbed venom, and omitting cutting and sucking (unless medical care cannot be obtained within 30 minutes).

4.6.2 Pathogens

Bubonic Plague Information: Individuals should be aware that bubonic plague is found throughout the Southwest. The plague is an illness that is caused by bacteria and is most often transmitted to humans by the fleas of rodents. The recommendations provided above for controlling exposures to rodent populations should be followed, and all dead rodents, including rabbits and squirrels, should be avoided.

First Aid - Reference American Red Cross Standard First Aid, 1993

Type	Signals	Care
Insect Bite	Stinger may be present Pain Swelling Possible allergic reaction	Remove stinger by scraping it away or by pulling with tweezers Wash wound Cover with a sterile bandage Apply a cold pack
Spider/Scorpion Bite/Sting	Bite mark Swelling Pain Nausea and vomiting Difficulty breathing or swallowing	Wash wound Apply a cold pack Get medical care to receive antivenin Call local emergency number, if necessary
Venomous Snake Bite	Bite mark Pain	Wash wound Keep bite area still and lower than heart Call local emergency number
Animal Bite	Bite mark Pain Bleeding	If bleeding is minor—wash wound Control bleeding Apply antibiotic ointment and cover If bleeding is severe—get medical attention If you suspect the animal has rabies call local emergency number/animal control personnel

Hantavirus Information: The Hantavirus Pulmonary Syndrome illness is a respiratory disease that is a serious often deadly respiratory disease that has been found in rural areas of the western United States. It is also known as the Sin Nombre (No-Name) illness. Preliminary evidence has shown that the illness is caused by a Hantavirus that may be carried in the urine, saliva, and feces of rodents (particularly rats and mice). There is no current evidence to indicate that illness is transmitted by biting insects (ticks, fleas, mosquitoes), or by person-to-person contact. Cats and dogs are not known be a reservoir host of hantaviruses in the United States, however, these domestic animals may bring infected rodents into contact with humans.

It is a good idea for project personnel to be aware of the presence of any rodents and to take precautions where rodents may have been. These precautions include avoiding rodents, rodent bedding or nests, and rodent droppings. Notify the Site Supervisor if any signs of rodents are encountered.

Bats and rabies exposure. Rabies is a fatal viral disease transmitted to humans by the bite of infected bats. Bats may frequent abandoned mines and thus there is always the risk for contact with bats at some of the sites. Pertinent information from the Centers for Disease Control (CDC)

on rabies transmission by bats, preventive measures, and procedures to follow if bitten by a bat are included in Appendix C. Employees must be familiar with this information. It should be reviewed during the initial safety briefing prior to conducting work in any known or suspected bat-infested areas.

4.7 Noise

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

4.7.1 Hearing Conservation

All personnel must wear hearing protection during the operation of noise producing machinery when noise levels exceed 85 dBA, or at the discretion of the SHSO. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 8.0.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, wherever possible barriers or increased distance will be used to minimize worker exposure to noise.

4.8 Spill Control Plan

All personnel must take every necessary precaution to minimize the potential for spills during site operations. All on-site personnel are obligated to report immediately any discharge, no matter how small, to the Site Supervisor.

Spill control apparatus will be located on site at any locations that the Site Supervisor or SSSHO foresees the potential for discharge to the ground. All absorbent materials used for the clean up will be containerized and labeled separately from other wastes, unless otherwise directed by the contracting officer. In the event of a spill, the Site Supervisor will follow the provisions outlined in Section 11 to contain and control released materials and to prevent spread to off-site areas.

4.9 Lockout/Tagout Procedures

Maintenance procedures will only be performed by individual who are familiar with lockout/tagout procedures. Lockout is the placement of a device that uses a positive means such

as a lock to hold an energy or material isolating device or system ensuring that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system will be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controlled may not be operated until the tag is removed. Lockout/tagout procedures will be used during required repairs to the drill rig or other equipment that may cause injury in the event of accidental start-up.

4.10 Sanitation

Site sanitation will be maintained at each site according to OSHA, Department of Health requirements and US Army Corps of Engineers (USACE) applicable sanitation requirements outlined in EM-385-1-1, Section 2. Sanitation requirements will be determined by the SSHO for each site.

4.10.1 Break Area

Breaks will be taken in the support zone away from the active work area. There will be no smoking, eating, drinking, or chewing gum or tobacco in the exclusion zone.

4.10.2 Potable Water

The following rules apply for all project field operations:

An adequate supply of potable water will be provided at each work site

Portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be drunk directly from the container, nor dipped from the container

Containers used for drinking water must be clearly marked and not used for any other purpose

Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups must be provided.

4.10.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking will be provided.

4.10.4 Lavatory

If permanent toilet facilities are not available within a reasonable distance, an appropriate number of portable chemical toilets will be provided.

4.10.5 Trash Collection

Trash collected from the exclusion and contamination reduction zone will be separated as routine hazardous waste. Trash collected in the support and break areas will be disposed of as non-hazardous waste. Labeled trash receptacles will be set up in the contamination reduction zones and in the support zone if deemed necessary by the SSHO.

4.11 Electrical Hazards

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

All electrical wiring and equipment must be a type listed by Underwriters Laboratories, Inc., (UL), Factory Mutual Engineering & Research (FM), or other recognized testing or listing agency.

All installations must comply with the National Electrical Safety Code, the National Electrical Code, or USCG regulations.

Portable and semi portable tools and equipment must be grounded by a multiconductor cord having an identified grounding conductor and a multicontact polarized plug-in receptacle.

Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.

Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.

Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.

All circuits must be protected from overload.

Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.

Plugs and receptacles must be kept out of water unless of an approved submersible construction.

All extension outlets must be equipped with GFCIs.

Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.

Extension cords or cables must not be fastened with staples, hung from nails, or suspended by bare wire.

Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

4.12 Lifting Hazards

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

Consider the size, shape, and weight of the object to be lifted. Two persons must lift an object if it cannot be lifted safely alone (e.g., >60 pounds).

The hands and the object should be free of dirt or grease that could prevent a firm grip.

Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces.

Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.

Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.

The load should be kept as low as possible, close to the body with the knees bent.

To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.

A worker should not carry a load that he or she cannot see around or over.

When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

4.13 Dust Control

Although there is no anticipated occupational exposure risk to airborne dust during project activities, dust will be controlled at all times with emphasis on times when individuals may be exposed to airborne dust. Activities likely to result in dust generation include well installation.

Dust will be controlled through the use of sprayed water. In addition, field personnel will remain upwind of any intrusive or dust-creating activity. If dust control measures are not adequate to suppress airborne dust, work will stop and not continue until appropriate dust control measures are employed.

4.14 Construction Equipment Safety Procedures

Only experienced, demonstrably proficient equipment operators will be used to operate the construction equipment. While operating equipment, the equipment operators will maintain communication with personnel on the ground through either direct voice contact or approved, standard hand signals. In addition, all site personnel in the immediate work area will be made aware of the equipment operations.

Motor vehicles and construction equipment present the potential for pinch and crush hazards. Personnel must remain in the line of sight of the equipment operators at all times. Heavy equipment will be equipped with a functioning back-up alarm or a spotter will be required when the vehicle is traveling in reverse.

All mechanical equipment will be inspected before the equipment is placed in service. All guards and safety devices for chain or belt drives will be in place when the equipment is in use. The front-end loader, motor grader, and track hoe will be inspected daily and the inspection will be documented by the site superintendent or designee. The individual conducting the inspection will look for frayed cables, leaking or abraded hoses, missing lock pins, and any other indications of unsafe or potentially unsafe conditions.

Underground and overhead utility lines can create hazardous conditions if they come in contact with excavation equipment. Appendix C provides an Underground/Overhead Utility Checklist that must be completed prior to any intrusive activities.

If excavations or trenches are to be developed, applicable provisions of EM-385-1-1 and 29 CFR1926 will be followed. Excavation s less than five feet in depth do not require protective systems provided a competent person i.e. SSHO or Site Supervisor) determines that there is no potential for cave-ins.

4.15 Chemical Hazards

Except as described in section on monitor well installation/sampling, no inhalation exposure hazard is anticipated for the duration of this project. Skin contact with potentially corrosive

materials will be prevented by using suitable hand, eye and whole body PPE as described in section 5.0.

5.0 Personal Protective Equipment

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the level of contaminants and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level.

5.1 Levels of Protection

Protection levels are determined based upon contaminants present in the work area. A summary of the levels is presented in this section.

5.1.1 Level D Protection

The minimum level of protection that will be required during site operations will be Level D, which will be worn as the initial protection level for site operations. The following equipment will be used:

Work clothing as prescribed by weather

Safety toe work boots, American National Standards Institute (ANSI) approved

Safety glasses or goggles, ANSI approved (if potential eye hazard is apparent)

Hard hat, ANSI approved

Hearing protection (If noise levels are expected to exceed 85 dBA)

5.1.2 Modified Level D Protection

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities are causing an increased potential for skin and/or eye contact with subsurface liquids and solids. Modified Level D consists of:

- Tyvek® coveralls
- Coated Tyvek® coveralls (in the event of potential liquid contact or contamination)
- Safety toe work boots
- Vinyl or latex booties, or polyvinyl chloride (PVC) overboots
- Safety glasses or goggles
- Hard hat
- Face shield (when projectiles pose a hazard)
- Nitrile gloves
- Hearing protection (if necessary)

Higher levels of protection are not anticipated for planned operations at any of the sites. If conditions warrant higher levels of protection, site work will be suspended until such conditions can be rectified or until this SSHP is amended to address such hazards. It is anticipated that respiratory protection will not be required for any site operations.

5.1.3 Selection of PPE

Equipment for personal protection will be selected by the SSHO for each task in consultation with the site supervisor and Health and Safety Coordinator (COE CIH) based on the potential for skin contact with potentially contaminated materials, site conditions, and ambient air quality. The anticipated PPE selection matrix for anticipated site tasks is given in the table below. This matrix is based upon information available at the time this plan was written. The level of protection may be upgraded or downgraded at the discretion of the SSHO and/or the CIH.

5.2 Using PPE

All people entering the exclusion zone must put on the required PPE in accordance with the requirements of this plan. When leaving the exclusion zone, PPE will be removed in accordance with the procedures listed, to minimize the spread of contamination.

Task	Level of Protection*	Notes
Mobilization/Demobilization	D	
Drilling	D Mod D	Add hearing protection as appropriate
Installation of instrumentation	D	
Sampling and well development	D Mod D	Wear chemical-resistant gloves suitable for protection against corrosive/acidic materials (with low PH) during contact with water. Suitable eye protection (face shield in combination with chemical splash goggles) should also be worn. Wear water/chemical resistant boots during water sampling activities.
Surveying activities (Geophysical, topographical, GPS)	D	

Employees will be provided with sunscreen with a minimum SPF 15 for all activities to cover exposed areas of skin.

6.0 Site Control

6.1 Authorization to Enter

Only personnel who have completed 40 hours of hazardous waste operations training as defined under OSHA Regulation 29 CFR 1910.120, have completed their 40-hour training or refresher training within the past 12 months, and have been certified by a physician within the past 24 months as fit for hazardous waste operations will be allowed within a site area designated as contaminated (exclusion and contamination reduction zones). Personnel without such training may enter the designated support zone. The Site Supervisor will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed within the contaminated zones.

6.2 Hazard Briefing

No person will be allowed in the exclusion zone a during site operations without first being given a site hazard briefing. In general, the briefing will consist of a review of the Tailgate Safety Meeting. All people on the site, including visitors, must sign the site-specific tailgate safety meeting form. Tailgate Safety Meetings will be held at the beginning of each shift. The SSHO or site supervisor will conduct the tailgate meeting.

6.3 Certification Documents

A training and medical file must be established for the project and kept on site during all site operations. The 40-hour training, update, and specialty training (first-aid/cardiopulmonary resuscitation [CPR]) certificates, as well as the current biennial medical clearance for all project field personnel, will be maintained within that file. All personnel must provide their training and medical documentation to the Site Supervisor prior to the start of field work.

6.4 Field Activity Daily Log

The Field Activity Daily Log will be used for project documentation and record keeping.

6.5 Entry Requirements

In addition to the authorization, hazard briefing and certification requirements listed above, no person will be allowed on any field site unless he or she is wearing the minimum PPE as described in Section 5.1.1. Personnel entering the exclusion zone or contamination reduction zone must wear the required PPE for those locations.

6.6 Emergency Entry and Exit

People who must enter the site on an emergency basis will be briefed of the hazards by the Site Supervisor. All hazardous activities will cease in the event of an emergency and any sources of emissions will be controlled, if possible.

People exiting the site because of an emergency will gather in a safe area for a head count. The Site Supervisor is responsible for ensuring that all people who entered the exclusion zone area have exited in the event of an emergency.

7.0 Decontamination

7.1 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

7.1.1 Exclusion Zone

The exclusion zone consists of the specific work area, or can be the entire area of suspected contamination. All employees entering the exclusion zone must use the required PPE and will have the appropriate training for hazardous waste work. The exclusion zone is the defined area where there is a possible contact with a health hazard. The location of each exclusion zone will be identified by cones or other appropriate means.

7.1.2 Contamination Reduction Zone

The contamination reduction zone or transition area will be established if necessary to perform decontamination of personnel and equipment. All personnel entering or leaving the exclusion zone will pass through this area to prevent any cross-contamination and for accountability. Tools and any equipment or machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the exclusion zone. Personal protective outer garments will be removed in the contamination reduction zone and will be cleaned or disposed of. This zone is the only appropriate corridor between the exclusion zone and the Support Zone.

7.1.3 Support Zone

The support zone is a clean area outside the contamination reduction zone located to prevent employee exposure to hazardous substances. Eating, drinking, or smoking will be permitted in the support area only after face and hands have been washed.

7.2 Posting

The exclusion zone, contamination reduction zone and support zone will be prominently marked and delineated using cones or yellow caution tape.

7.3 Decontamination General Rules

All personnel working in the exclusion zone must undergo personal decontamination prior to entering the support zone. The personnel decontamination area will consist of the following.

Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots or shoes

Personnel will remove their outer garment and gloves and deposit them in the lined waste receptacles. Personnel will wipe their hard hats, and boots with clean, damp cloths and then remove those items.

Personnel will thoroughly wash their hands and face before leaving the contamination reduction zone.

7.4 Equipment Decontamination

All vehicles that have entered the contaminated zone will be decontaminated prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

7.5 Personal Protective Equipment Decontamination

Field drilling and sampling activities will be conducted in Level D or modified Level D PPE. This protective clothing will be disposed of as solid waste, unless otherwise determined as highly contaminated through the subsequent analysis of collected soil samples.

8.0 Site Monitoring

8.1 Air Monitoring

The potential for inhalation exposure to hazardous or toxic materials is expected to be minimal for all proposed site activities. The potential for flammable atmospheres (in excess of 10% LEL) is also highly unlikely. All work is expected to be conducted outdoors in open areas and exposure to flammable materials is not likely. Therefore, it is anticipated that routine air monitoring will not be required. Air monitoring requirements may be subsequently instituted at the discretion of the SSHO, if site conditions or tasks may warrant it. If it is subsequently determined that air monitoring if required for specific task(s) than the contaminant(s)/parameters to be monitored, action level(s) instrumentation to be used, monitoring frequency and calibration procedures will be specified in the addendum for the affected site(s). No ionizing radiation hazards are anticipated. Therefore is not anticipated that radiation monitoring will be required

8.2 Noise Monitoring

Noise monitoring will be conducted if required by the SSHO/HSM. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment and drill rigs. As a general rule of thumb, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection (refer to Tables 2 and 4).

8.3 Monitoring Equipment Maintenance and Calibration (if required)

All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary (refer to Table 4). All air monitoring equipment calibrations, including the standard used for calibration, must be documented on the Field Activity Daily Log, or the calibration log. All completed Health & Safety documentation/forms must be reviewed by the Project Health & Safety Officer and maintained by the Site Supervisor.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturers' procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturers' procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

9.0 Employee Training

9.1 Site-Specific Training

Site-specific training will be accomplished through a review of this SSHP before work begins. All workers will review and sign the SSHP acknowledgment form. In addition, the daily Tailgate Safety Meetings will cover the work to be accomplished, the hazards anticipated, the protective clothing and procedures required to minimize site hazards, and emergency procedures. No work will be performed before the Tailgate Safety Meeting has been held and workers have signed the form.

9.2 First Aid and CPR

At least one preferably two employees current in first aid/CPR will be assigned to the work crew and will be on the site whenever operations are ongoing. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding precautions and protective equipment necessary to protect against exposure to blood-borne pathogens, as required by Part 1910.1030 and the Bloodborne Pathogens Infection Control Plan for Albuquerque and/or Omaha Districts. As a minimum, rubber gloves should be available for use by trained first-aiders for use when exposure to blood or other body fluids is a concern.

10.0 Medical Surveillance

10.1 First Aid and Medical Treatment

All persons on site must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the Site Supervisor. A trained site first aid provider will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The Site Supervisor must conduct an accident investigation as soon as emergency conditions no longer exist and first aid and/or medical treatment have been completed. All necessary reports must be completed and submitted to the HSM within 24 hours after the incident.

If first-aid treatment is required, first aid kits will be kept at the contamination reduction or support zones. If treatment beyond first aid is required, the injured should be transported to the medical facility. If the injured is not ambulatory, or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.2 Medical Restriction

If a physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee, and the Site Supervisor. The terms of the restriction will be discussed with the employee and this supervisor. Every attempt should be made to keep the employee working, while not violating the terms of the medical restriction.

11.0 Emergency Procedures

11.1 General

The Site Supervisor will establish evacuation routes and assembly areas for each site. All personnel entering the site will be informed of these routes and assembly areas. If the site is large and the evacuation routes not clear, a site plan will be made marking the evacuation routes and will be posted at conspicuous locations.

Each site will be evaluated for the potential for fire, explosion, chemical release, or other catastrophic events. Unusual events, activities, chemicals, and conditions will be reported to the Site Supervisor immediately.

11.2 Emergency Response

If an incident occurs, the following procedures will be used:

The Site Supervisor will evaluate the incident and assess the need for assistance

The Site Supervisor will call for outside assistance as needed

The Site Supervisor will act as liaison between outside agencies and on-site personnel

The Site Supervisor will ensure the Delivery Order Manager and SHSO are notified promptly of the incident

The Site Supervisor will take appropriate measures to stabilize the incident scene.

11.2.1 Fire

In the case of a fire on the site, the Site Supervisor will assess the situation and direct fire-fighting activities. The Site Supervisor will ensure that the client site representative (as appropriate) is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish, the local fire department will be summoned via 911 or other number. The Site Supervisor will notify the fire department after-the-fact regarding fires successfully extinguished.

11.2.2 Spill

If a spill occurs, the following procedures will be followed:

Notify Site Supervisor immediately.

Evacuate immediate area of spill.

If a small spill, don chemical resistant gloves absorb or otherwise clean up the spill and containerize the material, absorbent, and affected soils. In case of a large spill call 911.

The Site Supervisor has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

11.3 Safety Signals

Vehicle or portable air horns will be used for safety signals as follows:

- One long blast: Emergency evacuation of the site
- Two short blasts: Clear working area around powered or moving equipment.

11.4 Medical Emergency

All employee injuries must be promptly reported to the Site Supervisor. The Site Supervisor will:

Ensure that the injured employee receives prompt first aid and medical attention

Ensure that the Project Manager and Delivery Order Manager are promptly notified of the incident

Initiate an investigation of the incident.

11.4.1 First Aid—General

Survey the scene. Determine if it is safe to proceed. Protect yourself from exposure before attempting to rescue the victim.

Do a primary survey of the victim. Check for **airway** obstruction, **breathlessness**, and **pulse**. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.

Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victims' condition, and help being given.

Perform rescue breathing as necessary.

Perform CPR as necessary.

Do a secondary survey of the victim. Check **vital signs** and do a **head-to-toe exam**.

Treat other conditions as necessary. If the victim can be moved, take him to a location away from the work area where EMS can gain access.

11.4.2 First Aid—Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 3.0 will be removed from the work area and transported to the designated medical facility for examination and treatment.

11.4.3 First Aid—Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for information on inducing vomiting, if recommended. If unconscious keep the victim on his side and clear the airway if vomiting occurs.

11.4.4 First Aid—Skin Contact

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the contamination reduction zone, to the wash-up area. Personnel will remove any contaminated clothing, and then wash the affected area with water for at least 15 minutes. The worker should be transported to the medical facility listed below, if they show any sign of skin reddening, irritation, or if they request a medical examination.

11.4.5 First Aid—Eye Contact

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the exclusion zone, must immediately proceed to the eyewash station, set-up in the contamination reduction or support zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

11.5 Reporting Injuries and Illnesses

All injuries and illnesses, however minor, will be reported to the Site Supervisor immediately. The Site Supervisor will complete an injury report and submit it to the SHSO within 24 hours. In the event of any accident, injury or suspected occupational illness, the reporting procedures outlined in AR-385-40, AR-385-40 (USACE Supplement) and ER-385-1-92 will be followed. The appropriate form(s) including ENG 3394 will be completed and forwarded to the Albuquerque and/or Omaha Safety and Occupational Health Offices.

11.6 Emergency Information

Local public response agencies will be reviewed in the Tailgate Safety Meeting. (See table of emergency information on next page.)

Appendix A
Material Safety Data Sheets

Not Used.

Appendix B

Eng 3394 (USACE Accident Reporting Form)

Appendix C
Information on Bats and Rabies

The following information was taken from the Center for Disease Control (CDC) Web page: http://www.cdc.gov/ncidod/dvrd/rabies/Bats_&_Rabies/bats&.htm

What is rabies and how do people get it?

Rabies is an infectious viral disease that affects the nervous system of humans and other mammals. People get rabies from the bite of an animal with rabies (a rabid animal). Any wild mammal, like a raccoon, skunk, fox, coyote, or bat, can have rabies and transmit it to people. It is also possible, but quite rare, that people may get rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound.

Because rabies is a fatal disease, the goal of public health is, first, to prevent human exposure to rabies by education and, second, to prevent the disease by anti-rabies treatment if exposure occurs. Tens of thousands of people are successfully treated each year after being bitten by an animal that may have rabies. A few people die of rabies each year in the United States, usually because they do not recognize the risk of rabies from the bite of a wild animal and do not seek medical advice.

Why should I learn about bats and rabies?

Most of the recent human rabies cases in the United States have been caused by rabies virus from bats. Awareness of the facts about bats and rabies can help people protect themselves, their families, and their pets. This information may also help clear up misunderstandings about bats. When people think about bats, they often imagine things that are not true. Bats are not blind. They are neither rodents nor birds. They will not suck your blood -- and most do not have rabies. Bats play key roles in ecosystems around the globe, from rain forests to deserts, especially by eating insects, including agricultural pests. The best protection we can offer these unique mammals is to learn more about their habits and recognize the value of living safely with them.

How can I tell if a bat has rabies?

Rabies can be confirmed only in a laboratory. However, any bat that is active by day, is found in a place where bats are not usually seen (for example, in a room in your home or on the lawn), or is unable to fly, is far more likely than others to be rabid. Such bats are often the most easily approached. Therefore, it is best never to handle any bat.

What should I do if I come in contact with a bat?

If you are bitten by a bat -- or if infectious material (such as saliva) from a bat gets into your eyes, nose, mouth, or a wound -- wash the affected area thoroughly and get medical advice

immediately. Whenever possible, the bat should be captured and sent to a laboratory for rabies testing (see: How can I safely capture a bat in my home?).

People usually know when they have been bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you awaken and find a bat in your room, see a bat in the room of an unattended child, or see a bat near a mentally impaired or intoxicated person, seek medical advice and have the bat tested.

People cannot get rabies just from seeing a bat in an attic, in a cave, or at a distance. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur (even though bats should never be handled!).

How can rabies be prevented?

- Teach children never to handle unfamiliar animals, wild or domestic, even if they appear friendly. "Love your own, leave other animals alone" is a good principle for children to learn.
- Wash any wound from an animal thoroughly with soap and water and seek medical attention immediately.
- Have all dead, sick, or easily captured bats tested for rabies if exposure to people or pets occurs.
- Prevent bats from entering living quarters or occupied spaces in homes, churches, schools, and other similar areas where they might contact people and pets.
- Be a responsible pet owner by keeping vaccinations current for all dogs, cats, and ferrets, keeping your cats and ferrets inside and your dogs under direct supervision, calling animal control to remove stray animals from your neighborhood, and consider having your pets spayed or neutered.

Case study

In February 1995, the aunt of a 4-year-old girl was awakened by the sounds of a bat in the room where the child was sleeping. The child did not wake up until the bat was captured, killed, and discarded. The girl reported no bite, and no evidence of a bite wound was found when she was examined. One month later the child became sick and died of rabies. The dead bat was recovered from the yard and tested--it had rabies.

This case demonstrates several points:

- This child's infection with rabies was most likely the result of a bat bite. Children sleep heavily and may not awaken from the presence of a small bat. A bat bite can be superficial and not easily noticed.
- The bat was behaving abnormally. Instead of hiding, the bat was making unusual noises and was having difficulty flying. This strange behavior should have led to a strong suspicion of rabies.
- If the bat had been submitted for rabies testing, a positive test would have led to life-saving anti-rabies treatment.

Remember, in situations in which a bat is physically present and you cannot reasonably rule out having been bitten, safely capture the bat for rabies testing and seek medical attention immediately.

Where can I learn more about bats?

Contact your state or local wildlife conservation agency or Bat Conservation International:

Bat Conservation International, Inc.
P O Box 162603
Austin, Texas 78716
www.batcon.org

To learn more about endangered bats and the Endangered Species Act, contact the US Fish and Wildlife Service:

U S Fish and Wildlife Service
Division of Endangered Species
4401 N. Fairfax Drive, Room 452
Arlington, Virginia 22203
www.fws.gov

Where can I learn more about rabies?

Contact your state or local health department or the Centers for Disease Control and Prevention:

Centers for Disease Control and Prevention
National Center for Infectious Diseases
Rabies Section MS G-33
1600 Clifton Road
Atlanta, Georgia 30333
www.cdc.gov/ncidod/dvrd/rabies

Figure 1
Site Location Map

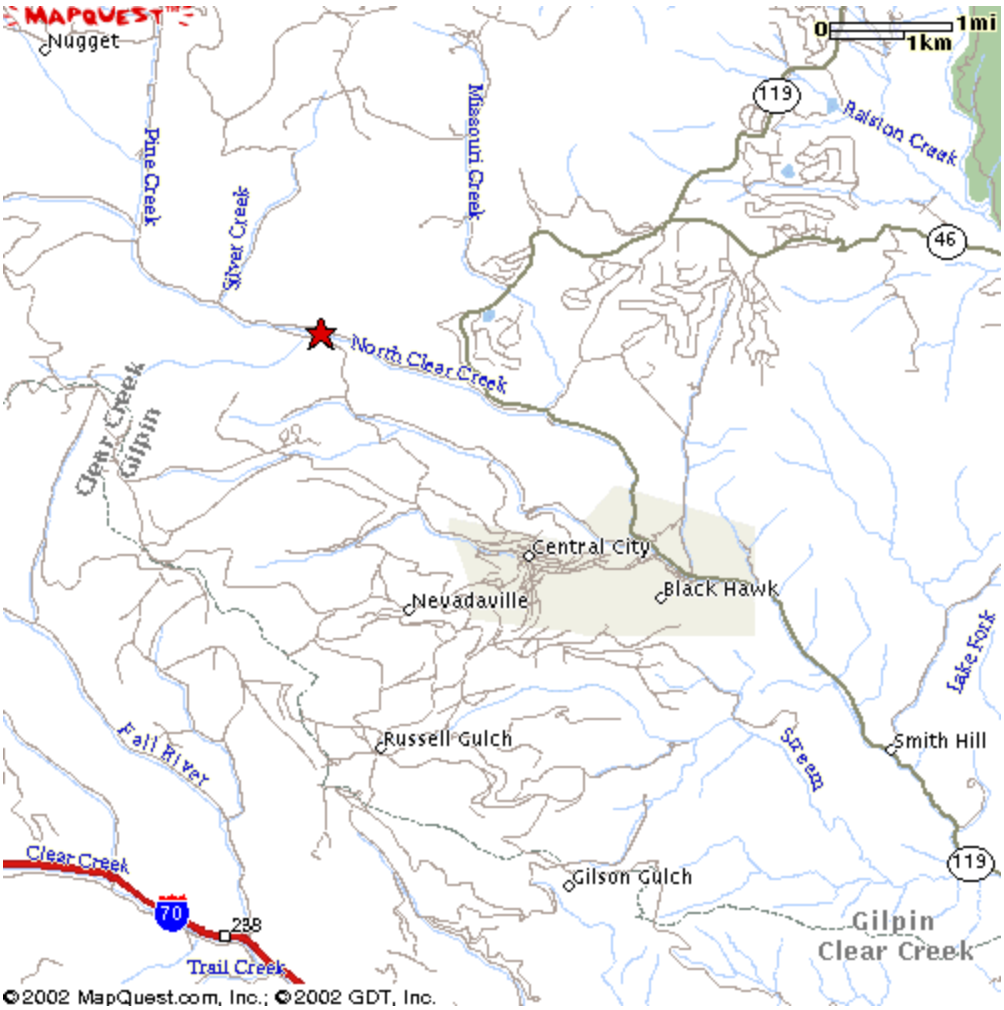
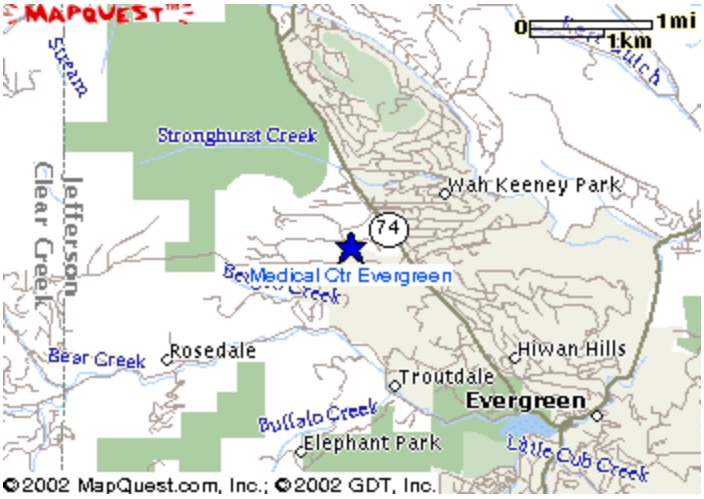


Figure 2

Hospital Route Map

Medical Center Evergreen
30940 Stagecoach Blvd # W100
Evergreen, CO

Colorado Highway is Evergreen Parkway in Evergreen. From Evergreen Pkwy, turn west onto Stagecoach Blvd. Medical Center Evergreen is located less than ½ mile.



Tailgate Safety Meeting Documentation

Topic(s):

SSHP review

_____

_____

Date_____

Presenter_____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s)

_____
_____
_____

Date_____

Presenter_____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s):
SSHP review

_____
_____
_____

Date_____

Presenter_____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s)

_____
_____
_____

Date_____

Presenter_____

Name	Organization