

APPENDIX A

SITE SAFETY AND HEALTH PLAN



SITE SAFETY AND HEALTH PLAN

YUMA PROVING GROUND



PREPARED FOR:

U.S. ARMY GARRISON

YUMA PROVING GROUND

CONTRACT NO. W91ZLK-05-D-0016-0002

PREPARED BY:

PARSONS

SALT LAKE CITY, UTAH

JANUARY 2008

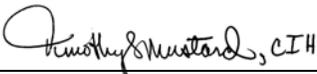
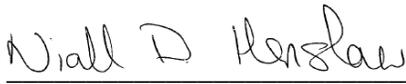
(REVISED JANUARY 2013)



SITE SAFETY and HEALTH PLAN

Project Title: Remediation Services at Yuma Proving Ground, Arizona
Project Number: 745994
Client Name: US Army Environmental Command
Contract Name: ACSIM ID/IQ
Contract Number: W91ZLK-05-D-0016-0002
Contractor: Parsons Infrastructure & Technology Group, Inc.
Task Order Period: 25 September 2007 – 24 September 2017
Original Submission: January 2008
Updated: August 2010; January 2013

REVIEWED AND APPROVED BY:

Project CIH:	 _____ Tim Mustard, CIH	<u>1/3/2013</u> Date
Project Manager:	 _____ Edward G. Staes	<u>1/3/2013</u> Date
Site Health and Safety Officer:	 _____ Niall D. Henshaw	<u>1/3/2013</u> Date



EMERGENCY INFORMATION SUMMARY

In order to facilitate the quick retrieval of information in the event of an emergency, this summary has been placed in the front of the document. Additional emergency information and rationale is also in Section 4.

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, telephone or radio contact should be made with the site point of contact or site emergency personnel who will then contact the appropriate response teams.

The local responders have been contacted and briefed on the nature of Parsons’ work activities and are equipped to provide emergency assistance.

Emergency Services	911
For all emergencies on the Firing Ranges contact Range Control. The preferred method for contact is the range radio. If a telephone call is necessary, call	(928) 328-5111
PrimeCare 24 Foothills Campus (Non-Emergency Care)	(928) 345-6830
Yuma Regional Medical Center	(928) 344-2000
Parsons Salt Lake City office (Receptionist)	(801) 572-5999
Parsons Project Manager (Mr. Ed Staes)	(801) 553-3316 (801) 891-3701 - cell
Field Team Leader/Site Health and Safety Officer (Mr. Niall Henshaw)	(801) 550-0826 - cell
Parsons Project Health and Safety Officer (Mr. Tim Mustard, C.I.H.)	(303) 564-3537 - cell
Parsons Safety Vice President (Mr. Jeff Kleinfelter)	(760) 450-6497 - cell (858) 759-5211 –alternate
Parsons PGS President (Ms. MaryAnn Hopkins)	(202) 469-6408 (703) 615-0929 - cell
Client Contact (Mr. Robert Rowden)	(210) 466-1887
YPG Points of Contact: (Ms. Donnett Brown) (Ms. Marla Lewis)	(928) 328-2754 (928) 328-3087



Emergency Medical Treatment and First Aid

For medical emergencies, fire services paramedics will respond to the injury/illness emergencies. Transportation will be provided by USAGYPG emergency personnel to a pick up point where the patient is transferred to a rural metro ambulance. Limited air evacuation support is available at the Laguna army Airfield or from Yuma Regional Medical Center.

For less serious injuries, or those that don't require immediate attention, arrange for the victim to be transported to the Regional Medical Center, Yuma, AZ. The Medical Center is about 28 miles (40 minute drive) from USAGYPG.

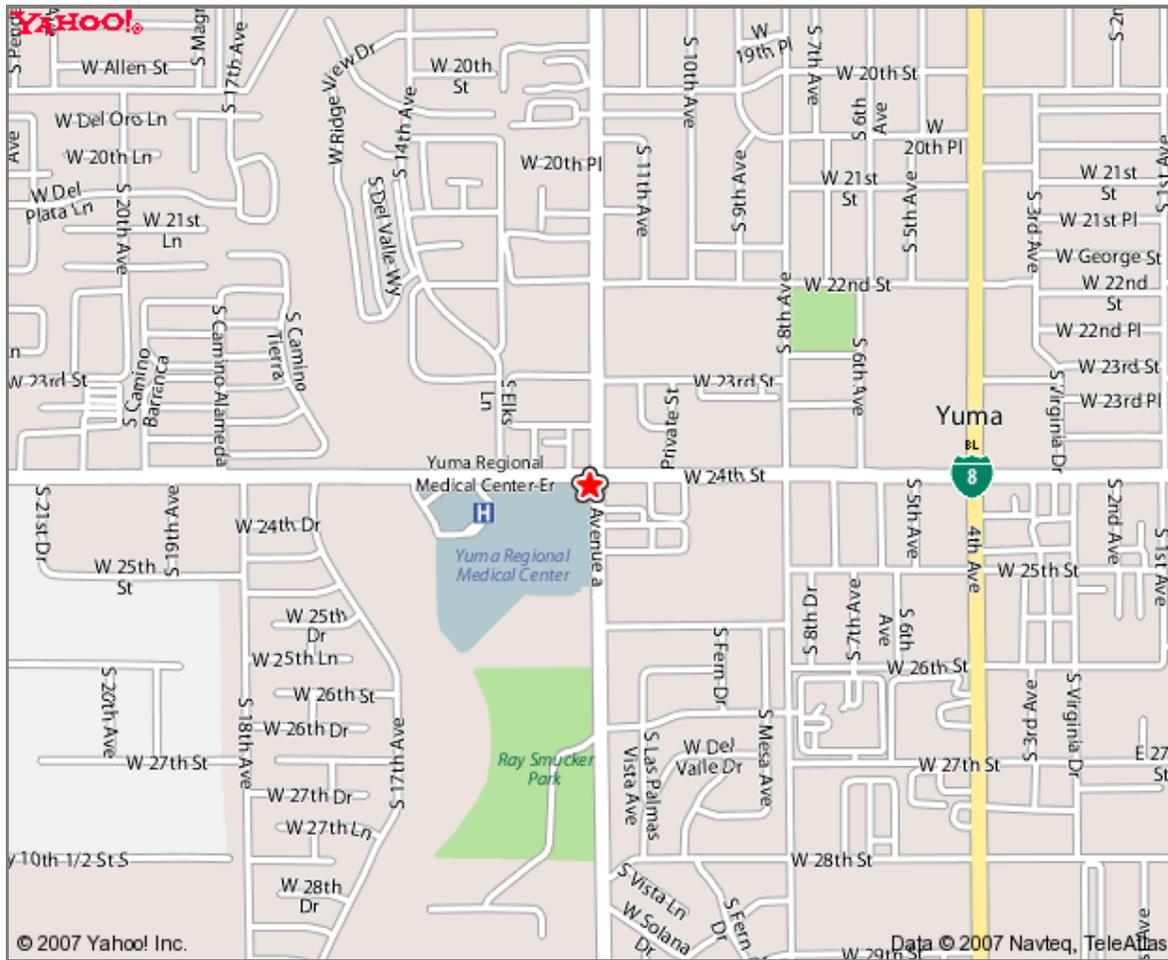
Directions to the Yuma Regional Medical Center from Yuma Proving Ground:

- Turn left at E Laguna Dam Rd - 5.1 mi
- Turn right at US-95 - 19.3 mi
- Turn left at S Pacific Ave - 1.0 mi
- Turn right at E 24th St - 2.0 mi.
- Turn left at S Ave A

Yuma Regional Medical Center

2400 S. Avenue A
Yuma, AZ 85364
Phone: (928) 344-2000





Internal Reporting

Immediately after an incident, notify the Parsons Project Health and Safety Manager (Tim Mustard) and the Parsons Project Manager (Ed Staes) and USAGYPG.

If the incident results in a lost work day case or worse, the Parsons PI&T Safety Manager (Jim Owen) and President (Todd Wager) must be notified.

Incident Reporting can also be conducted on the Parsons intranet (Pweb) at <https://webtools.parsons.com/safety/> (until May 17th 2010).

After May 17th 2010, access is through the IndustrySafe webpage (Pweb/Business Services/Safety – Incident Reporting).



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SECTION 1 – INTRODUCTION

1.1 PARSONS WORKPLACE HEALTH & SAFETY POLICY

Parsons has implemented a Safety, Health, and Risk Program (SHARP) which requires Project Managers to implement effective programs in these areas. Parsons’ goal is zero accidents and zero injuries with work tasks designed to minimize or eliminate hazards to personnel, equipment, and the general public. No employees should ever perform tasks that may endanger their own safety and health or that of others. Exhibit 1.1 summarizes Parsons’ workplace Health and Safety Policy.

Exhibit 1.1 – Parsons Workplace Health and Safety Policy

CORPORATE POLICY: WORKPLACE HEALTH AND SAFETY

STATEMENT OF POLICY:

As an industry-leading engineering, construction and technical services firm, Parsons is firmly committed to maintaining a safe and healthy working environment at its offices and project facilities. We share the National Safety Council’s Safety and Health Code of Ethics as the principles guiding our commitment to safety.

- We will hold safety and health as our highest core value.
- Executive management will lead the safety improvement process.
- Safety will be a responsibility shared by everyone in our organization.
- Safety performance will be a key indicator of our organizational excellence and will be incorporated into our business processes.
- We will communicate safety performance openly with employees.
- Employees will be given the knowledge and skills necessary to safely perform their jobs.
- We will extend our safety efforts beyond the workplace to include transportation, homes and communities.
- We will continually strive to improve our safety and health processes.

To meet its health and safety objectives, Parsons employees are expected to act proactively with regard to health and safety issues. This requires the combined efforts of a concerned management, responsible and knowledgeable supervision, and conscientious, well-trained employees.

Parsons will take reasonable action to meet or exceed the applicable occupational health and safety requirements, domestically and internationally, and will continuously monitor and improve operations, procedures, technologies and programs that are conducive to maintaining a safe and healthy environment.

RESPONSIBILITIES:

Parsons GBU management and supervisory personnel are responsible to:

- Comply with this policy and ensure that the applicable health and safety requirements at each domestic and international office and project facility are effectively implemented and monitored.



Exhibit 1.1 – Parsons Workplace Health and Safety Policy (Cont'd)

RESPONSIBILITIES: (cont'd)

- Ensure that the applicable health and safety requirements at each domestic and international project facility are effectively integrated with the preparation of proposals, project planning, and project execution.
- Monitor subcontractor safety performance in accordance with contract specifications as required by the contract with client.
- Ensure that safety information and statistics are reported to Parsons Corporate Safety Manager on a consistent and regular basis.

Parsons Corporate Safety personnel are responsible to:

- Develop, communicate, and oversee Parsons health and safety programs at Parsons business units.
- Provide assistance to Parsons business unit managers regarding health and safety regulations, reporting requirements, safety training, and other related issues.
- Monitor the effectiveness of Parsons health and safety programs, conduct investigations, develop OSHA reporting and worker's compensation claim procedures.
- Collect and maintain safety information and statistics for Parsons business units and operations, as shown in corporate policy.
- Keep senior management informed of significant internal and external developments regarding health and safety.
-

Parsons employees are responsible to:

- Exercise maximum appropriate care and good judgment regarding health and safety, and adhere to safety procedures to prevent accidents and injuries.
- Promptly report accidents and injuries to supervisory personnel.
- Promptly report an near misses, unsafe conditions, equipment, or practices to supervisory personnel

1.2 THE SITE-SPECIFIC SAFETY AND HEALTH PLAN

This Site-Specific Safety and Health Plan (SSHP) for Yuma Proving Ground (YPG) outlines safety and health requirements and guidelines developed by Parsons for project work. This plan should be used in conjunction with applicable sections from the Parsons Corporate Safety and Health Manual (CSHM) which is incorporated by reference. When implemented, these requirements will help protect site personnel, visitors, and the public from exposure to potential safety and health hazards.

This manual describes the Parsons Health and Safety policy, program responsibilities, training, medical surveillance and emergency care, safety equipment, program audits, record keeping and information distribution, and other work-related health and safety procedures. This SSHP will be updated as conditions or situations change, usually by



addenda to the SSHP. The SSHP will be reviewed at least annually and revised as necessary.

Parsons and subcontractor personnel must understand and implement the SSHP and any addenda. Parsons documents this by having employees sign an acknowledgement form stating that they understand the plan and its requirements.

1.3 SUBCONTRACTOR SAFETY PLANS

Subcontractors must establish a safety program for their work and employees. Contract specifications require subcontractors to review and accept Parsons SSHP and prepare their own SSHP for presentation to Parsons Project Manager at least 10 days before site mobilization. At a minimum, subcontractor safety and health plans must meet the requirements of this SSHP and provide safety equipment and safeguards suitable for the hazards involved. Subcontractors must ensure that appropriate safety and health information is available for project tasks.

SSHP requirements for Parsons personnel (e.g., training, substance abuse screening, and incident reporting) also apply to subcontractor personnel and should be spelled out in the subcontractor's safety plan.

If a subcontractor is performing activities that require specialized training (i.e. confined space entry, excavation/trenching, scaffold use, HAZWOPER, etc.), then copies of training certifications must be provided for applicable employees AND the supervisor.

Supervisors must possess the following certifications – HAZWOPER 8-hour Supervisor (29 CFR 1910.120(e)(4) – (not to be confused with 8-hour annual refresher), and other certifications, where applicable: such as, excavation competent person (29 CFR 1926.651[k]).



SECTION 2 – SCOPE OF WORK

2.1 SCOPE OF WORK

Parsons, in their contracted role with the U.S. Army Garrison Yuma Proving Ground is providing environmental services at Yuma Proving Ground for the work as specified in Contract Number W91ZLK-05-D-0016-0002 between Parsons and the U.S. Army Garrison Yuma Proving Ground.

A summary of the work to be performed under this contract is presented in Table 2-1.

TABLE 2.1 - SCOPE OF WORK SUMMARY

<i>Performance Objective</i>
<p>Approved Project Management Plan (PMP) and Quality Assurance Surveillance Plan (QASP):</p> <ul style="list-style-type: none"> • Draft PMP and QASP within 30 days of Task Order award, • Final PMP and QASP within 30 days of receipt of COR comments on the drafts.
<p>Achieve Remedy In Place (RIP) for groundwater at the following site by September 30, 2009:</p> <ul style="list-style-type: none"> • YPG-10: Fuel Bladder Test Site <p>Achieve Response Complete (RC) for media at the following site by the end of the Task Order:</p> <ul style="list-style-type: none"> • YPG-10: Fuel Bladder Test Site <p>Upon achievement of RC, perform any necessary Long-Term Management (LTM) at the above sites for the duration of the Task Order.</p>
<p>Achieve an approved Decision Document (DD) at the following sites by September 30, 2008:</p> <ul style="list-style-type: none"> • YPG-01: Old Chemical Laboratory (Building S-2500) • YPG-11: Former Pesticide Mix/Storage Building T-430 • YPG-31: West Environmental Test Area • YPG-32: Former Waste Disposal Area • YPG-45: Building 506 UST Fuel Release



Performance Objective

Perform any necessary Remedial Action (Operations) [RA(O)] or LTM at the following sites for the duration of the Task Order:

- YPG-01: Old Chemical Laboratory (Building S-2500)
- YPG-10: Fuel Bladder Test Site
- YPG-11: Former Pesticide Mix/Storage Building T-430
- YPG-31: West Environmental Test Area
- YPG-32: Former Waste Disposal Area
- YPG-45: Building 506 UST Fuel Release

Perform any necessary Remedial Action (Operations) [RA(O)] or LTM at the following sites for the duration of the Task Order:

- CCYPG-165: Fuel Station #1 (UST 207 & 209)
- CCYPG-204: UST Site Remediation, AAFES Gas Station

Achieve RC at the following sites by September 30, 2008:

- YPG-2: Chemical Waste Holding Tank (Building S-2060)
- YPG-3: Septic Tank Leachfield Building 2060)
- YPG-13B: Washpad 1 Castle Dome Heliport
- YPG-13C: Washpad 2 North Castle Dome Heliport
- YPG-13D: Waste Basin at Castle Dome Heliport
- YPG-13E: Septic Tank Leachfield (E) Kofa Building 3490
- YPG-13F: Septic Tank Leachfield Building 3021 LAAF
- YPG-23: Washrack/lagoon (West) at Kofa Building 3490
- YPG-25: Septic Tank Leachfield (North) at CDH
- YPG-26: Septic Tank Leachfield (South) at CDH

Upon achievement of RC, perform any necessary LTM at the above sites for the duration of the Task Order

Achieve an approved Remedial Investigation Report at the following site within two (2) years of notice to proceed on the CLIN:

- YPG-002-R-01: Mortar Impact Area



Performance Objective

Achieve an approved Corrective Measures Study (CMS) at the following sites within two (2) years of notice to proceed on the CLIN:

- CCYPG-027: Inactive Landfill 5Km SSE MAA (SWMU 37)
- CCYPG-028: Inactive Landfill NW MAA SE Imperial Dam (SWMU 36)
- CCYPG-029: Inactive Landfill E RT95 2Km W Kofa Ran. (SWMU 41)
- CCYPG-035A: Muggins Mountain (Surface and Hydrogeo)
- CCYPG-035B: Muggins Mountain (Trench and Subsurface)
- CCYPG-035C: Muggins Mountain (Open Detonation Activity)
- CCYPG-141: Inactive Landfill (SWMU 39)
- CCYPG-143: Inactive Landfill SSE of LAAF
- CCYPG-178: Inactive Landfill 3 Km East of Main ADMI N

If interim remedial action or site closure is achieved prior to completion of RFI, no CMS will be completed.

Achieve Site Close-Out of the following sites within two (2) years of notice to proceed on the CLIN:

- CCYPG-006A: Inactive OB/OD Burn On Ground Area
 - Burn on Ground Area (SWMU 56)
 - Trash Trench (SWMU 53)
 - Inactive North and South Pads (SWMU 54)

Achieve an approved Groundwater Monitoring Plan at the following site within 120 days of notice to proceed:

- Munitions Treatment Facility (OB/OD Area)

Upon approval of the Groundwater Monitoring Plan, implement the requirements of the Groundwater Monitoring Plan for the Duration of the Task Order.

The types of field work to be performed under this scope of work include, but are not limited to, the following:

- Characterization of nature and extent of contamination (surface & subsurface soil and groundwater sampling)
- Capping of UST and contaminated soil
- Soil/Debris Removal
- Geophysical surveys
- Installation of monitoring wells



- Abandonment of monitor wells
- UXO Avoidance

2.2 SITE-SPECIFIC HEALTH AND SAFETY PROGRAM APPLICATION

This safety program and referenced documents applies to locations, facilities, operations, and projects associated with contract work performed by Parsons and its subcontractors.

U.S. Army Garrison Yuma Proving Ground is located in the extreme southwestern portion of the State of Arizona, bordered on the west by the Colorado River. The installation is located in a very remote portion of Yuma County with the nearest major population center, the city of Yuma, approximately 25 miles to the south southwest. The population of the city of Yuma is approximately 77,000 inhabitants. U.S. Army Garrison Yuma Proving Ground is one of Department of Defense's largest installations, approximately 830,000 acres in size or roughly 1,300 square miles. Comparatively, it is slightly larger than the state of Rhode Island.

U.S. Army Garrison Yuma Proving Ground is a general purpose facility with over 50 years experience testing weapon systems of various types and sizes in a joint environment. The proving ground conducts tests on medium and long-range artillery, aircraft target acquisition equipment and armament, armored and wheeled vehicles, a variety of munitions, and personnel and supply parachute systems. Testing programs are conducted for United States military services, friendly foreign nations and private industry. U.S. Army Garrison Yuma Proving Ground is the Army's center for desert natural environment testing and the management of cold weather testing at the Cold Regions Test Center, Alaska, and tropic testing at the Tropic Test Center, various locations. U.S. Army Garrison Yuma Proving Ground is one of twenty-two major test ranges that comprise the Department of Defense (DoD) Major Range Test Facility Base.

The regional climate is classified as arid with mild winters, hot dry summers, and generally low rainfall.

Twenty eight (28) sites are covered under this work scope. The performance objectives associated with each one are shown previously on Table 2.1. The site activities and hazards associated with each site are summarized in Section 6 of this SSHP.



SECTION 3 – PROJECT SAFETY MANAGEMENT RESPONSIBILITIES AND AUTHORITY

3.1 SAFETY RESPONSIBILITY MATRIX

Exhibit 3.1 summarizes the responsibilities of key personnel related to the primary safety activities identified in the SSHP.

Parsons is contracted to perform remedial and closure activities including long term management as described in the Work Plan. Parsons developed this SSHP and will provide copies to personnel working on the project. Parsons will also provide on-site compliance supervision during site activities. Parsons’ duties and responsibilities are found in Table 4.1. Parsons qualified UXO personnel will identify, mark the location of, and report any munitions and explosives of concern (MEC) hazards for avoidance by work crews.

Parsons will manage this project from their Salt Lake City, Utah office. Personnel will be drawn from other Parsons’ offices as needed. The following personnel are designated to perform the stated job functions for the continuance of this project.

Exhibit 3.1 – Parsons Project/Safety Personnel

Project Manager (PM)	Edward Staes, PE	Alternate SHSO	TBD
Project Health and Safety Officer (PHSO)	Tim S. Mustard, CIH	UXO Safety Specialist	Niel Fiest
Occupational Medicine Physician	Everett Walker, MD	Yuma Safety	TBD
Field Team Leader (FTL)	Niall Henshaw, PG		
Site Health and Safety Officer (SHSO)	Niall Henshaw, PG		



**TABLE 3.1
RESPONSIBILITIES OF PROJECT PERSONNEL**

Title	General Description	Responsibilities
Project Manager	<p>Reports to upper-level management. Has authority to direct operations. Controls site activities. Through action, example, and training, instill a sincere attitude toward the zero accident philosophy in project personnel and help them develop a better understanding of accident prevention and loss control.</p>	<ul style="list-style-type: none"> • Ensures that Work Plan is completed on schedule. • Serves as liaison with public officials. • Uses Project/Site Health and Safety Officers to ensure that safety and health requirements are met. • Prepares and organizes background review of the project, work plan, SSHP, and field team. • Coordinates activities with appropriate officials. • Briefs field teams on their specific assignments. • Prepares final report and support files on emergency response activities.
Project Health and Safety Officer (CIH)	<p>Advises the Project Manager on aspects of health and safety. Develops, approves, signs, and implements the project Safety and Health Plan. Through action, example, and training, instill a sincere attitude toward the zero accident philosophy in project personnel and help them develop a better understanding of accident prevention and loss control.</p>	<ul style="list-style-type: none"> • Confirms each team member’s suitability for work based on a physician’s recommendation. • Implements SSHP. • Conducts project health and safety briefings. • Conducts inspections to determine if SSHP is being followed. • Coordinates any needed emergency medical care. • Ensures that required equipment is available. • Available for emergencies.



**TABLE 3.1 (CONTINUED)
RESPONSIBILITIES OF PROJECT PERSONNEL**

Title	General Description	Responsibilities
<p>Site Health and Safety Officer</p>	<p>Responsible to the Project Health and Safety Officer on aspects of health and safety on site. Stops work if any operation threatens worker/public health or safety. Performs on-site responsibilities of the Project Health and Safety Officer in his absence.</p> <p>Through action, example, and training, instill a sincere attitude toward the zero accident philosophy in project personnel and help them develop a better understanding of accident prevention and loss control.</p>	<ul style="list-style-type: none"> • Implements SSHP. • Conducts daily safety and health briefings. • Conducts daily safety and health inspections. • Maintains health and safety logbook. • Performs health and safety record keeping. • Ensures that protective clothing and equipment are properly stored and maintained. • Inspects protective clothing and equipment. • Monitors work parties for signs of stress, such as heat stress and fatigue. • Controls entry and exit at the Access Control Points. • Enforces the “buddy” system. • Knows emergency procedures, evacuation routes, and telephone numbers of ambulance, local hospital, poison control center, fire department, and police department. • Ensures decontamination lines and decontamination solutions are appropriate for type of chemical contamination on the site. • Controls decontamination of equipment, personnel, and samples from contaminated areas. • Ensures proper disposal of contaminated clothing and materials. • Ensures that required monitoring equipment is available. • Notifies emergency personnel by telephone/radio in event of emergency. Coordinates emergency medical care. • Conducts accident investigations with assistance from the Project Health and Safety Officer.
<p>Occupational Physician</p>	<p>Responsible for review of medical exam records of field team members.</p>	<ul style="list-style-type: none"> • Ensures that field team members meet physical capacity requirements for successful completion of assigned tasks. • Provides signed medical certificates of fitness for field team members.



**TABLE 3.1 (CONTINUED)
RESPONSIBILITIES OF PROJECT PERSONNEL**

Title	General Description	Responsibilities
Field Team Leader	Responsible for field team operations and safety. Through action, example, and training, instill a sincere attitude toward the zero accident philosophy in project personnel and help them develop a better understanding of accident prevention and loss control.	<ul style="list-style-type: none"> • Manages field operations. • Executes Work Plan and SSHP. • Enforces safety procedures. • Coordinates with Project Health and Safety Officer in determining protection level. • Enforces site control. • Documents field activities and sample collection. • Serves as a liaison with public officials.
UXO Safety Specialist	Responsible for developing, implementing and monitoring the Project UXO Safety and Health Plan. Through action, example, and training, instill a sincere attitude toward the zero accident philosophy in project personnel and help them develop a better understanding of accident prevention and loss control.	<ul style="list-style-type: none"> • Implements UXO Safety & Health Plan. • Provides surface clearance. • Monitors UXO intrusive activities. • Ensures project personnel are briefed on UXO safety requirements and operations. • Provides escort services for personnel. • Enforces UXO safety procedures. • Ensures that required UXO monitoring and safety equipment is available and operational.
Field Team Members	Other personnel entering site to conduct activities covered by plan. Through action, example, and training, maintain a sincere attitude toward the zero accident philosophy.	<ul style="list-style-type: none"> • Safely completes on-site tasks required to fulfill Work Plan. • Comply with SSHP. • Notify Site Health and Safety Officer or supervisor of suspected unsafe conditions. • Practice the “buddy” system.



TABLE 3.2
ROLES AND RESPONSIBILITIES

Work Elements		Project Manager	Project Safety Manager	Site Safety Manager	Project Controls Manager	Sector Manager	Division Manager	GBU Safety Manager	GBU QC Manager	GBU Risk Manager	GBU President	Corporate Workers Compensation Analyst	Corporate Safety	Resident Engineer/Superintendent	GBU BD Manager	Parsons CEO/President
1	Zero Incident Techniques and SHARP Management	X	D	P	P	R	R	R	E	S	E		E	S	S	E
2	Business Development Phase	X	P	P	P	R	E	S		S	E		E	P	D	E
Startup Phase	3 Initial Hazards Analysis and Planning	X	P	P	P	R	E	R	E	P	E	P		P		
	4 Project Safety Plan (PSP)	X	D	P		R	E	R		R	E		C			E
	5 Stakeholder PSP Alignment Meeting	X	D	P		E	E	P					C	P		
Administration/Design Phase	6 Awareness Campaign	X	D	P	P	E	A	R					C	P		
	7 Employee Orientation	P	P	X	P	R	A	E					C	P		
	8 Training	X	D	X	P	R	A	E					C			E
	9 Health and Safety Committee	X	D	X	P	R	A	R					C			
	10 Incident Investigations	X	P	X	P	R	R	A				P	E			E
	11 Measurement and Reporting	X	D	X	P	R	R	S				P	E			E
12 Audits, Inspections and Record Keeping	X	X	X	P	R	R	S	R	R			E			E	
Construction of Field Phase	13 Preconstruction Safety Activities	X	X	X		E	E	R					C			
	14 Project Site Orientation	X	D	X	P	E	E	S					C			
	15 Meet Local OSHA, Building Trades, and Other Agencies	X	D			E	E	S					C			
	16 Review Contractor/Subcontractor Safety Programs	E	S	R		E	E	S					C	P		
	17 Subcontractor Premobilization Meeting	X	P	P	P	E	E	S					C	P		
	18 Risk Mitigation Planning (Two-week Look-ahead)	P	P	P		E	E	S					E	X		
	19 Activity Hazard Analysis	E	P	P		E	E	S					E	X		
20 Recurring Field Safety Meetings/Training	X	D	X	P			S					E	P			
21 Project Management Site Safety Inspections	X	D	X				S					E	P			
Testing, Commissioning, Operations, and Decommissioning Phases		(to be developed)														
Closeout Phase	22 Lessons Learned and Final Safety Report	E	X	X		E	E	S	R				E	P		
	23 Records Retention	E	X	P		A	A	R					E			

Legend:

A	- Approves tools, plans, etc. established by the project.
C	- Consultant providing expert advice to the development leader.
D	- Development leader tasked to establish the tools, plans, etc. needed for the work element.
E	- Sponsor responsible to reinforce the need to comply with the established requirements.
P	- Participants in team or group implementation efforts, supporting the implementation leader.
R	- Reviews and comments on tools, plans, etc. established by the project to achieve the goal of the work element.
S	- Establishes requirements applicable to the project.
X	- Accountable and responsible to ensure that the project develops and implements the work element in accordance with established requirements.



SECTION 4 – ADMINISTRATIVE PHASE

4.1 PROJECT SAFETY COMMITTEE

The Yuma project will have a safety committee that includes representation from project stakeholders. The safety committee shall convene when 5 full-time Parsons employees or 25 subcontractor employees have been assigned and working on a field project. The safety committee meets quarterly at times and locations to be determined and posted by the chairperson on the safety billboard at least one week in advance. The chairperson of the safety committee is the SHSO.

Charter of the Safety Committee: The safety committee represents the mutual interests of project participants in completing the work with zero injuries. The committee meets at least quarterly to consider incentive programs, recent near misses or injuries, potential unsafe conditions, training programs, safety awareness, audit results, and related issues. The committee advises the Project Manager, who retains sole decision-making authority. The committee consists of equal numbers of professional and craft/trade personnel.

The chairperson schedules meetings, develops the agenda, and displays meeting minutes on the safety bulletin board. Workers may submit suggestions and topics for discussion to the chairperson at any time.

4.2 PROJECT ORIENTATION

The Project Safety Manager and Site Safety Manager help to develop the orientation and meets with new workers to review site procedures and requirements. Topics covered in the project orientation include:

- Names of personnel responsible for site safety and health
- Reporting emergencies, incidents and unsafe conditions
- Emergency/evacuation plans
- Safety, health and other hazards at the site
- Review of activities on site and related Activity Hazard Analyses (AHAs) (see Attachment A)
- Proper use of personal protective equipment
- Work practices by which a worker can minimize risk from hazards
- Safe use of engineering controls and equipment on site
- Acute effects of compounds at the site



- Decontamination procedures

Personnel, including subcontractors and visitors, on a project must attend the orientation program on their first day and sign an acknowledgment form indicating they attended and understood the orientation. Any individual who is unsure of any information presented in the orientation must request clarification. Individuals who do not participate in the orientation or refuse to sign the acknowledgment cannot leave the support zone to work in exclusion zones.

4.3 AWARENESS CAMPAIGN

The project has established an awareness program consistent with the Parsons safety awareness campaign and its various elements (e.g., signs, posters, banners, and focus briefings). This program promotes worker awareness of safety goals and daily risks, hazards, and exposures in the field. In addition to topics selected by corporate safety each month, the project will supplement the awareness program with information specifically applicable to the scope of work.

The Project Safety Manager may also provide training, presentations, or informational materials as part of the awareness campaign.

4.4 STAKEHOLDER SSHP ALIGNMENT MEETING

In lieu of a single Stakeholder SSHP Alignment Meeting, Parsons field personnel, subcontractors, regulators, and client representatives will be provided a copy of this SSHP upon arrival in the active work zone on site. Each individual that receives a copy of this SSHP will be required to review and provide a signature stating they accept and understand the provisions of the SSHP.

4.5 TRAINING

The project has a comprehensive health and safety training program tailored to the scope of work. Employees receive a general safety orientation as outlined in Section 4.2 upon assignment to the project. Parsons new hires shall receive a facility Employee Orientation within the first 7 days of employment, provided by Human Resources, the Safety Representative and the Staff Coordinator. Depending on the tasks being performed, specific training topics may also include:

- 40-hour HAZWOPER and 8-hour annual HAZWOPER refresher
- HAZWOPER Supervisor Training (managers and supervisors)
- CPR/First Aid/AED and bloodborne pathogens
- UXO/Chemical Aid training
- Back Safety – lifting and carrying
- Defensive Driving



- Parsons START/SHARP training (managers and supervisors)

4.6 AUDITS AND INSPECTIONS

The Project Safety Manager has implemented an audit and inspection program in conjunction with the GBU and corporate safety and quality assurance departments. The Project Manager, together with the Site Safety Manager or their designees, conduct a formal safety inspection monthly. The Site Safety Manager also conducts daily safety inspections.

Additional information on audits and inspections during construction is detailed in Section 6.5 of this SSHP.

4.7 MEETINGS

Project meetings of three or more people must begin with a safety topic. The meeting chairperson may present the safety topic or ask for a volunteer to open the discussion. In general, the “safety moment” is only one or two minutes long and is directly relevant to the work at hand or applicable to most individuals outside the workplace.

Daily toolbox safety meetings are held with personnel at the beginning of each shift to review current site conditions, incidents or injuries from the previous shift activities, safe or at-risk observations from the previous shift, activities planned for the current shift, anticipated hazards, engineering controls-work practices-PPE to protect against hazards and any additional safety topic or comments. Toolbox safety meetings shall be documented and signed by individuals accessing the site using a Safety Meeting Sign-In Sheet.

4.8 MEASUREMENT AND REPORTING

4.8.1 Emergencies

To accurately measure performance and comply with corporate and regulatory requirements, Parsons utilizes an online safety reporting system to report monthly work hours, near-miss incidents, first aid cases, property damage and personal injuries for its employees and subcontractors. Information containing Incident Reporting Guidelines is also available online and is included in Attachment B.

4.8.2 Incident Reporting

Employees involved in or witnessing an incident or near-miss incident must immediately report it to the responsible supervisor, who in turn immediately relays the report to Parsons Project Manager, Ed Staes, (801) 572-5999. Near-miss incidents that could cause significant injury or loss of life must also be immediately reported in the same manner. No supervisor may decline to accept or relay a report of injury or significant near-miss incident from a subordinate.

The Project Manager must ensure that incidents are reported to the GBU Safety Manager and other management personnel (as required) within four hours. The Project Safety



Manager (who has been trained on Parsons’ reporting requirements and Online Safety Reporting System) then prepares and submits the incident information.

The GBU Safety Manager must notify the local OSHA office within 8 hours if an accident involves the death of an employee or any hospitalization or disabling injury of a worker.

Subcontractors, when applicable, will submit a monthly report of exposure hours (hours worked on the project, paid or unpaid) to the Parsons Project Manager within three (3) days after the end of each month. The Project Manager compiles the figures and submits them to the Program Manager (or via the online safety reporting system if instructed by the Program Manager) by the first Friday of each month. Where necessary, estimated figures are acceptable.

4.9 INCIDENT INVESTIGATIONS

Accidents and significant near-miss incidents are investigated by an individual or team with training in accident investigation and root cause analysis. Subcontractors must investigate incidents involving their employees or activities and submit an investigation report to the Parsons Project Manager within 48 hours of an incident.

In Parsons, the GBU Safety Manager investigates or assigns an investigator to each significant incident. The investigator submits a final investigation report using the online safety reporting system within 72 hours of the incident. The Project Safety Manager maintains the investigation file.

4.10 RESPONSIBILITY/IDENTIFICATION OF KEY LINE PERSONNEL

Project:	Yuma Proving Ground, Yuma AZ
Parsons Executive responsible for project	Contact No.
Dr. Ross Miller	(801) 572-5999
Project Manager	Contact No.
Mr. Ed Staes	(801) 572-5999
Project Safety Manager	Contact No.
Mr. Tim Mustard	(303) 764-8810 (office) (303) 564-3537 (cell)
Project Site Manager and Site Safety Manager	Contact No.
Mr. Niall Henshaw	(801) 572-5999 (office) (801) 550-0826 (cell)
Client - Project Management	Contact No.
Mr. Charlie Ruerup	(928) 328-2977

These personnel have the authority and responsibility for implementing the provisions of this program.



4.11 MEDICAL REQUIREMENTS AND WORKERS COMPENSATION

In accordance with corporate requirements, the Project Safety Manager has established and implemented the following medical requirements for the project:

4.11.1 Substance Abuse and Alcohol Testing

The Division Safety Manager administers required substance abuse tests, including random drug and alcohol testing. A link to the corporate policy follows: https://livelink.parsons.com/livelink/livelink.exe/Substance_Abuse.doc?func=doc.Fetch&nodeId=2471927&vernum=6&docTitle=Substance+Abuse%2Edoc

4.11.2 Medical Services and Panel of Physicians

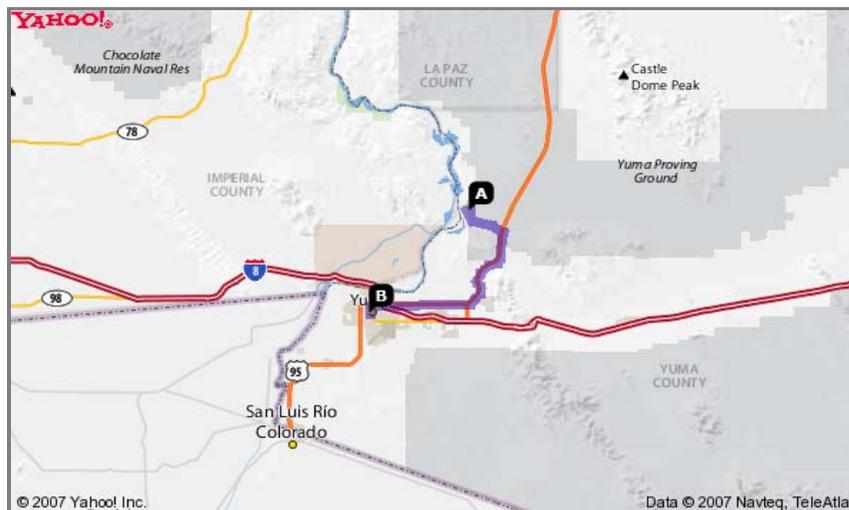
The Project Manager in conjunction with the Parsons Workers Compensation Analyst establishes a panel of medical providers for the project and selects medical facilities to treat work-related injuries and illnesses at the site, as follows:

1. Yuma Regional Medical Center

2400 S. Avenue A
Yuma, AZ 85364
Phone: (928) 344-2000

Directions to the Yuma Regional Medical Center from Yuma Proving Ground:

- Turn left at E. Laguna Dam Rd - 5.1 mi
- Turn right at US-95 - 32.4 mi
- Turn left at S. Pacific Ave. - 1.0 mi
- Turn right at E. 24th St - 2.0 mi
- Turn left at S. Ave A





4.11.3 Emergency Medical Response

Emergency Medical response information, including maps, direction and other specific information is located in the front preface of this SSHP. Telephone numbers for the applicable emergency departments are given below:

- **Hospital – Regional Medical Center, Yuma - (928) 344-2000**
- **Emergency Services - 911**
- **For all emergencies on the Firing Ranges contact Range Control. The preferred method for contact is the range radio. If a telephone call is necessary, call (928) 328-5111**

4.11.4 Workers Compensation Program

The Corporate Risk Management department establishes the appropriate workers compensation carrier. If a workers compensation loss occurs, the Corporate Workers Compensation Analyst (Donna Miller, **661-904-0978** - cell) handles communication with the carrier.

4.11.5 Medical Monitoring

Potential health hazards associated with this project require implementation of the following medical monitoring: As most of these sites are classified under RCRA, personnel conducting intrusive field work are under a medical monitoring program.

Labor Classification	Monitor For	Comments
Field Personnel	Noise	If noise exposures exceed 85 decibels over an 8-hour time weighted average, an employee must participate in a Hearing Conservation Program.
Field Personnel	Chemical exposures	If an employee is exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, they must participate in a Medical Surveillance Program.
Field Personnel	Respirator use	If an employee is required to wear a respirator on the project, they must participate in an appropriate Medical Surveillance Program for respirator use.

Mr. Timothy Mustard, C.I.H, the Project Safety Manager, **(303) 564-3537** administers the medical monitoring program.



4.12 SAFETY AWARD PROGRAM

Safety awards will be issued during the project. At intervals during the project, such as every quarter, should the project warrant an award, either on an individual or a group basis, recognition will be given.



SECTION 5 – PREMOBILIZATION PHASE

5.1 RISK ANALYSIS AND SAFETY SPECIFICATION DEVELOPMENT

Prior to field mobilization, a site-specific risk analysis must be conducted. Using the initial hazard analysis checklist, the Project Manager leads this analysis, which documents existing hazards that may impact the work, surrounding facilities, equipment, workers, or the public at large. The analysis includes evaluation of such items as:

- Overhead and underground power lines
- Sewer and water utilities
- Existing building interferences
- Traffic
- Security
- Fences
- Water hazards
- Existing geographical and environmental conditions
- Site conditions
- Competent person and employee training requirements

Upon completion of the site risk analysis, high-risk activities are listed in RFPs to subcontractors, where applicable, and bidders must describe controls and mitigation strategies in their proposals. The RFP notes will note that the list is representative and that the selected contractor must identify and control work-related hazards.

Pre-mobilization safety activities include an analysis of the scope of work and safety specifications in the prime contract, Parsons' project schedule and SSHP, draft RFPs, and proposed subcontractor agreements. The Project's standard safety specifications are given below.

- Preconstruction Safety Meeting
- Project Technical and General Conditions Specification Review
- Site Specific Risk Review Checklist

5.2 PREBID MEETING

Potential subcontractors will be advised of Parsons' safety requirements and site hazards during the bid and subcontracting process.



5.3 SUBCONTRACTOR PREQUALIFICATION REVIEW

Project procurement procedures require that subcontractors submit prequalification documentation for evaluation. The Procurement Manager or Division Safety Manager conducts the safety prequalification evaluation in accordance with the Parsons subcontractor prequalification process and form.

5.4 PREMOBILIZATION SAFETY MEETING

The Project Manager or designee holds a pre-mobilization safety meeting before the subcontractor begins work. The meeting includes subcontractor representatives, contracts manager, and representatives from disciplines, including safety. During the safety review, the meeting participants review specific safety site/area, pre-bid risk analysis, and competent person and site-specific safety plan requirements. In addition, the Project Manager obtains a safety point of contact from the subcontractors and emergency management information. The attached Pre-mobilization Safety Meeting Checklist (Exhibit 5.1) is used by the Project Manager or designee to document the meeting.

5.5 COMPETENT PERSON SUBMISSION REVIEW

Parsons and its subcontractors must identify OSHA-regulated and certified competent persons for work or tasks requiring that level of supervision. This is accomplished by understanding the processes by which the specific activity will proceed and identifying the applicable standard and regulations. The supervisor of the competent person must certify in writing the specific competencies of the named competent person.

The supervisor and competent person sign and submit the attached Parsons competent person document to the Parsons Project Manager.

5.6 SUBCONTRACTOR SAFETY PLAN SUBMISSION REVIEW

Subcontractors must submit safety programs to the Parsons Project Manager for review before they begin work on site. The Project Manager reviews the program for adequacy in accordance with the SSHP.

5.6.1 Contractor Site-Specific Safety Plans

At least 10 days before work begins, each subcontractor must submit two copies of its site safety program (SSP) to the Parsons Project Manager for review (or as otherwise specified in the subcontract). The Project Manager and Project Safety Manager review the SSP to ensure that it meets Parsons' requirements.



Exhibit 5.1 – Premobilization Safety Meeting Checklist

PARSONS

PREMOBILIZATION SAFETY MEETING

Date: _____ Project/Location: _____

Parsons Representative: _____ Subcontractor Representative: _____

The following project site safety, health and security requirements, procedures, and hazards have been identified and reviewed with the Subcontractor.

SSP/Emergency Planning/Response Plan		Demolition	
Competent/Qualified Person		Personal Protective Equipment	
Hazardous Materials/Waste		Cranes/Hoists/Annual Inspection Certificate	
Vehicle/Heavy Equipment		Overhead Power Lines	
Lockout/Tagout		Underground Utilities	
Electrical		Confined Spaces (Permit/Non-Permit)	
Fire Protection		Excavations/Trenching	
Hot Work/Welding/Cutting		Site Security/Visitor Control/Public Exposure	
Fall Protection/Guardrails/Scaffolding/Ladders		Permits (Excavation/Scaffolding/Demolition/Traffic/Confined Space/etc.)	

Additional Project Concerns:

Other Attendees:

Name	Title	Company
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



If a contractor needs assistance developing an SSP, the Project Safety Manager may provide an electronic copy of Parsons' example SSP from Appendix A2 of the SHARP Management manual.

The SSP must address the following elements:

- Responsibility
- Compliance
- Communication
- Hazard assessment
- Accident exposure and investigation
- Hazard correction
- Training and instruction
- Recordkeeping

The SSP must include applicable requirements of Parsons SSHP, USACE EM385-1-1, and OSHA 29 CFR 1910/1926:

- Scope of work evaluation that describes the sequence of work and associated hazardous activities.
- Specific activity hazards analysis (AHA).
- A project site employee orientation program that addresses location specific issues relative to safety and health.
- A site-specific emergency action plan that includes a list of key management contacts with home office, project site, home, and cellular telephone numbers.
- A site-specific medical emergency plan that lists qualified first aid personnel by name and includes copies of their current certificates.
- Key line management personnel, by name and position, who will enforce the SSP.
- Key competent or qualified personnel by name and copy of current documentation identifying specific certified competency (e.g., scaffolding, excavations, and fall protection).
- Written progressive disciplinary program for violations of safety procedures.
- Trenching and shoring plan (if applicable).
- HAZWOPER training documentation (if applicable).
- Contractor task hazard planning.
- Subcontractor weekly safety planning submission.
- Contractor workers daily task safety planning.

Exhibit 5.2 shows the Subcontractor Safety Plan Review form which can be used to evaluate the subcontractor's SSP and health and safety program.



Exhibit 5.2 – Subcontractor Site Specific Safety Plan Review

PARSONS

SUBCONTRACTOR SAFETY PLAN REVIEW

Date: _____ Project/Location: _____

Subcontractor: _____ Parsons Safety Manager: _____

The information provided here is based on a review of a subcontractor’s safety plan. Areas identified as incomplete are reevaluated and modified based on the standards in the contract specifications and the Project Safety Program manual. Subcontractors resubmit corrected sections of the SSP to the Parsons Construction Manager within one week of receiving review documentation.

Section	Complete	Incomplete	Section	Complete	Incomplete
Site Specific Safety Plan	_____	_____	Specific Activity Hazard Analysis (AHA)	_____	_____
Responsibilities Assigned	_____	_____	Project Site Employees Orientation Program	_____	_____
Hazard Communication	_____	_____	Emergency Action Plan	_____	_____
Hazard Assessment	_____	_____	Site Specific Medical Emergency Plan	_____	_____
Accident Investigation	_____	_____	Identification of Key Line Personnel	_____	_____
Hazard Correction	_____	_____	Identification of Competent & Qualified Personnel	_____	_____
Training and Instruction	_____	_____	Written Progressive Disciplinary Program	_____	_____
Recordkeeping	_____	_____	Written Trenching and Shoring Plan (if applicable)	_____	_____
Scope of Work Evaluation	_____	_____	Written 100% Fall Protection Plan (if applicable)	_____	_____
Other	_____	_____	Other	_____	_____

Additional Comments:

Reviewed by:

Name	Title	
_____	_____	_____



SECTION 6 – FIELD INVESTIGATION PHASE

6.1 SITE RISK ANALYSIS

Before work begins, Project Managers or designees lead a team that performs a risk analysis at each work site to identify hazards that require specific control measures. During weekly progress meetings, the Project Field Team Leader and subcontractors submit written summaries of upcoming work tasks and associated risks and control measures to the Project Manager or a designee using Exhibit 6.1. The weekly summaries identify upcoming mobilization or demobilizations tasks, audits and inspections, competent person changes, training and new activities requiring an Activity Hazard Analysis (AHA). Subcontractors add activities to these summaries at least two weeks in advance of the work. Potential hazard categories are listed in the following subsections. Hazards can be described under the following categories:

An AHA must be provided as described in Section 6.3 for each activity, in order to identify the required controls and/or PPE.

In addition to standard industrial-type chemicals of concern (fuels, volatile chemicals, metals), Yuma Proving Ground contains some unique hazards due to it being one of the U.S. Army's artillery testing facilities. The sites may contain specific hazards such as chemical weapons, chemical agents and agent byproducts, and ordnance. The following definitions are added for clarification:

- Chemical warfare material [materiel] (CWM) - An item configured as a munition containing a chemical substance that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. Includes V- and G-series nerve agents and H-series blister agent and lewisite in other than munition configurations. CWM does not include riot control agents; chemical herbicides; smoke and flame producing items; or soil, water, debris, or other media contaminated with chemical agent.
- Chemical warfare agent (CWA) - A chemical compound used in military operations to kill, seriously injure, or incapacitate persons through its chemical properties. Included are agents H, BZ, HD, L, G series agents and V series agents. Excluded are research, test, development, and evaluation (RTDE) dilute solutions; riot control agents, chemical defoliant, and herbicides; smoke, flame, and incendiaries; and industrial chemicals.
- Chemical surety material (CSM) (surety agent) - Items of explosive ordnance that contain nerve, mustard, or lewisite agents. Members of the U.S. Army's Technical Escort Unit (TEU) are authorized to handle, package, and ship CSM items.



- Munitions and Explosives of Concern (MEC) - Includes bombs; guided and ballistic missiles; artillery, mortar, and rocket ammunition; small arms ammunition; antipersonnel and antitank landmines; demolition charges; pyrotechnics; grenades; torpedoes and depth charges; containerized and uncontainerized high explosives and propellants; depleted uranium projectiles; toxic military chemical agents; and similar or related items or components otherwise designed to cause damage to personnel or material.
- Neat agent - A nondiluted, full strength CWA.
- Simulant - A chemical compound that is chemically similar to a specific agent, but is less toxic.
- Unexploded ordnance (UXO) - An item of MEC which has been primed, fuzed, armed, or otherwise prepared for action, and which has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to friendly operations, installations, personnel, or material and remains unexploded either through malfunction or design or for any other cause.
- UXO remnant - Explosive-free UXO item.
- UXO Avoidance - Techniques used by Explosive Ordnance Disposal (EOD) qualified personnel to reduce the possibility of unexpected contact with UXO during the investigation. If UXO is encountered which requires further action, Yuma personnel will be contacted for support.

This investigation is being completed under the “anomaly avoidance” principle. Qualified UXO personnel will be at the site during intrusive activities. The UXO work plan is given in Attachment C. Avoidance of UXO is the main control method to prevent injury from UXO and to prevent exposure to CWM. However, should any ordnance be encountered that may be of concern to the field crews and can be avoided, the item will be flagged and reported to YPG and an alternate site location will be selected. If the item cannot be avoided, activities will cease and YPG will be notified. At some sites included in this investigation, UXO construction support is to be practiced. At these sites, the UXO qualified personnel will monitor the excavation and earth moving activities. If the operation unearths or otherwise encounters a suspect ordnance item, operations will cease, and the immediate area will be evacuated. The item will be flagged and reported to YPG.

Specific hazards associated with each of the sites are summarized in the Table 6.1. General hazards are summarized throughout the remainder of this section.



TABLE 6.1 - SUMMARY OF SITE HAZARDS

Site Number	Site Description	Work Scope	Associated Hazards
YPG-01	Old Chemical Laboratory (Building S-2500)	Decision Document; Groundwater Sampling	Chemical warfare agents (CWAs) were tested at this site up until about 1969. Continued groundwater sampling
YPG-02	Chemical Waste Holding Tank (Building S-2060)	Decision Document	This site was a fuel UST. The tank was removed in 2002 and soil sampling confirmed that no contaminants exceed their ADEQ nonresidential SRL
YPG-03	Septic Tank Leachfield (Building 2060)	Decision Document	No anticipated fieldwork.
YPG-10	Fuel Bladder Test Site	SVE System Monitoring; Groundwater Sampling	
YPG-11	Former Pesticide Mix/Storage Building T-430	Decision Document	Several pesticides/herbicides have been detected in shallow soils at this former pesticide mixing facility, but only three contaminants (arsenic, dieldrin, and 4,4-dichlorodiphenyltrichloroethane [4,4-DDT]) were detected at concentrations slightly above ADEQ SRLs.
YPG-13B	Washpad 1 Castle Dome Heliport	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-13C	Washpad 2 North Castle Dome Heliport	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-13D	Waste Basin at Castle Dome Heliport	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-13E	Septic Tank Leachfield (E) Kofa Building 3490	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-13F	Septic Tank Leachfield Building 3021 LAAF	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-23	Washrack/lagoon (West) at Kofa Building 3490	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-25	Septic Tank Leachfield (North) at CDH	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.
YPG-26	Septic Tank Leachfield (South) at CDH	Decision Document	Decision Document recommends NFA (i.e. residential closure). No anticipated fieldwork.



TABLE 6.1 - SUMMARY OF SITE HAZARDS (Continued)

Site Number	Site Description	Work Scope	Associated Hazards
YPG-31	West Environmental Test Area	Decision Document LTM- GW Sampling	Used for storing and testing of Chemical Warfare Agents.
YPG-32	Former Waste Disposal Area	Decision Document LTM- GW Sampling	Used for disposing of Chemical Warfare Agents.
YPG-45	Building 506 UST Fuel Release	Decision Document Asphalt ground surface on locations of UST. Continue LTM GW sampling	This is an underground storage tank (UST) site that leaked heating oil. The steel tanks and contaminated soil around the tanks were removed. However, subsurface soil at the site exceeds the ADEQ SRL for benz(a)anthracene, benzo(a)pyrene, and total petroleum hydrocarbons (TPH).
YPG-002-R-01	Mortar Impact Area	Safely complete MEC and MC investigations that are sufficient to characterize the contamination, identify and quantify any associated risk, and support any necessary response actions.	Munitions and Explosives of Concern (NTP not received, separate H&S document when awarded)
CCYPG-027	Inactive Landfill 5Km SSE MAA (SWMU 37)	Test Excavations with soil samples, Limited geophysical survey	Construction debris Potential UXO
CCYPG-028	Inactive Landfill NW MAA SE Imperial Dam (SWMU 36)	Test Excavations with soil samples, Limited geophysical survey	Construction debris Potential UXO
CCYPG-029	Inactive Landfill E RT95 2Km W Kofa Ran. (SWMU 41)	Test Excavations with soil samples, Limited geophysical survey	Construction debris Potential UXO
CCYPG-035A	Muggins Mountain (Surface and Hydrogeology)	Complete CMS. Complete soil borings	Potential UXO
CCYPG-035B	Muggins Mountain (Trench and Subsurface)	Perform soil borings near trench boundaries, surface soil samples in selected areas	Potential UXO
CCYPG-035C	Muggins Mountain (Open Detonation Activity)	Complete CMS	Potential UXO



TABLE 6.1 - SUMMARY OF SITE HAZARDS (Continued)

Site Number	Site Description	Work Scope	Associated Hazards
CCYPG-141	Inactive Landfill (SWMU 39)	Test Excavations with soil samples.,	Construction debris Potential UXO
CCYPG-143	Inactive Landfill SSE of LAAF	Site visit to determine follow-on activities	
CCYPG-165	Fuel Station #1 (UST 207 & 209)	GW Monitoring.	
CCYPG-178	Inactive Landfill 3 Km East of Main ADMIN	Soil borings with soil samples from each boring, Limited geophysical survey	Construction debris Potential UXO
CCYPG-204	UST Site Remediation, AAFES Gas Station	GW Monitoring	
Kofa OB/OD	Open Burn/Open Detonation site	Concrete and Soil Removal Monitoring Well Installation	Heavy Equipment, UXO

6.1.1 Atmospheric Hazards

YPG is subject to thunderstorms and lighting storms during various seasons. Precaution is needed when these storms are in the vicinity. When thunderstorms and their associated potential of lighting strikes are in the vicinity, outdoor field operations will be suspended until the storms have passed. Because of the native vegetation coverage, the possibility of severe dust storms is not significant. High winds sometimes accompany thunderstorms and precautions should be taken if the winds exceed 30 mph.

6.1.2 Biological Hazards

Various biological hazards may be encountered at the site. In the Yuma area, rattlesnakes, lizards, spiders (recluse and black widow), ticks, scorpions, and rodents can present a health hazard if contact is made. Precautions should be taken to be aware of foot and hand placement. Proper PPE (i.e., gloves, work shoes, long sleeve coveralls) can provide protection. NIOSH-approved particulate filter respirators are mandatory if working in an environment where there may be the potential for the presence of Hantavirus and bird excrement.

6.1.2.1 Venomous Snakes/Lizards

Western diamondback, speckled, Mojave and Sonoran Desert (sidewinder) rattlesnakes are found on YPG. Snakes are normally active at night on or near paved roads. Although rarely encountered, these snakes are capable of causing serious illness or death. When dealing with humans, the snake's first reaction is to hide or escape. It is only when provoked or threatened that snakes will strike. Rattlesnakes often seek cover under rocks, shrubs, and logs. Personnel should check carefully before sitting down in these types of areas, and never place hands or feet where they are not easily seen.

The Gila Monster is a venomous lizard whose habitat and range occurs within the southwestern United States desert. This lizard may occur at YPG. It is a heavy, slow



moving lizard, up to 60 cm (2 feet) long. Its skin has the appearance of black, pink, orange, and yellow beads, laid down in intricate patterns. Unlike snakes which use hollow upper teeth (fangs), the Gila monster injects venom into its victim through grooves in the teeth of its lower jaw. The teeth are loosely anchored, which allows them to be broken off and replaced throughout their lives. The Gila monster produces only small quantities of its neurotoxic venom, which is secreted into the lizard's saliva. By chewing its prey, however, it tries to put as much of the venom into the bloodstream of its victim as possible. The Gila monster's bite is normally not fatal to humans (there are no confirmed reports of fatalities), but it can bite quickly and holds on tenaciously. When Gila Monsters bite, they hold on tightly and chew. This helps them work their venom into the bite. Avoidance of the lizard will prevent biting and its venom.

6.1.2.2 Insect/Arachnid/Arthropod Bites and Stings

Poisonous or nuisance insects and insect-like creatures at the site may include ants, bees (honeybees, bumble bees, wasps, and hornets), mosquitoes, scorpions, and spiders. The possibility of an allergic reaction exists if a person has been bitten or stung. If **an allergic reaction occurs (which is life-threatening)**, with reactions in the form of swelling of the tissues, difficulty breathing, blurring of vision, unconsciousness, convulsions, fall in blood pressure, shock and consequently the threat of death, **treatment and advanced medical support are needed immediately.**

Ants may be observed throughout the sites. Do not stand on, place equipment on, or otherwise disturb the anthills. An insect repellent may be used if it does not interfere with the desired sampling analyses. Frequent self-checks for crawling ants should also be performed.

West Nile virus is spread by the bite of an infected mosquito, and can infect people, horses, many types of birds, and some other animals. No outbreaks have been reported in Yuma County but isolated cases have been reported in surrounding counties. Most people who become infected with West Nile virus will have either no symptoms or only mild ones. On occasions, West Nile virus infection can result in a severe and sometimes fatal illness known as West Nile encephalitis (an inflammation of the brain). The risk of severe disease is higher for persons 50 years of age and older. There is no evidence to suggest that West Nile virus can be spread from person to person or from animal to person. Human illness from West Nile virus is rare, even in areas where the virus has been reported. The chance that any one person is going to become ill from a mosquito bite is low. You can further reduce your chances of becoming ill by protecting yourself from mosquito bites. To avoid mosquito bites, apply insect repellent containing DEET (N,N-diethyl-meta-toluamide) when you're outdoors. When possible, wear long-sleeved clothes and long pants treated with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing. Do not apply repellents containing permethrin directly to exposed skin. If you spray your clothing, there is no need to spray repellent containing DEET on the skin under your clothing. Also, consider staying indoors at dawn, dusk, and in the early evening, which are peak mosquito biting times.

Most scorpions are harmless to humans, although the sting is extremely painful and will require painkilling treatment. The following may be observed in cases of moderate to



more serious poisoning: malaise, sweating, heart palpitations, rise in blood pressure, salivation, nausea, vomiting and diarrhea. These symptoms should be treated in a similar way to snake bites, and medical attention should be obtained as quickly as possible. Treatment normally consists of pain alleviation with the pain at the site of the sting can sometimes be limited with an ice cube to slow the spreading of the venom, while medical attention is been obtained.

The poisonous spiders likely to be encountered are the Recluse spiders (*Loxosceles deserta* and *L. arizonica*), and the Black Widow (*Latrodectus mactans*). They are usually found in buildings, utility box or monitoring well covers, or piles of debris, rocks, wood, or leaves. These spiders are typically non-aggressive, and bite only when disturbed. The Recluse, a close relative to the brown recluse spider in the Midwest, is up to one inch long with a violin or “fiddle” shaped mark on the top of the head. It is generally brown, but more poisonous varieties may be pale-brown, reddish-brown, orange, or gray. The Black Widow is a smaller, bulbous black spider with a red or yellow hourglass-shaped mark on the underside. It weaves shapeless diffuse webs in undisturbed areas. Persons who are believed to have been bitten by a Recluse or Black Widow spider should be transported to a hospital. The spider should be collected for confirmation of the species. Reactions to a Recluse spider bite may be nothing, immediate, or delayed, depending upon the sensitivity of the person bitten and the amount of venom injected. A small white blister often occurs at the bite site surrounded by a swollen area. Within 24 to 36 hours, the victim may experience fever, chills, restlessness, weakness, nausea, and joint pain. Within 24 hours, the bite site can erupt into a “volcanic lesion”, which produces a hole in the flesh due to damaged gangrenous tissue. The open wound may range in size from an adult thumbnail to the span of a hand, with recovery taking months, and sometimes requiring plastic surgery and skin grafts. Reactions to a Black Widow spider include intense pain at the site of the bite after approximately 15 to 60 minutes, followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities. Death may occur due to complications, but usually not from the bite itself.

6.1.2.3 Ticks

The primary hazard associated with ticks is Rocky Mountain Spotted Fever. Between 1988 and 2005, no cases have been reported in Yuma or La Paz counties. However, isolated cases have been reported in surrounding counties. People get Rocky Mountain spotted fever from the bite of an infected tick or by contamination of the skin with the contents of an attached tick when it is removed from the skin. People with Rocky Mountain spotted fever get a sudden fever (which can last for 2 or 3 weeks), severe headache, tiredness, deep muscle pain, chills, nausea, and a characteristic rash. The rash might begin on the legs or arms, can include the soles of the feet or palms of the hands, and can spread rapidly to the trunk or the rest of the body. Symptoms usually begin 3 to 12 days after a tick bite.

To prevent tick bites, it is recommended that DEET (vapor-active repellent) be applied to any exposed skin surface (except lips and eyes), and apply permethrin repellent spray to field clothing. It should be noted that the permethrin repellent should be allowed to dry on the clothing before putting the clothing onto the body. This combination of DEET and



permethrin provides the maximum protection from ticks. Long-sleeved shirts with snug collar and cuffs, pants tucked into socks, and personal protective equipment will offer some protection. Personnel should perform self-checks for ticks at the end of each workday.

If an allergic reaction occurs, with reactions in the form of blurring of consciousness, unconsciousness, convulsions, fall in blood pressure, shock and consequently the threat of death may occur. Treatment and advanced medical support are needed immediately. Treatment normally consists of pain alleviation with the pain at the site of the sting can sometimes be limited with an ice cube to slow the spreading of the venom. Medical attention should be obtained as quickly as possible.

6.1.2.4 Rodents

Hantavirus has been reported in the western and southwestern U.S. A fatality from the disease has been reported in La Paz county in 2006. Deer mice (*Peromyscus* species) are the primary reservoir for the virus. The virus is excreted in mouse feces, urine, and saliva. People become infected when the virus is inhaled, through breaks in the skin, by ingesting contaminated food or water, or by being bitten by an infected rodent.

The incubation period for Hantavirus may be three days to six weeks. Symptoms include fever, chills, headache, dizziness, muscle aches, dry cough, nausea, vomiting, abdominal cramps, diarrhea, and shortness of breath. Progression of the disease leads to fluid in the lungs, heart irregularities, and kidney failure. Personnel will use HEPA-equipped air-purifying respirators when working in rodent-infested areas or when entering sheds of buildings containing mice infestations.

6.1.3 Chemical Exposures

Table 6-2 lists potential chemical hazards that have been detected or could be suspected at YPG or the sites under this investigation. Potential contaminants, which are suspected based on documented disposal practices or are degradation contaminants at YPG, have also been included in Table 6.2. This table lists the potential routes of exposure and their symptoms for each contaminant. Other information such as Threshold Limit Values (TLVs), Permissible Exposure Limits (PELs), Immediately Dangerous to Life or Health (IDLH) values, Recommended Exposure Limits (RELs), and applicable properties are also found in this table.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Asbestos	0.1 f/cc ^{g/} (29 CFR 1910.1001) ^{h/}	0.1 f/cc	NA	NA	NA	White or greenish, blue, or gray-green, fibrous solid. Irritates eyes and respiratory system. Causes asbestosis, shortness of breath, fibrosis, restricted pulmonary function, clubbed fingers, and lung cancer. Carcinogen.
Asphalt (fumes)	5 mg/m ³ ^{i/}	5 mg/m ³	NA	NA	NA	Dark-brown to black, cementitious material, solid or semisolid in consistency, with a pitch-like or tarry liquid. Heated asphalt emits toxic vapors and hydrogen sulfide. Irritates eyes and respiratory system. In animals, causes skin tumors. Carcinogen.
Benzene	1 (29 CFR 1910.1028) ^{h/}	0.5	500	4.7	9.24	Colorless to light-yellow liquid (solid < 42°F) with an aromatic odor. Eye, nose, skin, and respiratory system irritant. Causes giddiness, headaches, nausea, staggered gait, fatigue, anorexia, exhaustion, dermatitis, bone marrow depression, and leukemia. Mutagen, experimental teratogen, and carcinogen.
Beryllium	0.002 mg/m ³	0.002 mg/m ³	4 mg/m ³	NA	NA	Hard, brittle, gray-white, metallic solid. Irritates lungs, skin, eyes, and mucous membranes. Causes berylliosis, anorexia, low-weight, weakness, chest pain, coughing, blue skin, clubbed fingers, pulmonary insufficiency, dermatitis, and lung cancer. Mutagen and carcinogen.
Bromoform	5 mg/m ³	0.5 (skin)	850	NA	NA	Clear to yellow liquid with chloroform odor. Irritates eyes and skin. High concentrations may causes dizziness, nausea, confusion,



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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						headache, fatigue, and enlarged liver. Also attacks kidneys and heart. In animals, causes liver and kidney cancer. Carcinogen.
Cadmium (dust)	0.2 mg/m ³ ^{j/} (29 CFR 1910.1027) ^{g/}	0.01 mg/m ³ ^{k/} 0.002 mg/m ³ ^{l/}	9 mg/m ³	NA	NA	Silver-white, blue-tinged, lustrous, odorless, metallic solid. Causes pulmonary edema, shortness of breath, coughing, chest tightness/pain, loss of sense of smell, chills, muscle aches, headaches, nausea, vomiting, diarrhea, mild anemia, and prostatic and lung cancer. Also attacks kidneys. Mutagen, experimental teratogen, and carcinogen.
Cadmium Sulfide (as Cd)	0.005 mg/m ³ ^{j/}	0.01 mg/m ³	9 mg/m ³	NA	NA	Light-yellow, orange, or red, cubic crystals. Causes vomiting, diarrhea, headaches, and muscle cramps. Mutagen and carcinogen.
Chlordane (alpha and gamma)	0.5 mg/m ³ (skin)	0.5 mg/m ³ (skin)	100 mg/m ³	NA	NA	Amber-colored, viscous, liquid insecticide with pungent, chlorine-like odor. Skin irritant. Causes blurred vision, confusion, incoordination, delirium, coughing, nausea, vomiting, diarrhea, irritability, convulsions, tremors, and decrease in urinary output. In animals, causes liver cancer and lung, liver, and kidney damage. Mutagen, experimental teratogen, and carcinogen.
Chlorine	1	0.5	10	5	11.48	Greenish-yellow gas, liquid or crystals, with a pungent, irritating odor. Strong eye and mucous membrane irritant. Causes burning of eyes, nose, and mouth; tearing; runny nose; coughing; choking; substernal pain; nausea;



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Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						vomiting; headaches; dizziness; collapse due to temporary or permanent suspension of circulation or respiration; pulmonary edema; pneumonia; reduced oxygen in blood; dermatitis; and frostbite (liquid). Mutagen.
Chloroform (Trichloromethane)	50 (ceiling)	10	500	205 ^{m/}	11.42	Colorless, heavy liquid with pleasant odor. Irritates eyes and skin. Anaesthetic. Causes dizziness, mental dullness, nausea, confusion, headache, fatigue, anesthesia, and enlarged liver. Also attacks kidneys and heart. In animals, causes liver and kidney cancer. Experimental teratogen, and carcinogen.
Chromium metal	1 mg/m ³	0.5 mg/m ³	250 mg/m ³	NA	NA	Blue-white to steel gray, lustrous, brittle, hard, odorless, metallic solid. Irritates eyes, skin, and respiratory system. Causes lung fibrosis. Explosive.
Cycloate	NA	NA	NA	NA	NA	Clear, colorless to amber or yellow, oily, liquid carbonate herbicide with an aromatic odor. Irritates skin and eyes. Causes salivation, convulsions, and possibly death. Mutagen.
Diazinon	0.1 mg/m ³ (skin)	0.1 mg/m ³ (skin)	NA	NA	NA	Colorless, liquid insecticide with faint ester-like odor. Irritates eyes. Causes eye pupil contraction, blurred vision, dizziness, confusion, weakness, convulsions, shortness of breath, salivation, abdominal cramps, nausea, and vomiting. Mutagen and experimental teratogen.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
1,1-Dichloroethane (DCA)	100	100	3,000	120	11.06	Colorless, oily liquid with chloroform-like odor and hot saccharine taste. Irritates skin. Causes CNS depression and kidney, lung, and liver damage. Experimental teratogen and questionable carcinogen.
1,2-Dichloroethane (DCA) (Ethylene Dichloride, EDC)	2	10	50	100	11.05	Colorless liquid with a pleasant, chloroform-like odor. Strong narcotic. Irritates eyes. Causes corneal opaqueness, nausea, CNS depression, vomiting, dermatitis, and damage to liver, kidneys, and cardiovascular system. In animals, causes cancer of the forestomach, mammary gland, and circulatory system. Mutagen, experimental teratogen, and carcinogen.
1,1-Dichloroethene (DCE) (Vinylidene Chloride)	NA	5	NA	NA	10.00	Colorless liquid or gas (>89°F) with a mild, sweet, chloroform-like odor. Irritates eyes, skin, and throat. Causes dizziness, headaches, nausea, shortness of breath, liver and kidney dysfunctions, and lung inflammation. Mutagen and carcinogen.
Dieldrin	0.25 mg/m ³ (skin)	0.25 mg/m ³ (skin)	50 mg/m ³	0.04	NA	Colorless to light-tan, crystalline, organochlorine insecticide with a mild, chemical odor. Causes headaches, dizziness, nausea, vomiting, vague discomfort, sweating, limb jerking, convulsions, and coma. In animals, causes kidney and liver damage and lung, liver, thyroid, and adrenal gland tumors. Mutagen, experimental teratogen, and carcinogen.



TABLE 6.2
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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Diesel Fuel	NA	100 mg/m ³	600	0.08	NA	Colorless to brown, slightly viscous liquid with a gasoline- or kerosene-like odor. Irritates eyes, nose, and throat. Causes dizziness, drowsiness, headaches, nausea, dry cracked skin, and chemical pneumonia.
Diisopropyl Methylphosphonate (DIMP)	NA	NA	NA	NA	NA	By-product of manufacture of the nerve agent, sarin. Moderately toxic by ingestion.
Dimethyl Methylphosphonate (DMMP)	NA	NA	NA	NA	NA	Feeding studies in rats and mice indicate compound is not very toxic (LD 50=5,000 mg/kg) o/. Causes muscle weakness in rats and mice. Experimental reproductive effects. Mutagen and questionable carcinogen.
1,3 – Dinitrobenzene (m-dinitrobenzene)	1 mg/m ³ (skin)	0.15 (skin)	50 mg/m ³	NA	10.43	Pale-white/yellow solid. Spontaneous combustion with prolonged exposure to fire/heat. May cause anoxia, cyanosis; visual disturbance, central scotomas; burning mouth, dry throat, thirst; yellowing hair, eyes, skin; anemia; liver damage.
Dinitrotoluene (DNT)	1.5 mg/m ³ (skin)	1.5 mg/m ³ (skin)	50 mg/m ³	NA	NA	Orange-yellow, crystalline solid with a characteristic odor. Causes permanent tissue damage due to oxygen deficiency, blue skin, anemia, jaundice, and reproductive effects. In animals, causes liver, skin, and kidney tumors. Mutagen, experimental teratogen, and carcinogen.



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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Dioxin (2,3,7,8-TCDD [2,3,7,8-tetrachlorodibenzo-p-dioxin])	NA	NA	NA	NA	NA	Colorless solid, no known odor. Causes chloracne, liver damage, and gastrointestinal disturbances. In animals, is toxic to the immune system, spontaneous abortion, carcinogen.
Ethylbenzene	100	100	800	0.25-200	8.76	Colorless liquid with an aromatic odor. Irritates eyes, skin, and mucous membranes. Causes dermatitis, headaches, narcosis, and coma. Mutagen and experimental teratogen.
Ethylene Glycol	NA	NA	NA	0.08	NA	Clear, colorless, syrupy, odorless, liquid (solid<9°F) antifreeze. Irritates eyes, skin, nose, and throat. Causes nausea, vomiting, abdominal pain, weakness, dizziness, stupor, convulsions, CNS depression, and skin sensitization. Mutagen and experimental teratogen.
Fuel Oil	400 ^{o/}	400 ^{o/}	1,100 ^{o/}	0.13	NA	Moderately flammable. Will be detected by taste and odor before reaching toxic levels.
Furans (chlorinated dibenaofurans [CDFs])	NA	NA	NA	NA	NA	Colorless solid, no known odor. Causes chloracne, liver damage, gastrointestinal disturbances. In animals, is toxic to the immune system, spontaneous abortion, carcinogen.
Gasoline	NA	300	NA	0.005-10	NA	Clear/amber flammable, volatile liquid with a characteristic odor. Irritates eyes, skin, and mucous membranes. Causes dermatitis, headaches, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia, and possible liver and



TABLE 6.2
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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						kidney damage. In animals, causes liver and kidney cancer. Monitor for BTEX constituents. Carcinogen.
Hydrogen Sulfide	20	10	100	0.00001-0.8 ^{m/}	10.46	Colorless gas with strong odor of rotten eggs. Rapidly fatigues sense of smell. Irritates eyes and respiratory tract. Causes interrupted breathing, coma, convulsions, conjunctivitis, eye pain, tearing, visual intolerance to light, corneal vesicles, dizziness, headaches, fatigue, irritability, insomnia, and gastrointestinal disturbances.
Kerosene	NA	NA	NA	0.08	NA	Pale-yellow or water-white, oily liquid with a characteristic fuel oil odor. Irritates eyes, skin, nose, and throat. Causes burning sensation in chest, headaches, nausea, weakness, restlessness, incoordination, confusion, hallucinations, fever, drowsiness, vomiting, diarrhea, dermatitis, and chemical pneumonia. Mutagen and suspected carcinogen.
Lead	0.05 mg/m ³ (29 CFR 1910.1025) ^{h/}	0.5 mg/m ³	100 mg/m ³	NA	NA	Heavy, ductile, bluish-gray, soft metal. Irritates eyes. Causes weakness, exhaustion, insomnia, facial pallor, anorexia, low-weight, malnutrition, constipation, gingival lead constipation, abdominal pain, gastritis, colic, line, anemia, wrist and ankle paralysis, joint pains, tremors, low blood pressure, and kidney disease. Mutagen, experimental teratogen, and suspected carcinogen.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Lewisite (L)	0.003 ^{p/} (ceiling)	NA	NA	NA	NA	Blister agent. Dark oily liquid with geranium-like odor. Immediate pain on contact. Affects eyes, lungs, and blisters skin. Acts as a systemic poison, causing pulmonary edema, diarrhea, restlessness, weakness, subnormal temperature, and low blood pressure. Experimental teratogen.
Lindane [Benzene Hexachloride (BHC), Hexachlorocyclohexane]	0.5 mg/m ³ (skin)	0.5 mg/m ³ (skin)	50 mg/m ³	3.9 mg/m ³	NA	White to yellow or brown, crystalline, powdered, organochlorine pesticide with a slightly musty or phosgene-like odor. Irritates eyes, nose, throat, and skin. Causes headaches, nausea, convulsions, blue skin, respiratory difficulties, muscle spasms and aplastic anemia. In animals, causes liver and kidney damage. Some isomers are mutagens, experimental teratogens, and carcinogens.
Malathion	15 mg/m ³ (skin)	1 mg/m ³ (skin)	250 mg/m ³	10 mg/m ³	NA	Deep-brown to yellow liquid (solid < 37° F) insecticide with garlic odor. Eye and skin irritant. Causes eye pupil contraction, aching eyes, blurred vision, tearing, salivation, anorexia, nausea, vomiting, abdominal cramps, diarrhea, giddiness, confusion, incoordination, runny nose, headaches, chest tightness, wheezing, and larynx spasms. Mutagen, experimental teratogen, and questionable carcinogen.
Mercury (aryl, inorganic, and vapors)	0.1 mg/m ³ (ceiling) (skin)	0.1 mg/m ³ (skin)	10 mg/m ³	NA	NA	Silver-white, heavy, odorless, liquid or tin-white ductile, malleable, soft, solid metal. Corrosive to skin, eyes, and mucous



TABLE 6.2
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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
	0.05 mg/m ³ (vapor) (skin)	0.025 mg/m ³ (inorg) (skin)				membranes. Causes dermatitis, coughing, chest pain, shortness of breath, bronchitis, lung inflammation, ringing in the ears, tremors, insomnia, irritability, indecision, headaches, fatigue, weakness, fever, salivation, inflammatory - disease of the mouth, gastrointestinal disturbances, anorexia, low-weight, and protein in the urine. Mutagen, experimental teratogen, and questionable carcinogen.
Methane	NA	NA	NA	NA	NA	Colorless, odorless, tasteless gas. Simple asphyxiant, which diminishes the amount of oxygen in the air that is breathed. Causes rapid respiration, air hunger, diminished mental alertness, impaired muscular coordination, faulty judgement, depressed sensations, emotional instability, fatigue, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma, and death. Dangerous fire and explosion hazard when exposed to heat or flame.
Methylene Chloride (Dichloromethane, Methylene Dichloride)	25	50	2,300	25-320	11.32	Colorless liquid (gas>104°F) with a sweet, chloroform-like odor (not noticeable at dangerous concentrations). Irritates eyes and skin. Causes nausea, vomiting, fatigue, weakness, unnatural drowsiness, light-headedness, numbness, tingling limbs, and nausea. In animals, causes lung, liver, salivary and mammary gland tumors. Mutagen, experimental teratogen, and carcinogen.



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Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Motor Oil	NA	NA	NA	NA	NA	Yellow-brown, oily liquid with a characteristic odor. Irritates skin, lungs, and gastrointestinal tract.
Mustard (H, HD)	0.003 mg/m ³ p/ (ceiling)	NA	NA	NA	NA	Blister agent. Yellow, oily liquid. Garlic odor. Reddening of skin or appearance of blisters may occur several hours after exposure.
Nickel (soluble) (insoluble or metal)	0.1 mg/m ³ 1 mg/m ³	0.5 mg/m ³ 1 mg/m ³	10 mg/m ³ 10 mg/m ³	NA NA	NA NA	Lustrous, silvery, odorless, hard, malleable, ductile, metallic solid. Causes nausea, vomiting, diarrhea, conjunctivitis, sensitization dermatitis, allergic asthma, pneumonitis, and lung and nasal cancer. Mutagen, experimental teratogen, and carcinogen.
Nitrocellulose (Collodion)	NA	NA	NA	NA	NA	Colorless or slightly yellow, syrupy liquid or solid. Ether-like odor. Used as a propellant. May be ignited by heat, sparks, or flames. Vapors can cause dizziness or suffocation. Contact may irritate or burn skin and eyes.
Nitroglycerine	0.2 mg/m ³	0.05	75 mg/m ³	NA	NA	Colorless to pale-yellow, viscous liquid or crystalline solid (<56F) with a sweet taste. Explosive component of dynamite. May be ignited by heat, sparks, or flames. Causes throbbing headaches, dizziness, nausea, vomiting, abdominal pain, abnormally low blood pressure, flushed skin, palpitations, convulsions, vertigo, methamoglobinemia, delirium, CNS depression, angina, blue skin, and skin irritation. Mutagen, experimental teratogen, and questionable carcinogen.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
PCB (Aroclor-1242, Chlorodiphenyl with 42% Chlorine)	1 mg/m ³ (skin)	1 mg/m ³ (skin)	5 mg/m ³	NA	NA	Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor. Irritates eyes and skin. Causes chloracne, liver damage, gastrointestinal disturbances, and reproductive effects. In animals, causes leukemia and tumors of the pituitary gland and liver. Carcinogen.
Perchlorate (as an anion)	Not Established	Not Established	Not Established	NA	NA	White, crystalline solid. Decomposes at 400C. Strong Oxidizer. Hygroscopic. Highly explosive in the presence of reducing material. May cause damage to blood, liver, kidneys and thyroid. Eye irritant and possible skin irritant. May be harmful if inhaled and ingested.
Phosphorus (red)	0.1 mg/m ³	0.1 mg/m ³	NA	NA	NA	Reddish-brown solid. Odorless. Eye irritant. Large quantities ignite spontaneously.
Phosphorus (white or yellow)	0.1 mg/m ³	0.1 mg/m ³	5 mg/m ³	NA	NA	White to yellow, soft, waxy solid with acrid fumes. Usually shipped or stored in water. Ignites spontaneously in moist air. Irritates eyes, skin, and respiratory tract. Causes skin burns, abdominal pain, nausea or vomiting, jaundice, anemia, dental pain, salivation, sweating, blue skin, liver damage, and jaw pain and swelling. Also affects kidneys.
Portland Cement	5 mg/m ³ ^{1/} 10 mg/m ³ ^{j/}	10 mg/m ³ ^{q/}	5,000 mg/m ³	NA	NA	Gray, odorless powder composed of lime, aluminum, silica, and iron oxide. Irritates eyes, skin, and nose. Causes coughing, expectoration, shortness of breath upon exertion, wheezing, chronic bronchitis, and dermatitis.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
RDX (Cyclonite)	1.5 mg/m ³ (skin)	1.5 mg/m ³ (skin)	NA	NA	NA	White, crystalline, high explosive powder. Irritates eyes, skin, and mucous membranes. Causes headaches, irritability, fatigue, weakness, tremors, nausea, dizziness, vomiting, insomnia, and convulsions. Experimental teratogen.
Sarin (GB)	0.0003 mg/m ³ _{p/}	0.0001 mg/m ³ _{p/}	0.2 mg/m ³ _{p/}	NA	NA	Nerve agent. Colorless liquid. Very high toxicity, especially through eye contact. Small drop on skin can be fatal. Vapor causes pupil of eye to contract. Liquid does not injure skin but penetrates rapidly.
Silica, crystalline (as respirable dust) (Sand)	0.05-0.10 mg/m ³ _{q/}	0.05-0.10 mg/m ³ _{q/}	50 mg/m ³ _{q/}	NA	NA	Colorless, odorless, tasteless, crystalline solid or amorphous powder. Irritates eyes and respiratory system. Causes coughing, shortness of breath, wheezing, decreased pulmonary function, silicosis, and increased susceptibility to tuberculosis. Carcinogen.
Sodium Carbonate (Soda Ash; Carbonic Acid, Disodium Salt; Disodium Carbonate; Trona)	NA	NA	NA	NA	NA	White, odorless, small crystals or crystalline powder with an alkali taste. Irritates eyes and skin. Moderately toxic by inhalation and absorption. Mildly toxic by ingestion.
Sodium Hydroxide	2 mg/m ³ (ceiling)	2 mg/m ³ (ceiling)	10 mg/m ³	NA	NA	Clear to slightly turbid, colorless liquid or colorless to white, odorless solid in flake, bead, lump, stick, or granular form. Corrosive irritant to eyes, skin, and mucous membranes. Causes lung inflammation, eye and skin burns with scarring, and temporary loss of hair. Mutagen.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Soman (GD)	0.00003 mg/m ³ p/	NA	0.06 mg/m ³ p/	NA	NA	Nerve agent. Colorless liquid with fruity or camphor odor. Highly toxic by ingestion, inhalation, and skin absorption. Smallest drop is lethal.
Stoddard Solvent	500 mg/m ³	600 mg/m ³	20,000 mg/m ³	NA	NA	Colorless liquid with a kerosene-like odor. Composed of 85% nonane and 15% trimethylbenzene. Irritates eyes, nose, and throat. Causes dizziness, dermatitis, and chemical pneumonia. In animals, causes kidney damage.
Sulfuric Acid	1 mg/m ³	0.2 mg/m ³	15 mg/m ³	2.4 mg/m ³	NA	Colorless to dark-brown, oily, odorless liquid. Pure compound is a solid <51°F. Irritates eyes, nose, skin, and throat. Causes pulmonary edema, bronchitis, emphysema, conjunctivitis, mouth inflammations, dental erosion, inflammation of the trachea and bronchial tubes, severe eye and skin burns, and dermatitis. Experimental teratogen.
Tabun (GA)	0.0001 mg/m ³ p/	NA	0.2 mg/m ³	NA	NA	Pale- to dark-amber, liquid, nerve agent with a colorless vapor. Vapor has a fruity to bitter-almond smell. Very toxic by all routes. Causes nausea, vomiting, diarrhea, muscle twitching, and convulsions. Cholinesterase inhibitor.
Tetrachloroethene (PCE) (Perchloroethylene)	100 ^{j/}	25	150	5-50	9.32	Colorless liquid with a mild chloroform odor. Eye, nose, skin and throat irritant. Causes nausea, flushed face and neck, vertigo, dizziness, headaches, hallucinations, incoordination, drowsiness, coma, pulmonary



**TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona**

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						changes, and skin redness. Cumulative liver, kidney, and CNS damage. In animals, causes liver tumors. Mutagen, experimental teratogen, and carcinogen.
1,1,2,2-Tetrachloroethane	5 (skin)	1 (skin)	100	3-5	11.10	Heavy, colorless to pale-yellow liquid with pungent, chloroform-like odor. Powerful narcotic and liver poison. Strong irritant to eyes and mucous membranes. Causes nausea, vomiting, abdominal pain, finger tremors, jaundice, hepatitis, liver tenderness, dermatitis, blood disorders, sleepiness, hallucinations, distorted perceptions, tearing, salivation, restlessness, dizziness, convulsions, coma, death, and kidney damage. In animals, causes liver tumors. Mutagen and carcinogen.
Thiodiglycol (2,2'-thiodiethanol)	NA	NA	NA	NA	NA	Mustard breakdown product. May cause eye and skin irritation. May be harmful by inhalation, ingestion, or skin absorption.
TNT (2,4,6-Trinitrotoluene)	1.5 mg/m ³ (skin)	0.1 mg/m ³ (skin)	500 mg/m ³	NA	10.59	Colorless to pale-yellow, odorless solid or crushed flakes. Irritates skin and mucous membranes. Causes liver damage, jaundice, blue skin, sneezing, hallucinations or distorted perceptions, coughing, sore throat, nervous system degeneration, headaches, weakness, muscle pain, kidney damage, cataracts, sensitization dermatitis, increased leukocytes in the blood, anemia, and cardiac irregularities. Explosion hazard. Mutagen.



**TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona**

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
Toluene	200	20 (skin)	500	0.2-40 ^{m/}	8.82	Colorless liquid with sweet, pungent, benzene-like odor. Irritates eyes and nose. Causes fatigue, weakness, dizziness, headaches, hallucinations or distorted perceptions, confusion, euphoria, dilated pupils, nervousness, tearing, muscle fatigue, insomnia, skin tingling, dermatitis, bone marrow changes, and liver and kidney damage. Mutagen and experimental teratogen.
1,1,1-Trichloroethane (TCA) (Methyl Chloroform)	350	350	700	20-500	11.00	Colorless liquid with a mild chloroform-like odor. Irritates eyes and skin. Causes headaches, exhaustion, CNS depression, poor equilibrium, dermatitis, liver damage, cardiac arrhythmia, hallucinations or distorted perceptions, motor activity changes, aggression, diarrhea, and nausea or vomiting. Mutagen, experimental teratogen, and questionable carcinogen.
1,1,2-Trichloroethane (TCA)	10 (skin)	10 (skin)	100	NA	11.00	Colorless liquid with a sweet, chloroform-like odor. Irritates eyes, skin, lungs, and nose. Causes dermatitis, liver and kidney damage, and CNS depression. In animals, causes liver cancer. Mutagen and carcinogen.
Trichloroethene (TCE)	100	10	1,000	21.4-400	9.45	Clear, colorless or blue liquid with chloroform-like odor. Irritates skin and eyes. Causes fatigue, giddiness, headaches, vertigo, visual disturbances, tremors, nausea, vomiting, drowsiness, dermatitis, skin tingling, cardiac arrhythmia, and liver injury.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						In animals, causes liver and kidney cancer. Mutagen, experimental teratogen, and carcinogen.
Vinyl Chloride	1 (29 CFR 1910.1017) ^{h/}	1	NA	260	9.99	Colorless gas (liquid <7°F) with a pleasant odor at high concentrations. Severe irritant to skin, eyes, and mucous membranes. Causes weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or blue skin on the extremities, liver cancer, and frostbite (liquid). Also attacks lymphatic system. Mutagen, experimental teratogen, and carcinogen.
VX	0.00001 mg/m ³ ^{p/}	NA	0.2 mg/m ³ ^{p/}	NA	NA	Odorless, pale-amber liquid or colorless, vapor, nerve agent, similar in appearance to motor oil. Extremely toxic by skin and eye absorption. Smallest drop is lethal. Destroys all neuroenzymes and causes sleep disturbance, visual field changes, hallucinations, distorted perceptions, increased blood pressure, diarrhea, nausea, vomiting, spasms, and death. Experimental teratogen.
Xylene (o-, m-, and p-isomers)	100	100	900	0.05-200 ^{m/}	8.56 8.44 (p)	Colorless liquid with aromatic odor. P-isomer is a solid <56°F. Irritates eyes, skin, nose, and throat. Causes dizziness, drowsiness, staggered gait, incoordination, irritability, excitement, corneal irregularities, conjunctivitis, dermatitis, anorexia, nausea,



**TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona**

Compound	PEL ^{a/} (ppm)	TLV ^{b/} (ppm)	IDLH ^{c/} (ppm)	Odor Threshold ^{d/} (ppm)	Ionization Potential ^{e/} (eV)	Physical Description/Health Effects/Symptoms
						vomiting, abdominal pain, and olfactory and pulmonary changes. Also targets blood, liver, and kidneys. Mutagen and experimental teratogen.
Zinc Sulfide	NA	NA	NA	NA	NA	Colorless crystals or white to grayish-white or yellowish powder. Causes gastritis, vomiting, and diarrhea. May form hydrogen sulfide in the body.

a/ PEL = Permissible Exposure Limit. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm. Expressed as parts per million (ppm) unless noted otherwise. PELs are published in the NIOSH Pocket Guide to Chemical Hazards, 2004. AEL = Airborne Exposure Limit. Limit used for chemical agents as established by the U.S. Army.

b/ TLV = Threshold Limit Value - Time-Weighted Average. Average air concentration (same definition as PEL, above) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH), 2009 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

c/ IDLH = Immediately Dangerous to Life or Health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise. IDLH values are published in the NIOSH Pocket Guide to Chemical Hazards, 2004.

d/ When a range is given, use the highest concentration.

e/ Ionization Potential, measured in electron volts (eV), used to determine if field air monitoring equipment can detect substance. Values are published in the NIOSH Pocket Guide to Chemical Hazards, 2004.

f/ NA = Not available.

g/ f/cc = fibers per cubic centimeter.

h/ Refer to expanded rules for this compound.

i/ mg/m³ = milligrams per cubic meter.

j/ NIOSH recommends reducing exposure to the lowest feasible concentration (LFC), and limiting the number of workers exposed.

k/ Total dust.

l/ Respirable fraction.

m/ Olfactory fatigue has been reported for the compound and odor may not serve as an adequate warning property.



TABLE 6.2
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN
Yuma Proving Ground, Arizona

n/ LD50 = Median lethal dose; mg/kg = milligrams per kilogram.

o/ Based on exposure limits for petroleum distillates (petroleum naphtha).

p/ Airborne exposure limit (AEL) developed by United States Department of the Army.

q/ Total dust containing no asbestos and less than 1% crystalline silica.

r/ Depends upon variety.

(skin) = Refers to the potential contribution to the overall exposure by the cutaneous route.

(STEL) = Short Term Exposure Limit, a 15 minute time-weighted average that should not be exceeded at any time during the work day.

(ceiling) = Ceiling concentration which should not be exceeded at any time.

REL = Recommended Exposure Limit. NIOSH develops and periodically revises RELs for hazardous substances or conditions in the workplace.

Note: PEL values are not in all cases Federal OSHA, but in some cases are CAL/OSHA values.



6.1.4 Environmental Hazards

Environmental hazards can occur from heat stress, hypothermia, solar radiation, and fires and explosions. Heat stress could occur in the summer months or when protective clothing decreases the body's natural ventilation. Heat stress can occur even when temperatures are moderate if employees are wearing impermeable protective clothing. Yuma Proving ground is located within the Sonoran Desert of southwestern United States. Temperatures commonly exceed 100°F (38°C) during the summer months. During the winter months, daytime minimum temperatures have not gone below freezing (32°F (0°C)). However, daily minimum lows have been below freezing. Cold exposure may cause severe injury by freezing exposed body surfaces (frostbite) or result in profound generalized cooling (hypothermia), possibly causing death. Areas of the body which have surface area-to-volume ratios such as fingers, toes, and ears are the most susceptible to frostbite.

6.1.4.1 Heat Stress

Heat stress prevention is important because once a person suffers from heat stroke or heat exhaustion, that person may be more likely to have additional heat-related illnesses. The following steps to prevent heat stress should be followed:

- Provide air conditioned shelter or shaded areas to protect personnel during rest periods.
- Urge workers to drink water to keep their body fluids at normal levels. Constantly use the buddy system to ensure that all personnel are adequately hydrated.
- Adjust work schedules according to monitoring requirements and performing work during cooler hours of the day.

Heat stress monitoring will be initiated for workers wearing semi-permeable or impermeable clothing, when temperatures above 70°F (21°C), using one or both of the following methods:

Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.

If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

If oral temperature exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.



Do not permit a worker to continue current activities when oral temperature exceeds 100.6°F (38.1°C).

6.1.4.2 Hypothermia

Hypothermia is defined as a decrease in the body core temperature below 96°F (36°C). The following symptoms appear (in the order listed) as the body loses heat faster than it can be produced:

- Voluntary exercise to stay warm
- Involuntary exercise to stay warm (shivering)
- Loss of judgment and reasoning abilities
- Feelings of apathy, listlessness, and indifference
- Loss of control of the hands

The following steps should be taken to prevent hypothermia:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors
- Ensure the availability of a dry changes of clothes
- Develop a capability for temperature recording at the site
- Ensure the availability of warm drinks

Monitoring the oral temperature on the job site can also be used to defend against hypothermia. This should be done at the supervisor's discretion based on changes in the worker's performance or mental status, or when the wind-chill is less than 20°F (-7°C) or a wind-chill is less than 30°F (-2°C) with precipitation. Any worker developing moderate hypothermia, defined as a core temperature of 92° (34°C), may not return to work for 48 hours.

6.1.4.3 Solar Radiation

Excessive exposure to the sun may cause sunburn, cancers, and eye damage from ultraviolet (UV) radiation. The best defense against sunburn and skin cancer is to wear a hat, pants, and long-sleeved shirt when working outdoors. Sunscreens with a high Sun Protection Factor (SPF) (such as SPF-30 or greater) should be applied to exposed skin 30 to 60 minutes before exposure and reapplied periodically. Ultraviolet radiation contained in sunlight not only causes sunburn, but can result in eye inflammation, cataracts, and retinal injury. Personnel should choose sunglasses with side shields and lenses, which filter out UV radiation.

6.1.4.4 Fire and Explosions

Support vehicles will be equipped with fire extinguishers. Field team members will be trained in the use of the extinguishers. Personnel may fight small fires if it is safe to do so. In the event of a range fire or explosion, evacuate personnel to a safe location upwind of the incident and contact the YPG Fire Department by telephone (928-328-2316) or via



radio through Range Control. Employees should be aware of fire from contact with hot vehicle exhaust and dry rangeland vegetation.

6.1.5 Physical Hazards

Physical hazards consists of those hazards associated the natural environment and other manmade objects.

6.1.5.1 Slip, Trip, and Fall Hazards

Work sites may contain slip, trip, and fall hazards for site workers, such as:

- Holes, pits, or ditches
- Slippery surfaces
- Steep grades
- Uneven grades
- Sharp objects, such as nails, metal shards, and broken glass
- Weather conditions, such as snow or rain, will make surfaces slippery and obscure visibility

Site personnel will be instructed to look for potential safety hazards and immediately inform the SHSO or the Field Team Leader about any new hazards. If the hazard cannot be immediately removed, action must be taken to warn site workers about the hazard.

6.1.5.2 Motor Vehicles and Heavy Equipment

Working with large motor vehicles and heavy equipment can be a major hazard. Injuries can result from equipment hitting or running over personnel, or overturning of vehicles. Vehicles and heavy equipment design and operation will be according to 29 CFR Subpart O, 1926.600 through 1926.602. Backhoes and vertical boring rigs are the only large equipment expected for these investigations. The following precautions will be taken to help prevent injuries and accidents.

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked and maintained in good working order throughout the duration of field activities. Completion of a daily vehicle inspection report will be required for vehicles that are used on a daily basis (drill rig, backhoe, forklift, semi, or dump truck). Support vehicles such as pickup trucks can be inspected weekly.
- Large construction motor vehicles will not be backed up unless the vehicle has a reverse signal alarm audible above the surrounding noise level, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.



- Construction and heavy equipment will be provided with necessary safety equipment including seat belts, rollover protection, emergency shut-off during rollover, backup warning lights, and audible alarms. Safety protection systems will be checked daily and documented on the vehicle inspection report.
- Blades and buckets will be lowered to the ground and parking brakes will be set before shutting off any heavy equipment or vehicle.
- Field support vehicles will be equipped with an appropriate first aid kit and fire extinguisher.

6.1.5.3 Underground Utilities Hazards

The YPG excavation permit, which will be obtained prior to the commencement of work, includes an evaluation of underground utilities. YPG shall be responsible for the clearance of buried utilities.

6.1.5.4 Unexploded Ordnance

The investigation is being completed under the “anomaly avoidance” or construction support principle depending on the site (Attachment C). Site visits have been conducted by qualified UXO personnel, and no ordnance of concern has been observed. Qualified UXO personnel will be at the site during intrusive operations. Avoidance of UXO is the main control method to prevent injury from UXO and to prevent exposure to CWM. However, should any ordnance be encountered that may be of concern to the field crews and can be avoided, the item will be flagged and reported to YPG. If the item cannot be avoided, activities will cease and YPG will be notified.

6.1.5.5 Overhead Electrical Lines

Precautions will be exercised when drilling or conducting any activities near any overhead electrical lines. The driller must maintain a safe clearance distance (minimum of 20 feet) between overhead utility lines and the drill rig mast. Spotters will also be used to confirm that the safe distance is being observed. Overhead precautions will also be used near large equipment and/or vehicles such as semi-trucks, backhoes, and dump trucks.

6.1.5.6 Confined Space Entry

OSHA confined space entry standards (29 CFR 1910.146) will be followed if confined space entry is required. No confined space entry is anticipated during the implementation of this work plan. However, should a confined space be encountered, YPG will be notified and the necessary requirements completed. Confined space entry is not anticipated.

6.1.5.7 Noise-Induced Hearing Loss

Planned activities will involve the use of heavy equipment, such as drill rigs and backhoes. The unprotected exposure of site workers to this noise during activities can result in noise-induced hearing loss. The SHSO will ensure that either earmuffs or disposable foam earplugs are made available to, and used by, personnel near operating



heavy equipment, or other sources of high intensity noise. Hearing protection is required any time the noise level reaches 85 dbA or greater. Double protection is required anytime noise levels exceed 104 dbA. Hazardous Noise Placards will be posted as required.

Noise monitoring will be accomplished by field determination. If a normal speaking voice cannot be heard at a minimum three-foot distance, hearing protection will be required. Hearing protection is required within 50 feet of an operating drill rig or field generator.

6.1.5.8 Excavation Activities

Excavation may be anticipated at some sites. Excavation permits will be obtained from YPG. This permit will be applicable for the sites in this investigation. **Site personnel will not enter the excavations at any time unless applicable shoring systems are in place.** OSHA requirements concerning excavation activities must be followed. The SHSO shall have working knowledge of 29 CFR Part 1926.651.

6.1.5.9 Site Illumination

Field activities are not anticipated to occur at night; however, should investigations be required in the evening hours, site illumination will be in accordance with 29 CFR 1926.56.

6.1.5.10 Site Sanitation

YPG and/or Parsons will make sanitary facilities available. Transportation to the facilities will be available to personnel working at the sites. If transportation is not convenient, use of a portable toilet and hand cleaning facilities will be made available to site workers.

Municipal waste will be placed in appropriate dumpsters available throughout YPG. If site workers are at remote site locations, municipal wastes will be bagged in poly bags and returned for proper disposal. Disposable PPE will be bagged and properly disposed of.

6.2 FIVE HAZARD CONTROL MEASURES – ORDER OF PRECEDENCE

Site hazards and hazards resulting from investigation and remediation activities are controlled using one or more of the control measures listed below. The order of precedence is as follows:

1. **Engineer/design to eliminate or minimize hazards.** A major component of the design phase is to select appropriate safety features to eliminate a hazard and render it fail-safe or provide redundancy using backup components.
2. **Guard the hazard.** Hazards that cannot be eliminated by design must be reduced to an acceptable risk level by safety guards or isolation devices that render them inactive.
3. **Provide warnings.** Hazards that cannot be totally eliminated by design or guarding are controlled through using a warning or alarm device.



4. **Provide special procedures or training.** When design, guarding, or warnings cannot eliminate hazards, subcontractors must develop procedures, training, and audits to ensure safe completion of work. Training cannot be a substitute for hazard elimination when life-threatening hazards are present.
5. **Provide personal protective equipment.** To protect workers from injury, the last method in the order of precedence is the use of personal protective equipment, such as hard hats, gloves, eye protection, life jackets, and other protective equipment with the understanding that bulky, cumbersome, and heavy personal protective equipment is often discarded or not used, rendering this method ineffective without proper controls.

6.2.1 Air Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances. Periodic monitoring is required during some onsite activities. Only activities which may encounter airborne contamination (i.e., drilling) require air monitoring.

Personal monitoring during site activities should also be performed using a photoionization detector (PID). The site safety manager will periodically confirm air monitoring data and review calibration and recordkeeping procedures.

Type of Equipment	Minimum Calibration Frequency	Parameter(s) to be Measured	Minimum Sampling Frequency	Sampling Locations
Photoionization Detector	1/day	Organic Vapors	5-ft intervals (while drilling)	Breathing zone (while drilling)

6.2.2 Decontamination

Procedures for leaving a contaminated area must be planned and implemented prior to going onsite. Work areas and decontamination procedures must be established based on expected site conditions.

At a minimum, adequate wash water must be present in the Support Zone for personnel to be able to wash their face and hands. Personal protective equipment and sampling equipment must be decontaminated or disposed. The disposable PPE and sampling equipment will be placed in plastic bags and disposed of properly.

6.2.2.1 Personnel Decontamination

To prevent harmful materials from being transferred into clean areas or from exposing unprotected workers, field personnel exiting an area of potential contamination will undergo decontamination. The extent of decontamination depends on a number of factors, the most important being the type and concentration of the contaminant involved.

Personnel Decontamination Procedures

An exclusion zone, contamination reduction zone, and support zone will be established whenever field personnel are using PPE. Decontamination station layout will be made on



a site-specific basis and will be based on the level of PPE used, the types of chemical hazards encountered, and the site conditions, including topography, wind direction, and traffic patterns. Defined site access and egress points will be established and personnel will enter and exit only through these points. As a general rule, persons assisting in the decontamination station may be in one level lower of respiratory protection than required in the work zone.

If personnel are in Level D-modified protection (no respirator but using protective gloves and/or suits and other equipment), a portable decontamination station will be set up at the site. The decontamination station will include provisions for collecting disposable PPE (e.g., garbage bags); washing boots, gloves, vinyl rain suits, field instruments and tools; and washing hands, face, and other exposed body parts. Refuse from decontamination will be properly disposed of in accordance with procedures for investigation-derived waste (IDW) management.

Buckets of water or garden sprayers will be used for rinsing. Large plastic garbage bags will be used to store decontaminated clothing (gloves, Tyvek[®] coveralls, etc.) and equipment. Metal or plastic cans or drums will be used to store potentially contaminated liquids. Washing and rinsing are done in combination with a sequential doffing of clothing starting at the first decon station with the most heavily contaminated article and progressing to the last station with the least contaminated article. An exclusion zone will be established for drilling and excavating to prevent personnel from entering these areas without proper safety equipment (e.g., hard hat, steel-toe boots, etc.).

6.2.2.2 Decontamination Procedures During Medical Emergencies

During some medical emergencies, it may be possible that decontamination would aggravate or cause more serious health effects. If prompt, life saving, First Aid and medical treatment are required, decontamination procedures may be modified.

Physical Injury

- Physical injuries can range from a sprained ankle to a compound fracture, and from a minor cut to massive bleeding. Depending on the seriousness of the injury, treatment may be given at the site by trained personnel. For minor medical problems or injuries, the normal decontamination procedure should be followed.
- For more serious injuries, additional assistance may be required at the site, or the victim may have to be transported to a medical facility. Life-saving care should be started immediately, without considering decontamination. The outside garments don't need to be removed unless they cause delays, interfere with treatment, or aggravate the problem. Respirators and backpack assemblies must always be removed. Chemical-resistant clothing can be cut away. If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, rubber, or blankets to help prevent contaminating medical personnel and the inside of ambulances. Outside garments are then removed at the medical facility. No attempt should be made to wash or rinse the victim at the site unless it is known that the individual has been contaminated with an extremely toxic or corrosive material that could also cause severe injury or loss of life.



Chemical Agent Exposure

While unlikely, should exposure to suspect military chemical agent occurs, the field team will immediately move to an upwind location and begin emergency decontamination. Personnel will follow the directions of emergency personnel. Emergency decontamination will consist of the following steps:

- Contaminated clothing shall be removed and the skin flushed with a diluted sodium hypochlorite solution.
- The skin should then be washed with soap and water, preferably in a shower.
- After initial decontamination, personnel will be monitored, treated as necessary, and transported to the YPG Health Clinic.
- If personnel develop symptoms of exposure after work hours, **Call 911 for Emergency Transportation** (inform ambulance personnel of possible chemical agent exposure).

6.2.2.3 Equipment Decontamination

Drill rigs, soil excavating equipment, and other heavy equipment will be steam-cleaned, and drilling equipment will be decontaminated prior to moving to a new site. Drilling equipment used for multiple boreholes will be decontaminated prior to drilling each boring at the site. Heavy equipment will be decontaminated in the following manner:

- Decontamination personnel will don appropriate PPE to include: safety eyewear, coveralls, gloves, and steel toe shoes.
- Steam-clean the equipment using a high-pressure steam sprayer and potable water.
- Clean with tap water and detergent soap using a brush, if necessary, to remove particulate matter and surface films.
- Rinse thoroughly with potable water.

Parsons or its subcontractors will not handle chemical agent-contaminated equipment. Chemical agent-contaminated equipment is not anticipated.

6.2.3 Levels of Protection and Personal Protective Equipment

The personal protection level prescribed for the Yuma Project will be OSHA Level D or D modified. Level C or Level B personal protection is not anticipated. If respiratory protection is required, personnel will halt work and consult with the Project Manager and Project Safety Manger for further direction.

Site Control activities may include UXO vehicle access and down-hole boring clearance, if necessary.

The specific protective equipment for the tasks outlined in this SSHP is listed below. Only persons trained and experienced in using the monitoring equipment will be used to operate the on-site monitoring equipment.



Level D

- Safety glasses with side shields (or splash goggles, when liquid hazards exist)
- Safety boots

- Hard hat (where bump and overhead hazards exist)
- Polyvinyl Chloride (PVC) or Nitrile gloves when handling chemicals or potentially contaminated material
- Hearing protection (when near heavy equipment or noisy environment)
- High visibility traffic vests when working around heavy equipment

PPE used during the course of this field investigation will meet the following applicable OSHA Standards:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and face	29 CFR 1910.133	ANSI Z87.1
Respiratory	29 CFR 1910.134	ANSI Z88.1
Head	29 CFR 1910.135	ANSI Z89.1
Foot	29 CFR 1910.136	ANSI Z41.1

6.2.4 Action Levels

The following action levels should also be used to determine the required levels of protection for work activities. These measurements will be determined using the monitoring instruments or their equivalent specified in Section 6.2.1 of this plan.

Measurement of Volatile Organic Compounds

The following action levels will be used for unknown organic vapors:

0 - 1 mu	Level D
>1 to 500 mu	Level B, if compound is unknown
>500 mu	Stop work; reevaluate activities and site area

(mu = meter units on photoionization detector)

Level C respiratory protection is not anticipated. If conditions indicate that respiratory protection is needed, personnel will consult with the Project Manager and Project Safety Manager for further direction. Level C may be used for organic vapor protection, if the identity of the chemical is known. For example, Level C may be used for protection against some of the common industrial solvents present at YPG, such as trichloroethylene



(TCE) and methylene chloride. As Level C respiratory protection is been used at these sites for particulate hazards, the respiratory protection will be in accordance with selection criteria and guidance presented in the Parsons Respiratory Protection Program.

6.3 ACTIVITY HAZARDS ANALYSIS

Parsons and its subcontractors are required to conduct an activity hazards analysis (AHA) for aspects of the work. The activity hazards analyses consist of the following three steps:

1. Identify the task and break it down into steps.
2. Identify the hazards associated with each step.
3. Identify the specific hazard control measure used for each step in accordance with the order-of-precedence method of control.

AHAs for this project are contained in Attachment A of this SSHP and will be reviewed prior to performance of the tasks (on a daily basis, if necessary).

Exhibit 6-1 is a sample activity hazards analysis form. Exhibit 6.2 shows one example of a training record to be completed and kept on file for each activity hazards analysis.

6.4 SAFETY SYSTEMS ANALYSIS

GBU Safety Managers use the safety systems analysis for field staff and subcontractors whose work requires that they be on site for over six months. The analysis provides management with a rating that reflects the safety and health program effectiveness.

6.5 SITE INSPECTION

The site inspection is a protocol designed to identify and correct unsafe acts and conditions, as well as recognize safe work practices and accomplishments, in Parsons or subcontractors' scope of work. The Project Manager or Project Safety Manager should develop standard safety checklists appropriate to the work being performed. Exhibit 6.3 is an example of a simple checklist to evaluate a project's status. The Project Manager shall develop a checklist based on questions from the audit programs in Attachment B of the SHARP Manual.

Inspections involve a daily or weekly walk-around of a project site that focuses on safety. The Project Manager or Project Site Manager responsible for the work conducts inspections, accompanied by the Project Safety Manager as necessary. Daily walk-arounds' do not have to be documented, but once a week the Project Manager or designee prepares an inspection report using Exhibit 6.3 and forwards it to the Project Safety Manager for maintaining in the project file. Items found to be out of compliance must be assigned to the responsible party for corrective action and the corrective action tracked to completion. Subcontractors shall be advised of noncompliance items using a Notice of Subcontractor Violation, included as Exhibit 6.4.



Exhibit 6.1 – Example Activity Hazards Analysis Form

PARSONS

ACTIVITY HAZARDS ANALYSIS

Page ____ of ____

Project Name & Number:		AHA No.		Date:		New:	
Location:		Contractor:				Revised:	
Required Personal Protective Equipment				Analysis by:		Date:	
		Superintendent/Competent Person		Reviewed by:		Date:	
Work Operation:				Approved by:		Date:	
Work Activity	Potential Hazards	Preventive or Corrective Measures		Inspection Requirements			

Training Requirements:

Assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle.



6.6 DAILY SITE WALK CHECKLIST

The Project Manager, Project Site Manager or Site Safety Manager conducts a daily safety site walk using the Safety and Health Inspection Checklist in Exhibit 6.3 to identify problem areas. Items found to be out of compliance must be assigned corrective action and the corrective action tracked to completion.

6.7 SAFETY AND HEALTH ENFORCEMENT

Parsons and its subcontractors enforce applicable requirements of OSHA 1910 and 1926 as well as EM 385-1-1, where applicable. In addition, subcontractors must comply with and enforce Parsons site requirements.

Parsons and its subcontractors have written progressive disciplinary systems available for review in the respective Human Resources departments.

6.8 NOTICE OF VIOLATION OF SAFETY AND HEALTH REGULATIONS

The project has a formal notice of subcontractor violation of safety and health regulations program to ensure that violations are issued in an immediately dangerous to life and health (IDLH) situation or when the subcontractor repeatedly fails to comply with safety and health requirements.

The notice (Exhibit 6.4) documents poor performance and requires a response from subcontractor senior management. The notice contains five distinct levels of discipline, from submission of a recovery plan to contract termination.

6.9 COMPETENT FIRST AID PERSON

The OSHA Regulations (29 CFR 1910.151 and 1926.50) state the employer shall ensure the ready availability of medical personnel for advice and consultation on matters of occupational health. In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite (i.e. 4 minutes for activities that can be expected to result in an accident involving suffocation, severe bleeding, or other life threatening or permanently disabling injury or illness and 15 minutes for other types of injuries), which is available for the treatment of injured employees, a person who has a valid certificate in first-aid training from the American Red Cross or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid. First-aid supplies must be accessible for immediate use and be of sufficient size and number to handle common first aid incidents.

Since the response time for medical support at some sites may be greater than 15 minutes, the project will require at least one individual on site at times that work is being performed to have a valid certificate in CPR and first aid.



Exhibit 6.3 - Remediation Safety and Health Inspection Checklist

Project: _____ Date: _____

Inspector: _____ Time: _____

Any items that have been found deficient must be corrected before work or use.

This checklist includes, but is not limited to, the following:

	Yes	No
Safe Access and Workspace		
Are safe access and adequate space for movement available for:		
Emergencies		
Work area		
Is overhead protection provided for areas of exposure?		
Is lighting adequate?		
Planning Work for Safety		
Are employees provided with required personal protective equipment (PPE)?		
Have other contractors and trades been coordinated with to prevent congestion and avoid hazards?		
Is air monitoring necessary to determine whether any chemical exposure exists?		
Utilities and Services Identification		
Has the Parsons Drilling Protocol been followed?		
Have utilities been identified by signs/mark-out?		
Have high voltage lines been moved or de-energized, or barriers erected to prevent employee contact?		
Sanitary Facilities		
Is drinking water available?		
Are toilet facilities adequate?		
Work Procedures – Materials Handling		
Is material handling space adequate?		
Is material handling equipment adequate and proper?		
Is material handling equipment in good condition?		
Are workers properly trained to operate equipment and handle hazardous materials?		

Comments:



Exhibit 6.4 – Notice of Subcontractor Violation of Safety and Health Regulations

PARSONS

Notice of Subcontractor Violation of Safety and Health Regulations

Date: _____
Contractor Name: _____
Address: _____

Attention: _____

This letter officially notifies you that you have been found to be in violation of the following Safety Regulations:

_____ on (date) _____, by _____

Nature of violation: _____

This/These violations occurred at the following locations: _____

at the following times _____ and dates _____

The name of the employees was/were _____

under the supervision of _____



PARSONS

Notice of Noncompliance with Safety and Health Regulations

Under conditions of this enforcement procedure check items that apply:

_____ 1. You are being notified of this violation and should take corrective action to prevent a reoccurrence. The corrective action shall be documented to the Parsons Construction Management representative immediately.

_____ 2. You must submit a plan for compliance to your Parsons Construction Management representative and the Construction Safety Manager within two days of receipt of this letter. The compliance plan must include the means or methods of compliance and the date that the requirements for compliance will be completed. Once compliance has been achieved, a follow up letter must be sent to the Parsons Construction Management representative and Construction Safety Manager. Failure to comply will result in disciplinary action against your Company.

_____ 3. You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and the Subcontractor responds formally that the procedure is understood and will comply.

_____ 4. You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and you **must** confirm formally the disciplinary action to be taken against the supervisor and employees.

_____ 5. Work on the site will stop until the Parsons Construction Management representative reviews the facts with the Subcontractor and determines if the contract between the parties will be terminated.

Sincerely,

Parsons Representative _____

cc: Issuing Construction Manager Representative
Job File
GBU Safety Manager
Project Manager



SECTION 7 – SAFETY TRAINING

7.1 PROJECT SAFETY ORIENTATION

The Parsons Project Manager, Project Site Manager/Field Team Leader, or Project Safety Manager conducts the site-specific orientation for new Parsons staff and subcontractor personnel.

The Orientation takes less than one hour to complete and consists of Parsons and regulatory reference material, including:

- YPG specific information
- Applicable OSHA 1910 General Industry and 1926 Construction Regulations and others, as required
- Parsons applicable requirements, including items covered in Section 4.2.
- Subcontractor requirements

Visitors to the Parsons work area(s) must receive a brief orientation as described in Section 4.2, and be escorted by the Project Manager, Project Site Manager, Project Safety Manager or a designee familiar with the potential hazards on the project.

Subcontractors must conduct similar orientations for their staff and craft employees and must document orientations using the Employee/Subcontractor Training Acknowledgement form (Exhibit 7.1 is one example of this type of form). The Project Manager or a designee maintains the orientation documents and acknowledgement forms.

7.2 PARSONS U SAFETY MODULES AND START TRAINING – ZERO INCIDENT TECHNIQUES

Consistent with Parsons corporate initiatives in safety training, the Project Manager will identify applicable personnel (i.e. managers, engineers and supervisors, including subcontractor personnel), that shall be current in the completion of safety modules on ParsonsU and that should receive START training to further Parsons' goal of zero incidents.

The GBU and Division Safety Manager serve as the certified trainers for periodic START/SHARP training sessions for new personnel. They should be contacted if personnel need to receive training.



Exhibit 7.1 - Employee/Subcontractor Training Acknowledgement

PARSONS

Name of Trainer: _____

Training Subject: _____

Training materials used: _____

Name of employee: _____

Date of hire/assignment: _____

I, _____, hereby certify that I have received training as described above in the following areas:

- Names of personnel responsible for site safety and health.
- Safety, health or other hazards at the site.
- The proper use of personal protective equipment.
- The potential occupational hazards in general in the work area and associated with my job assignment.
- Work practices by which a worker can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Acute effects of compounds on the site.
- Decontamination procedures.
- General safety requirements indicate the safe work conditions, safe work practices and personal protective equipment required for my work.
- The hazards of any chemicals to which I may be exposed and my right to information contained on material safety data sheets for those chemicals, and how to understand this information.
- My right to ask questions, or provide any information to the employer on safety either directly or anonymously without any fear of reprisal.
- Disciplinary procedures the employer will use to enforce compliance with general safety requirements.

I understand this training and agree to comply with general safety requirements for my work area.

Employee Signature

Date



Exhibit 7.2 – Safety Meeting Sign-In Sheet

Safety Meeting Presenter: _____

Date: _____

1. Current Weather Conditions:
2. Temperature (°F) = _____ Wind Direction = _____ Wind Speed = _____
Clear - Sunny – Cloudy – Rain - Snow Forecast = _____

3. Current Site Conditions (circle as appropriate):
Dry - Wet - Muddy - Frozen - Snow Covered - Other (describe) _____

4. Incidents or Injuries to report from Previous Day Activities: No Yes - explain below: _____

5. Safe and/or At-Risk Observations from Previous Day Activities: _____

6. Activities Taking Place Today: _____

7. Anticipated Hazards: _____

8. Engineering Controls-Work Practices-PPE to Protect Against Hazards: _____

9. Additional Safety Topic or Comments: _____



7.3 DAILY TOOLBOX SAFETY MEETINGS

Parsons and its subcontractors conduct daily toolbox safety meetings at the beginning of each work shift at the first site in the field and at any other sites during the day. These meetings are informal and brief include topics relevant to the site and the upcoming work. The meetings may include reviews of recent incidents on the project. The Project Manager or a designee is responsible for the toolbox safety training content and documenting and retaining attendance records using Exhibit 7.2.

7.4 ACTIVITY HAZARDS ANALYSIS TRAINING

When the activity hazards analysis is complete, the Parsons Project Manager/Site Manager/Supervisor or subcontractor conducts a training session with employees involved with the analyzed task. The training may be informal and at the site where the task is performed. Employees should be given an opportunity to provide input regarding task steps, hazards identified, and appropriate control measures.

The Project Manager or a designee documents and maintains the activity hazards analyses using Exhibit 6.2.

7.5 REGULATORY TRAINING PROGRAM

OSHA regulations require specific training in certain circumstances. Based on the scope of work and meetings with regulatory officials, the following training topics are provided on the project:

- General – Workers engaged in activities which are potentially exposed to hazardous substances and health hazards must be trained to meet 1910.120(e)(1). Annual 8-hour refresher training as per 29 CFR 1910.120(e)(3) is required for workers. Supervisors must be trained to meet 29 CFR 1910.120(e)(4). On-site workers shall have received 40 hours of initial off-site training in hazardous waste operations, and three days field experience under the direct supervision of a trained, experienced supervisor as required by 29 CFR Part 1910.120(e). Copies of required certificates will be maintained at the Parsons YPG office by the SHSO.
- CPR/AED/First aid – provided to personnel based on project activities identified in the Scope of Work (i.e. life threatening) and EMS response time (i.e. less than 15 minutes). See Section 6.9.
- Respiratory protection – must meet 29 CFR 1910.134. Medical qualification by a physician is required to wear a respirator. Annual fit testing and training is also required. Fit testing of respirators will be mandatory for personnel in Level B and C activities. Workers that are required to use Level B or C PPE will have been trained in the proper use of the PPE including donning, doffing, care and maintenance, limitations, and safety procedures. They will also be briefed on site-specific hazards.



- Confined space entry – Supervisor must be trained to meet 29 CFR 1926.651(j).
- Asbestos abatement – must meet 29 CFR 1926.1101.
- Excavation/trenching – must meet 29 CFR 1926.651.
- Training will include recognition of potential UXO hazards, safety precautions, and reporting of suspect UXO material. The types of ordnance likely to be encountered will be viewed. UXO avoidance philosophy will be discussed and followed by the staff. This information will be reviewed by the UXO specialist at each UXO site prior to the start of operations.

The Project Manager determines the necessary training and coordinates the training with the Project Safety Manager.

7.6 OSHA OUTREACH PROGRAMS

When applicable, the project may use qualified instructors and online courses to conduct OSHA 10-hour construction safety training. If applicable, supervisory staff must complete the 30-hour course. Depending on the scope of work, similar requirements may be included in subcontracts. Participants successfully completing the course receive a certificate of completion.

7.7 SPECIALIZED TRAINING AND ORIENTATIONS

Project personnel receive specialized training on client rules and requirements as well as the unique tools, equipment, and procedures used to perform the work, as applicable. A project budget will be established for specialized training, if necessary.

Prior to beginning work on a site, the Field Team Leader/SHSO will provide a briefing on the following topics:

- Name of personnel responsible for site safety and health
- Site history
- Identify safety, health, and other hazards at the site
- Proper use of PPE and monitoring equipment
- Work practices by which the employee can minimize risk from hazards
- Work zones and their locations and the level of protection to be used in each zone on the site
- Acute and chronic effects of compounds at the site
- UXO, potential CWA, chemical agent byproducts, and chemical simulants
- Decontamination procedures
- Emergency procedures, evacuation routes, and emergency telephone numbers



A health and safety briefing will be held each morning of work and will include work-site topics and plans for the day's activities. Briefings will be documented on the Daily Health and Safety Briefing Form (Attachment B). The SHSO or his designee will maintain health and safety records. The SHSO will also be responsible for the completion of the Safety forms in Attachment B; the site manager (if different from the SHSO) will be responsible for the operations forms.



SECTION 8 – RECORDKEEPING AND POSTING

Parsons and its subcontractors must comply with the recordkeeping requirements of OSHA, YPG, Parsons Corporation, and this safety program, including:

- OSHA 300 logs
- Medical treatment and follow-up
- Heavy equipment inspection logs
- Training
- Inspections
- Audits
- Others as required

The Project Manager or Project Site Manager is the official record keeper for files relating to Parsons employees. Each subcontractor maintains its files.

The project displays the safety posters in the field trailer located at YPG.



SECTION 9 – SAFETY AND HEALTH REQUIREMENTS

9.1 SAFETY AND HEALTH REQUIREMENTS

Table 9-1 represents OSHA, YPG, and Parsons corporate regulations and requirements which may be applicable to various aspects of the project. Based on the most recent risk assessments, the Parsons Project Manager and Project Safety Manager update the listed topics periodically. Training and other requirements are updated in this SSHP as required by changes to Table 9-1.

Parsons and its subcontractors are individually responsible for training their respective employees and for complying with the project requirements. Failure to comply could lead to disciplinary actions against Parsons employees and subcontractors or their employees.

Exhibit 9.1 – Competent Person and Activity Hazards Analysis Requirements

Safety and Health Requirement	OSHA Regulation	EM 385-1-1 Regulation	Competent Qualified Person	Training Required	Written Plan and AHA Required
1. General Safety & Health	1926.20	01.A	Yes	Yes	Yes
2. Safety Training	1926.21	01.B.01	Yes	Yes	Yes
3. First Aid and Medical	1926.23, 50	03.A	Yes	Yes	Yes
4. Fire Protection and prevention	1926.24, 150-155, 352	09.A	Yes	Yes	Yes
5. Housekeeping	1926.25	14.C	N/A	N/A	N/A
6. Illumination	1926.26, 56	07.A	Recommended	N/A	N/A
7. Sanitation	1926.27, 51	02.A	N/A	N/A	N/A
8. Personal Protective Equipment	1926.28, 95-98, 100-107	05.A	Yes	Yes	Yes
9. Acceptable Certifications	1926.29		Yes	Yes	Yes
10. Incorporation by Reference	1926.31	Preamble	N/A	N/A	N/A
11. Emergency Employee Action Plans	1926.35	01.E	Recommended	Yes	Yes
12. Noise Exposure	1910.95; 1926.52	05.C	Yes	Yes	Yes
13. Radiation Protection	1926.53, 54		Yes	Yes	Yes
14. Gases, Vapors, Dusts and Mists	1926.1926.55		Yes	Yes	Yes
15. Ventilation	1926.57, 353		Recommended	Yes	Yes
16. Hazard Communication	1926.59	1.B.06	Yes	Yes	Yes
17. Process Safety Management	1910.119; 1926.64		Yes	Yes	Yes



Exhibit 9.1 – Competent Person and Activity Hazards Analysis Requirements (Cont.)

Safety and Health Requirement	OSHA Regulation	EM 385-1-1 Regulation	Competent Qualified Person	Training Required	Written Plan and AHA Required
18. Hazardous Waste Operations and Emergency Response	1910.120; 1926.65	28.A	Yes	Yes	Yes
19. Accident prevention signs and tags	1926.200	08.A	N/A	N/A	N/A
20. Signaling	1926.201	08.B	Recommended	N/A	Yes
21. Barricades	1926.202		N/A	N/A	N/A
22. Material Storage	1926.250	14.B	N/A	Yes	Yes
23. Rigging	1926.251	15.A	Yes	Yes	Yes
24. Waste Disposal	1926.252	14.D	Yes	Yes	Yes
25. Tools	1926.300-307	13.A	N/A	N/A	Yes
26. Electrical	1926.400-415	11.E	Yes	Yes	Yes
27. General Electrical	1926.416	11.A	Yes	Yes	Yes
28. Lockout Tag-out	1910.147; 1926.417	12.A	Yes	Yes	Yes
29. Lockout Tag-out Permit System	1910.147	12.A	Yes	Yes	Yes
30. Maintenance of Electrical Equipment	1926.431	11A	Yes	Yes	Yes
31. Environmental Deterioration of Electrical Equipment	1926.432		Yes	Yes	Yes
32. Batteries/Battery Charging Equipment	1926.441	11.E	N/A	Yes	Yes
33. Fall Protection	1926.500-503	21.A	Yes	Yes	Yes
34. Motor Vehicles, Mechanized Equipment	1926.600-603	18.A	Yes	Yes	Yes
35. Powered Industrial Trucks (forklifts)	1910.178		Yes	Yes	Yes
36. Site Clearing	1926.604	31.A	N/A	Yes	Yes
37. Excavations	1926.650-652	25.A	Yes	Yes	Yes
38. Excavation Permit	N/A	N/A	Yes	Yes	Yes
39. Compressed Air	1926.803	26.I	Yes	Yes	Yes
40. Demolition	1926.850-860 inclusive	23.A	Yes	Yes	Yes
41. Rollover Protective Structures; Overhead Protection	1926.1000-1003 inclusive		N/A	N/A	Yes
42. Stairways and Ladders Scope	1926.1050	21.A	N/A	Yes	Yes
43. Stairways/Ladders General Requirements	1926.1051		Yes	Yes	Yes
44. Stairways	1926.1052	21.E	Recommended	Yes	N/A



Exhibit 9.1 – Competent Person and Activity Hazards Analysis Requirements (Cont.)

Safety and Health Requirement	OSHA Regulation	EM 385-1-1 Regulation	Competent Qualified Person-Supv	Training Required	Written Plan and AHA Required
45. Ladders	1926.1053	21.D	Yes	Yes	Yes
46. Ladder/Stair Training	1926.1060		Yes	Yes	Yes
47. Internal Traffic Control	N/A	8.D	N/A	Yes	Yes
48. Traffic Movement Restriction Times	N/A	8.C	N/A	Yes	Yes
49. Major Material Movements	N/A	N/A	N/A	Yes	Yes
50. Right-of-way Restrictions	N/A	N/A	N/A	Yes	Yes

ATTACHMENT A

ACTIVITY HAZARD ANALYSES

Activity Hazard Analysis (AHA)

Activity/Work Task: EMERGENCY RESCUE OPERATIONS	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix					
Contract Number: W91ZLK-05-D-0016	Severity	Probability				
Date Prepared: 29 December 2009		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Michael E. Short/Technical &Ops. Dir	Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Tim Mustard, CIH	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
Notes: (Field Notes, Review Comments, etc.)	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.					RAC Chart	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					E = Extremely High Risk	
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					H = High Risk	
					M = Moderate Risk	
					L = Low Risk	
Job Steps	Hazards	Controls				RAC
1. Establish location for desired work area to conduct operations, to include: a. Establish Work Area Control Zones b. Assist with Personnel Decontamination c. Perform Rescue of Injured Down Range Member d. Perform Medical Monitoring of Injured Identification	1a. Slip, trip and fall.	1a. Worker awareness of potential slippery/uneven surfaces and tripping hazards plus inspection and policing of debris.				L
	1b. Biological hazards.	1b. Conduct a reconnaissance of the area to be used to ensure there are no biological hazards or endangered flora/fauna species present. The individual conducting the recon must take precautions and be certain that they are wearing a long sleeved shirt and have used the appropriate insect repellent if desired. Any biological hazards encountered will be noted in the log and if possible the site located to a more suitable area. 1b. <u>Hazardous Plants</u> - PPE for avoidance of hazardous plants (specifically Poison Ivy/Oak and Sumac) will consist of long sleeved shirts and long pants, or coveralls; safety glasses; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. Daily protective controls will consist of: <ul style="list-style-type: none"> • Field personnel applying a protective barrier cream (such as Ivy X[®]) to potentially exposed skin at the beginning of each day; • Use of a protective cover on automobile seats, to be replaced each day; 				L
		1b. <u>Hazardous Plants</u> - PPE for avoidance of hazardous plants (specifically Poison Ivy/Oak and Sumac) will consist of long sleeved shirts and long pants, or coveralls; safety glasses; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. Daily protective controls will consist of: <ul style="list-style-type: none"> • Field personnel applying a protective barrier cream (such as Ivy X[®]) to potentially exposed skin at the beginning of each day; • Use of a protective cover on automobile seats, to be replaced each day; 				L

Job Steps	Hazards	Controls	RAC
		<ul style="list-style-type: none"> • Field personnel washing with poison ivy/oak oil cleanser (such as Tecnu[®]) (following directions on bottle) at breaks and the end of each field day, or as soon as a rash appears (do not apply to broken skin); • Field personnel changing into clean clothing or removing coveralls and removing automotive seat covers before leaving the site each day; and • Any other protective measures deemed appropriate. <p>1b. <u>Ticks</u> - PPE for avoidance of tick bites will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. Daily protective controls will consist of:</p> <ul style="list-style-type: none"> • Wearing light colored clothing to easily identify presence of ticks; • Application of a Permethrin[®]/Permanone[®] spray to clothing the day before field work. (Note: this is to be sprayed on clothing only and allowed to dry (Never apply directly on skin.) and application of insect repellent containing DEET[®] on exposed skin; • Use of Duct tape to blouse pants and create a protective seal; • Field tick-checks to be performed at breaks throughout the day using the Buddy System; and • Daily inspection of entire body to locate attached ticks after removal of clothing. <p>If a tick is imbedded in the skin, tick removal will be performed with narrow headed tweezers available in each field kit. The tick will be grabbed where the mouthparts enter the skin and the tick gently pulled out and then crushed. The bite area and the hands will be cleansed with an antiseptic wipe found in the field kit or soap and water.</p> <p>1b. <u>Stinging/Biting Insects and Poisonous Snakes</u> - PPE for avoidance of stinging/biting insects (I.e. Spiders, Bees) and poisonous snakes will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as a hard hat, baseball cap or head scarf. UXOSO will brief field crews on all potential stinging and biting insects and poisonous snakes that inhabit the work area. Descriptive Information Packets will be posted in the Field Office and given to Field Team Leaders. Daily protective controls will consist of:</p>	<p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
	<p>1c. Endangered/threatened flora/fauna.</p> <p>1d. Vehicle and heavy equipment traffic in area.</p> <p>1e. Lifting hazards.</p> <p>1f. Cold/Heat Stress</p> <p>1g. Contact with chemical agent or other hazardous chemicals.</p>	<ul style="list-style-type: none"> • Field personnel need to be aware of their surroundings; • Use of PPE (gloves) when moving or disturbing piles of old wood/logs and large rocks; • Nest of bees, wasps or hornets need to be identified and avoided; and • Consider all snakes to be poisonous and avoided <p>1c. Conduct reconnaissance IAW approved WP and avoid endangered/threatened species if at all possible.</p> <p>1d. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses and a high visibility safety vest when working around heavy equipment. Establish arm and hand signals or radio communication with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc.</p> <p>1e. Ensure that you, and if there is another individual assisting you, both have solid footing, leather work gloves and use the proper lifting technique, bend at the knees keeping your back as straight as possible and lift with your knees, not your back. Ensure you have good visibility in the direction you are carrying an item. Do not attempt to carry anything by yourself in excess of 50 lbs. or any item that blocks your visibility or is cumbersome to carry alone.</p> <p>1f. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.</p> <p>1g. Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being accomplished. Inherent with PDS operations, both the PDS Tent and Monitoring Tent are needed to be maintained at temperatures greater than 68°F. Electrical floor heating units are prohibited in the PDS or Monitoring Tent. Portable propane heaters can be used, but these cause “off gassing” of carbon monoxide (CO²). A CO² Meter capable of reading levels from 0 – 25ppm is required and will be periodically observed for current levels. If the level is reached or exceeded; the heating unit will be turned off; the PDS and Monitoring Tent will be opened and allow fresh air to ventilate through, until CO² level is below 25ppm.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
	<p>1h. MEC/UXO Hazards</p> <p>1i. Noise in excess of OSHA standards</p> <p>1j. Fire/Explosion</p> <p>1k. Pressurized cylinders – sudden release of contents</p>	<p>1h. If an MEC item is encountered alert the rest of the team and conduct an inspection of the item IAW the approved WP, SOP and EM 385-1-97.</p> <p>1i. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The site safety officer will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.</p> <p>1j. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP, applicable SOPs and EM 385-1-1, Chapter 18. Proper fire extinguishers will be on site and serviceable. There will be no “Hot Fueling” authorized at any time.</p> <p>1k. Periodic inspection of all pressurized cylinders by field crew. Proper storage of cylinders in accordance with SOPs. Some operations require the use of a Cascade System (multiple pressurized cylinders) to provide breathable air for downrange team. The valves, gauges and connections are needed to be visibly checked hourly while team is downrange.</p>	<p>M</p> <p>L</p> <p>L</p> <p>L</p>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. Rescue litter and retrieval device 2. Appropriate PPE for selection operation, at minimum – <ol style="list-style-type: none"> a. Long Sleeve Shirt b. Long Legged Pants c. Sturdy Work Boots d. Leather Gloves e. Safety Glasses, when required f. Hard Hat, when required g. Safety Vest, when required h. Additional PPE to conduct other operations, as directed 3. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 4. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 5. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project supplied or personal Cellular Phone 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. Selected site personnel performing Rescue will be trained and practice Rescue procedures 4. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. 5. All personnel involved in this operation that are required to wear Self-Contained Breathing Apparatus (SCBA) or a full-face Air Purifying Respirator (APR) will be certified under 29 CFR1910.134 <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. Personnel potentially exposed to contaminant-related health and safety hazards: OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	<ol style="list-style-type: none"> 1. <u>Initial (Site Selection)</u> – General inspection of assigned or designated area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. 2. <u>Daily</u>- Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew's status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel's cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations and relocate to re-establish communications link with the Field Office or UXOSO. 3. <u>Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. 4. <u>Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Only qualified personnel will be allowed to operate rescue litter and retrieval device.

Training Acknowledgement:

Printed Name	Signature	Date

Activity Hazard Analysis (AHA)

Activity/Work Task: FUELING OPERATIONS	Overall Risk Assessment Code (RAC) (Use highest code)	L	
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix		
Contract Number: W91ZLK-05-D-0016	Severity	Probability	
Date Prepared: 3 January 2013		Frequent Likely Occasional Seldom Unlikely	
Prepared by (Name/Title): Michael E. Short/Technical &Ops. Dir	Catastrophic	E E H H M	
Reviewed by (Name/Title): Ed Grunwald, CIH	Critical	E H H M L	
	Marginal	H M M L L	
Notes: (Field Notes, Review Comments, etc.)	Negligible	M L L L L	
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)		
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely. "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	RAC Chart	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	E = Extremely High Risk H = High Risk M = Moderate Risk L = Low Risk	
Job Steps	Hazards	Controls	RAC
1. General Fueling Operations	1a. Slip, trip and fall.	1a. Worker awareness of potential slippery/uneven surfaces and tripping hazards plus inspection and policing of debris.	L
	1b. Biological hazards.	1b. See Biological Hazards AHA, which must be used in conjunction with this AHA if applicable.	L
	1c. Endangered/threatened flora/fauna.	1c. Conduct reconnaissance IAW approved WP and avoid endangered/threatened species if at all possible.	L
	1d. Fire/Explosion	1d. Smoking or open flames within 50 feet of where flammables are being used or transferred or where equipment is being fueled is prohibited. Each service or fueling area will have at least one 20-B:C rated fire extinguisher within 75 feet of each pump. Clearly identified and easily accessible Emergency Cut-Off switch(es) will be installed and clearly marked at a location remote from dispensing devices to shut off the power to all dispensing devices in an emergency. Equipment using flammable liquid fuel shall be shut down during refueling, servicing, or maintenance. Those vehicles or equipment without an internal grounding system will be bonded between the fueling system and themselves, prior to dispensing fuel.	L

Job Steps	Hazards	Controls	RAC
	<p>1e. Contact with chemical agent or other hazardous chemicals</p> <p>1f. Vehicle and heavy equipment traffic in area.</p> <p>1g. Pinch hazard from assembly and placement of equipment</p> <p>1h. Cold/Heat Stress</p>	<p>1e. Operators need to be aware of potential exposure to corrosive and/or flammable liquids when conducting vehicle fueling. Operators will not eat, drink or smoke when performing these tasks. Any visible leaking will be immediately reported to their supervisor. Select appropriate PPE, based on task.</p> <p>1f. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses and a high visibility safety vest when working around heavy equipment.</p> <p>1g. Wear leather gloves and place hands on smooth surfaces checking the area on which you are going to place your hands for pinch areas as well.</p> <p>1h. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. OSHA Approved Fuel Cans; Approved Fire Extinguishers; Bonding Strap; Funnels; Drip Pans, and Absorbent Material 2. Hand Tools 3. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 4. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 5. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project supplied or personal Cellular Phone 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	<p><u>1. Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer’s instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement.</p> <p><u>2. Daily-</u> Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. UXOSO will update site’s MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew’s status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel’s cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations or relocate to re-establish communications link with the Field Office or UXOSO.</p> <p><u>3. Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment.</p> <p><u>4. Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.</p>

Training Requirements: Only qualified personnel will be allowed to use OSHA approved fuel cans, approved fire extinguishers, bonding straps, funnels, drip pans, and absorbent materials.

Training Acknowledgement:

Printed Name

Signature

Date

Activity Hazard Analysis (AHA)

Activity/Work Task: MOBILIZATION/DEMobilIZATION	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix					
Contract Number: W91ZLK-05-D-0016	Severity	Probability				
Date Prepared: 3 January 2013		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Michael E. Short/Technical &Ops. Dir	Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Ed Grunwald, CIH	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)				
		"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.			RAC Chart	
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible			E = Extremely High Risk	
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.			H = High Risk	
					M = Moderate Risk	
					L = Low Risk	
Job Steps	Hazards	Controls				RAC
1. Site Set Up or Tear Down, to include install or dismantle – a. Trailers; Tents; CONEX containers, and storage sheds (Refer to ESAT AHA for Explosive Storage Magazines)	1a. Slip, trip and fall. 1b. Biological hazards. 1c. Endangered/threatened flora/fauna. 1d. Pinch hazard from assembly and placement of equipment. 1e. Lifting hazards.	1a. Worker awareness of potential slippery surfaces and tripping hazards plus inspection and policing of debris. 1b. See Biological Hazards AHA, which must be used in conjunction with this AHA if applicable. 1c. Conduct reconnaissance IAW approved WP and avoid endangered/threatened species if at all possible. 1d. Wear leather gloves and place hands on smooth surfaces checking the area on which you are going to place your hands to avoid sharp areas and pinch points. 1e. Ensure that you, and if there is another individual assisting you, both have solid footing, leather work gloves and use the proper lifting technique, bend at the knees keeping your back as straight as possible and lift with your knees, not your back. Ensure you have good visibility in the direction you are carrying an item. Do not attempt to carry anything by yourself in excess of 50 lbs. or any item that blocks your visibility or is cumbersome to carry alone.				L L L L L

Job Steps	Hazards	Controls	RAC
	<p>1f. Cold/Heat Stress</p> <p>1g. Vehicle and heavy equipment traffic in area.</p> <p>1h. Use of hand and power tools</p> <p>1i. Fire/Explosion</p> <p>1j. Noise in excess of OSHA standards</p> <p>1k. MEC/UXO Hazards</p> <p>1l. Collapse Hazards</p> <p>1m. Inclement Weather (Winds; Snow; Ice and Dust)</p>	<p>1f. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.</p> <p>1g. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses, and a high visibility safety vest when working around heavy equipment.</p> <p>1h. Use the proper tools for the specific job being performed. Be certain that the tools to be used are serviceable and free of slippery surfaces. Hand and power tool use will be IAW EM 385-1-1, Chapter 13.</p> <p>1i. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP, applicable SOPs and EM 385-1-1, Chapter 18. Proper fire extinguishers will be on site and serviceable. There will be no "Hot Fueling" authorized at any time.</p> <p>1j. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The site safety officer will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.</p> <p>1k. Inspect the area for the presence of UXO using a magnetometer to assist in finding items in brush and dense vegetation. If an MEC item is encountered alert the rest of the team and conduct an inspection of the item IAW the approved WP, SOP and EM 385-1-97.</p> <p>1l. Secure all locking pins and bracing supports for portable shelters and tents IAW manufacturer's manual. Do not use "make shift" replacement parts to secure braces or supports. Shelters and tents with missing parts will not be erected until authorized parts are on hand.</p> <p>1m. Personnel need to be aware of special precautions to safely erect or tear down portable shelters and tents in adverse weather conditions. Tents and collapsible shelters will be anchored to the ground to prevent being blown over in strong winds. Tents and collapsible shelters will be lowered and secured when wind speeds exceed 25mph.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p> <p>L</p> <p>M</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
<p>2. Establishment/Termination of services, to include -</p> <ul style="list-style-type: none"> a. Electrical connections b. Water/Sewer/Portable Toilets 	<p>2. The Hazards listed in Hazard 1 are applicable to Hazard 2. Hazards 2a and 2b are added.</p> <p>2a. Underground Utilities</p> <p>2b. Electrical Shock.</p>	<p>2. The Controls that are listed in Controls 1 are applicable to Controls 2. Controls 2a and 2b are added.</p> <p>2a. The local utility locating hotline will be contacted to identify the locations of buried utilities before subsurface activities are allowed to commence.</p> <p>2b. Ensure that the electrical company or equipment company installs and connects any electrical lines. In the event there is an electrical problem that cannot be corrected by merely unplugging and re-plugging an item or replacing a blown fuse then an electrician will be contacted to correct the problem. All electrical appliances, equipment will have a third prong for proper grounding and all electrical outlets will have three pronged receptacles and meet the requirements of EM 385-1-1, Chapter 11. GFCIs will be used for all outdoor connections.</p>	<p>L</p> <p>L</p>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. Hand and Power Tools 2. Appropriate PPE for selection operation, at minimum – <ol style="list-style-type: none"> a. Long Sleeve Shirt b. Long Legged Pants c. Sturdy Work Boots d. Leather Gloves e. Safety Glasses, when required f. Hard Hat, when required g. Safety Vest, when required h. Additional PPE to conduct other operations, as directed 3. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 4. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 5. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project supplied or personal Cellular Phone 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. Certified Electrician 4. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. 5. All personnel operating any motorized equipment, to include ATVs or Segways will provide proof of competency (documentation of training or experience) to the UXOSO prior to operating the equipment. <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	<ol style="list-style-type: none"> 1. <u>Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer’s instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. 2. <u>Daily-</u> Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. UXOSO will update site’s MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew’s status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel’s cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations or relocate to re-establish communications link with the Field Office or UXOSO. 3. <u>Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. 4. <u>Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Only qualified personnel will be allowed to operate hand and power tools.

Training Acknowledgement:

Printed Name

Signature

Date

Activity Hazard Analysis (AHA)

Activity/Work Task: DECONTAMINATION STATION FOR PERSONNEL, EQUIPMENT AND RCW MATERIAL	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix					
Contract Number: W91ZLK-05-D-0016	Severity	Probability				
Date Prepared: 3 January 2013		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Michael E. Short/Technical &Ops. Dir	Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Ed Grunwald, CIH	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				H = High Risk	
					M = Moderate Risk	
					L = Low Risk	
Job Steps	Hazards	Controls				RAC
1. Establish location for desired work area to conduct operations, to include:	1a. Slip, trip and fall.	1a. Worker awareness of potential slippery/uneven surfaces and tripping hazards plus inspection and policing of debris.				L
a. Establish Work Area Control Zones (EZ, CRZ and SZ);	1b. Biological hazards.	1b. See Biological Hazards AHA, which must be used in conjunction with this AHA if applicable.				L
b. Erection of PDS Tent or Shelter;	1c. Endangered/threatened flora/fauna.	1c. Conduct reconnaissance IAW approved WP and avoid endangered and threatened species if at all possible.				L
	1d. Cold/Heat Stress	1d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.				L
	1e. Contact with chemical agent or other hazardous chemicals	1e. Personnel will don the proper PPE commensurate with the chemical hazard, the control zone where work is being accomplished and a Rescue Team is on standby. Ensure all personnel are halted before crossing into an established zone without proper PPE.				L

Job Steps	Hazards	Controls	RAC
	<p>1f. MEC/UXO Hazards</p> <p>1g. Lifting hazards.</p> <p>1h. Hand and Power tool operation</p> <p>1i. Electrical Shock.</p> <p>1j. Pressurized cylinders – sudden release of contents</p>	<p>1f. Inspect the area selected for the PDS to be cleared of the presence of UXO using a magnetometer to assist in finding items in brush and dense vegetation. If an MEC item is encountered alert the rest of the team and conduct an inspection of the item IAW the approved WP, SOP and EM 385-1-97.</p> <p>1g. Ensure that you, and if there is another individual assisting you, both have solid footing, leather work gloves and use the proper lifting technique, bend at the knees keeping your back as straight as possible and lift with your knees, not your back. Ensure you have good visibility in the direction you are carrying an item. Do not attempt to carry anything by yourself in excess of 50 lbs. or any item that blocks your visibility or is cumbersome to carry alone.</p> <p>1h. When operating power tools they will be handled, operated and maintained IAW the manufactures instructions, the approved WP and any applicable SOPs. The power tool will be inspected prior to use to ensure that all of the hand and safety guards are in place and that the chain, if present, is properly tightened and that the tool is otherwise in good working order. Depending on the power tool PPE will vary and it too must be serviceable, operable and free of any defect.</p> <p>PPE will be worn IAW the approved WP and inspected by the user prior to donning. Hand and power tool use will be IAW EM 385-1-1, Chapter 13.</p> <p>1i. Due to the nature of PDS operations and the abundant use of water, the electrical services should be “hard-wired” into the PDS by a certified electrician. In the event that this cannot be accomplished, all electrical power lines need to be securely fastened to the upper frames of the structure or tent and used with GFCI connections. All electrical appliances, equipment will have a third prong for proper grounding and all electrical outlets will have three pronged receptacles and meet the requirements of EM 385-1-1, Chapter 11.</p> <p>1j. Periodic inspection of all pressurized cylinders by PDS crew. Proper storage of cylinders in accordance with SOPs and EM 385-1-1, Chapter 20.</p>	<p>M</p> <p>L</p> <p>L</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
<p>2. PDS Tent is operational and ready for use for the following:</p> <ul style="list-style-type: none"> a. Processing of Personnel b. Processing of RCW Material c. Processing of Equipment <p>3. Emergency Operations -</p> <ul style="list-style-type: none"> a. Injured Down Range Member b. Rescue Crew sent to assist Team Down Range 	<p>1k. Vehicle and heavy equipment traffic in area.</p> <p>2. The Hazards itemized in Hazard 1 are applicable to Hazard 2.</p> <p>2a. Contact with chemical agent or other hazardous chemicals</p> <p>2b. Pressurized cylinders – sudden release of contents</p> <p>3. The Hazards itemized in Hazard 1 and 2 are applicable to Hazard 3.</p>	<p>1k. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses, and a high visibility safety vest when working around heavy equipment. Establish arm and hand signals or radio communication with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc.</p> <p>2. The Controls itemized in Control 1 are applicable to Control 2.</p> <p>2a. Inherent with PDS operations, both the PDS Tent and Monitoring Tent are needed to be maintained at temperatures greater than 68°F. Electrical floor heating units are prohibited in the PDS or Monitoring Tent. Portable propane heaters can be used, but these cause “off gassing” of carbon monoxide (CO²). A CO² Meter capable of reading levels from 0 – 25ppm is required and will be periodically observed for current levels. If the level is reached or exceeded; the heating unit will be turned off; the PDS and Monitoring Tent will be opened and allow fresh air to ventilate through, until level is below 25ppm. PDS personnel will process, clean and “double bag” all equipment and any RCW Material, prior to turning these items over for continued evaluation. At no time, will PDS personnel open and remove an item that was originally processed as “bagged”. Should a bag appear to be opened, cut or torn, the PDS Supervisor will notify UXOSO for instructions.</p> <p>2b. The cylinders in question will be the propane heaters, if used and the SCBA tanks used by the field team and possibly the PDS personnel. The SCBAs will be handled IAW the WP and SOP. The propane heater will be checked once an hour to ensue it is operating properly and there are no obstructions in front of the jet.</p> <p>3. The Controls itemized in Control 1 and 2 are also applicable to Control 3.</p>	<p>L</p> <p>L</p> <p>L</p>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. Tent or Structure for PDS 2. Wooden Stakes/Plastic Pin Flags 3. Power and Hand Tools 4. Decontamination Equipment – <ol style="list-style-type: none"> a. Decontamination solution of 5% bleach b. Scrub Brushes c. 5-gal Decontamination Buckets d. Hand Sprayers e. Shuffle Pans f. 30-gal Trash bags g. Detergent (Soap) h. Water i. 6-mil Plastic bags and sheeting material j. RCWM repackaging k. Plastic bags (various sizes) 5. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 6. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 7. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project supplied or personal Cellular Phone 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. All personnel operating heavy equipment will provide proof of competency (documentation of training or experience) to the UXOSO prior to operating the equipment. 4. All personnel involved in this operation that are required to wear Self-Contained Breathing Apparatus (SCBA) or a full-face Air Purifying Respirator (APR) will be certified under 29 CFR1910.134 5. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	<ol style="list-style-type: none"> 1. <u>Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer’s instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. 2. <u>Daily-</u> Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. UXOSO will update site’s MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew’s status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel’s cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations and relocate to re-establish communications link with the Field Office or UXOSO. 3. <u>Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. 4. <u>Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Only qualified personnel will be allowed to operate tent or structure for PDS, wooden stakes/plastic pin flags, and hand and power tools.

Training Acknowledgement:

Printed Name

Signature

Date

Activity Hazard Analysis (AHA)

Activity/Work Task: WALKING/WORKING IN RUGGED TERRAIN	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix	
Contract Number: W91ZLK-05-D-0016	Severity	Probability
Date Prepared: May 17, 2010		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Niall D. Henshaw	Catastrophic	E E H H M
Reviewed by (Name/Title): Tim Mustard, CIH	Critical	E H H M L
	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	RAC Chart
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	H = High Risk
		M = Moderate Risk
		L = Low Risk

Job Steps	Hazards	Controls	RAC
<p>Walking/hiking taking place in rugged terrain ranging from relatively flat land to steep, rugged topography and from wetland to desert conditions.</p> <p>Also includes hiking in streambeds</p>	<p>1. Slips, trips and falls</p>	<p><u>Situational awareness</u> is a control which will be critical in all aspects of this AHA. Situational awareness consists of LOCATION, LOCATION, AND LOCATION.</p> <p>Can you answer the following four questions:</p> <ol style="list-style-type: none"> 1) Where am I and where is my buddy? 2) What things can hurt me? 3) How do I get out? 4) Where is the essential equipment (GPS, keys, phone, emergency contact numbers etc.)? <p>1a. Prior to activity, ensure that the footwear has adequate non-slip soles and ankle-support.</p> <p>1b. Perform warm-up exercises before undertaking the activity. This will keep the muscles loose and ready for unforeseen movement.</p> <p>1c. Show up fit, alert, and ready to work. Part of this site activity involves strenuous hiking in difficult terrain.</p>	M

Job Steps	Hazards	Controls	RAC
	<p>2. Falling down and landing on ground.</p> <p>3. Side-hilling</p> <p>4. Falling Rocks</p> <p>5. Walking/hiking in uneven areas</p>	<p>1d. Ensure that you are thoroughly inspecting the ground in front of you for possible wet or muddy spots, holes, vines, rocks etc. that could cause you to slip, trip or fall. Carefully pick the spots where you intend to step.</p> <p>1e. Walk carefully in uneven terrain, especially when the ground surface may be obscured by vegetation or during twilight or evening.</p> <p>2a. If you do slip and commence to fall, attempt to fall on your side uphill and not on your outstretched arms. This will prevent injury to your hands, wrists, and arms.</p> <p>2b. When walking across a side-hill, be careful not to walk directly above or below another person. Watch for loose and falling rocks.</p> <p>2c. Be especially careful of foot placement while side hilling. Avoid twisting an ankle/knee.</p> <p>3a. Always treat hilly and mountainous topography with caution. Be particularly alert for falling rocks, rock slides, or rock falls when working/walking in proximity to cliff faces or steep rock outcrops. If working in an area (i.e. a cliff) where rocks could potentially fall on your head, be very aware of your surroundings.</p> <p>4a. Carefully pick the spots where you intend to step. Be careful of dislodging rocks onto other workers below or following you. If rocks are falling/rolling down the hill, yell "ROCK" or similar warning to workers below you.</p> <p>5a. When hiking in wet areas or in proximity to water, beware of stepping onto slippery rocks, slopes, or ground. Be cautious of stepping onto unsupported vegetation, soft mud, or quicksand. Use a pole or branch to probe the path surface ahead of you when crossing wetland areas. Wet rocks can be slick. Take extra care when crossing these areas. Use a pole or branch to probe the path surface ahead</p>	<p></p> <p>M</p> <p>L</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
		<p>of you, if visibility is impaired.</p> <p>5b. In descent you should find it easier if you keep your knees slightly bent and your body weight back so that you are in a partial sitting position. Your centre of gravity will be lower and this will help you maintain good balance especially when combined with the use of long poles.</p> <p>6a. Each field team will have some means of communication with either the other teams or the base station (radio/cell phone) to use for emergency communication. Although it is not anticipated that team members will be outside of voice range from one another, they will maintain radio contact at all times.</p> <p>7a. Wear eye protection to prevent the branches from poking you in the face.</p> <p>7b. When moving through the brush/juniper trees, watch for branches.</p> <p>7c. Keep your "situational awareness" to assess if the trees/brush has the potential to come in contact with you. Use your hands and body to move the branches aside. If your partner is close to you and may be hit by the branches, warn them of the hazard.</p> <p>8a. Hazardous Plants PPE for avoidance of hazardous plants (specifically Poison Ivy/Oak and Sumac) will consist of long sleeved shirts and long pants, or coveralls; safety glasses; leather gloves; and head cover such as baseball cap or head scarf.</p> <p>8b. Closely look for snakes or insects before placing your hands on objects such as rock outcrops or trees or picking up objects from the ground.</p> <p>8c. If you encounter a snake, remain calm and back away slowly. Always give snakes plenty of room to escape from you. Never approach, tease, corner, or poke at any snake.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p>
	<p>6. Remote locations</p> <p>7. Poking face/eye with branches</p> <p>8. Biological Hazard (poisonous plants, ticks, bees, mosquitoes, snakes, spiders, etc.)</p>		

Job Steps	Hazards	Controls	RAC
	<p>9. Severe weather conditions</p> <p>10. Heat and Cold Stress</p>	<p>8d. PPE for avoidance of tick bites will consist of long sleeved shirts and long pants, or coveralls; leather gloves; and head cover such as baseball cap or head scarf. Team members will perform self-inspection for ticks when showering after work.</p> <p>If a tick is imbedded in the skin, tick removal will be performed with narrow headed tweezers available in each field kit. The tick will be grabbed where the mouthparts enter the skin and the tick gently pulled out and then crushed. The bite area and the hands will be cleansed with an antiseptic wipe found in the field kit or soap and water.</p> <p>9a. Dress appropriately for the weather conditions: as necessary wear a hat, long pants, boots or sturdy shoes, jacket, and skin and eye protection (i.e., sunscreen and sunglasses).</p> <p>9b. Layered clothing made of wool or synthetic (polyester, polar fleece, etc.) is most efficient in protecting you from the weather and can be removed or added as needed.</p> <p>9c. Other items that should at least be present in the vehicle include raingear, warm shirt or jacket, emergency food (granola bars or other non-perishable items), waterproof matches or cigarette lighter, pocket knife, flashlight, duct tape, emergency thermal blanket, and maps. These items should be carried with the field team if they are planning on hiking a long distance from the vehicle.</p> <p>9d. Whenever a lightning threat becomes apparent, move to a low spot and seek shelter immediately.</p> <p>9e. The team will carry First Aid Kit — for any small emergencies. It should also contain sunscreen and insect repellent.</p> <p>10a. As the summer approaches and the temperature rises heat stress will become critical. With dehydration, comes a decrease in the ability to think and concentrate. Staying hydrated will allow you to remain alert and less likely to lose concentration and slip/fall.</p>	<p>L</p> <p>M</p>

Job Steps	Hazards	Controls	RAC
	11. Strains and sprains	<p>10b. Drink plenty of fluids to maintain adequate levels of hydration.</p> <p>10c. During warm weather, ensure at least that the team will carry at least 1 gallon of drinking water per person.</p> <p>11a. Treatment of Sprains and Strains: First aid measures for a sprain or strain can best be remembered by the acronym RICE - Rest, Ice, Compression, and Elevation.</p> <p><i>Rest</i> the injured area. Try not to move or put pressure on the affected joint. A sling or splint may be recommended to immobilize the joint and allow damaged ligaments or muscles to heal.</p> <p><i>Ice</i> the affected area to reduce swelling. After 24 hours, either ice or heat may be applied to reduce pain.</p> <p><i>Compress</i> the joint by wrapping it in an Ace bandage to help reduce swelling and pain.</p> <p><i>Elevate</i> the joint to reduce swelling.</p>	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<p>Hand held magnetometer, DGM mapping, shovel, hand tools, PPE to include gloves, work boots, eye protection, hard hats and hearing protection as necessary.</p> <p>Depending on condition requirements also make sure everyone has an adequate supply of water and emergency food or snacks. There should be at least one small first aid kit/team. Other items may include sunscreen, insect repellent, maps, compass, GPS, survival gear (matches/lighter, knife, emergency blanket, raingear, etc.)</p>	<p>At least one member onsite will hold current certification in first aid and CPR. All Site personnel that may be exposed to contaminant-related health and safety hazards will be current in their OSHA HAZWOPER training (received 40-hr initial training and attended an 8-hr refresher training within past 12 months) and be enrolled in a medical monitoring program in accordance with 29 CFR 1910.120(f). These personnel will receive UXO awareness as a component of their site-specific training. Team members will also have Parsons Safety Training (ParsonsU), and 8-hr Supervisor's Training in accordance with 29 CFR Part 1910.120(e) for Supervisors, as applicable.</p>	<p>Workers will inspect PPE before each use in accordance with the manufacturer's instructions. If equipment fails to function properly during inspection or during use, equipment is to be turned in for repair/ replacement. Inspect contents of first aid kit.</p>

Training Requirements: Only qualified personnel will be allowed to operate hand held magnetometer, DGM mapping shovel, and hand tools.

Training Acknowledgement:

Printed Name	Signature	Date

Activity Hazard Analysis (AHA)

Activity/Work Task: SOIL HANDLING IN A CHEMICAL OR OTHER HAZARDOUS ENVIRONMENTS	Overall Risk Assessment Code (RAC) (Use highest code)	M				
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix					
Contract Number: W91ZLK-05-D-0016	Severity	Probability				
Date Prepared: 3 January 2013		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Michael E. Short/Technical &Ops. Dir	Catastrophic	E	E	H	H	M
Reviewed by (Name/Title): Tim Mustard, CIH	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk	
					H = High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				M = Moderate Risk	
					L = Low Risk	
Job Steps	Hazards	Controls				RAC
1. Establish location for desired work area to conduct Soil Handling in a Chemical Environment, to include:	1a. Slip, trip and fall.	1a. Worker awareness of potential slippery surfaces and tripping hazards plus inspection and policing of debris.				L
a. Establish Work Area Control Zones	1b. Biological hazards.	1b. See Biological Hazards AHA, which must be used in conjunction with this AHA if applicable.				L
b. Manual Excavation	1c. Endangered/threatened flora/fauna.	1c. Conduct reconnaissance IAW approved WP and avoid endangered and threatened species if at all possible.				L
c. Mechanical Excavation	1d. Cold/Heat Stress	1d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.				L
d. Ordnance Identification	1e. Contact with chemical agent or other hazardous chemicals	1e. Monitoring for CA and VOCs during this operation is required. The breathing zone will be continually monitored by the Photo Ionizing Detector (PID) and appropriate CA Air Monitoring devices (Refer to ECBC Plan contained in WP). Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being accomplished.				L
e. Soil Sampling						

Job Steps	Hazards	Controls	RAC
	<p>1f. MEC/UXO Hazards</p> <p>1g. Lifting hazards.</p> <p>1h. Hand and Power tool operation</p> <p>1i. Vehicle and heavy equipment traffic in area.</p> <p>1j. Pinch and cut hazard from handling scrap metal.</p> <p>1k. Unintentional Detonation</p>	<p>1f. Inspect the area for the presence of UXO using a magnetometer to assist in finding items in brush and dense vegetation. If an MEC item is encountered alert the rest of the team and conduct an inspection of the item IAW the approved WP, SOP and EM 385-1-97.</p> <p>1g. Ensure that you, and if there is another individual assisting you, both have solid footing, leather work gloves and use the proper lifting technique, bend at the knees keeping your back as straight as possible and lift with your knees, not your back. Ensure you have good visibility in the direction you are carrying an item. Do not attempt to carry anything by yourself in excess of 50 lbs. or any item that blocks your visibility or is cumbersome to carry alone.</p> <p>1h. When operating power tools they will be handled, operated and maintained IAW the manufactures instructions, the approved WP and any applicable SOPs. The power tool will be inspected prior to use to ensure that all of the hand and safety guards are in place and that the chain, if present, is properly tightened and that the tool is otherwise in good working order. Depending on the power tool PPE will vary and it too must be serviceable, operable and free of any defect.</p> <p>PPE will be worn IAW the approved WP and inspected by the user prior to donning. Hand and power tool use will be IAW EM 385-1-1, Chapter 13.</p> <p>1i. Be aware of any vehicles or heavy equipment in area and be certain to wear hard hat and high visibility safety vest when working around heavy equipment. Establish arm and hand signals or radio communication with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc.</p> <p>1j. Wear all required PPE, ensure that it is serviceable, and check hand placement to ensure there are no sharp surfaces.</p> <p>1k. Establish clear and defined work area zones, such as Minimum Safe Distance (MSD) between teams and non-essential personnel. All MEC/UXO work ceased when unauthorized personnel enter into the work area.</p>	<p>M</p> <p>L</p> <p>L</p> <p>L</p> <p>M</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
	<p>1l. Noise in excess of OSHA standards</p> <p>1m. Underground Utilities</p> <p>1n. Fire/Explosion</p> <p>1o. Confined Space – Cave In/Entrapment</p>	<p>1l. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The site safety officer will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.</p> <p>1m. The local utility locating hotline will be contacted to identify the locations of buried utilities before subsurface activities are allowed to commence.</p> <p>1n. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP, applicable SOPs and EM 385-1-1, Chapter 18. Proper fire extinguishers will be on site and serviceable. There will be no “Hot Fueling” authorized at any time.</p> <p>1o. Any excavation deeper than 4ft are classified as confined spaces (non-permit required). Component Soil Person (UXOSO) will inspect the excavation daily and periodically to ensure engineering controls are adequate and working. Engineering controls are Sloping, Benching and Shoring. No work will be allowed in an excavation that has standing water. The water will be removed and re-entry will only be allowed after the Component Person inspects the excavation site.</p> <p>Egress points must be placed no further than 25ft from any worker. If ladders are used, they must –</p> <ul style="list-style-type: none"> a. Extend from the floor surface of the excavation and extend a minimum of 3ft beyond surface level of the excavation b. Be clear of all equipment and engineering controls for workers to use c. Upon entry into the excavation, be OSHA rated and support the worker’s weight to include tools and equipment 	<p>L</p> <p>L</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
<p>2. Conduct Operations in a HTRW Environment -</p> <ul style="list-style-type: none"> a. Establish Work Area Control Zones b. Manual Excavation c. Mechanical Excavation d. Ordnance Identification e. Soil Sampling 	<p>2. The Hazards itemized in Hazard 1 are applicable to Hazard 2. In addition hazard 2b is added.</p> <p>2a. Contact with chemical agent or other hazardous chemicals.</p> <p>2p. Pressurized cylinders – sudden release of contents</p>	<p>2. The Controls itemized in Control 1 are applicable to Control 2.</p> <p>2a. Monitoring for VOCs and identified hazardous emissions during this operation is required. The breathing zone will be continually monitored by the Photo Ionizing Detector (PID) and appropriate Air Monitoring devices, IAW WP and SSHP. Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being accomplished.</p> <p>2b. Periodic inspection of all pressurized cylinders by field crew. Proper storage of cylinders in accordance with SOPs</p>	<p>L</p> <p>L</p>
<p>3. Conduct Operations in Other Hazardous Environment -</p> <ul style="list-style-type: none"> a. Establish Work Area Control Zones b. Manual Excavation c. Mechanical Excavation d. Ordnance Identification e. Soil Sampling 	<p>3. The Hazards itemized in Hazard 2 are applicable to Hazard 3.</p>	<p>3. The Controls itemized in Control 2 are applicable to Control 3.</p>	<p>L</p>
<p>4. Backfill Operations –</p> <ul style="list-style-type: none"> a. Excavation Backfill b. Soil Compaction c. Re-Seeding 	<p>4. The Hazards itemized in Hazard 3 are applicable to Hazard 4. In addition hazard 4b is added.</p> <p>4a. Contact with chemical agent or other hazardous chemicals.</p> <p>4b. High Pressure</p>	<p>4. The Controls itemized in Control 3 are applicable to Control 4.</p> <p>4a. Hydro-seeding material can cause skin reactions. Crews will use appropriate PPE during operations.</p> <p>4b. Hydro-seeding equipment produces extreme pressure that can cause injuries. Protective safeguards will not be removed or altered.</p>	<p>L</p> <p>L</p>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. Hand and Power Tools 2. Appropriate PPE for selection operation, at minimum – <ol style="list-style-type: none"> a. Long Sleeve Shirt b. Long Legged Pants c. Sturdy Work Boots d. Leather Gloves e. Safety Glasses, when required f. Hard Hat, when required g. Safety Vest, when required h. Additional PPE to conduct other operations, as directed 3. Heavy Equipment, as needed or specified by WP or SSHP 4. Air Monitoring Equipment; Pumps; Stands 5. Sampling Equipment, at a minimum - <ol style="list-style-type: none"> a. Sampling Bowls and Spoons b. 6-mil plastic sheeting and bags c. Cleaning Solution, Water and Soap d. 5-gal Buckets e. Nitrile Gloves f. Supplied jars and shipping containers g. Miscellaneous sampling supplies 6. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 7. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 8. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project supplied or personal Cellular Phone 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. All personnel operating heavy equipment will provide proof of competency (documentation of training or experience) to the UXOSO prior to operating the equipment. 4. All personnel involved in this operation that are required to wear Self-Contained Breathing Apparatus (SCBA) or a full-face Air Purifying Respirator (APR) will be certified under 29 CFR1910.134 5. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. 6. Component Person (UXOSO) for Soils. <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	<ol style="list-style-type: none"> 1. <u>Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer’s instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. 2. <u>Daily-</u> Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. UXOSO will update site’s MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew’s status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel’s cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations and relocate to re-establish communications link with the Field Office or UXOSO. Component Soil Person (UXOSO) will inspect the excavation daily and periodically to ensure engineering controls are adequate and working. 3. <u>Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. 4. <u>Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Only qualified personnel will be allowed to operate hand and power tools, heavy equipment, air monitoring equipment, pumps, stand, sampling equipment, and site vehicles.

Training Acknowledgement:

Printed Name

Signature

Date

Activity Hazard Analysis (AHA)

Activity/Work Task: TRENCHING AND EXCAVATION	Overall Risk Assessment Code (RAC) (Use highest code)	L
Project Location: Yuma Proving Ground; Yuma, Arizona	Risk Assessment Code (RAC) Matrix	
Contract Number: W91ZLK-05-D-0016	Severity	Probability
Date Prepared: 8/7/12		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Nate Jones - Engineer	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Ed Staes, Project Manager	Marginal	H M M L L
	Negligible	M L L L L
<p>Notes: (Field Notes, Review Comments, etc.).</p> <p>To be reviewed prior to trenching and excavation activities. If excavation or trenching depths are to exceed 5 feet then an excavation/trenching plan needs to be prepared and approved prior to work commencing.</p> <p>This AHA does not replace the Specific Operating Manual for the equipment. The specific operating manuals are required to be reviewed prior to using the equipment in addition to this AHA.</p>		
<p>Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)</p>		
<p>"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</p>		RAC Chart
<p>"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p>		E = Extremely High Risk
<p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.</p>		H = High Risk
		M = Moderate Risk
		L = Low Risk

Job Steps	Hazards	Controls	RAC
1. Work Area Setup	1a. Tripping Hazards	1a. Worker awareness of potential uneven and slippery surfaces and tripping hazards.	L
	1b. Cold and Heat Stress Injuries	1b. Implement cold/heat stress control program.	L
	1c. Biological Hazards (ticks, mosquitoes, snakes, spiders, etc.)	1c. Personnel awareness of potential exposure to biological hazards. Wear appropriate clothing (hat, long-sleeve shirt, long pants, gloves, and boots) and insect repellants. Wear thick gloves when clearing plants or debris from work area.	L
	1d. Atmospheric Hazards	1d. Seek shelter in a building or vehicle upon the approach of a thunderstorm. Site activity shall be suspended after consultation with the SHSO until the storms have passed.	L
	1e. Operation of Motor Vehicle	1e. Drivers will have a valid driver's license and will wear a seat belt at all times.	L
	1f. Immobilized Vehicle	Drivers are prohibited from using any communication devices (e.g., cell phones) while operating any motor vehicles. Personnel will be aware of road conditions and hazard.	
	1g. Communication	Drivers will maintain the speed limit at all times. Personnel will practice defensive driving techniques.	
	1h. Noise		
	1i. Back Injury		
	1j. Utilities	1f. Personnel will drive only on established roads or on cleared roads to the sites.	L
	1k. Site Security	Vehicles will be parked facing away from the site, and keys will be left in or on the vehicle.	

Job Steps	Hazards	Controls	RAC
		<p>1g. Prior to commencement of daily activities, the method of communication will be discussed. Personnel that will be working at the site will have cellular phones or other means of communication with which to communicate with each other and with the field office. If needed hand signals will be confirmed.</p> <p>1h. Hearing protection will be worn in hazardous noise areas.</p> <p>1i. Personnel will utilize proper lifting techniques.</p> <p>1j. The site will be inspected for both overhead and buried utilities. All overhead lines shall be confirmed to be outside the swing radius of all equipment. To ensure All buried utilities are marked Blue Stakes (or similar call before you dig programs) needs to be notified at least 48 business hours before digging. In addition, all property owners should be notified and asked to mark any private utilities. Prior to performing any trenching or excavation at TEAD an excavation permit must be completed.</p> <p>1k. The excavation area will be adequately delineated to prevent unauthorized entrance.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p> <p>L</p>
2. Equipment inspection	<p>2a Tools and equipment</p> <p>2b Machinery</p>	<p>1a. All tools and equipment will be in good working order. No damaged equipment will be used until repaired or replaced.</p> <p>2b Heavy machinery used to trench and excavate will be inspected to ensure no fuel or hydraulic leaks are present. All components and controls will be tested for proper operations.</p>	<p>L</p> <p>L</p>
3. Equipment operation	<p>3a. Equipment negligence</p> <p>3b. Entering excavation</p>	<p>3a. Be alert when working around heavy equipment. Ground guide for the backing up of all vehicles. No heavy equipment will be operated without a ground guide. High visibility vests will be worn by personnel working around heavy equipment. All operators will be trained on the equipment being used.</p> <p>3b. No worker is to enter the excavation or trench while the excavation equipment is in operation. In additional the employees entering the excavation must confirm with the equipment operator that they understand you are entering the excavation.</p>	<p>L</p> <p>L</p>
4. Excavation Materials Management	<p>4a Contaminated materials</p> <p>4b Truck Traffic</p> <p>4c UXO Management</p>	<p>4a. Prior to beginning excavation confirm if the materials being removed are expected to be contaminated or clean. If the materials are suspected of potentially being contaminated confirm a screening plan is in place for the material and workers.</p> <p>4b Should live loading be used for removing and disposing of the materials ensure a loading area is properly established and the entry/exit configuration and process is understood by all drivers and the excavation operator. If needed establish hand signals for communication.</p> <p>4c. If the excavation is to occur within an area suspected of having the potential for</p>	<p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
		UXO then a trained UXO technician will be onsite and all excavation activities will be conducted according the safe UXO avoidance techniques.	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Common hand tools, vehicles (including haul trucks) and excavation equipment	All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additional training (such as first aid/CPR, bloodborne pathogens, respiratory protection, confined space entry, etc.) will be provided as applicable. Personnel will be trained in the safe use of required equipment and in the required PPE. All personnel operating heavy equipment will provide proof of competency with the equipment to the SHSO prior to operating the equipment. UXO Personnel must be certified as EOD-trained and must be approved for the project.	<p><u>1. Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement.</p> <p><u>2. Daily-</u> Housekeeping of assembly and work areas for debris and hazards. Periodic communication checks in with Project Engineer or Project Manager. At a minimum Field Staff will call when they arrive on site and when they leave, if they are working alone.</p> <p><u>3. Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment.</p> <p><u>4. Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.</p>

Training Requirements: Only qualified personnel will be allowed to operate vehicle, heavy equipment, all terrain vehicle (ATV), battery operated vehicles, and hand and power tools.

Training Acknowledgement:

Printed Name

Signature

Date

Job Steps	Hazards	Controls	RAC
		<p>given to Field Team Leaders. Daily protective controls will consist of:</p> <ul style="list-style-type: none"> • Field personnel need to be aware of their surroundings; • Use of PPE (gloves) when moving or disturbing piles of old wood/logs and large rocks; • Nest of bees, wasps or hornets need to be identified and avoided; and • Consider all snakes to be poisonous and avoided <p>(Note: Snakes tend to seek the shade generated by vehicles. Operators need to be aware and take extra precautions when approaching, reaching under and entering vehicles in areas prone with snakes.)</p>	
	1c. Endangered/threatened flora/fauna.	1c. Conduct reconnaissance IAW approved WP and avoid endangered and threatened species if at all possible.	L
	1d. Cold/Heat Stress	1d. All site activities must be conducted IAW the approved WP ensuring that appropriate clothing and PPE is worn to assist in the prevention of cold and heat stress injuries. Use the buddy system at all times and have sufficient and appropriate fluids available for the conditions.	L
	1e. Contact with chemical agent or other hazardous chemicals	1e. Vehicle operators need to be aware of potential exposure to corrosive and/or flammable liquids when conducting vehicle inspections. Operators will not eat, drink or smoke when performing these tasks. Any visible leaking will be immediately reported to their supervisor. Any spills of vehicle additives (anti-freeze, oil, hydraulic fluids, etc.) will be cleaned up immediately. Personnel will don the proper PPE commensurate with the chemical hazard encountered and the work is being accomplished.	L
	1f. Pinch and cut hazard from operating near sharp edges	1f. Operators will use good and serviceable leather gloves when performing service checks. Potential pinch and cut hazards when performing vehicle inspections inside the engine compartment; around doors; latches and lift gates.	L
	1g. Failure of Integral Safety Equipment	1g. During the inspection of the vehicle, if the operator notices that any of the vehicle's integral safety equipment (lights, brakes and turn-signals) is inoperable; that vehicle is no longer operational and cannot be used until repaired. Any issued safety equipment (first aid kit, fire extinguisher, etc) will be present and operational before the vehicle is operated. All vehicles, regardless of type, that are removed from the site for	L

Job Steps	Hazards	Controls	RAC
	<p>1h. Inclement Weather (Winds; Snow; Ice and Dust)</p> <p>1i. Fire/Explosion</p> <p>1j. Operator Distractions (Cell Phones; Eating; Smoking; Road Rage; Traffic Flow and Exhaustion)</p> <p>1k. Towing Hazards</p> <p>1l. MEC/UXO Hazards</p>	<p>repairs will be re-inspected and accepted by a Competent person or assigned operator, IAW EM385-1-1.</p> <p>1h. Vehicle operators need to be aware of special controls to safely operate vehicles in adverse weather conditions. This may include reducing speed to maintain control; braking distances and improve visibility.</p> <p>1i. Refueling of all vehicles, heavy equipment and other fueled equipment will be conducted in accordance with the SSHP, applicable SOPs and EM 385-1-1. Proper fire extinguishers will be on site and serviceable. There will be no "Hot Fueling" authorized at any time.</p> <p>1j. Vehicle Operators will follow and adhered to all local, state or foreign rules of Safe Vehicle Operations. Obeying posted speed limits; traffic signals and signs; weight and height restrictions for any over-weight or over-height vehicles, and common courtesy on the road. Defensive Driving habits are needed to be adhered to avoid the perils of Road Rage. Trip planning will assist the operator in avoiding construction and traffic hazards. Eating, smoking and use of cellular phones by the vehicle operator, while driving or during refueling operations is prohibited. Vehicle operators' conducting long distance hauls of over 8 hours in length; will take a mandatory Rest Halt at least once every four hours for 25 minutes. A Rest Halt can be taken by any vehicle operator should the need arise. During a Rest Halt, the vehicle operator will re-inspect the vehicle to ensure that all integral safety equipment is still operational. If any safety equipment fails, the operator will notify their supervisor; give their location and remain at that location, until repairs can be completed.</p> <p>1k. Use of "ground guides" will be used, when vehicle(s) are not equipped with an audible warning device and/or there is an obstructed view, or the vehicle is in a congested area. When transporting Heavy Equipment by trailers, the trailer will be "chocked" with approved devices when unhooked from the transporting vehicle. When attempting to hook onto the trailer, "ground guides" will not place any part of their body between the trailer and vehicle.</p> <p>1l. If an MEC item is encountered alert the rest of the team and conduct an inspection of the item IAW the approved WP, SOP and EM 385-1-97.</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p> <p>M</p>

Job Steps	Hazards	Controls	RAC
<p>2. General Operations of Heavy Equipment Vehicles, to include:</p> <p>a. Pre-operational, During and After Checks</p> <p>b. Normal Vehicle Operations</p> <p>c. Perform Operator Level Maintenance</p>	1m. Noise in excess of OSHA standards	1m. If the heavy equipment and/or power tools used are louder than 85dB (A) then the appropriate hearing attenuation PPE must be worn. This could be ear plugs, ear muffs or both depending on the noise level. The site safety officer will measure the noise level of the equipment and prescribe the applicable noise attenuation PPE to be worn.	L
	2. The Hazards itemized in Hazard 1 are applicable to Hazard 2. In addition hazard 2c; 2d and 2e are added.	2. The Controls itemized in Control 1 are also applicable to Control 2.	L
	2a. Contact with chemical agent or other hazardous chemicals	2a. Equipment Operators will need to place a supplemental drip pan or catch basin underneath the engine and transfer cases at the end of the day.	L
	2b. Failure of Integral Safety Equipment	2b. Heavy Equipment will be inspected and tested, in accordance with manufacturer's recommendations and certified in writing by a Competent person prior to being placed in use. If at any time, the equipment is removed and subsequently returned to the site, it will be re-inspected and recertified, IAW EM 385-1-1. Heavy Equipment will be equipped with Roll Over Protection System (ROPS).	L
	2c. Vehicle and heavy equipment traffic in area.	2c. Be aware of any vehicles or heavy equipment in area and be certain to wear a hard hat, safety glasses and a high visibility safety vest when working around heavy equipment. Establish arm and hand signals or radio communication with the equipment operator and be certain the equipment is grounded and shut off when within the arc of the boom, shovel, etc.	L
	2d. Underground Utilities	2d. The local utility locating hotline will be contacted to identify the locations of buried utilities before subsurface activities are allowed to commence.	L
	2e. Confined Space – Cave In/Entrapment	2e. Any excavation deeper than 4ft into which a piece of heavy equipment is to operate in is classified as a confined space (non-permit required). Competent Soil Person (UXOSO) will inspect the excavation daily and periodically to ensure engineering controls are adequate and working. Engineering controls for excavation vehicles are Sloping and, Benching. No work will be allowed in an excavation that has standing water. The water will be removed and re-entry will	L

Job Steps	Hazards	Controls	RAC
<p>3. General Operations of All Terrain (UTV) Vehicles, to include:</p> <ul style="list-style-type: none"> a. Pre-operational, During and After Checks b. Normal Vehicle Operations c. Perform Operator Level Maintenance <p>4. General Operations of Battery Operated Equipment (Segway), to include:</p> <ul style="list-style-type: none"> a. Pre-operational, During and After Checks 	<p>3. The Hazards itemized in Hazards 1 and 2 are applicable to Hazard 3 exception of 2e. In addition hazard 3b is added.</p> <p>3a. Failure of Integral Safety Equipment</p> <p>3b. UTV Hazards</p> <p>4. The Hazards itemized in Hazards 1, 2, and 3 are applicable to Hazard 4. In addition hazard 4b is added.</p> <p>4a. Segway Hazards</p>	<p>only be allowed after the Competent Person inspects the excavation site.</p> <p>Egress points are placed no further than 25ft from any workers. If ladders are used, they must –</p> <ul style="list-style-type: none"> a. Extend from the floor surface of the excavation and extend a minimum of 3ft beyond surface level of the excavation b. Be clear of all equipment and engineering controls for workers to use c. Upon entry into the excavation, be OSHA rated and support the worker's weight to include tools and equipment <p>3. The Controls itemized in Controls 1 and 2 are also applicable to Control 3.</p> <p>3a. All UTV Equipment will be inspected and tested, in accordance with manufacturer's recommendations and certified in writing by a Competent person prior to being placed in use, IAW EM 385-1-1, Chapter 18, Section I. UTVs will be used only off road, unless equipped for paved road use by manufacturer. UTVs will only be operated during daylight hours, unless equipped for night use by manufacturer. All UTVs will be equipped with mufflers, spark arrester, tail lights, stop lights and an audible signal device (horn). Only UTVs with four or more wheels may be used.</p> <p>3b. Passengers are prohibited on Class I ATVs (Class I ATV – single seat centered over the engine). Passengers are only allowed to occupy a seat, they may not sit in the bed of the UTV, in the trailer if so equipped or on any other part of the UTV. Maintain safe and appropriate separation distances between UTV, when traveling as a group. The manufacturer's recommended payload will not be exceeded at any time.</p> <p>4. The Controls itemized in Controls 1, 2, and 3 are applicable to Control 4.</p> <p>4a. This type of vehicle is not addressed in EM 385-1-1 and will have to be evaluated as an UTV for operations, inspection,</p>	<p>L</p> <p>L</p> <p>L</p> <p>L</p>

Job Steps	Hazards	Controls	RAC
b. Normal Vehicle Operations c. Perform Operator Level Maintenance	4b. Electrical Shock.	hazards and PPE. This equipment will only be operated during daylight hours. 4b. All Segway equipment is battery operated and requires to be re-charged at the end of each day's operation. Electrical hook-ups and installation, if required, will be conducted by a certified electrician, local electrical company or equipment company. In the event there is an electrical problem that cannot be corrected by merely un-plugging and re-plugging an item or replacing a blown fuse, then an electrician will be contacted to correct the problem. All electrical appliances, extension cords and equipment will have a third prong for proper grounding; all electrical outlets used on project sites will have three pronged receptacles and meet the requirements of EM 385-1-1, Chapter 11. GFCIs will be used for all outdoor connections.	<div style="border: 1px solid green; width: 15px; height: 15px; display: inline-block;"></div>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
<ol style="list-style-type: none"> 1. Hand and Power Tools 2. Appropriate PPE for selection operation, at minimum – <ol style="list-style-type: none"> a. Long Sleeve Shirt b. Long Legged Pants c. Sturdy Work Boots d. Leather Gloves e. Safety Glasses, when required f. Hard Hat, when required g. Safety Vest, when required h. Steel-toed boots, as directed i. Additional PPE to conduct other operations, as directed 3. Heavy Equipment, as needed or specified by WP or SSHP 4. Additional equipment to conduct other operations, that may include – <ol style="list-style-type: none"> a. Motorcycle Helmet, w/full face or goggles and gloves (UTV/Segway); 	<p><u>Qualified Personnel</u></p> <ol style="list-style-type: none"> 1. First Aid/CPR – UXOSO or site safety officer and one other individual. 2. Site Manager or SUXOS 3. All UTV operators will be licensed and trained by a recognized accredited ATV Training Course or in-house resource that is certified as a Trainer by an accredited organization. 4. All personnel operating any motorized equipment, to include UTVs or Segways will provide proof of competency (documentation of training or experience) to the UXOSO prior to operating the equipment. 5. UXO Personnel must be certified as an EOD-trained and must have the necessary experience for the position filled. 6. Competent Person (UXOSO) for Soils. 	<ol style="list-style-type: none"> 1. <u>Initial (Site Selection)</u> – General inspection of assembly area. Equipment will be inspected daily by operator prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. 2. <u>Daily</u>- Housekeeping of assembly and work areas for debris and hazards. UXOSO will perform audits and spot checks to verify compliance. UXOSO will update site's MSDS files on all items, supplies and material brought onto site. Periodic communication checks between Field Office or UXOSO and Field Crews, as deemed necessary, to ensure crew's status and relay emergency information. Field Office and UXOSO will maintain a telephonic roster of all site personnel's cellular phone numbers to ensure two forms of communications. In the event that a field crew fails to make a communications check, they will cease operations and relocate to re-establish communications link with the Field Office or UXOSO.

Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
5. Designated Site vehicles will be equipped with the minimum - <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing c. Serviceable First Aid Kit d. Serviceable A:BC rated 2.5lb or larger fire extinguisher 6. Other vehicles designated as personnel conveyance will be equipped with – <ol style="list-style-type: none"> a. Map and Directions to site medical facility b. Project Emergency Contact Telephone Listing 7. Two forms of Communications <ol style="list-style-type: none"> a. Project issued Radio b. Project or personal Cellular Phone 	<u>Training</u> <ol style="list-style-type: none"> 1. Site-specific WP, SOP and AHA 2. Personnel potentially exposed to contaminant-related health and safety hazards: OSHA 40 hour and applicable 8 hour 3. Equipment operation 4. Heat/Cold Stress 5. Biological hazards 6. Flora/Fauna endangered/threatened 7. Daily safety and operational briefing 8. Site visitor training 	Competent Soil Person (UXOSO) will inspect the excavation daily and periodically to ensure engineering controls are adequate and working. <u>3. Weekly</u> – First Aid/CPR kit(s), fire extinguisher(s), vehicles and equipment. <u>4. Final (Site Departure)</u> – Inspection of the entire area to ensure the site is left in the same or better than when we arrived.

Training Requirements: Only qualified personnel will be allowed to operate vehicle, heavy equipment, all terrain vehicle (ATV), battery operated vehicles, and hand and power tools.

Training Acknowledgement:

Printed Name	Signature	Date

ATTACHMENT B

PROJECT FORMS



PARSONS

Safety Meeting Sign-in Sheet

SAFETY MEETING PRESENTER: _____ DATE: _____

Current Weather Conditions:

Temperature (°F) = _____ Wind Direction = _____ Wind Speed = _____

Clear - Sunny – Cloudy – Rain - Snow Forecast = _____

Current Site Conditions (circle as appropriate):

Dry - Wet - Muddy - Frozen - Snow Covered - Other (describe) _____

1. Incidents or Injuries to report from Previous Day Activities: No Yes - explain below:

2. Safe and/or At-Risk Observations from Previous Day Activities:

3. Activities Taking Place Today:

4. Anticipated Hazards:



5. Engineering Controls-Work Practices-PPE to Protect Against Hazards:

6. Additional Safety Topic or Comments:



PARSONS

EMPLOYEE/SUBCONTRACTOR TRAINING ACKNOWLEDGEMENT

Name of Trainer: _____

Training Subject: _____

Training materials used: _____

Name of employee: _____

Date of hire/assignment: _____

I, _____, hereby certify that I have received training as described above in the following areas:

- Names of personnel responsible for site safety and health.
- Safety, health or other hazards at the site.
- The proper use of personal protective equipment.
- The potential occupational hazards in general in the work area and associated with my job assignment.
- Work practices by which a worker can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Acute effects of compounds on the site.
- Decontamination procedures.
- General safety requirements indicate the safe work conditions, safe work practices and personal protective equipment required for my work.
- The hazards of any chemicals to which I may be exposed and my right to information contained on material safety data sheets for those chemicals, and how to understand this information.
- My right to ask questions, or provide any information to the employer on safety either directly or anonymously without any fear of reprisal.
- Disciplinary procedures the employer will use to enforce compliance with general safety requirements.

I understand this training and agree to comply with general safety requirements for my work area.

Employee Signature

Date



PARSONS

SAFETY PROGRAM ACCEPTANCE FORM

Instructions: This form is to be completed by each person to work on the subject project work site and returned to the safety manager.

I have read and agree to abide by the contents of the Project Safety Program and applicable Site Specific Addenda for the following project:

YUMA PROVING GROUND

Signed

Date

RETURN TO:

Project Manager



PARSONS

FIELD EXPERIENCE DOCUMENTATION FORM

OSHA requires (29CFR1910.120(e)) that personnel involved in hazardous waste operations have 40-hours of initial training and a minimum of three days field experience working under the direction of a trained and experienced supervisor. This form serves to document the three days of additional field training/experience.

Employee Name: _____

Employee Number (or Social Security No.): _____

Project Name(s): _____

Project Number(s): _____

Dates of Field Training: _____

Summary of Activities Performed: _____

Levels of Respiratory Protection Used: _____

Comments: _____

Field Supervisor Signature: _____

Date: _____

Return this form to the Project Manager



PARSONS	Safety – The first thing you do!
----------------	---

Date: _____

Project/Task: _____

Your Name: _____

Before you begin any new task pause for 30 seconds and ask yourself the following questions. Take corrective actions as necessary prior to beginning work.

- Do I know exactly what I am doing?
- Have I reviewed the AHA for this task?
- Do I have all the right people involved?
- Is there any potential that I or my coworkers could get hurt?
- Are there any questions I should be asking fellow employees?
- Should I talk to my supervisor?
- Have I read the Work Plan and fully understand the procedures relating to this job?
- Am I using the proper tools?
- Do I have the proper PPE?
- Will I be working as safely as I know how?
- Do I see anything that just doesn't look quite right?
- Am I in a hurry? Would I be safer if I slowed down?

Each of these questions should be answered to your full satisfaction before you proceed with the work. Remember, no job is so important that you must jeopardize your safety.

Job Hazards? (List direct hazard of job duties)

1. Hazards: _____

Mitigation: _____

2. Hazards: _____

Mitigation: _____

3. Hazards: _____

Mitigation: _____

Work Area	Yes	No
Work Area Clean	<input type="checkbox"/>	<input type="checkbox"/>
Permits Attained	<input type="checkbox"/>	<input type="checkbox"/>
Standard PPE (Hard hat, vest, glasses, gloves, safety boots)	<input type="checkbox"/>	<input type="checkbox"/>
Additional PPE needed:		

Briefly review hazards and mitigations again after lunch.



PARSONS

“NEAR MISS” INCIDENT INVESTIGATION REPORT FORM

1) Project name and number: _____

2) “Near miss” location: _____

3) Incident date and time: _____

4) Personnel present (optional): _____

5) Describe incident: _____

6) What action or condition contributed to incident? _____

7) What action was taken or suggested to prevent reoccurrence? _____

8) Comments _____

9) Date of report _____ Prepared by _____

10) Office health and safety representative review:

Signature

Date



PARSONS

WEEKLY VEHICLE INSPECTION REPORT

LICENSE PLATE NUMBER: _____ VEHICLE MAKE AND TYPE: _____

RENTAL AGENCY: _____ THE WEEK BEGINNING MON. THE ____ OF ____ (Day) (Month) (Year)

Check the following and make sure that they are in proper working order

	Mon Time: _____	Tue Time: _____	Wed Time: _____	Thurs Time: _____	Fri Time: _____	Sat Time: _____	Sun Time: _____
General Vehicle Exterior							
General Vehicle Interior							
Headlights							
Taillights							
Turn Signals							
Break Lights							
Reverse Lights							
Interior Lights							
Brakes							
Horn							
Tires							
Windshield wipers							
Windshield washers							
Spare Tire							
Defrosters / Defoggers							
Battery terminals free of corrosion							
Cooling system hoses							
Belts							

KEY:



= OK



= Repair Needed



= Adjustment Made

Please note any problems, unusual conditions, repairs made or fluids added (except fuel):

Fluids: Please check the approximate level. Note: Check transmission fluid while vehicle is running!

Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register	Oil: <input type="checkbox"/> Full <input type="checkbox"/> 1 Quart low <input type="checkbox"/> Does not register
Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register	Coolant: <input type="checkbox"/> Full <input type="checkbox"/> Needs some <input type="checkbox"/> Does not register
Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register	Transmission: <input type="checkbox"/> Full <input type="checkbox"/> 1 Pint low <input type="checkbox"/> Does not register
Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F	Fuel: <input type="checkbox"/> E <input type="checkbox"/> 1/4 <input type="checkbox"/> 1/2 <input type="checkbox"/> F



PARSONS

ACCIDENT REPORT FORM (PAGE 1 OF 2)

Project: _____

EMPLOYER

1. Name: _____
2. Mail Address: _____
(No. and Street) (City or Town) (State and Zip)
3. Location (if different from mail address): _____

INJURED OR ILL EMPLOYEE

4. Name: _____ Social Security No.: _____
(first) (middle) (last)
5. Home Address: _____
(No. and Street) (City or Town) (State and Zip)
6. Age: _____ 7. Sex: male () female ()
8. Occupation: _____
(specific job title, **not** the specific activity employee was performing at time of injury)
9. Department: _____
(enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

10. THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

11. Place of accident or exposure: _____
(No. and Street) (City or Town) (State and Zip)
12. Was place of accident or exposure on employer's premises? Yes () No ()
13. What was the employee doing when injured? _____

(be specific – was employee using tools or equipment or handling material?)
14. How did the accident occur? _____
(describe fully the events that resulted in the injury or occupational illness. Tell what happened and how. Name objects and substances involved. Give details on all factors that led to accident. Use separate sheet for additional space). _____



PARSONS

ACCIDENT REPORT FORM (PAGE 2 OF 2)

15. Time of accident: _____

16. PARSONS WITNESS TO ACCIDENT

(Name) (Affiliation) (Phone No.)

(Name) (Affiliation) (Phone No.)

(Name) (Affiliation) (Phone No.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

17. Described injury or illness in detail; indicate part of body affected:

18. Name the object or substance that directly injured the employee. (For example, object that struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.).

19. Date of injury or initial diagnosis of occupational illness: _____
(date)

20. Did the accident result in employee fatality: Yes () No ()

21. Number of lost days: _____/restricted workdays _____ resulting from injury or illness?

OTHER

22. Name and address of physician: _____
(No. and Street) (City or Town) (State and Zip)

23. If hospitalized, name and address: _____
(No. and Street) (City or Town) (State and Zip)

24. Date of report: _____ Prepared by: _____

Official position: _____



PARSONS

NOTICE OF SUBCONTRACTOR VIOLATION OF SAFETY AND HEALTH REGULATIONS

Date: _____

Contractor Name: _____

Address: _____

Attention: _____

This letter officially notifies you that you have been found to be in violation of the following _____ Safety _____ Regulations:

on (date) _____, by _____.

- | | | | | | | | |
|------------------------------|-------|-----------------------------|-------|--------------------|-------|--|-------|
| Confined Space Entry | _____ | Lockout/Tagout | _____ | Hot Work | _____ | Personal Protective Equipment | _____ |
| Knowledge of the environment | _____ | Awareness of warning alarms | _____ | Evacuation routes | _____ | Back-up Alarms | _____ |
| Assembly locations | _____ | Fall Protection | _____ | Scaffolding | _____ | Environmental/Hazardous Material Storage | _____ |
| Trenching | _____ | Safe Work Practices | _____ | Security Practices | _____ | | |

Other: _____

This/These violations occurred at the following locations: _____

at the following times _____ and dates _____

The name of the employees was/were _____
 under the supervision of _____



PARSONS

NOTICE OF NONCOMPLIANCE WITH SAFETY AND HEALTH REGULATIONS

Under conditions of this enforcement procedure check all items that apply:

_____ 1. You are being notified of this violation and should take corrective action to prevent a reoccurrence. The corrective action shall be documented to the Parsons Construction Management representative immediately.

_____ 2. You must submit a plan for compliance to your Parsons Construction Management representative and the Construction Safety Manager within two days of receipt of this letter. The compliance plan must include the means or methods of compliance and the date that the requirements for compliance will be completed. Once compliance has been achieved, a follow up letter must be sent to the Parsons Construction Management representative and Construction Safety Manager. Failure to comply will result in disciplinary action against your Company.

_____ 3. You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and the Subcontractor responds formally that the procedure is understood and will comply.

_____ 4. You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and you **must** confirm formally the disciplinary action to be taken against the supervisor and employees.

_____ 5. All work on the site will stop until the Parsons Construction Management representative reviews all the facts with the Subcontractor and determines if the contract between the parties will be terminated.

Sincerely,

Parsons Representative

cc: Issuing Construction Manager Representative
Job File
GBU Safety Manager
Project Manager



PARSONS

PREMOBILIZATION SAFETY MEETING CHECKLIST

Date: _____ Project/Location: _____

Parsons Representative: _____

Subcontractor Representative: _____

The following project site safety, health and security requirements, procedures, and hazards have been identified and reviewed with the Subcontractor.

SSP/Emergency Planning/Response Plan		Demolition	
Competent/Qualified Person		Personal Protective Equipment	
Hazardous Materials/Waste		Cranes/Hoists/Annual Inspection Certificate	
Vehicle/Heavy Equipment		Overhead Power Lines	
Lockout/Tagout		Confined Spaces (Permit/Non-Permit)	
Electrical		Excavations/Trenching	
Fire Protection		Site Security/Visitor Control/Public Exposure	
Hot Work/Welding/Cutting		Process Safety Management (PSM)	
Fall Protection/Guardrails/Scaffolding/Ladders		Permits (Excavation/Scaffolding/Demolition/Traffic/Confined Space/etc.)	

Additional Project Concerns:



PARSONS

REMEDIATION SAFETY AND HEALTH INSPECTION CHECKLIST

Project: _____ Date: _____

Inspector: _____ Time: _____

Any items that have been found deficient must be corrected before work or use.

This checklist includes, but is not limited to, the following:

	Yes	No
Safe Access and Workspace		
Are safe access and adequate space for movement available for:		
Emergencies		
Work area		
Walkways and passageways		
Is overhead protection provided for all areas of exposure?		
Is lighting adequate?		
Planning Work for Safety		
Are employees provided with all required personal protective equipment (PPE)?		
Have other contractors and trades been coordinated with to prevent congestion and avoid hazards?		
Is air monitoring necessary to determine whether any chemical exposure exists?		
Utilities and Services Identification		
Has the Parsons Drilling Protocol been followed?		
Have all utilities been identified by signs/markout?		
Have high voltage lines been moved or de-energized, or barriers erected to prevent employee contact?		
Sanitary Facilities		
Is drinking water available?		
Are toilet facilities adequate?		
Work Procedures – Materials Handling		
Is material handling space adequate?		
Is material handling equipment adequate and proper?		
Is material handling equipment in good condition?		
Are workers properly trained to operate equipment and handle hazardous materials?		

Comments: _____



PARSONS

ACTIVITY HAZARDS ANALYSIS TRAINING RECORD

Job Number _____

AHA
Number _____

Job Location _____

Date: _____

Name of Trainer: _____

Subjects Covered: _____

Training Aids Used: _____

Attendees (Please sign name legibly):

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(Use additional sheets if necessary)



PARSONS

YUMA PROVING GROUND PROJECT

Procedures following a Parsons/Subcontractor Incident

Incident Definition: any unexpected or unplanned event that results in a personal injury requiring medical treatment beyond first aid, or property damage over \$1,000.

Near Miss Definition: near misses are incidents where no property was damaged and no personal injury sustained, but where damage and/or injury easily could have occurred.

At the Scene:

- Provide necessary medical attention to injured worker
- Properly secure the scene for an effective investigation

Within two (2) hours of an incident, notify the following:

- Project Manager, Program Safety Manager and Program Manager

If the incident results in a lost work day case or worse, the GBU President and GBU Safety Manager must be notified. 7/05



PARSONS

YUMA PROVING GROUND PROJECT

For all First Aid cases or Near Miss incidents, notify the Program Safety Manager and Program Manager within 24 hours.

By the Close of Business after an incident/near miss:

- Submit an Accident Report Form: <https://pwebtools.parsons.com/safety>
- Document everything in the field log book.

Contact Information: Office / Cell

- GBU President- Tom Roell: (626) 440-3255 / (626) 419-4885
- GBU Safety Manager- Jim Owen: (210) 805-2291 / (626) 201-9713
- Project Manager- Ed Staes: (801) 572-5999
- Program Safety Mgr- Tim Mustard: (303) 764-8810 / (303) 450-9778

PARSONS Emergency Contact Numbers: (24-hour)

- US/Canada: (866) 727-1411; International: (775) 326-4594 7/05

CONSTRUCTION SITE AUDIT GUIDE

PARSONS

Construction Safety Audit Guide

Office Location: _____
 Audit Conducted By: _____
 Audit Date: _____

B-28

YUMA PROVING GROUND SITE SAFETY AND HEALTH PLAN

Question	Satis- factory	Unsatis- factory	N/A	Comments
General Work Environment				
Are all worksites clean and orderly?				
Are work surfaces kept dry or appropriate means taken to ensure that the surfaces are slip-resistant?				
Are all spilled materials or liquids cleaned up immediately?				
Is combustible scrap, debris, and waste stored safely and removed from the worksite promptly?				
Is accumulated combustible dust routinely removed from elevated surfaces, including the overhead structure of buildings?				
Is combustible dust cleaned with a vacuum system to prevent the dust from going into suspension?				
Is metallic or conductive dust prevented from entering or accumulation on or around electrical enclosures or equipment?				
Are covered metal waste cans used for oily and paint-soaked waste?				
Are all oil- and gas-fired devices equipped with flame failure controls to prevent the flow of fuel if pilots or main burners are not working?				
Are paint spray booths, dip tanks, and similar equipment cleaned regularly?				
Are the minimum number of toilets and washing facilities provided?				
Are all toilets and washing facilities clean and sanitary?				
Are all work areas adequately illuminated?				
Are pits and floor openings covered or otherwise guarded?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Personal Protective Equipment and Clothing				
Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials?				
Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions or burns?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Personal Protective Equipment and Clothing				
Are employees who need corrective lenses (glasses or contacts lenses) in working environments with harmful exposures, required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures?				
Are protective gloves, aprons, shields, or other means provided against cuts, corrosive liquids, and chemicals?				
Are hard hats provided and worn where danger of falling objects exists?				
Are hard hats inspected periodically for damage to the shell and suspension system?				
Is appropriate foot protection required where there is the risk of foot injuries from hot, corrosive, poisonous substances, falling objects, and crushing or penetrating actions?				
Are approved respirators provided for regular or emergency use where needed?				
Is all protective equipment maintained in a sanitary condition and ready for use?				
Are eye wash facilities and a quick drench shower available within the work area where employees are exposed to injurious corrosive materials?				
Where special equipment is needed for electrical workers, is it available?				
When lunches are eaten on the premises, are they eaten in areas where there is no exposure to toxic materials or other health hazards?				
Is protection against the effects of occupational noise exposure provided when sound levels exceed those of the OSHA noise standard?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Walkways				
Are aisles and passageways kept clear?				
Are aisles and walkways marked as appropriate?				
Are wet surfaces covered with non-slip materials?				
Are holes in the floor, sidewalk, or other walking surface repaired properly, covered, or otherwise made safe?				
Is safe clearance provided for walking in aisles where motorized or mechanical handling equipment is operating?				
Are spilled materials cleaned up immediately?				
Are materials or equipment stored in so that PSP projectiles do not interfere with the walkway?				
Are changes of direction or elevations readily identifiable?				
Are aisles or walkways that pass near moving or operating machinery, welding operations or similar operations arranged so employees will not be subjected to potential hazards?				
Is adequate headroom provided for the entire length of any aisle or walkway?				
Are standard guardrails provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground?				
Are bridges provided over conveyors and similar hazards?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Floor and Wall Openings				
Are floor openings guarded by a cover, guardrail, or equivalent on all sides (except at entrance to stairways or ladders)?				
Are toeboards installed around the edges of a permanent floor opening (where persons may pass below the opening)?				
Are skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds?				
Is the glass in windows, doors, glass walls that are subject to human impact, of sufficient thickness and type for the condition of use?				
Are grates or similar type covers over floor openings such as floor drains, of such design that foot traffic or rolling equipment will not be affected by the grate spacing?				
Are unused portions of service pits and pits not actually in use either covered or protected by guardrails or equivalent?				
Are manhole covers, trench covers and similar covers, plus their supports, designed to carry a truck rear axle load of at least 20,000 pounds when located in roadways and subject to vehicle traffic?				
Are floor or wall openings in fire resistive construction provided with doors or covers compatible with the fire rating of the structure and provided with self-closing feature when appropriate?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Stairs and Stairways				
Are standard stair rails or handrails on all stairways having four or more risers?				
Are all stairways at least 22 inches wide?				
Do stairs have at least a 6-foot-6-inch overhead clearance?				
Do stairs angle no more than 50 and no less than 30 degrees?				
Are stairs of hollow-pan-type treads and landings filled to noising level with solid material?				
Are step risers on stairs uniform from top to bottom, with no riser spacing greater than 7½ inches?				
Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?				
Are stairway handrails located between 30 and 34 inches above the leading edge of stair treads?				
Do stairway handrails have at least 1½ inches of clearance between the handrails and the wall or surface they are mounted on?				
Are stairway handrails capable of withstanding a load of 200 pounds, applied in any direction?				
Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?				
Do stairway landings have a dimension measured in the direction of travel, at least equal to width of the stairway?				
Is the vertical distance between stairway landings limited to 12 feet or less?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Elevated Surfaces				
Are signs posted, when appropriate, showing the elevated surface load capacity?				
Are surfaces elevated more than 30 inches above the floor or ground provided with standard guardrails?				
Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toeboards?				
Is a permanent means of access and egress provided to elevated storage and work surfaces?				
Is required headroom provided where necessary?				
Is material on elevated surfaces piled, stacked, or racked in a manner to prevent it from tipping, falling, collapsing, rolling, or spreading?				
Are dock boards or bridge plates used when transferring materials between docks and trucks or rail cars?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Exiting or Egress				
Are all exits marked with an exit sign and illuminated by a reliable light source?				
Are the directions to exits, when not immediately apparent, marked with visible signs?				
Are doors, passageways or stairways, that are neither exits nor access to exits and which could be mistaken for exits, appropriately marked NOT AN EXIT, TO BASEMENT, STOREROOM, etc.?				
Are exit signs provided with the word EXIT in lettering at least 5 inches high and the stroke of the lettering at least ½ inch wide?				
Are exit doors side-hinged?				
Are all exits kept free of obstructions?				
Are at least two means of egress provided from elevated platforms, pits or rooms where the absence of a second exit would increase the risk of injury from hot, poisonous, corrosive, suffocating, flammable, or explosive substances?				
Are there sufficient exits to permit prompt escape in case of emergency?				
Are special precautions taken to protect employees during construction and repair operations?				
Is the number of exits from each floor of a building, and the number of exits from the building itself, appropriate for the building occupancy load?				
Are exit stairways which are required to be separated from other parts of a building enclosed by at least two-hour fire-resistive construction in buildings more than four stories in height, and not less than one-hour fire resistive construction elsewhere?				
When ramps are used as part of required exiting from a building, is the ramp slope limited to 1 foot vertical and 12 feet horizontal?				
Where exiting will be through frameless glass doors, glass exit doors, storm doors, and such are the doors fully tempered and meet the safety requirements for human impact?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Exit Doors				
Are doors that are required to serve as exits designed and constructed so that the way of exit travel is obvious and direct?				
Are windows that could be mistaken for exit doors, made inaccessible by means of barriers or railings?				
Can exit doors be opened from the direction of exit travel without the use of a key or any special knowledge or effort, when the building is occupied?				
Is a revolving, sliding, or overhead door prohibited from serving as a required exit door?				
Where panic hardware is installed on a required exit door, will it allow the door to open by applying a force of 15 pounds or less in the direction of the exit traffic?				
Are doors on cold storage rooms provided with an inside release mechanism that will release the latch and open the door even if it is padlocked or otherwise locked on the outside?				
Where exit doors open directly onto any street, alley or other area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?				
Are doors that swing in both directions and are located between rooms where there is frequent traffic, provided with viewing panels in each door?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Portable Ladders				
Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached, and moveable parts operating freely without binding or undue play?				
Are non-slip safety feet provided on each ladder?				
Are non-slip safety feet provided on each metal or rung ladder?				
Are ladder rungs and steps free of grease and oil?				
Is it prohibited to place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded?				
Is it prohibited to place ladders on boxes, barrels, or other unstable bases to obtain additional height?				
Are employees instructed to face the ladder when ascending or descending?				
Are employees prohibited from using ladders that are broken, missing steps, rungs, or cleats, broken side rails or other faulty equipment?				
Are employees instructed not to use the top 2 steps of ordinary stepladders as a step?				
When portable rung ladders are used to gain access to elevated platforms, roofs, and the like does the ladder always extend at least 3 feet above the elevated surface?				
Is it required that when portable rung or cleat type ladders are used the base is so placed that slipping will not occur, or it is lashed or otherwise held in place?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Portable Ladders				
Are portable metal ladders legibly marked with signs reading "CAUTION" "Do Not Use Around Electrical Equipment" or equivalent wording?				
Are employees prohibited from using ladders as guys, braces, skids, gin poles, or for other than their intended purposes?				
Are employees instructed to only adjust extension ladders while standing at a base (not while standing on the ladder or from a position above the ladder)?				
Are metal ladders inspected for damage?				
Are the rungs of ladders uniformly spaced at 12 inches, center to center?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Hand Tools and Equipment				
Are all tools and equipment (both company and employee-owned) used by employees at their workplace in good condition?				
Are hand tools such as chisels, punches, which develop mushroomed heads during use, reconditioned or replaced as necessary?				
Are broken or fractured handles on hammers, axes, and similar equipment replaced promptly?				
Are worn or bent wrenches replaced regularly?				
Are appropriate handles used on files and similar tools?				
Are employees made aware of the hazards caused by faulty or improperly used hand tools?				
Are appropriate safety glasses, face shields, and similar equipment used while using hand tools or equipment that might produce flying materials or be subject to breakage?				
Are jacks checked periodically to ensure that they are in good operating condition?				
Are tool handles wedged tightly in the head of all tools?				
Are tool cutting edges kept PSP so the tool will move smoothly without binding or skipping?				
Are tools stored in dry, secure location where they won't be tampered with?				
Is eye and face protection used when driving hardened or tempered spuds or nails?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Portable (Power Operated) Tools and Equipment				
Are grinders, saws, and similar equipment provided with appropriate safety guards?				
Are power tools used with the correct shield, guard or attachment recommended by the manufacturer?				
Are portable circular saws equipped with guards above and below the base shoe?				
Are circular saw guards checked to ensure that they are not wedged up, thus leaving the lower portion of the blade unguarded?				
Are rotating or moving parts of equipment guarded to prevent physical contact?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Portable (Power Operated) Tools and Equipment				
Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?				
Are effective guards in place over belts, pulleys, chains, and sprockets, on equipment such as concrete mixers, air compressors, and the like?				
Are portable fans provided with full guards or screens having openings 1/2 inch or less?				
Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?				
Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction?				
Are pneumatic and hydraulic hoses on power-operated tools checked regularly for deterioration or damage?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Abrasive Wheel Equipment Grinders				
Is the work rest used and kept adjusted to within 1/8 inch of the wheel?				
Is the adjustable tongue on the top side of the grinder used and kept adjusted to within 1/4 inch of the wheel?				
Do side guards cover the spindle, nut, and flange and 75 percent of the wheel diameter?				
Are bench and pedestal grinders permanently mounted?				
Are goggles or face shields always worn when grinding?				
Is the maximum RPM rating of each abrasive wheel compatible with the RPM rating of the grinder motor?				
Are fixed or permanently mounted grinders connected to their electrical supply system with metallic conduit or other permanent wiring method?				
Does each grinder have an individual on and off control switch?				
Is each electrically operated grinder effectively grounded?				
Before new abrasive wheels are mounted, are they visually inspected and ring tested?				
Are dust collectors and powered exhausts provided on grinders used in operations that produce large amounts of dust?				
Are splashguards mounted on grinders that use coolant, to prevent the coolant reaching employees?				
Is cleanliness maintained around grinder?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Powder Actuated Tools				
Are employees who operate powder-actuated tools trained in their use and carry a valid operator's card?				
Do the powder-actuated tools being used have written approval of the Division of Occupational Safety and Health?				
Is each powder-actuated tool stored in its own locked container when not being used?				
Is a sign at least 7" by 10" with bold type reading "POWDER-ACTUATED TOOL IN USE" conspicuously posted when the tool is being used?				
Are powder-actuated tools left unloaded until they are actually ready to be used?				
Are powder-actuated tools inspected for obstructions or defects each day before use?				
Do powder-actuated tools operators have and use appropriate personal protective equipment such as hard hats, safety goggles, safety shoes, and ear protectors?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Machine Guarding				
Is there a training program to instruct employees on safe methods of machine operation?				
Is there adequate supervision to ensure that employees are following safe machine operating procedures?				
Is there a regular program of safety inspection of machinery and equipment?				
Is all machinery and equipment kept clean and properly maintained?				
Is sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?				
Is equipment and machinery securely placed and anchored, when necessary to prevent tipping or other movement that could result in personal injury?				
Is there a power shut-off switch within reach of the operator's position at each machine?				
Can electric power to each machine be locked out for maintenance, repair, or security?				
Are the noncurrent-carrying metal parts of electrically operated machines bonded and grounded?				
Are foot-operated switches guarded or arranged to prevent accidental actuation by personnel or falling objects?				
Are manually operated valves and switches controlling the operation of equipment and machines clearly identified and readily accessible?				
Are all emergency stop buttons colored red?				
Are all pulleys and belts that are within 7 feet of the floor or working level properly guarded?				
Are all moving chains and gears properly guarded?				
Are splashguards mounted on machines that use coolant, to prevent the coolant from reaching employees?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Machine Guarding				
Are methods provided to protect the operator and other employees in the machine area from hazards created at the point of operation, ingoing nip points, rotating parts, flying chips, and sparks?				
Are machinery guards secure and so arranged that they do not offer a hazard in their use?				
If special hand tools are used for placing and removing material, do they protect the operator's hands?				
Are revolving drums, barrels, and containers required to be guarded by an enclosure that is interlocked with the drive mechanism, so that revolution cannot occur unless the guard enclosure is in place, so guarded?				
Do arbors and mandrels have firm and secure bearings and are they free from play?				
Are provisions made to prevent machines from automatically starting when power is restored after a power failure or shutdown?				
Are machines constructed so as to be free from excessive vibration when the largest size tool is mounted and run at full speed?				
If machinery is cleaned with compressed air, is air pressure controlled and personal protective equipment or other safeguards used to protect operators and other workers from eye and body injury?				
Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor?				
Are saws used for ripping, equipped with anti-kick back devices and spreaders?				
Are radial arm saws so arranged that the cutting head will gently return to the back of the table when released?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Lockout Blockout Procedures				
Is all machinery or equipment capable of movement, required to be de-energized or disengaged and blocked or locked out during cleaning, servicing, adjusting or setting up operations, whenever required?				
Is the locking-out of control circuits in lieu of locking-out main power disconnects prohibited?				
Are all equipment control valve handles provided with a means for locking-out?				
Does the lockout procedure require that stored energy (i.e. mechanical, hydraulic, air,) be released or blocked before equipment is locked-out for repairs?				
Are appropriate employees provided with individually keyed personal safety locks?				
Are employees required to keep personal control of their key(s) while they have safety locks in use?				
Is it required that employees check the safety of the lock out by attempting a start up after making sure no one is exposed?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Lockout Blockout Procedures				
Where the power disconnecting means for equipment does not also disconnect the electrical control circuit:				
Are the appropriate electrical enclosures identified?				
Is a mean provide to ensure that the control circuit can also be disconnected and locked out?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Welding, Cutting, and Brazing				
Are only authorized and trained personnel permitted to use welding, cutting, or brazing equipment?				
Do all operators have a copy of the appropriate operating instructions and are they directed to follow them?				
Are compressed gas cylinders regularly examined for obvious signs of defects, deep rusting, or leakage?				
Is care used in handling and storage of cylinders, safety valves, relief valves, and the like, to prevent damage?				
Are precautions taken to prevent the mixture of air or oxygen with flammable gases, except at a burner or in a standard torch?				
Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used?				
Are cylinders kept away from sources of heat?				
Is it prohibited to use cylinders as rollers or supports?				
Are empty cylinders appropriately marked their valves closed and valve-protection caps on?				
Are signs reading: DANGER NO-SMOKING, MATCHES, OR OPEN LIGHTS, or the equivalent posted?				
Are cylinders, cylinder valves, couplings, regulators, hoses, and apparatus kept free of oily or greasy substances?				
Is care taken not to drop or strike cylinders?				
Unless secured on special trucks, are regulators removed and valve-protection caps put in place before moving cylinders?				
Do cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on stem valves when in service?				
Are liquefied gases stored and shipped valve-end up with valve covers in place?				
Are employees instructed to never crack a fuel-gas cylinder valve near sources of ignition?				
Before a regulator is removed, is the valve closed and gas released form the regulator?				
Is red used to identify the acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Welding, Cutting, and Brazing				
Are pressure-reducing regulators used only for the gas and pressures for which they are intended?				
Is open circuit (No Load) voltage of arc welding and cutting machines as low as possible and not in excess of the recommended limits?				
Under wet conditions, are automatic controls for reducing no-load voltage used?				
Is grounding of the machine frame and safety ground connections of portable machines checked periodically?				
Are electrodes removed from the holders when not in use?				
Is it required that electric power to the welder be shut off when no one is in attendance?				
Is suitable fire extinguishing equipment available for immediate use?				
Is the welder forbidden to coil or loop welding electrode cable around his body?				
Are wet machines thoroughly dried and tested before being used?				
Are work and electrode lead cables frequently inspected for wear and damage, and replaced when needed?				
Do means for connecting cables' lengths have adequate insulation?				
When the object to be welded cannot be moved and fire hazards cannot be removed, are shields used to confine heat, sparks, and slag?				
Are firewatchers assigned when welding or cutting is performed, in locations where a serious fire might develop?				
Are combustible floors kept wet, covered by damp sand, or protected by fire-resistant shields?				
When floors are wet down, are personnel protected from possible electrical shock?				
When welding is done on metal walls, are precautions taken to protect combustibles on the other side?				
Before hot work is begun, are used drums, barrels, tanks, and other containers so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors?				
Is it required that eye protection helmets, hand shields and goggles meet appropriate standards?				
Are employees exposed to the hazards created by welding, cutting, or bracing operations protected with personal protective equipment and clothing?				
Is a check made for adequate ventilation in and where welding or cutting is performed?				
When working in confined places are environmental monitoring tests taken and means provided for quick removal of welders in case of an emergency?				
Question	Satisfactory	Unsatisfactory	N/A	Comments
Compressors and Compressed Air				
Are compressors equipped with pressure relief valves, and pressure gauges?				
Are compressor air intakes installed and equipped to ensure that only clean uncontaminated air enters the compressor?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Compressors and Compressed Air				
Are air filters installed on the compressor intake?				
Are compressors operated and lubricated in accordance with the manufacturer's recommendations?				
Are safety devices on compressed air systems checked frequently?				
Before any repair work is done on the pressure system of a compressor, is the pressure bled off and the system locked-out?				
Are signs posted to warn of the automatic starting feature of the compressors?				
Is the belt drive system totally enclosed to provide protection for the front, back, top, and sides?				
Is it strictly prohibited to direct compressed air towards a person?				
Are employees prohibited from using highly compressed air for cleaning purposes?				
If compressed air is used for cleaning off clothing, is the pressure reduced to less than 10 psi?				
When using compressed air for cleaning, do employees use personal protective equipment?				
Are safety chains or other suitable locking devices used at couplings of high pressure hose lines where a connection failure would create a hazard?				
Before compressed air is used to empty containers of liquid, is the safe working pressure of the container checked?				
When compressed air is used with abrasive blast cleaning equipment, is the operating valve a type that must be held open manually?				
When compressed air is used to inflate auto tires, is a clip-on chuck and an inline regulator preset to 40 psi required?				
Is it prohibited to use compressed air to clean up or move combustible dust if such action could cause the dust to be suspended in the air and cause a fire or explosion hazard?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Compressed Air Receivers				
Is every receiver equipped with a pressure gauge and with one or more automatic, spring-loaded safety valves?				
Is the total relieving capacity of the safety valve capable of preventing pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent?				
Is every air receiver provided with a drainpipe and valve at the lowest point for the removal of accumulated oil and water?				
Are compressed air receivers periodically drained of moisture and oil?				
Are all safety valves tested frequently and at regular intervals to determine whether they are in good operating condition?				
Is there a current operating permit issued by the Division of Occupational Safety and Health?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Compressed Air Receivers				
Is the inlet of air receivers and piping systems kept free of accumulated oil and carbonaceous materials?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Compressed Gas and Cylinders				
Are cylinders with a water weight capacity over 30 pounds equipped with means for connecting a valve protector device, or with a collar or recess to protect the valve?				
Are cylinders legibly marked to clearly identify the gas contained?				
Are compressed gas cylinders stored in areas, which are protected from external heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines?				
Are cylinders located or stored in areas where they will not be damaged by passing or falling objects, or subject to tampering by unauthorized persons?				
Are cylinders stored or transported in a manner to prevent them creating a hazard by tipping, falling or rolling?				
Are cylinders containing liquefied fuel gas, stored or transported in a position so that the safety relief device is always in direct contact with the vapor space in the cylinder?				
Are valve protectors always placed on cylinders when the cylinders are not in use or connected for use?				
Are all valves closed off before a cylinder is moved, when the cylinder is empty, and at the completion of each job?				
Are low pressure fuel-gas cylinders checked periodically for corrosion, general distortion, cracks, or any other defect that might indicate a weakness or render it unfit for service?				
Does the periodic check of low pressure fuel-gas cylinders include a close inspection of the cylinders' bottom?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Hoist and Auxiliary Equipment				
Is each overhead electric hoist equipped with a limit device to stop the hook travel at its highest and lowest point of safe travel?				
Will each hoist automatically stop and hold any load up to 125 percent of its rated load, if its actuating force is removed?				
Is the rated load of each hoist legibly marked and visible to the operator?				
Are stops provided at the safe limits of travel for trolley hoist?				
Are the controls of hoists plainly marked to indicate the direction of travel or motion?				
Is each cage-controlled hoist equipped with an effective warning device?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Hoist and Auxiliary Equipment				
Are close-fitting guards or other suitable devices installed on hoist to ensure that hoist ropes will be maintained in the sheave grooves?				
Are all hoist chains or ropes of sufficient length to handle the full range of movement for the application while still maintaining two full wraps on the drum at all times?				
Are nip points or contact points between hoist ropes and sheaves which are permanently located within 7 feet of the floor, ground or working platform, guarded?				
Is it prohibited to use chains or rope slings that are kinked or twisted?				
Is it prohibited to use the hoist rope or chain wrapped around the load as a substitute, for a sling?				
Is the operator instructed to avoid carrying loads over people?				
Are only employees who have been trained in the proper use of hoists allowed to operate them?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Industrial Trucks – Forklifts				
Are only trained personnel allowed to operate industrial trucks?				
Is substantial overhead protective equipment provided on high lift rider equipment?				
Are the required lift truck operating rules posted and enforced?				
Is directional lighting provided on each industrial truck that operates in an area with less than 2 foot candles per square foot of general lighting?				
Does each industrial truck have a warning horn, whistle, gong or other device which can be clearly heard above the normal noise in the areas where operated?				
Are the brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop when fully loaded?				
Will the industrial truck's parking brake effectively prevent the vehicle from moving when unattended?				
Are industrial trucks operating in areas where flammable gases or vapors, or combustible dust or ignitable fibers may be present in the atmosphere, approved for such locations?				
Are motorized hand and hand/rider trucks so designed that the brakes are applied, and power to the drive motor shuts off when the operator releases his/her grip on the device that controls the travel?				
Are industrial trucks with internal combustion engine operated in buildings or enclosed areas, carefully checked to ensure such operations do not cause harmful concentration of dangerous gases or fumes?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Spraying Operations				
Is adequate ventilation ensured before spray operations are started?				
Is mechanical ventilation provided when spraying operation is done in enclosed areas?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Spraying Operations				
When mechanical ventilation is provided during spraying operations, is it so arranged that it will not circulate the contaminated air?				
Is the spray area free of hot surfaces?				
Is the spray area at least 20 feet from flames, sparks, operating electrical motors, and other ignition sources?				
Are portable lamps used to illuminate spray areas suitable for use in a hazardous location?				
Is approved respiratory equipment provided and used when appropriate during spraying operations?				
Do solvents used for cleaning have a flash point of 100E F or more?				
Are fire control sprinkler heads kept clean?				
Are "NO SMOKING" signs posted in spray areas, paint rooms, paint booths, and paint storage areas?				
Is the spray area kept clean of combustible residue?				
Are spray booths constructed of metal, masonry, or other substantial noncombustible material?				
Are spray booth floors and baffles noncombustible and easily cleaned?				
Is infrared drying apparatus kept out of the spray area during spraying operations?				
Is the spray booth completely ventilated before using the drying apparatus?				
Is the electric drying apparatus properly grounded?				
Are lighting fixtures for spray booths located outside of the booth and the interior lighted through sealed clear panels?				
Are the electric motors for exhaust fans placed outside booths or ducts?				
Are belts and pulleys inside the booth fully enclosed?				
Do ducts have access doors to allow cleaning?				
Do all drying spaces have adequate ventilation?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Entering Confined Spaces				
Are confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry?				
Before entry, are all lines to a confined space, containing inert, toxic, flammable, or corrosive materials valved off and blanked or disconnected and separated?				
Is it required that all impellers, agitators, or other moving equipment inside confined spaces be locked-out if they present a hazard?				
Is either natural or mechanical ventilation provided prior to confined space entry?				
Before entry, are appropriate atmospheric tests performed to check for oxygen deficiency, toxic substance, and explosive concentrations in the confined space before entry?				
Is adequate illumination provided for the work to be performed in the confined space?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Entering Confined Spaces				
Is the atmosphere inside the confined space frequently tested or continuously monitor during conduct of work?				
Is there an assigned safety standby employee outside of the confined space, whose sole responsibility is to watch the work in progress, sound an alarm if necessary, and render assistance?				
Is the standby employee or other employees prohibited from entering the confined space without lifelines and respiratory equipment if there are any questions as to the cause of an emergency?				
In addition to the standby employee, is there at least one other trained rescuer in the vicinity?				
Are all rescuers appropriately trained and using approved, recently inspected equipment?				
Does all rescue equipment allow for lifting employees vertically from a top opening?				
Are there trained personnel in First Aid and CPR immediately available?				
Is there an effective communication system in place whenever respiratory equipment is used and the employee in the confined space is out of sight of the standby person?				
Is approved respiratory equipment required if the atmosphere inside the confined space cannot be made acceptable?				
Is all portable electrical equipment used inside confined spaces either grounded and insulated, or equipped with ground fault protection?				
Before gas welding or burning is started in a confined space, are hoses checked for leaks, compressed gas bottles forbidden inside of the confined space, torches lighted only outside of the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is to be taken into the confined space?				
If employees will be using oxygen-consuming equipment such as salamanders, torches, furnaces, in a confined space, is sufficient air provided to ensure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume?				
Whenever combustion-type equipment is used in confined space, are provisions made to ensure the exhaust gases are vented outside of the enclosure?				
Is each confined space checked for decaying vegetation or animal matter, which may produce methane, hydrogen sulfide, etc?				
Is the confined space checked for possible industrial waste, which could contain toxic properties?				
If the confined space is below the ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Environmental Controls				
Are all work areas properly illuminated?				
Are employees instructed in proper first aid and other emergency procedures?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Environmental Controls				
Are hazardous substances identified which may cause harm by inhalation, ingestion, skin absorption, or contact?				
Are employees aware of the hazards involved with the various chemicals they may be exposed to in their work environment, such as ammonia, chlorine, epoxies, and caustics?				
Is employee exposure to chemicals in the workplace kept within acceptable levels?				
Can a less harmful method or product be used?				
Is the work area's ventilation system appropriate for the work being performed?				
Are spray painting operations done in spray rooms or booths equipped with an appropriate exhaust system?				
Is employee exposure to welding fumes controlled by ventilation, use of respirators, exposure time, or other means?				
Are welders and other workers nearby provided with flash shields during welding operations?				
If forklifts and other vehicles are used in buildings or other enclosed areas, are the carbon monoxide levels kept below maximum acceptable concentration?				
Has there been a determination that noise levels in the facilities are within acceptable levels?				
Are steps being taken to use engineering controls to reduce excessive noise levels?				
Are proper precautions being taken when handling asbestos and other fibrous materials?				
Are caution labels and signs used to warn of asbestos?				
Are wet methods used, when practicable, to prevent the emission of airborne asbestos fibers, silica dust and similar hazardous materials?				
Is vacuuming with appropriate equipment used whenever possible rather than blowing or sweeping dust?				
Are grinders, saws, and other machines that produce respirable dusts vented to an industrial collector or central exhaust system?				
Are all local exhaust ventilation systems designed and operating properly such as airflow and volume necessary for the application? Are the ducts free of obstructions or the belts slipping?				
Is personal protective equipment provided, used, and maintained wherever required?				
Are there written standard operating procedures for the selection and use of respirators where needed?				
Are restrooms and washrooms kept clean and sanitary?				
Is all water provided for drinking, washing, and cooking potable?				
Are all outlets for water not suitable for drinking clearly identified?				
Are employees' physical capacities assessed before being assigned to jobs requiring heavy work?				
Are employees instructed in the proper manner of lifting heavy objects?				
Where heat is a problem, have all fixed work areas been provided with spot cooling or air conditioning?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Environmental Controls				
Are employees screened before assignment to areas of high heat to determine if their health condition might make them more susceptible to having an adverse reaction?				
Are employees working on streets and roadways where they are exposed to the hazards of traffic, required to wear bright colored (traffic orange) warning vest?				
Are exhaust stacks and air intakes located that contaminated air will not be re-circulated within a building or other enclosed area?				
Is equipment producing ultra-violet radiation properly shielded?				
Question	Satisfactory	Unsatisfactory	N/A	Comments
Flammable and Combustible Materials				
Are combustible scrap, debris, and waste materials (i.e. oily rags) stored in covered metal receptacles and removed from the worksite promptly?				
Is proper storage practiced to minimize the risk of fire including spontaneous combustion?				
Are approved containers and tanks used for the storage and handling of flammable and combustible liquids?				
Are all connections on drums and combustible liquid piping, vapor and liquid tight?				
Are all flammable liquids kept in closed containers when not in use (e.g. parts cleaning tanks, pans)?				
Are bulk drums of flammable liquids grounded and bonded to containers during dispensing?				
Do storage rooms for flammable and combustible liquids have explosion-proof lights?				
Do storage rooms for flammable and combustible liquids have mechanical or gravity ventilation?				
Is liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards?				
Are liquefied petroleum storage tanks guarded to prevent damage from vehicles?				
Are all solvent wastes and flammable liquids kept in fire-resistant covered containers until they are removed from the worksite?				
Is vacuuming used whenever possible rather than blowing or sweeping combustible dust?				
Are fire separators placed between containers of combustibles or flammables, when stacked one upon another, to ensure their support and stability?				
Are fuel gas cylinders and oxygen cylinders separated by distance, fire resistant barriers or other means while in storage?				
Are fire extinguishers selected and provided for the types of materials in areas where they are to be used?				
Class A: Ordinary combustible material fires.				
Class B: Flammable liquid, gas or grease fires.				
Class C: Energized-electrical equipment fires.				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Flammable and Combustible Materials				
If a Halon 1301 fire extinguisher is used, can employees evacuate within the specified time for that extinguisher?				
Are appropriate fire extinguishers mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials?				
Is the transfer/withdrawal of flammable or combustible liquids performed by trained personnel?				
Are fire extinguishers mounted so that employees do not have to travel more than 75 feet for a class "A" fire or 50 feet for a class "B" fire?				
Are employees trained in the use of fire extinguishers?				
Are extinguishers free from obstructions or blockage?				
Are all extinguishers serviced, maintained, and tagged at intervals not to exceed one year?				
Are all extinguishers fully charged and in their designated places?				
Is a record maintained of required monthly checks of extinguishers?				
Where sprinkler systems are permanently installed, are the nozzle heads directed or arranged so that water will not be sprayed into operating electrical switchboards and equipment?				
Are "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored?				
Are "NO SMOKING" signs posted on liquefied petroleum gas tanks?				
Are "NO SMOKING" rules enforced in areas involving storage and use of flammable materials?				
Are safety cans used for dispensing flammable or combustible liquids at a point of use?				
Are all spills of flammable or combustible liquids cleaned up promptly?				
Are storage tanks adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes?				
Are storage tanks equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure?				
Are spare portable or butane tanks, which are used by industrial trucks stored in accord with regulations?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Fire Protection				
Do you have a fire prevention plan?				
Does your plan describe the type of fire protection equipment and/or systems?				
Have you established practices and procedures to control potential fire hazards and ignition sources?				
Are employees aware of the fire hazards of the material and processes to which they are exposed?				
Is your local fire department well acquainted with your facilities, location, and specific hazards?				
If you have a fire alarm system, is it tested at least annually?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Fire Protection				
If you have a fire alarm system, is it certified as required?				
If you have interior standpipes and valves, are they inspected regularly?				
If you have outside private fire hydrants, are they flushed at least once a year and on a routine preventive maintenance schedule?				
Are fire doors and shutters in good operating condition?				
Are fire doors and shutters unobstructed and protected against obstructions, including their counterweights?				
Are fire door and shutter fusible links in place?				
Are automatic sprinkler system water control valves, air and water pressures checked weekly/periodically as required?				
Is maintenance of automatic sprinkler system assigned to responsible persons or to a sprinkler contractor?				
Are sprinkler heads protected by metal guards, when exposed to physical damage?				
Is proper clearance maintained below sprinkler heads?				
Are portable fire extinguishers provided in adequate number and type?				
Are fire extinguishers mounted in readily accessible locations?				
Are fire extinguishers recharged regularly and noted on the inspection tag?				
Are employees periodically instructed in the use of extinguishers and fire protection procedures?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Hazardous Chemical Exposures				
Are employees trained in the safe handling practices of hazardous chemicals such as acids, caustics, and the like?				
Are employees aware of the potential hazards involving various chemicals stored or used in the workplace--such as acids, bases, caustics, epoxies, and phenols?				
Is employee exposure to chemicals kept within acceptable levels?				
Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?				
Are all containers, such as vats and storage tanks labeled as to their contents--e.g. "CAUSTICS"?				
Are all employees required to use personal protective clothing and equipment when handling chemicals (i.e. gloves, eye protection, and respirators)?				
Are flammable or toxic chemicals kept in closed containers when not in use?				
Are chemical piping systems clearly marked as to their content?				
Where corrosive liquids are frequently handled in open containers or drawn from storage vessels or pipelines, are adequate means readily available for neutralizing or disposing of spills or overflows properly and safely?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Hazardous Chemical Exposures				
Have standard operating procedures been established and are they being followed when cleaning up chemical spills?				
Where needed for emergency use, are respirators stored in a convenient, clean, and sanitary location?				
Are respirators intended for emergency use adequate for the various uses for which they may be needed?				
Are employees prohibited from eating in areas where hazardous chemicals are present?				
Is personal protective equipment provided, used and maintained whenever necessary?				
Are there written standard operating procedures for the selection and use of respirators where needed?				
If you have a respirator protection program, are your employees instructed on the correct usage and limitations of the respirators?				
Are the respirators NIOSH approved for this particular application?				
Are they regularly inspected and cleaned sanitized and maintained?				
If hazardous substances are used in your processes, do you have a medical or biological monitoring system in operation?				
Are you familiar with the Threshold Limit Values or Permissible Exposure Limits of airborne contaminants and physical agents used in your workplace?				
Have control procedures been instituted for hazardous materials, where appropriate, such as respirators, ventilation systems, handling practices, and the like?				
Whenever possible, are hazardous substances handled in properly designed and exhausted booths or similar locations?				
Do you use general dilution or local exhaust ventilation systems to control dusts, vapors, gases, fumes, smoke, solvents or mists which may be generated in your workplace?				
Is ventilation equipment provided for removal of contaminants from such operations as production grinding, buffing, spray painting, and/or vapor decreasing, and is it operating properly?				
Do employees complain about dizziness, headaches, nausea, irritation, or other factors of discomfort when they use solvents or other chemicals?				
Is there a dermatitis problem--do employees complain about skin dryness, irritation, or sensitization?				
Have you considered the use of an industrial hygienist or environmental health specialist to evaluate your operation?				
If internal combustion engines are used, is carbon monoxide kept within acceptable levels?				
Is vacuuming used, rather than blowing or sweeping dusts whenever possible for clean up?				
Are materials that emit toxic asphyxiant, suffocating, or anesthetic fumes stored in remote or isolated locations when not in use?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Hazard Communication				
Is there a list of hazardous substances used in your workplace?				
Is there a written hazard communication program dealing with material safety data sheets (MSDS) labeling, and employee training?				
Who is responsible for MSDSs, container labeling, and employee training?				
Is each container for a hazardous substance (i.e. vats, bottles, storage tanks,) labeled with product identity and a hazard warning (communication of the specific health hazards and physical hazards)?				
Is there a Material Safety Data Sheet readily available for each hazardous substance used?				
How will you inform other employers whose employees share the same work area where the hazardous substances are used?				
Is there an employee training program for hazardous substances?				
Does this program include:				
An explanation of what an MSDS is and how to use and obtain one?				
MSDS contents for each hazardous substance or class of substances?				
Explanation of "Right to Know"?				
Identification of where employees can see the employer's written hazard communication program and where hazardous substances are present in their work area?				
The physical and health hazards of substances in the work area, how to detect their presence, and specific protective measures to be used?				
Details of the hazard communication program, including how to use the labeling system and MSDSs?				
How employees will be informed of hazards of non-routine tasks, and hazards of unlabeled pipes?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Electrical				
Are your workplace electricians familiar with the OSHA Electrical Safety Orders?				
Do you specify compliance with OSHA for all contract electrical work?				
Are all employees required to report as soon as practicable any obvious hazard to life or property observed in connection with electrical equipment or lines?				
Are employees instructed to make preliminary inspections and/or appropriate tests to determine what conditions exist before starting work on electrical equipment or lines?				
When electrical equipment or lines are to be serviced, maintained or adjusted, are necessary switches opened, locked-out and tagged whenever possible?				
Are portable electrical tools and equipment grounded or of the double insulated type?				
Are electrical appliances such as vacuum cleaners, polishers, and vending machines grounded?				
Do extension cords being used have a grounding conductor?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Electrical				
Are multiple plug adapters prohibited?				
Are ground-fault circuit interrupters installed on each temporary 15 or 20 ampere, 120 volt AC circuit at locations where construction, demolition, modifications, alterations, or excavations are being performed?				
Are all temporary circuits protected by suitable disconnecting switches or plug connectors at the junction with permanent wiring?				
Is exposed wiring and cords with frayed or deteriorated insulation repaired or replaced promptly?				
Are flexible cords and cables free of splices or taps?				
Are clamps or other securing means provided on flexible cords or cables at plugs, receptacles, tools, and equipment and is the cord jacket securely held in place?				
Are all cord, cable, and raceway connections intact and secure?				
In wet or damp locations, are electrical tools and equipment appropriate for the use or location or otherwise protected?				
Is the location of electrical power lines and cables (overhead, underground, under floor, other side of walls) determined before digging, drilling or similar work is begun?				
Are metal measuring tapes, ropes, hand lines or similar devices with metallic thread woven into the fabric prohibited where they could come in contact with energized parts of equipment or circuit conductors?				
Is the use of metal ladders prohibited in area where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures, or circuit conductors?				
Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?				
Are disconnecting means always opened before fuses are replaced?				
Do all interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment, and enclosures?				
Are all electrical raceways and enclosures securely fastened in place?				
Are all energized parts of electrical circuits and equipment guarded against accidental contact by approved cabinets or enclosures?				
Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance?				
Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?				
Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates?				
Are disconnecting switches for electrical motors in excess of two horsepower, capable of opening the circuit when the motor is in a stalled condition, without exploding? (Switches must be horsepower rated equal to or in excess of the motor hp rating).				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Electrical				
Is low voltage protection provided in the control device of motors driving machines or equipment, which could cause probably injury from inadvertent starting?				
Is each motor disconnecting switch or circuit breaker located within sight of the motor control device?				
Is each motor located within sight of its controller or the controller disconnecting means capable of being locked in the open position or is a separate disconnecting means installed in the circuit within sight of the motor?				
Is the controller for each motor in excess of two horsepower, rated in horsepower equal to or in excess of the rating of the motor it serves?				
Are employees who regularly work on or around energized electrical equipment or lines instructed in the cardiopulmonary resuscitation (CPR) methods?				
Are employees prohibited from working alone on energized lines or equipment over 600 volts?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Noise				
Are there areas in the workplace where continuous noise levels exceed 85 dBA? (To determine maximum allowable levels for intermittent or impact noise, see 29 CFR 1910 and 1926)				
Are noise levels being measured using a sound level meter or an octave band analyzer and records being kept?				
Have you tried isolating noisy machinery from the rest of your operation?				
Have engineering controls been used to reduce excessive noise levels?				
Where engineering controls are determined not feasible, are PPE or administrative controls (i.e. worker rotation) being used to minimize individual employee exposure to noise?				
Is there an ongoing preventive health program to educate employees in safe levels of noise and exposure, effects of noise on their health, and use of personal protection?				
Is the training repeated annually for employees exposed to continuous noise above 85 dBA?				
Have work areas where noise levels make voice communication between employees difficult been identified and posted?				
Is approved hearing protective equipment (noise attenuating devices) available to every employee working in areas where continuous noise levels exceed 85 dBA?				
If you use ear protectors, are employees properly fitted and instructed in their use and care?				
Are employees exposed to continuous noise above 85 dBA given periodic audiometric testing to ensure that you have an effective hearing protection system?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Fueling				
Is it prohibited to fuel an internal combustion engine with a flammable liquid while the engine is running?				
Are fueling operations done in such a manner that likelihood of spillage will be minimal?				
When spillage occurs during fueling operations, is the spilled fuel cleaned up completely, evaporated, or other measures taken to control vapors before restarting the engine?				
Are fuel tank caps replaced and secured before starting the engine?				
In fueling operations is there always metal contact between the container and fuel tank?				
Are fueling hoses of a type designed to handle the specific type of fuel?				
Is it prohibited to handle or transfer gasoline in open containers?				
Are open lights, open flames, or sparking or arcing equipment prohibited near fueling or transfer of fuel operations?				
Is smoking prohibited in the vicinity of fueling operations?				
Are fueling operations prohibited in building or other enclosed areas that are not specifically ventilated for this purpose?				
Where fueling or transfer of fuel is done through a gravity flow system, are the nozzles of the self-closing type?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Identification of Piping Systems				
When nonpotable water is piped through a facility, are outlets or taps posted to alert employees that it is unsafe and not to be used for drinking, washing, or other personal use?				
When hazardous substances are transported through above ground piping, is each pipeline identified at points where confusion could introduce hazards to employees?				
When pipelines are identified by color painting, are all visible parts of the line so identified?				
When pipelines are identified by color painted bands or tapes, are the bands or tapes located at reasonable intervals and at each outlet, valve or connection?				
When pipelines are identified by color, is the color code posted at all locations where confusion could introduce hazards to employees?				
When the contents of pipelines are identified by name or name abbreviation, is the information readily visible on the pipe near each valve or outlet?				
When pipelines carrying hazardous substances are identified by tags, are the tags constructed of durable materials, the message carried clearly and permanently distinguishable and are tags installed at each valve or outlet?				
When pipelines are heated by electricity, steam or other external source, are suitable warning signs or tags placed at unions, valves, or other serviceable parts of the system?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Material Handling				
Is there safe clearance for equipment through aisles and doorways?				
Are aisle ways designated, permanently marked, and kept clear to allow unhindered passage?				
Are motorized vehicles and mechanized equipment inspected daily or prior to use?				
Are vehicles shut off and brakes set prior to loading or unloading?				
Are containers or combustibles or flammables, when stacked while being moved, always separated by dunnage sufficient to provide stability?				
Are dock boards (bridge plates) used when loading or unloading operations are taking place between vehicles and docks?				
Are trucks and trailers secured from movement during loading and unloading operations?				
Are dock plates and loading ramps constructed and maintained with sufficient strength to support imposed loading?				
Are hand trucks maintained in safe operating condition?				
Are chutes equipped with sideboards of sufficient height to prevent the materials being handled from falling off?				
Are chutes and gravity roller sections firmly placed or secured to prevent displacement?				
At the delivery end of rollers or chutes, are provisions made to brake the movement of the handled materials.				
Are pallets usually inspected before being loaded or moved?				
Are hooks with safety latches or other arrangements used when hoisting materials so that slings or load attachments won't accidentally slip off the hoist hooks?				
Are securing chains, ropes, chockers, or slings adequate for the job to be performed?				
When hoisting material or equipment, are provisions made to ensure that no one will be passing under the suspended loads?				
Are Material Safety Data Sheets available to employees handling hazardous substances?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Transporting Employees and Materials				
Do employees who operate vehicles on public thoroughfares have valid operator's licenses?				
When seven or more employees are regularly transported in a van, bus or truck, is the operator's license appropriate for the class of vehicle being driven?				
Is each van, bus, or truck used regularly to transport employees, equipped with an adequate number of seats?				
When employees are transported by truck, are provision provided to prevent their falling from the vehicle?				
Are vehicles used to transport employees, equipped with lamps, brakes, horns, mirrors, windshields, and turn signals in good repair?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Transporting Employees and Materials				
Are transport vehicles provided with handrails, steps, stirrups, or similar devices, so placed and arranged that employees can safely mount or dismount?				
Are employee transport vehicles equipped at all times with at least two reflective type flares?				
Is a full charged fire extinguisher, in good condition, with at least 4 B:C rating maintained in each employee transport vehicle?				
When cutting tools with PSP edges are carried in passenger compartments of employee transport vehicles, are they placed in closed boxes or containers that are secured in place?				
Are employees prohibited from riding on top of any load, which can shift, topple, or otherwise become unstable?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Control of Harmful Substances by Ventilation				
Is the volume and velocity of air in each exhaust system sufficient to gather the dusts, fumes, mists, vapors or gases to be controlled, and to convey them to a suitable point of disposal?				
Are exhaust inlets, ducts and plenums designed, constructed, and supported to prevent collapse or failure of any part of the system?				
Are clean-out ports or doors provided at intervals not to exceed 12 feet in all horizontal runs of exhaust ducts?				
Where two or more different type of operations are being controlled through the same exhaust system, will the combination of substances being controlled, constitute a fire, explosion or chemical reaction hazard in the duct?				
Is adequate makeup air provided to areas where exhaust systems are operating?				
Is the intake for makeup air located so that only clean, fresh air, which is free of contaminants, will enter the work environment?				
Where two or more ventilation systems are serving a work area, is their operation such that one will not offset the functions of the other?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Sanitizing Equipment and Clothing				
Is personal protective clothing or equipment that employees are required to wear or use, of a type capable of being easily cleaned and disinfected?				
Are employees prohibited from interchanging personal protective clothing or equipment, unless it has been properly cleaned?				
Are machines and equipment, which processes, handle or apply materials that could be injurious to employees, cleaned and/or decontaminated before being overhauled or placed in storage?				
Are employees prohibited from smoking or eating in any area where contaminants are present that could be injurious if ingested?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Sanitizing Equipment and Clothing				
When employees are required to change from street clothing into protective clothing, is a clean change room with separate storage facility for street and protective clothing provided?				
Are employees required to shower and wash their hair as soon as possible after a known contact has occurred with a carcinogen?				
When equipment, materials, or other items are taken into or removed from a carcinogen regulated area, is it done in a manner that will not contaminate non-regulated areas or the external environment?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Tire Inflation				
Where tires are mounted and/or inflated on drop center wheels is a safe practice procedure posted and enforced?				
Where tires are mounted and/or inflated on wheels with split rims and/or retainer rings is a safe practice procedure posted and enforced?				
Does each tire inflation hose have a clip-on chuck with at least 24 inches of hose between the chuck and an in-line hand valve and gauge?				
Does the tire inflation control valve automatically shut off the airflow when the valve is released?				
Is a tire restraining device such as a cage, rack, or other effective means used while inflating tires mounted on split rims, or rims using retainer rings?				
Are employees strictly forbidden from taking a position directly over or in front of a tire while it's being inflated?				

Question	Satis- factory	Unsatis- factory	N/A	Comments
Emergency Action Plan				
Are you required to have an emergency action plan?				
Does the emergency action plan comply with OSHA and NGSS requirements?				
Have emergency escape procedures and routes been developed and communicated to all employees?				
Do employees, who remain to operate critical plant operations before they evacuate, know the proper procedures?				
Is the employee alarm system that provides a warning for emergency action recognizable and perceptible above ambient conditions?				
Are alarm systems properly maintained and tested regularly?				
Is the emergency action plan reviewed and revised periodically?				
Do employees know their responsibilities:				
For reporting emergencies?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Emergency Action Plan				
During an emergency?				
For conducting rescue and medical duties?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Infection Control				
Are employees potentially exposed to infectious agents in body fluids?				
Have occasions of potential occupational exposure been identified and documented?				
Has a training and information program been provided for employees exposed to or potentially exposed to blood and/or body fluids?				
Have infection control procedures been instituted where appropriate, such as ventilation, universal precautions, workplace practices, and personal protective equipment?				
Are employees aware of specific workplace practices to follow when appropriate? (Hand washing, handling PSP instruments, handling of laundry, disposal of contaminated materials, reusable equipment.)				
Is personal protective equipment provided to employees, and in all appropriate locations?				
Is the necessary equipment (i.e. mouthpieces, resuscitation bags, and other ventilation devices) provided for administering mouth-to-mouth resuscitation on potentially infected patients?				
Are facilities/equipment to comply with workplace practices available, such as hand-washing sinks, biohazard tags and labels, needle containers, detergents/disinfectants to clean up spills?				
Are all equipment and environmental and working surfaces cleaned and disinfected after contact with blood or potentially infectious materials?				
Is infectious waste placed in closable, leak proof containers, bags or puncture-resistant holders with proper labels?				
Has medical surveillance including HBV evaluation, antibody testing, and vaccination been made available to potentially exposed employees?				
Training on universal precautions?				
Training on personal protective equipment?				
Training on workplace practices, which should include blood drawing, room cleaning, laundry handling, clean up of blood spills?				
Training on needle stick exposure/management?				
Hepatitis B vaccinations?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Ergonomics				
Can the work be performed without eyestrain or glare to the employees?				
Does the task require prolonged raising of the arms?				
Do the neck and shoulders have to be stooped to view the task?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Ergonomics				
Are there pressure points on any parts of the body (wrists, forearms, back of thighs)?				
Can the work be done using the larger muscles of the body?				
Can the work be done without twisting or overly bending the lower back?				
Are there sufficient rest breaks, in addition to the regular rest breaks, to relieve stress from repetitive-motion tasks?				
Are tools, instruments and machinery shaped, positioned, and handled so that tasks can be performed comfortably?				
Are all pieces of furniture adjusted, positioned, and arranged to minimize strain on all parts of the body?				

Question	Satisfactory	Unsatisfactory	N/A	Comments
Crane Checklist				
Are the cranes visually inspected for defective components prior to the beginning of any work shift?				
Are all electrically operated cranes effectively grounded?				
Is a crane preventive maintenance program established?				
Is the load chart clearly visible to the operator?				
Are operating controls clearly identified?				
Is a fire extinguisher provided at the operator's station?				
Is the rated capacity visibly marked on each crane?				
Is an audible warning device mounted on each crane?				
Is sufficient illumination provided for the operator to perform the work safely?				
Are cranes of such design, that the boom could fall over backward, equipped with boomstops?				
Does each crane have a certificate indicating that required testing and examinations have been performed?				
Are crane inspection and maintenance records maintained and available for inspection?				

ATTACHMENT C

**UXO AVOIDANCE
AND
CONSTRUCTION SUPPORT SERVICES**



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1.0 INTRODUCTION

This plan is intended to provide requirements for qualified Unexploded Ordnance (UXO) Technicians to perform Munitions and Explosives of Concern (MEC) location and construction support activities at Yuma Proving Ground (USAGYPG).

1.1 GENERAL

Parsons recognizes that a safe working environment can only be achieved by close and complete cooperation between management and employees, which is achieved through direction and administration of the approved Work Plan (WP). Procedures are a corporate responsibility, while implementation in a safe and efficient manner is the direct responsibility of UXO safety personnel.

This plan describes safety and health procedures and the equipment required minimizing the potential for hazardous exposures during these activities. Adherence to the requirements of this WP will significantly reduce, but not eliminate, the potential for occupational injury and illness at each work area. Careful research will promote the discovery, evaluation, and protection against most possible hazards which may be encountered during completion of this work activity; however, should operational circumstances substantially differ from those described and/or anticipated, activities shall be temporarily terminated until the suspect hazards are evaluated and appropriate safety, health, and operational precautions are implemented.

This WP is designed to address only UXO-related tasks; as such, it will supplement any existing approved Work Plans.

1.2 PURPOSE

This WP establishes procedures, guidelines, and general safety precautions to be followed by UXO Technicians when providing UXO avoidance and construction support in areas with potential UXO contamination.



1.3 REFERENCES

- ER 385-1-92, USACE Safety and Occupational Health Guidance Manual for Hazardous, Toxic, and Radioactive Waste and Construction Activities;
- EP 75-1-2, Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities;
- 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response;
- EM 385-1-1, USACE Safety and Health Requirements;
- EP 1110-1-18, Ordnance and Explosive Response, Chapter 23, UXO Support for Construction Activities.
- EP 385-1-97, Explosive Safety and Health Requirements Manual.



2.0 SCOPE OF WORK

2.1 DESCRIPTION OF TASKS

UXO Technicians will perform the following services:

- Provide UXO Construction Support – Provide two UXO Technicians (one Tech III and one Tech II), when appropriate, to conduct anomaly avoidance and UXO construction support during intrusive activities. The type of support will be dependent on the specific task outlined in the WP.

UXO technicians will not handle any MEC material that is encountered. Upon discovery of any such items, the UXO team will stop activities, evacuate the area, and notify the Project Manager/Field Team Leader. The UXO Technicians will, if possible, identify, the item, and clearly mark it with red pin flags.



3.0 RESPONSIBILITY

3.1 RESPONSIBILITIES OF UXO PERSONNEL

The responsibilities of the project UXO personnel are as follows:

3.1.1 SUXOS

The SUXOS is the most senior UXO-qualified contractor representative on-site. This individual:

- Implements and executes the tasks outlined in the Scope of Work.
- Assures that personnel are briefed daily on safety and health requirements.
- Interfaces daily with the construction manager to ensure personnel understand the day's activities and potential concerns.
- Monitors aspects of UXO related activities and MEC characterization and investigation.
- Continually evaluates operations to determine the effectiveness and efficiency of established UXO procedures.
- Prepares daily field reports and logs of on-site UXO activities and recommends implementation of corrective actions as necessary.
- In the absence of the government Safety Specialist, is the final authority for on-site personnel regarding matters concerning UXO and has stop work authority for UXO related operational activities to correct safety deficiencies.
- Monitors ordnance related work performance of operational personnel to assure observance of UXO related safety and health rules.
- Maintains records on UXO related safety and health issues and assures reportable accident and incident reports are submitted in a timely manner.
- The UXOSO reports directly to the Parsons Operations Manager, regarding ordnance and personnel related issues, and indirectly to the Parsons site manager.

3.1.2 UXO Technician II

The UXO Tech II:

- Is responsible for safely conducting site inspection construction support activities as assigned by the UXOSO.
- Is responsible for the ordnance related safety of non-UXO personnel in his accompaniment.



- Can temporarily stop UXO related operational activities to correct safety deficiencies.

3.2 OPERATIONS

Prior to any operations commencing, the UXO team will conduct a site review, with the site manager, of the anticipated location of the ingress/egress area and the planned activities. This review will allow for discussion of the overall operation, visual observations, and any potential areas of concern.

3.2.1 Anomaly Avoidance

For operations that require anomaly avoidance services, the UXO Technicians will visually survey the surface areas within the area to be worked. In the event any MEC items are located, the team will relocate the item out of the work area if acceptable to move, mark the item and notify the site manager. If the item is unacceptable to move, it will be marked and an alternate route or work area will be selected. If the scope does not allow for an alternate site selection, the team will notify the PM for guidance.

Prior to intrusive activities, the UXO Technicians will conduct a subsurface check using a GA 52Cx Schonstedt magnetometer or equivalent. In the event a subsurface anomaly is detected, the excavation or drilling area will be relocated to an adjacent area free of subsurface anomalies.

For activities requiring drilling or borehole tasks, the UXO Technicians will conduct a surface magnetometer check to ensure that the drilling location is free of anomalies for the first two feet. Thereafter a down-hole magnetometer check will be conducted every two feet using a Schonstedt MG 230 down-hole magnetometer or equivalent. If a subsurface anomaly is detected at any time during the process, the drilling location will be relocated and the process repeated. .

3.2.2 Construction Support

For excavation tasks requiring construction support services, each area will be assessed for the likelihood and risk associated with the presence of MEC. A risk level will be assigned to the specific site, and the team staffed in accordance with EP 75-1-2 *Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities*, Chapter 6 *MEC Support During Construction Activities*.

Once excavation operations commence, the UXO Technicians will monitor both the excavation and earth moving activities. The UXO Techs will closely watch the excavation



and the removal and dumping of the soil in an effort to ensure that there are no UXO items either in the excavation or in the lifts.

The UXO Technicians will use a GA 52Cx Schonstedt or equivalent to assist in checking the excavated soil, which will be placed in the designated lay-down area and inspected prior to release for removal or other disposition. Due to the possible high density of magnetic debris, which would cause interference with the instrument, it may not be possible to use a magnetometer. In any event the UXO Techs will carefully use a rake or shovel to check the excavated material for the presence of UXO.

If the operation unearths, or otherwise encounters a MEC item, operations will cease, and the area encompassing the HFD for the item will be evacuated. Construction activities will be suspended until positive identification is made determining that the item is not hazardous or if found to be hazardous, appropriate notifications made, and final disposition of the item is completed. The UXO Team will mark the item with two crossed red pin flags placed directly adjacent to, but not touching the item. If the item is acceptable to move, it may be relocated in order for operations to continue as stated above.

3.2.3 Schonstedt Magnetic Locator

Schonstedt Heliflux GA 52Cx Magnetic Locators detect subsurface ferrous metal items. The technology is based upon fluxgate sensors organized in a gradiometer format. The Schonstedt locator is a hand-held unit that employs two (2) fluxgate magnetometers that are aligned and mounted a fixed distance apart to detect changes in the earth's ambient magnetic field caused by ferrous metal (the sensors are fixed and aligned to eliminate a response to the earth's ambient field). The Magnetic Locators respond with an audio output when either one of the two sensors is exposed to a disturbance of the earth's ambient field associated with a ferrous target and/or the presence of a permanent field associated with a ferrous target (in most cases, it will be a combination of both circumstances). The Schonstedt Magnetic Locators are highly portable magnetometers that can be used to quickly screen surface and near-surface areas for ferrous content.

3.2.4 Daily Operational Procedures

The protocols to be followed daily shall be as follows:

- The UXOSO will review existing site conditions and recommend any required safety and health modifications to this WP based on the same.
- Safety and monitoring equipment will be checked for proper function.
- The UXOSO in conjunction with the on-site safety officer will ensure that first aid and other emergency response equipment is complete and readily available.



- At the morning safety meeting, operational personnel will be briefed and updated on safety precautions, any change to the tasks and objectives of the WP, and anticipated weather conditions.
- The UXOSO will discuss the day's activities with the site manager to determine the areas to be worked, the number of personnel required, and the UXO construction support activities required.



4.0 QUALIFICATION REQUIREMENTS

4.1 TRAINING AND QUALIFICATIONS

UXO personnel will meet the training requirements as outlined in Section 7.5 *Regulatory Training Program* of this SSHP. In addition, UXO personnel will be trained in first aid/CPR, use of personal protective equipment (PPE), and other subjects as applicable. The UXO Safety Officer/Team Leader will have the OSHA 30-hr Construction Safety Training or equivalent. UXO personnel will also meet the training requirements and qualifications of Department of Defense Explosives Safety Board (DDESB), Technical Paper (TP) 18 – *Minimum Qualifications for UXO Technicians and UXO-Qualified Personnel*. Formal UXO training will be verified by inclusion of the individual on the UXO Data Base Roster maintained by CEHNC.

In addition to the formal HAZWOPER and UXO training requirements, UXO personnel will receive site-specific training during daily tailgate safety meetings and other project safety training. UXO personnel will review and be familiar with AHAs applicable to the USAGYPG project (Attachment A of this SSHP).

The UXO technicians will provide UXO related site-specific training to the non-UXO contractor personnel assigned to this project. Such training may include UXO recognition, MEC hazard identification, and UXO avoidance procedures.

4.2 MEDICAL MONITORING

UXO personnel engaged in field activities must be enrolled in a medical surveillance program as required by 29 CFR Part 1910.120(f). Physician's statements on Parsons UXO personnel will be maintained on site by the Site Safety Officer.



5.0 MEC SAFETY

This section is intended to supplement the Site Safety and Health Plan (SSHP). Personnel will become familiar with the contents of this section and the SSHP.

UXO Technicians shall perform construction support while working in areas possibly containing UXO. These tasks include the inspection/investigation of areas, marking and avoiding UXO, and if applicable locating site access routes.

5.1 ORDNANCE SAFETY PRECAUTIONS

Maximum safety in any UXO operation can only be achieved through adherence to applicable safety procedures, a preplanned approach, and intensive supervision. The following precautions shall be observed:

- DO NOT touch or move any ordnance item(s) regardless of the markings or apparent condition.
- DO NOT enter an ordnance site if an electrical storm is occurring or approaching. If a storm approaches, leave the site immediately and seek shelter.
- DO NOT use radios or cellular phones in the vicinity of suspect ordnance items.
- DO NOT walk across an area where the ground cannot be seen. If dead vegetation or animals are observed, leave the area immediately due to potential contamination by chemical agent.
- DO NOT drive vehicles into a suspected MEC area, use clearly marked lanes.
- DO NOT carry matches, cigarettes, lighters, or other flame-producing devices onto an MEC contaminated site.
- Prohibit unnecessary personnel from entering the site.
- Always assume ordnance items contain a live charge until it can be ascertained otherwise.
- Do not be misled by markings on the ordnance item stating practice bomb, a dummy or inert. Even practice bombs have explosive charges that are used to mark/spot the point of impact; or the item could be mismarked.
- The location of any ordnance items found should be clearly marked so it can be easily located and avoided.



5.2 MORNING SAFETY MEETINGS

Prior to commencing work each day, the Site Safety Officer will conduct a Morning Safety Meeting for personnel entering the site. At a minimum, the meeting will include the daily objectives, planned operations, potential hazards and risks associated with each day's planned activities for UXO Technicians, previous confirmed encounters with hazardous materials, and any other issues relevant to the WP tasks and objectives. Meeting attendance will be documented.

5.3 SAFE WORK PRACTICES

Personnel working with MEC shall comply with the following general precautions while conducting operation activities:

- Operations will cease and personnel will evacuate the site when severe weather, with lightning, is within five miles of the work site.
- Cease operations during sand, dust, or snowstorms.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the work area.
- Fires for heating or cooking are only permitted in authorized areas.
- Do not conduct any operational activities without approved operating procedures and proper supervision.
- Do not become careless by reason of familiarity with MEC related materials.
- Avoid direct physical contact with suspect chemical hazards.
- Field personnel shall alert team personnel of a suspected or potentially dangerous situation. If an alarm sounds or the presence of a strong nauseating odor or the visual observance of fire or smoke should occur; personnel are to evacuate the site and notify the UXOSO.
- Field teams must be aware of monitoring equipment, wind direction, nearest water source, evacuation routes and emergency communication and notification procedures.
- A first aid-kit shall be readily available.
- Operational activities involving MEC will only be conducted during daylight hours, which are defined as 30 minutes after sunrise up to 30 minutes prior to sun set.



5.4 PERSONAL PROTECTIVE EQUIPMENT

UXO personnel will wear Level D personal protective equipment (PPE), which includes cotton work clothes, leather gloves and work boots. If an eye hazard exists then safety glasses will be worn. Hearing protection if applicable will be worn if the noise level at the site exceeds the 85db. In the event an overhead hazard exists hard hats will be worn, Work being conducted around heavy equipment requires, hard hats, safety glasses and bright colored safety vests to be worn. In the event a task requires an upgrade in PPE level, the protocol in the Work Plan will be followed.



6.0 RECORD KEEPING

The UXOSO will keep a Daily Activity Log Book, which is the official record of UXO related operational activities completed and will contain, as a minimum, the following information:

1. Date and start and stop times;
2. Daily weather conditions;
3. Personnel conducting the UXO related activities, company, and title or classification;
4. Record of Site UXO Tailgate Safety Meeting;
5. Actual work activities;
6. Equipment used for the UXO related activities;
7. UXO related injuries, incidents, or any other safety and health-related issues or situations, including as many facts concerning the accident/incident as possible;
8. Official communications, written and verbal; and
9. Any other UXO issues relevant to the project.



7.0 COMMUNICATIONS

The UXO team will have a minimum of two means of communication. This is to ensure that in the event one method of communication fails there is a suitable alternative. The UXO Team must be able to communicate with one another and the Site manager at all times. This is generally accomplished via two way radio, and mobile phone. Off-site communications shall be available via land line or cell phone for emergency purposes.

The UXO Team and equipment operators will establish hand signals for use in guiding the equipment operator and in the event a UXO is discovered, or for any other hazardous development.

APPENDIX B

STANDARD OPERATING PROCEDURES (SOPs)

- SOP 1.0 Three Phase QC Inspection and Corrective Action**
- SOP 2.0 Field Instrumentation QA/QC**
- SOP 3.0 Borehole Logging**
- SOP 4.0 Duplicate and Split Spoon Sample Preparation**
- SOP 5.0 Field Equipment Decontamination**
- SOP 6.0 Global Positioning System Surveys**
- SOP 7.0 Magnetometer Surveys**
- SOP 8.0 Surface Debris Removal and Landfill Sites**
- SOP 9.0 Test Pit/Trench construction and Sampling**

**STANDARD OPERATING
PROCEDURE**

**1.0
THREE PHASE QC INSPECTION
AND CORRECTIVE ACTION**

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 1.0	Date Effective: March 2009	Revision 0
Title: THREE PHASE QC INSPECTION AND CORRECTIVE ACTION		
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1.0 PURPOSE

The Parsons Quality Control (QC) system is the means by which Parsons will ensure that the work performed, including that of suppliers and subcontractors, meets quality standards. A three phase system of QC and corrective action will be utilized which includes: 1) a preparatory meeting with inspections; 2) an initial meeting with inspections; and 3) ongoing QC and corrective actions. A completion inspection will also be performed at the conclusion of operations as part of ongoing QC.

2.0 SCOPE

This procedure applies to field activities conducted or overseen by Parsons.

3.0 REQUIREMENTS

The Parsons QC system consists of a three phase QC and corrective action program. The QC control program is implemented prior to initiating a field mobilization and will remain in effect throughout its duration. The three phase control program includes as appropriate:

- A preparatory meeting with inspections;
- An initial meeting with inspections; and
- Ongoing QC inspections and corrective actions (including completion inspection).

4.0 REFERENCES

ANSI/ASQC E4-1994, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs.

5.0 DEFINITIONS

Definitions are provided in the Parsons Project Work Plan, Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and Standard Operating Procedures (SOPs).

6.0 RESPONSIBILITIES

The Project Manager or designee is responsible for assuring that:

- The three phase QC inspection program is implemented and documented;
- Qualified personnel are assigned responsibility for performing QC inspection;
- QC inspection forms are completed; and
- QC forms, records, and follow-up documentation are included in project files.

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7.0 PROCEDURE

During field work, QC inspections will be performed and inspection reports produced that summarize QC activities and inspections for the three phase QC program (see Attachments 1-1, 1-2, 1-3, and 1-4). The purpose of these reports will be to document inspection activities, work plan variances, nonconformances, and corrective action for field activities.

7.1 Phase 1 – Preparatory Meeting

Phase 1 consists of a preparatory meeting scheduled and conducted jointly by the Project Manager and the Field Operations Manager and attended by other QC system personnel (as applicable) prior to beginning a field mobilization. The preparatory meeting will be held after all required plans/documents/materials have been submitted, reviewed, and approved.

At the preparatory meeting the applicable management workers will be informed as to the acceptable level of workmanship required in order to meet contract specifications, and an inspection will be performed to assure that the field mobilization is ready to successfully proceed.

The results of the preparatory meeting will be documented by minutes prepared and filed by the Field Operations Manager. Attachment 1-1 is an example of the Preparatory Meeting Inspection Report that will be used for documentation during Phase 1.

7.2 Phase 2 – Initial Meeting

Phase 2 consists of an initial meeting and inspection scheduled and conducted by the Field Operations Manager, to be performed in the field at the beginning of a field mobilization. Its purpose is to ensure that activities conform to approved plans/documents/materials, which may include some of the following: Parsons Project Work Plan, QAPP, HASP, and SOPs.

This meeting will include a review of plans and procedures employed to complete the field mobilization and an initial phase inspection performed shortly after field work has begun. Documentation in the form of the Initial Meeting Inspection Report will be prepared and filed by the Field Operations Manager. The initial meeting will be attended by the Field Operations Manager, QC system personnel, government personnel, and subcontractors, as applicable and appropriate. The initial meeting and inspection may be repeated for each new field mobilization, or any time acceptable specified quality standards are not being met. Attendees will be notified at least 24 hours in advance of an initial meeting. Attachment 1-2 is an example of the Initial Meeting Inspection Report that will be used for documentation during Phase 2.

7.3 Phase 3 – Ongoing Quality Control and Corrective Action

Phase 3 consists of ongoing QC inspections and any necessary corrective action, and will be conducted to assure that control activities, including control testing, are being performed until the mobilization is completed. Ongoing Quality Control and Corrective Action Reports will be completed

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and filed by the Field Operations Manager. The report(s) will be made a matter of record in the QC inspection documentation. Attachment 1-3 is an example of the Ongoing Quality Control and Corrective Action Report that will be used for documentation during Phase 3.

7.3.1 Completion Inspection

A completion inspection will be performed in a post-operation debrief to verify that work performed during a field mobilization has been completed and documented according to approved plans/documents/materials (which may include Parsons Project Work Plan, QAPP, HASP, and SOPs), and that corrective actions have been successfully implemented. The Project Manager or designee will conduct and file this inspection. Attachment 1-4 is an example of the Completion Inspection Report that will be used to document this activity.

7.4 Additional Preparatory and Initial Phases

Additional preparatory and initial meetings and/or inspections may be conducted by the Project Manager or designee if necessary during the same field mobilization should any of the following occur:

- The quality of ongoing work is unacceptable;
- There are changes in the applicable QC staff, on-site production supervision, or work crew;
- Previously unanticipated field activities with significantly different or unique QC requirements are initiated;
- Work on a field mobilization is resumed after a substantial period of inactivity;
- Other or additional problems develop which require action.

8.0 REPORTS TO MANAGEMENT

Project documentation including: raw data logs; Preparatory, Initial, and Completion Inspection Reports; Ongoing Quality Control and Corrective Action Reports; meeting minutes; audits; and final reports will be reduced to a summary and may be stored electronically. These documents will be filed in a timely manner by the preparer and made available for review by the Project Manager. The final report and all intermediate reports will include the project status or results and conclusions, results of assessments, and any significant QC concerns or problems. Documentation will be retained in accordance with applicable rules and regulations.

The Field Operations Manager will submit Ongoing Quality Control and Corrective Action Reports and convey significant issues including quality concerns or problems to the Project Manager verbally and/or via written updates. Issues of interest to United States Army Garrison Yuma Proving Ground (USAGYPG) as a whole should be submitted by the Project Manager.

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9.0 ATTACHMENTS

- Attachment 1-1 Preparatory Meeting Inspection Report
- Attachment 1-2 Initial Meeting Inspection Report
- Attachment 1-3 Ongoing Quality Control and Corrective Action Report
- Attachment 1-4 Completion Inspection Report



PARSONS

INITIAL MEETING INSPECTION REPORT

CQC REPORT Pg _____ of _____

Report No: _____ Date: _____

Project: US Army Garrison Yuma Proving Ground

Prepared By: _____

Work Activity

INSPECTION PARTICIPANTS

Name

Organization

Applicable Work Plan/SOP

Applicable Drawings & Documents

REVIEW OF TASK REQUIREMENTS

Results

Satisfactory

Unsatisfactory

Preparatory Meeting Minutes Reviewed

Personnel Trained for Task

Health and Safety /Medical History Complete

Work Plan/Health and Safety Plan Signed-Off

SOPs Reviewed

Field Equipment & Instruments On-site

Health and Safety Monitoring Equipment On-site

Instruments Calibrated

Field Forms Identified & On-site

Decontamination Material On-site

Required Permits & Clearances On-site

All Conflicts and Differences Resolved

Examination of Preliminary Work Completed:

Physical Examination of Materials & Equipment

Results

Item Examined

Examination Procedure

Satisfactory

Unsatisfactory



PARSONS

**ONGOING QUALITY CONTROL
AND CORRECTIVE ACTION
REPORT**

CQC REPORT

Pg _____ of _____

Report No:

Date:

Day of the Week: M T W TH F ST SN

Project: US Army Garrison Yuma Proving Ground

Prepared By:

**Weather Conditions
(circle)**

Sky: Bright Sun/Clear Partly Cloudy Overcast Rain Snow

Humidity: Dry/Low Moderate High

Temperature: ≤32°F 33-50°F 51-70°F 71-85°F >85°F

Wind: Calm Low Moderate High

1. Contract/Subcontractor Personnel On-site and Areas of Responsibility:

Name	Job Title	Hours	Employer	Location & Description of Work

2. Work Performed:

3. Job Safety:

4. Inspection Performed:

5. Remarks:

6. Delays:

7. Encountered Issues or Problems and Corrective Action:

**STANDARD OPERATING
PROCEDURE**

2.0

FIELD INSTRUMENTATION QA/QC

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 2.0	Date Effective: March 2009	Revision 0
Title: FIELD INSTRUMENTATION QA/QC		
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1.0 OBJECTIVE

The objective of this procedure is to define field requirements for quality assurance/quality control (QA/QC), for equipment and instrument calibration, inspection, and maintenance.

2.0 BACKGROUND

Instruments and equipment used to gather, generate, or measure environmental data must be calibrated to ensure that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Equipment, instruments, tools, gauges, and other items requiring preventive maintenance must be serviced according to the manufacturer's specifications. Raw data from the field measurements and sample collection activities must be recorded in the appropriate logbook or field form and standard reporting units must be used for comparability and consistency.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager is responsible for ensuring that calibration is completed and documented daily in accordance with this procedure, that equipment and instrument inspection and maintenance is conducted, and that measurements are taken to the specified accuracy.

QC Field Coordinator: The QC Field Coordinator is responsible for validation of field data by:

- Conducting routine checks during the processing of data (e.g. errors in identification codes);
- Checking the consistency with parallel data sets obtained presumably from the same population (e.g., from the same portion of the aquifer or volume of soil).

Field Geologist: The Field Geologist is responsible for calibrating, inspecting, and maintaining instruments, and for taking measurements to the specified precision.

4.0 REQUIRED MATERIALS

- Applicable instruments including groundwater multiparameter device field instruments, photoionization detectors (PIDs), or other instruments or equipment as needed based on the field sampling plans.
- Maintenance schedule
- Equipment Calibration Log
- Field logbook

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- Field activity forms
- Indelible black ink pens

5.0 PROCEDURES

5.1 Equipment and Instrument Calibration

The frequency of calibration procedures for applicable instruments (e.g., groundwater multiparameter device field instruments) will be performed at intervals and by procedures specified by the manufacturer, or more frequently as conditions dictate. Applicable field instrument calibration will be documented on form such as the Equipment Calibration Log (Attachment 2-1).

To ensure comparability between sample data of similar samples and sample conditions, standard solutions and material traceable to the National Institute of Standards and Technology (NIST), or similar agency, or EPA-published standards/protocols will be used to calibrate the field instruments.

5.2 Equipment and Instrument Inspection and Maintenance

5.2.1 Equipment and Instrument Inspection

Equipment used during field sampling will be examined to ensure that it is in proper operating condition. This includes checking the manufacturer's operating manual and the instructions for each instrument to ensure that maintenance requirements are being observed. Field notes for previous sampling trips will be reviewed so that the notations on any prior equipment problem are not overlooked and necessary repairs to equipment have been carried out.

5.2.2 Equipment and Instrument Maintenance

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's recommendations.

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to the maintenance schedule and to arrange any necessary and prompt service, as required. Service to the equipment, instruments, tools, gauges, etc., will be performed by qualified personnel. In the absence of any manufacturer's recommended maintenance criteria, a maintenance procedure will be developed by the operator based upon experience and previous use of the equipment.

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Logs will be established to record maintenance and service procedures and schedules. Maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges.

6.0 RESTRICTIONS/LIMITATIONS

Manufacturer calibration and operating procedures take precedence over any information provided in this SOP.

7.0 ATTACHMENTS

Attachment 2-1 Equipment Calibration Log

**STANDARD OPERATING
PROCEDURE**

**3.0
BOREHOLE LOGGING**

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 3.0	Date Effective: March 2009	Revision 0
Title: BOREHOLE LOGGING		
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1.0 OBJECTIVE

The objective of this procedure is to define the requirements necessary for borehole and sample logging. This procedure provides a uniform set of guidelines to aid in developing consistency among sample descriptions and sample techniques. The importance of accurate, complete, clear, and legible logs cannot be overemphasized.

2.0 BACKGROUND

Borehole logging is used to determine the geologic relationships of subsurface soil and rock formations. The relationship of geologic formations and features is important in constructing cross sections, describing groundwater flow, and determining probable contaminant migration pathways.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager is responsible for ensuring that field personnel have been trained in the use of this procedure, for verifying that soil boring and sampling activities are performed in compliance with this procedure, and for ensuring consistency in logging between Field Geologists.

Field Geologist: The Field Geologist is responsible for on-site monitoring of drilling and soil sampling operations and for recording (logging) pertinent information regarding the geologic materials penetrated, ensuring adequate completeness for cross-section construction.

4.0 REQUIRED MATERIALS/EQUIPMENT

4.1 Required

- Clipboard
- Appropriate forms
- Waterproof permanent marking pen
- Engineer's tape measure, graduated-feet, 10^{ths}
- Sand grain size chart
- Munsell soil color charts
- Site map
- Hand lens
- Field book, straight edge, and permanent ink marker
- Engineer's tape (weighted), graduated-feet, 10^{ths}, when required
- Portable organic vapor detector, when required

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- Water level indicator, when drilling below the water table
- Sample jars or bags (cooler and ice required when collecting environmental samples)

4.1 Optional

- Copy of drilling contract
- Brunton compass
- Pocket penetrometer
- Flagging tape
- Cooler and water bottles
- Flashlight
- Rock hammer

5.0 SPECIAL REQUIREMENTS

Whenever practical, UXO clearance will be completed prior to the arrival of larger equipment such as drill rigs or cone penetrometer rigs. In some instances pre-clearance will not be practical for and will be completed concurrently with the sampling activity, as outlined below.

5.1 UXO Clearance for Intrusive Work

Intrusive work performed at this facility in a suspect or known UXO area will require subsurface clearance to a prescribed depth using a metal locating device. Magnetometer measurements will be taken at the surface and subsurface at 2-foot intervals. This process will be repeated to a prescribed depth based on the potential UXO item or until undisturbed soil is encountered, as identified by the site geologist. Prior to each measurement, the drill rig, augers, and any interference materials (i.e., drill rods, plug, wrenches, etc.) must be moved at least 20 feet from the drill location or borehole, or to a distance where magnetic interference is not observed.

6.0 PROCEDURE FOR COMPLETING SOIL BORING LOG

An example Soil Boring Log is presented as Attachment 3-1. This form is intended for use in the field during the drilling, sampling, and logging process for soil borings. Information will be neatly and legibly recorded while in the field. The purpose of the log is to clearly document the events and findings of the drilling activity. Pertinent data related to boring/drilling operations must be clearly recorded as objectively as possible. Parsons has the option to resubmit this form in a deliverable as a completely redrafted/typed form as a combination of information applied in the field and office. The original field log will be retained in the permanent file. Alterations or changes between the office copy and the field original will be justified. The Soil Boring Log will be completed according to the following instructions:

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- Location Map: Sketch SWMU and soil boring location, with a scale and North arrow
- Client/Project: Yuma Proving Grounds
- Page: Indicate page number of the log within sequence
- Boring Number: The letters SB, followed initially by 0
- Location: SWMU number
- Date: Start and end date of boring, use MM/DD/YY format
- Weather: Describe current conditions, temperature, and wind speed and direction, and any significant changes during operations
- Logged By: Name of logging geologist
- Drilled By: Name of driller and drilling company
- Drilling Method: State the drilling method and outside dimensions of augers or bits (Hollow Stem Auger - HSA; Air Rotary - AR; Rotosonic - RS)
- Sampling Method: Describe length of sampling apparatus and type (i.e., 2.0' split spoon).
The sampling method, or "sample technique", should be easily translated to one of the following codes during data entry:
 - S Split-spoon core sampling
 - T Shelby tube core sampling
 - U Soil auger
 - X Composite core sample
 - M Macrocore
- Hole Diameter: Measure the outside auger or drill casing diameter to the nearest tenth of a foot
- Total Depth: Measure the total boring depth to the nearest tenth of a foot, using a weighted engineering tape measure
- Moisture Content: Determine the moisture content using the following table. Note that "Wet" describes saturated material:

Code	Description
DRY	Dry
LM	Little Moisture
MOIST	Moist
VMOIST	Very Moist
WET	Wet

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- Sorting: Determine grain sorting, using terms listed below:
 - Very Well (VW)
 - Well (W)
 - Moderately (M)
 - Poorly (P)
 - Very Poorly (VP)

- Density: Defined as the number of drops required by a 140 lb. hammer over 30 inches to drive a 2-inch outside diameter, 1 3/8 inch inside diameter, split-spoon 6 inches. Thumb penetration can be used to determine the soil boring density of samples collected by techniques that are not hammer-driven. Use the table below to determine the soil boring density.

Sand or Gravel	(Blows/ft.)	Silt or Clay	(Blows/ft.)	Thumb Penetration
VL (Very Loose)	0-4	VSO (Very Soft)	0-2	Very easy-inches
L (Loose)	4-10	SO (Soft)	2-4	Easily inches
MD (Medium Dense)	10-30	M (Medium Soft)	4-8	Moderate effort-inches
D (Dense)	30-50	ST (Stiff)	8-15	Indented easily
VD (Very Dense)	> 50	VST (Very Stiff)	15-30	Indented by nail
		H (Hard)	> 30	Difficult by nail

Other descriptions may include:

- NC (Noncemented)
 - PC (Poorly cemented)
 - If hard rock/bedrock is encountered, consult the Field Operations Manager for descriptions..
- Plasticity: Determine the ease in which soils are deformed. Use the list below to characterize soil plasticity:
 - EXTREMELY HARD, resistant to pressure, not broken by hand
 - NONPLASTIC, not wire formable
 - SLIGHTLY PLASTIC, wire formable but soil remains easily deformed
 - PLASTIC, wire formable, moderate pressure required
 - VERY PLASTIC, wire formable, little pressure required

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- Sample: Record numerically, the order in which the samples were taken
- Head Space Reading: If required, record the head space reading and the type of instrument used
- Sample Recovery: Obtain sample from split-spoon, Shelby tube, or other sampling device, and measure the length of the recovered sample to the nearest 0.01 foot. Also note the distance the boring was advanced to obtain this sample (e.g., a recovery of 1.8 out of 2 feet).
- Penetration Resistance: For hammer driven sampling methods, record the blow counts for every 6 inches of driving the sample
- Color: Describe the soil color based on the combination of hues, values, _____ and colors using a Munsell color chart.
- USCS Classification/Lithology/Grain Size, Modifications/Remarks: The predominant lithology or lithologies should be identified first in capital letters by Unified Soil Classification System (USCS) code, followed by qualifying adjectives that define grain size, color (using a Munsell chart), mineralogy, structural/textural features, bedding and laminations. For mixed lithologies within a common interval, provide relative percentages of the two or more lithologies within parenthesis following the lithologic name. For example: Sand fine-medium (60%) brownish yellow (10 YR. 6/6), and gravel coarse (40%) very pale brown (10 YR. 7/3). Any obvious features related to evidence of contamination, such as odor or staining, should be documented, as should anything unusual or unexpected that is encountered while drilling. Drilling comments and occurrences should also be noted under this section.

The determination of the top of the water bearing interval will be based on visual observations of cuttings from the borehole and from core samples. Water level depths will be checked using an electronic water level indicator. Drill cuttings, where required, and development water will be placed into appropriate containers. Each container will be labeled with date, media, and source. IDW will be managed as discussed in the IDW SOP.

The acceptable data codes, based on USCS augmented by lithology and special codes, are identified in Table 1. Data codes (GRAIN) for grain size (soil) are listed below:

Action or Measurement		Acceptable Entries	
Code	Description	Code	Description
GRAIN	Grain size (soil)	For soils:	
		C	Coarse
		CF	Coarse to fine
		F	Fine
		FM	Fine to medium
		LG	Large

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M	Medium
MC	Medium to coarse
SMALL	Small
VC	Very coarse
VF	Very fine

Rock texture codes are available but have not been included because they are not expected. If hard rock/bedrock is encountered, consult the Field Operations Manager for rock texture codes.

7.0 ATTACHMENTS

Attachment 3-1 Example Boring Log

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TABLE 1
DATA CODES: SOIL CLASSIFICATION AND LITHOLOGY
YUMA PROVING GROUND, ARIZONA

Action or Measurement		Acceptable Entries	
Code	Description	Code	Description
USCS	Unified Soil Classification System augmented by lithology and special codes		Separate dual USCS codes by a hyphen.
		USCS Codes:	
		CH	Fat clay, inorganic clay of high plasticity
		CL	Lean clay, sandy clay, silty clay, or low to medium plasticity
		GC	Clayey gravel, gravel-sand-clay mixtures
		GM	Silty gravel, gravel-sand-silt mixtures
		GP	Gravel, poorly graded, gravel-sand mixtures, little or no fines
		GW	Well graded gravel-sand mixture, little or no fines
		MH	Silt, fine sandy or silty soil with high plasticity
		ML	Silty and very fine sand, silty or clayey fine sand or clayey silt with slight plasticity
		OH	Organic clays of medium to high plasticity, organic silts
		OL	Organic silts and organic silty clays of low plasticity
		PT	Peat or other highly organic soil
		SC	Clayey sand, sand-clay mixtures
		SI	Shells
		SM	Silty-sand, sand-silt mixtures
		SP	Sand, poorly-graded, gravelly sands
		SW	Sand, well-graded, gravelly sands
		WD	Wood
		Special Codes:	
		ASH	Ash
		ASPHLT	Asphalt (road material)
		CONC	Concrete
		CRLMSN	Crushed limestone
		FILL	Unknown man-made landfill material
		LC	Lost core
		NR	No recovery
		NTLOGD	Not logged
		RUBBLE	Construction debris rubble or demolition fill

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TABLE 1 (CONTINUED)
DATA CODES: SOIL CLASSIFICATION AND LITHOLOGY
YUMA PROVING GROUND, ARIZONA

Action or Measurement		Acceptable Entries	
Code	Description	Code	Description
USCS	Unified Soil Classification		
(continued)	System augmented by lithology and special codes	VOID	Void or cavity
WSTAT	Final status of the well	CB	Well filled with grout: cement-bentonite
		FB	Well filled with bentonite
		FC	Well filled with concrete
		FG	Well filled with gravel
		FS	Well filled with soil
		NC	Well filled with grout: neat cement
		O	Open well
		OP	Open well with piezometer or observation well installed
		WD	Well damaged
MODIF	Lithology modifications	B	Boulders
		BDWX	Badly weathered
		CAL	Calcareous
		CARB	Carbonaceous
		CC	Concretions
		CEM	Cemented
		CHE	With chemicals (based on headspace reading)
		CL	Clayey
		CS	Clay strata or lenses
		DCOLOR	Discolored
		FAULT	Faulted
		FECC	Iron concentrations
		FILL	Disturbed soil
		FRACT	Fractured
		FRIA	Friable
		G	Gravelly
		HPL	Highly plastic
		IRNST	Iron stained
		LIG	Lignite fragments
		MICA	Micaceous
		ML	Silty

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TABLE 1 (CONTINUED)
DATA CODES: SOIL CLASSIFICATION AND LITHOLOGY
YUMA PROVING GROUND, ARIZONA

Action or Measurement		Acceptable Entries	
Code	Description	Code	Description
MODIF (continued)	Lithology modifications	SH	Shale fragments
		MOT	Mottled
		O	Organic matter
		ODOR	Odiferous
		OX	Oxidized
		PL	Plastic
		ROUND	Rounded
		RT	Rootlets
		S	Sandy
		SDL	Sandstone lenses
		SDS	Sandstone fragments
		SHLN	Shale lenses
		SHLY	Shaly
		SIS	Silt strata or lenses
		SL	Slickensides
		SLF	Shell fragments
		SLWX	Slightly weathered
		SO	Solid
		THSK	Thin streaks
		TR	Trace
		TRCL	Trace of clay
		TRG	Trace of gravel
		TRML	Trace of silt
		TRMN	Trace of manganese
		TRS	Trace of sand
		WCL	With clay
		WFE	With iron oxide
		WG	With gravel
		WGML	With gravel and silt
		WLAM	With laminations
		WML	With silt
		WS	With sand
		WX	Weathered

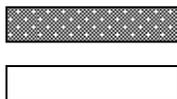
LOCATION MAP		INSTALLATION		PAGE ____ OF ____							
		WELL NUMBER		LOCATION SWMU#							
		DATE ____ / ____ / ____		WEATHER							
		LOGGED BY		DRILLED BY							
		DRILLING METHOD		SAMPLE METHOD							
		GRAVEL PACK		SEAL							
CASING TYPE			DIAMETER	LENGTH	HOLE DIA.						
SCREENING TYPE		SLOT	DIAMETER	LENGTH	TOTAL DEPTH						
HEAD SPACE READING	SORTING	DENSITY	PLASTICITY	MOISTURE CONTENT	SAMPLE	(FT.)	SAMPLE RECOVERY	COLOR	GRAPHIC	USCS CLASSIFICATION/LITHOLOGY/ GRAIN SIZE/MODIFICATIONS/REMARKS	WELL COMPLETION

EXPLANATION



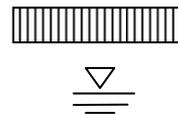
GROUT

BENTONITE



SAND PACK

CASING



SCREEN

WATER LEVEL

**STANDARD OPERATING
PROCEDURE**

4.0

**DUPLICATE AND SPLIT SAMPLE
PREPARATION**

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 4.0	Date Effective: March 2009	Revision 0
Title: DUPLICATE AND SPLIT SAMPLE PREPARATION		
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1.0 OBJECTIVE

The objective of this procedure is to define the requirements for the collection and preparation of duplicate and/or split samples.

2.0 BACKGROUND

Duplicate and split samples are typically obtained for one of two purposes: 1) as a means of quality control (QC) from the point of sample collection through all analytical processes (if the initial and duplicate samples are not within specification, the reasons for the discrepancy must be found and corrected, if possible), or 2) for later laboratory analyses, if needed. Collocated or duplicate samples will be collected to provide information on the variability of the contaminants in the field.

Duplicate samples are samples collected from a location as close to the primary sample location as possible. They are collected to provide a means of assessing the reliability of field sampling methods and analytical data resulting from field samples.

Split samples are normally obtained for the express purpose of submitting identical samples to different laboratories for comparative analytical results. Duplicate and/or split samples may be collected as composite or grab samples from most media or waste types. The same equipment and techniques used for primary samples will be required when obtaining duplicate and/or split samples.

Comparative analyses between laboratories can also be obtained for semivolatile organic compounds and/or metals. Duplicate samples can also be obtained for VOC and non-VOC contaminated media by careful grab samples. For most split or duplicate sampling for non-VOC parameters, in all media, compositing is recommended.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager will ensure that sampling efforts are conducted in accordance with this procedure and other SOPs pertaining to specific media sampling.

Field Geologist: The Field Geologist is responsible for ensuring that field personnel collect split and duplicate samples in accordance with this and other relevant procedures.

QC Field Coordinator: The QC Field Coordinator is responsible for ensuring that this procedure is correctly implemented and that the quantity and quality of split and duplicate samples collected meet the requirements of the Project QA/QC Plan.

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4.0 REQUIRED MATERIAL/EQUIPMENT

The supplies and equipment required to obtain duplicate and/or split samples is identical to that for primary media sampling.

5.0 PROCEDURES

5.1 Duplicate/Split Samples

The following steps must be followed when collecting duplicate samples:

1. Determine the frequency of obtaining duplicate/split samples as specified in the site-specific sampling plan.
2. Proceed with site sampling to the point that a duplicate sample is required.
3. The duplicate/split samples are samples taken at the same time, as close as possible, and under the exact conditions as those required for the primary sample.

Note: Any sample or portion of a sample that is to be analyzed for VOCs shall be collected and contained immediately. Do not stir, mix, or agitate samples for VOC analysis before containment.

4. Follow the specific media sampling plan. The preparation and disposition of the duplicates will be the same as those for the primary samples.
5. Obtain VOC samples first (without mixing or compositing), then proceed to Step 6. For soil, homogenize remaining portion of soil volume following VOC sample collection. Collect sample for SVOC analysis, then samples for remaining analyses. For water, duplicate or split samples will be collected immediately after the primary analysis sample is collected.
6. Place the sample(s) in the appropriate sample container. Duplicate/split samples will be labeled or tagged according to their intended use as detailed in the sampling plan. If the sampling plan duplicates are to be held for possible later analyses, they may be labeled as "XXX duplicate," where the number "XXX" refers to the primary sample ID. If the duplicates/split are intended for QC measures, they may be given discrete sample numbers in accordance with the sample numbering protocol. Duplicate/split samples must be properly identified in the field logbook and on other sampling forms as required.
7. Seal, pack, and transport duplicate/split samples in the same manner as that used for other samples from the sampling site.

Note: Split samples will have a separate chain-of-custody record and will be sent to a different laboratory than the primary samples.

8. Decontaminate all equipment. Place all disposable liquids and solids in the appropriate containers.

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9. Remove personal protective clothing and equipment and place in the designated containers. Field sampling personnel must be contamination-free before leaving the sampling site.
10. Document activities.

6.0 RESTRICTIONS/LIMITATIONS

Samples for VOCs must be collected and contained immediately. Agitation by mixing, stirring, or shaking will cause vaporization of the volatile fraction to a significant degree. Resample if agitation has occurred.

**STANDARD OPERATING
PROCEDURE**

5.0

FIELD EQUIPMENT DECONTAMINATION

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 5.0	Date Effective: March 2009	Revision 0
Title: FIELD EQUIPMENT DECONTAMINATION		
Office of Contact: PARSONS		Page 2 of 7

1.0 OBJECTIVE

The objective of this procedure is to describe the requirements for decontamination of field environmental sampling equipment.

2.0 BACKGROUND

Decontamination of field equipment is necessary to ensure the quality of samples by preventing cross-contamination. Further, decontamination reduces health hazards and prevents the spread of contaminants off-site.

3.0 RESPONSIBILITY

Field Operations Manager: The Field Operations Manager is responsible for ensuring that field personnel are trained in the use of this procedure and that decontamination is conducted in accordance with this procedure.

QC Field Coordinator: The QC Field Coordinator is responsible for verifying that this procedure is correctly implemented. The QC Field Coordinator (or other qualified field personnel) may also be required to collect and document rinsate samples to provide quantitative verification that these procedures have been correctly implemented.

4.0 REQUIRED EQUIPMENT

4.1 Large Equipment

Large equipment includes:

- Drilling rigs, backhoes, augers, drill pipe, bits, casing, and screen
- High-pressure or steam-spray unit
- 2- to 5-gallon manual-pump sprayer (pump sprayer material must be compatible with the solution used)
- Plastic sheeting
- Potable water
- Stiff-bristle brushes
- Gloves, goggles, boots, and other protective clothing as specified in the project Health and Safety Plan

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4.2 Small Equipment

Small equipment includes:

- Split spoons or other samplers, bailers, compositing bowls, spatulas, spoons, trowels, filtration equipment, and other reusable utensils or items that directly contact samples
- Plastic sheeting
- 5-gallon plastic buckets
- Phosphate-free detergent
- Stiff-bristle brushes
- Nalgene or Teflon sprayers or wash bottles, or 2- to 5-gallon manual-pump sprayer (pump sprayer material must be compatible with the solution used)
- Disposable wipes, paper towels, or clean rags
- Potable water
- Distilled water
- Disposable wipes, paper towels, or clean rags
- Gloves, goggles, and other protective clothing as specified in the project Health and Safety Plan

4.3 Pumps and Pump Assemblies

The required equipment for decontamination of pumps and pump assemblies include:

- Applicable sized containers (5 gallon or 30-40 gallon)
- Plastic sheeting
- 5-gallon (or larger) containers of potable water
- Stiff-bristle brushes
- Disposable wipes, paper towels, or clean rags
- Gloves, goggles, and other protective clothing as specified in the project Health and Safety Plan

5.0 PROCEDURES

5.1 Heavy Equipment Decontamination

Heavy equipment includes drilling rigs and backhoes. The following steps must be followed when decontaminating this equipment:

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1. Set up a decontamination pad that is large enough to fully contain the equipment to be cleaned. Use one or more layers of heavy plastic sheeting to cover the ground surface. Raise the edges of the pad using wood or other material such that a berm is created to contain rinse water. Slope the pad towards one corner which will act as a sump to facilitate collection of liquids generated during decontamination.
2. Don gloves, boots, goggles, and any other personal protective equipment as specified in the project Health and Safety Plan.
3. With heavy equipment in place, spray areas and surfaces (e.g., rear of rig, backhoe bucket, etc.) exposed to contaminated soils using a steam unit or high-pressure sprayer. Use steam units and sprayers in accordance with the project Health and Safety Plan.
4. If soapy water was used for the washdown step, rinse the equipment with potable water.
5. Remove equipment from the decontamination pad and allow to air dry before returning it to the work site.
6. Record equipment type, date, time, and method of decontamination in the appropriate logbook.
7. After each use, properly collect all contaminated waters, sludge, and disposable gloves, boots, and clothing, and dispose in accordance with Section 5.5 below.

5.2 Downhole Equipment Decontamination

Downhole equipment includes hollow-stem augers, drill pipe, bits, casing, and screen. The following steps must be followed when decontaminating this equipment:

1. If possible, use heavy equipment decontamination pad or create a centralized decontamination area set up to contain contaminated rinse water and minimize the spread of airborne spray.
2. Set up a "clean" area upwind of the decontamination area to receive cleaned equipment for air drying. At a minimum, clean plastic sheeting must be used to cover the ground, tables, or other surfaces on which decontaminated equipment is to be placed.
3. Don gloves, boots, goggles, and any other personal protective equipment as specified in the project Health and Safety Plan.
4. Place object to be cleaned on metal or wooden sawhorses or other supports.
5. Using a high-pressure sprayer or steam unit, spray the contaminated equipment. Use steam units and sprayers in accordance with the project Health and Safety Plan. Aim downward to avoid spraying outside the decontamination area. Be sure to spray inside the piping or augers, corners, and gaps. Use a brush, if necessary, to dislodge dirt.
6. If using soapy water, rinse the equipment using clean water.

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7. Remove the equipment from the decontamination area and place in the clean area to air-dry.
8. If necessary, wrap clean downhole equipment in plastic or use other protective material, as feasible, to ensure that it does not become dirty prior to next use.
9. Record the equipment type, date, time, and method of decontamination in the appropriate logbook.
10. After decontamination activities are completed, properly collect all contaminated waters, sludge, plastic sheeting (unless it will be reused at the decontamination pad), and disposable gloves, boots, and clothing and dispose in accordance with Section 5.5 below.

5.3 Sampling Equipment Decontamination

Sampling equipment includes split spoons or other samplers, spatulas, spoons, trowels, compositing bowls, filtration equipment, and other reusable utensils or items that directly contact samples. The following steps must be followed when decontaminating this equipment:

1. Set up a decontamination line on plastic sheeting. The decontamination line should progress from dirty to clean and end with an area for drying decontaminated equipment. At a minimum, clean plastic sheeting must be used to cover the ground, tables, or other surfaces on which decontaminated equipment is to be placed.
2. Don gloves, boots, goggles, and any other personal protective equipment as specified in the project Health and Safety Plan.
3. Wash the item thoroughly in a 5-gallon bucket of soapy water. Use a stiff-bristle brush to dislodge any clinging dirt. If possible, disassemble any items that might trap contaminants internally before washing. Do not reassemble until decontamination is complete.
4. Rinse the item in a 5-gallon bucket of potable water. Rinse water should be replaced as needed, generally when cloudy.
5. Rinse with distilled/ deionized water.
6. If necessary, wrap clean sampling equipment in plastic or use other protective material, as feasible, to ensure that it does not become dirty prior to next use.
7. Record the decontamination protocol, equipment, or description together with the date and time of decontamination in the appropriate logbook.
8. After decontamination activities are completed, properly collect all contaminated waters, plastic sheeting, and disposable gloves, boots, and clothing and dispose in accordance with Section 5.5 below.

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5.4 Groundwater Sampling Pump Decontamination

The following steps must be followed when decontaminating pumps, if required:

1. Set up decontamination area and separate clean storage area using plastic sheeting to cover the ground, tables, and other porous surfaces. Set up three containers in a triangle. The two containers at the base of the triangle will be used to contain dilute (non-foaming) soapy water and the other potable water. The drum at the apex will receive wastewater. Place 5-gallon cans of potable water adjacent to the water container on the same side as the potable water container.
2. Don gloves, boots, goggles, and any other personal protective equipment as specified in the project Health and Safety Plan.
3. Pump should be set up in the same configuration as for sampling. Submerge pump intake and all downhole wetted parts (tubing, piping, foot valve, etc.) in soapy water of the first container. Place the discharge outlet in the waste container above the level of wastewater. Pump soapy water through the pump assembly until it discharges to the waste container.
4. Move pump assembly to the potable water container while leaving discharge outlet in the waste container. All downhole wetted parts must be immersed in the potable water rinse. Pump potable water through the pump assembly until it runs clear.
5. Decontaminate the discharge outlet by hand following the steps outlined in Section 5.3, Item 3 of this SOP.
6. Remove the decontaminated pump assembly to the clean area and allow to air-dry. Intake and outlet orifices should be covered to prevent the entry of airborne contaminants and particles.
7. Record the equipment type and identification, date, time, and method of decontamination in the appropriate logbook.
8. After decontamination activities are completed, properly collect all contaminated waters, plastic sheeting, and disposable gloves, boots, and clothing and dispose in accordance with Section 5.5 below.

5.5 Waste Disposal

The following steps must be followed when disposing of wastes:

1. All wash water and rinse water that have come in contact with contaminated equipment are to be handled, packaged, labeled, marked, documented, stored, and disposed of as investigation-derived waste unless other arrangements are approved in advance.
2. Place contaminated items in properly labeled drums for disposal. Liquids and solids must be drummed separately.

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3. If large quantities of used decontamination solutions are generated, segregate each type of waste in separate containers. This may permit the disposal of wash water and rinse water in a sanitary sewage treatment plant rather than as a hazardous waste.
4. Unless required, plastic sheeting and disposable protective clothing may be treated as a solid non-hazardous waste, and disposed accordingly.

5.6 Documentation

- Record decontamination process in the field log book as described above in this SOP.

6.0 RESTRICTIONS/LIMITATIONS

The following restrictions/limitations apply to these field equipment decontamination procedures:

- When feasible, use of disposable equipment is recommended to minimize the extent of decontamination required.
- Sensitive, non-waterproof, or other equipment that can not be extensively decontaminated should be used in a manner that prevents contamination to the greatest possible extent (e.g., wrapping delicate instruments in plastic bags during use on-site). If decontamination is necessary despite these efforts, a damp cloth should be used to wipe any potential contaminated portions of such equipment.
- Equipment rinsate blank quality control samples will be collected in accordance with the Quality Assurance Project Plan to determine the effectiveness of field equipment decontamination. Equipment rinsate blanks will be obtained by pouring distilled/deionized water over decontaminated sampling equipment and collecting it in appropriate sampling containers for analysis, to determine if residual contamination is present. These samples will be handled, packaged, and shipped in a manner identical to that used for environmental samples.

**STANDARD OPERATING
PROCEDURE**

6.0

GLOBAL POSITIONING SYSTEM SURVEYS

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 6.0	Date Effective: March 2009	Revision 0
Title: GLOBAL POSITIONING SYSTEM (GPS) SURVEYS		
Office of Contact: PARSONS		Page 2 of 6

1.0 OBJECTIVE

The objective of this procedure is to provide a general description and technical guidance on Global Positioning System (GPS) surveys during site investigations.

2.0 BACKGROUND

GPS consists of a network of 24 orbiting satellites, maintained by the U.S. Department of Defense. Satellites broadcast radio signals to GPS receivers, allowing position determination within an accuracy ranging from 100 m to 10 cm (decimeter).

Types:

Base Station (decimeter accuracy) – Normally used by surveyors.

Real-time Differential Correction Method (decimeter accuracy) – A system where the Radio Technical Commission for Maritime Services (RTCM) Commission set up stations (acting as base stations) where a real-time differential correction data link is relayed real-time to the GPS unit.

Hand Held (meter accuracy) – For initial/non-survey grade site investigation.

A GPS survey can be used to map points, lines, or areas, and can be used in conjunction with other investigative surveys (e.g., geophysical surveys).

Common terms associated with GPS surveys:

- Global Positioning System (GPS) Survey - A mapping technology whereby constellation satellites provide worldwide coverage for positioning information
- Post-processing - Computations involved in refining collected GPS satellite data.
- Base Station - A stationary GPS receiver located at a point with known survey coordinates. In order to achieve the desired decimeter accuracy in mapping, a GPS base station is used in coordination with rover mapping, and data is post-processed using specialized PC software.
- Differential Correction - The process of applying a position “correction” to data collected by a receiver based on the difference between a computed position and its known value at a base station.
- Position Dilution of Precision (PDOP) - Index used to measure satellite geometry and distribution. A lower value represents a better geometry for position determination.

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3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager will ensure that survey efforts are conducted in accordance with this procedure and any manufacturer's requirements or operational manuals.

Field Geologist: The Field Geologist is responsible for ensuring that the survey data is collected in accordance with this and other relevant procedures.

QC Field Coordinator: The QC Field Coordinator is responsible for ensuring that this procedure is correctly implemented and that the quantity and quality of survey measurements collected meet the requirements of the project.

4.0 REQUIRED EQUIPMENT

- GPS instrumentation
- Field logbook
- Indelible black ink pens and markers
- Survey measurement documentation forms and data sheets
- Personal protective equipment and gear
- Appropriate surveying equipment for obtaining field measurements as specified in site-specific sampling plans

5.0 PROCEDURES

5.1 Preparation

1. Determination of mapping locations. GPS mapping will be completed as needed along geophysical grid locations, site features, sampling locations, or other features of interest.
2. Objects such as buildings or trees may interfere with data collection and may require reevaluation of the mapping plan. Additionally, high PDOP values may restrict timing of data collection.

5.2 GPS Data Collection - General

1. Using the GPS unit, in accordance with its operational manual, the data will be collected with the data collector.
2. The site feature types can be inputted into the data collector to assist in the collection and download of data. This method may facilitate the generation of necessary site maps. The

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data logger allows for input of descriptive information where features need to be better defined.

3. If post-processing of the data is required, the data will be downloaded onto a computer and processed using differential correction methods each night following data collection.
4. The data will be downloaded and used to generate site maps or other maps of interest. The method of download will be instrument-specific and will likely be related to the way in which the data will be used.
5. The data will be stored in the database and within a field computer, based on need.

5.3 Collection of GPS Data – Real-Time Correction Devices

1. The GPS unit which has the capability for real-time correction may be used.
2. After device start-up, the GPS unit will be checked to ensure the real-time correction link is operational. If the PDOP is high, the accuracy may be very limited.
3. The points of interest will be obtained using the data collector similar to the other types of GPS measuring systems.

5.4 Collection of GPS Data – Base Station Operations

1. The GPS almanac for the previous day will be checked to determine times when satellite configuration is poor (high PDOP).
2. A GPS base station will be established at a nearby known surveyed point, typically a SWMU monument. If a nearby, known surveyed point is not available, see note below. The antennae height from the survey point will be measured and entered into the base station controller. The recording interval will be determined and entered into the controller. It is essential that the recording interval on the rover be equal to or greater than that on the base station. The base station must be set to log prior to rover data collection, and turned off only after all rover data collection is complete.

Note: If a nearby, known surveyed point is not available near the site where GPS is to be performed, a unique location at the site will be used as the GPS base station. The identity of this point will be indicated on the Geophysical/GPS QA/QC form. In situations such as this, no surveyed coordinates will be available to the GPS processor. As a result, the processor will have to use the value that the proprietary GPS software selects as coordinates. See item number 4 below for a discussion of how this effects the acquisition of a static point.

3. The GPS rover clock will be compared to timekeeping on other relative instruments (e.g., EM polycorder). All clocks will be set to the time as indicated by the GPS rover unit.
4. Prior to or following GPS mapping, a GPS static point will be recorded at a known location (e.g. a SWMU monument or monitoring well) with the rover unit. If a known,

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surveyed location is not available at the site, see note below. This point will be used to check accuracy of the survey.

Note: At sites where a known, surveyed location is not available, the static point must be acquired at the location that was selected for the base station (see item number 2 above). The coordinates selected by the GPS system (based on the average location of the base station), will be the only known site coordinates and will be used to evaluate the quality of the GPS data.

5. Features (mounds, trenches, monitoring wells, etc.) or geophysical lines will be logged using the log function on the rover.
6. The field team will periodically check to ensure that data are being properly recorded. If a discrepancy is found the survey team will go back to the last verified location and continue forward with the survey.
7. The data will be downloaded onto a computer and processed using differential correction methods each night following data collection.
8. At the completion of each workday, the data will be plotted to determine whether the objectives of the survey have been satisfied. Additional data will be obtained, as needed, to complete the survey objectives. Files will be checked for completeness.

5.5 Instrument Calibration

Calibration is not required for the GPS system. The instrument normally has an indication of the potential errors with the instrument.

However, the following set up procedure will be completed daily before the GPS rover is used (for base station operations).

5.5.1 Initial Set-up Procedure

1. Previously collected data will be cleared from the receiver memory, provided the data has been downloaded.
2. The antennae height will be measured, recording interval determined, and the data will be entered into the controller. It is essential that the recording interval on the rover be greater than or equal to that on the base station.
3. Before logging any data, the receiver will be allowed to warm up for at least five minutes to ensure that it is locked onto and using at least five satellites. The PDOP should be less than 3.5 throughout the mapping process to obtain decimeter accuracy. A PDOP between 3.5 and 6 will give submeter accuracy.

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5.6 Operating and Preventive Maintenance

Manufacturer's instructions shall be consulted for proper operation and preventive maintenance requirements. The QA/QC manager shall ensure that the survey team has read and understands all manufacturer's instructions.

6.0 RESTRICTIONS/LIMITATIONS

This procedure provides a description of the principles of operation, instrumentation, applicability, and implementation of GPS survey methods used during hazardous waste site investigations. The description is for methods and equipment that are readily available and typically applied; it is not intended to provide a complete discussion of the state-of-the-art.

SITE SURVEY FORM

Site ID: _____

Name: _____

Date: _____

Weather: _____

Arrive Time: _____

Depart Time: _____

MEC or MD Present? _____

MEC means it poses explosive munitions hazard; MD is non-explosive munitions debris

General Site Description:

Describe surface topography, vegetation type and quantity, soils, animals, tracks/burrows, endangered/protected species, access constraints, and other site features

Describe feature type (e.g., waste pile, backfilled trench, soil mound, disturbed soil, scattered debris, etc.); Describe waste material (e.g., wood, glass, concrete, metal, MEC/MD, etc.); Describe quantity, approx. volume (cy), surface area, and if hazardous or non-Hazardous.

Feature ID (see map)

Description

<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">GPS</p> <p>N: _____</p> <p>E: _____</p> </div>	<div style="border: 1px solid black; height: 100px; margin-bottom: 5px;"></div> <p style="margin-top: 0;">Photo IDs: _____</p>
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">GPS</p> <p>N: _____</p> <p>E: _____</p> </div>	<div style="border: 1px solid black; height: 100px; margin-bottom: 5px;"></div> <p style="margin-top: 0;">Photo IDs: _____</p>
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">GPS</p> <p>N: _____</p> <p>E: _____</p> </div>	<div style="border: 1px solid black; height: 100px; margin-bottom: 5px;"></div> <p style="margin-top: 0;">Photo IDs: _____</p>

SITE SURVEY FORM (cont.)

Site ID: _____

Date: _____

Feature ID (see map)

Description

<p>GPS</p> <p>N: _____</p> <p>E: _____</p>	<p>Photo IDs: _____</p>
<p>GPS</p> <p>N: _____</p> <p>E: _____</p>	<p>Photo IDs: _____</p>
<p>GPS</p> <p>N: _____</p> <p>E: _____</p>	<p>Photo IDs: _____</p>
<p>GPS</p> <p>N: _____</p> <p>E: _____</p>	<p>Photo IDs: _____</p>
<p>GPS</p> <p>N: _____</p> <p>E: _____</p>	<p>Photo IDs: _____</p>

**STANDARD OPERATING
PROCEDURE**

7.0

MAGNETOMETER SURVEYS

Revision: 0

Date Effective: March 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

SOP 7.0	Date Effective: March 2009	Revision 0
Title: MAGNETOMETER SURVEYS		
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1.0 OBJECTIVE

The objective of this procedure is to provide a general description and technical guidance on conducting magnetometer surveys during site investigations.

2.0 BACKGROUND

A **magnetometer** is a scientific instrument used to measure the strength and/or direction of the earth's magnetic field in the vicinity of the instrument. Magnetism varies from place to place and differences in Earth's magnetic field can be caused by the differing nature of rocks and the interaction between charged particles from the sun and the magnetosphere of a planet.

Magnetometers used in geophysical surveys may use a single sensor to measure the total magnetic field strength, or may use two (sometimes more) spatially separated sensors to measure the gradient of the magnetic field (the difference between the sensors). In most hazardous waste or munitions related applications the latter (gradiometer) configuration is preferred because it provides better resolution of small, near-surface phenomena. Magnetometers may also use a variety of different sensor types. Proton precession magnetometers have largely been superseded by faster and more sensitive fluxgate and cesium instruments.

Every kind of material has unique magnetic properties, even those that we do not think of as being "magnetic." Different materials below the ground can cause local disturbances in the Earth's magnetic field that are detectable with sensitive magnetometers. Magnetometers react very strongly to iron; however, brick, burned soil, and many types of rock are also magnetic, and archaeological features composed of these materials are very detectable. Where these highly magnetic materials do not occur, it is often possible to detect very subtle anomalies caused by disturbed soils or decayed organic materials. The chief limitation of magnetometer surveys is that subtle features of interest may be obscured by highly magnetic geologic or modern materials.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager will ensure that survey efforts are conducted in accordance with this procedure and other Standard Operating Procedures (SOPs) pertaining to the specific survey method.

Field Geologist/Geophysicist: The Field Geologist/Geophysicist is responsible for ensuring that field personnel collect survey data in accordance with this and other relevant procedures.

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QC Field Coordinator: The QC Field Coordinator is responsible for ensuring that this procedure is correctly implemented and that the quantity and quality of survey measurements collected meet the requirements of the Project QA/QC Plan.

4.0 REQUIRED EQUIPMENT

- Geonics G-858 or equivalent magnetometer
- Magnetometer processing software
- Field logbook
- Indelible black ink pens and markers
- Survey measurement documentation forms and data sheets
- Personal protective equipment and gear
- Appropriate surveying equipment for obtaining field measurements as specified in site-specific sampling plans

5.0 PROCEDURES

5.1 Preparation

1. Determination of magnetometer surveying locations will be based on the site-specific work plan.
2. Magnetic surveys will be performed using a G-858 magnetometer. The G-858 magnetometer uses two cesium vapor sensors, each with a miniature atomic absorption unit from which a signal proportional to the intensity of the ambient magnetic field is derived. For this project, the G-858 will be used as a gradiometer with the two sensors mounted on an aluminum pole and separated vertically by a distance of 1.5 feet.
3. Data will be collected along parallel lines. The spacing between adjacent survey lines will be determined based on the type of debris expected at each site (e.g. drums, storage tanks, burial pits, etc.), but it is expected that line spacings will be on the order of 5 to 10 feet.
4. A grid will be based on the line-spacing and outlined on a map to cover the area to be surveyed. Approximate coordinates of grid corners will be established.

5.2 Surveying Techniques

1. Prior to the start of the geophysical survey, the operator will perform the required QC to ensure the instrument is functional and operating as designed. The required QC testing is outlined in Section 5.4.

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2. The geophysical operator will operate the G-858 in a slung position and will carefully survey the area trying to keep the height of the instrument at an equal distance above the ground. During the survey the operator will monitor the instrument readings during data acquisition and evaluate the downloaded data. The sensitivity of the G-858 magnetometer sensors ranges from 0.01 to 0.05 nanoTeslas (nT), and data can be acquired as fast as ten times per second.
3. Data from the G-858 sensors consisting of location and geophysical measurement values will be recorded on the instrument's data logger. Electronic location data will be collected using fiducials, with the collection of each line started as the instrument is carried over one end line of the grid and ended as it is carried over the opposite end line. Intermediate locations will be located at each site using survey tapes. Intermediate tapes will be placed every 100 feet as necessary for each survey, and the operator will place a fiducial mark in the data as the instrument is carried over each of the intermediate tapes.

5.3 Electronic Data Handling

1. The raw data files will be preprocessed using Magmap to interpolate the fiducial data points between the start, intermediate, and end lines of the grid. The data will then be exported as an ASCII data file. The exported data will include position information, data from the two magnetometer sensors, a gradient channel showing the difference between the readings measured by the two sensors, and the data acquisition time stamp. These data files will then be imported into the Geosoft Oasis Montaj™ (Oasis) geophysical data processing environment.
2. Any spikes present in the data will be manually edited or removed. The geophysical processor then will evaluate the results of the latency test to determine the instrument latency correction necessary for the data set. This latency correction corrects for delays that occur in the electronics of the G-858 and in the processing of the data on the data logger. The latency correction will be computed by determining the latency value that corrects the position to overlap the anomaly due to the latency test item when the sensors travel over it in different directions. Typically with the magnetometer, this value is around 0.05 seconds.
3. Once this value is determined, it will be applied to the whole data set, and the gradient channel will be gridded and displayed. The displayed values will be evaluated against the information in the field notes to determine if they are consistent and whether or not the data meet expected data quality standards. The processor will then make anomaly selections on the data.
4. Anomalies identified will then be reacquired using a hand-held Schonstedt magnetometer. The Schonstedt is more sensitive to smaller debris (e.g. nails, bottle caps, etc.) than the G-858, but should be sufficient for the reacquisition of large buried debris. If results are

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inconclusive using the Schonstedt, the G-858 will be used to reacquire the anomaly in question.

5.4 Quality Control of Instrumentation

The quality of the mapped geophysical data will be ensured by several tests performed with the geophysical instruments. These tests, the objective of each test, and the acceptance criteria are described below.

1. A six-line test will be conducted to evaluate the repeatability and positional accuracy of the response amplitude of a ferrous object. The operator will walk back and forth over a known point six times. The first two passes will be with no spike object present; passes three through six will incorporate the test object at the known point; the fifth pass will be walked slowly; and the sixth will be walked quickly. The positions of the anomalies from the six passes will be evaluated to ensure the data are being located accurately. This test will only be performed once during the project.
2. A static test will be conducted at the beginning and end of each day the magnetometer is used. This test will involve collecting background data with the instrument in a static (stationary) mode for three minutes, collecting data with a test item for one minute, and removing the test item and collecting data for one minute. The static test will be repeated at the end of the day and the response (test item value minus background value) will be compared with the test conducted prior to the survey. The range of the background readings recorded by the instrument during the 3-minute static tests should not exceed +/-1 nT for the total magnetic field measured by the two G-858 sensors. The pre- and post-survey responses should be within 20 percent of one another.
3. A personnel and equipment noise check will also be performed each day. For this test, the operator will move his/her body in relation to the sensor(s) to ensure there are no metallic items on the operator that will interfere with the measurements. The operator will also shake the instrument cables to ensure that poor connectors and cables will not introduce noise into the data. The range of the readings recorded by the instrument during each test should not exceed 3nT/foot for the magnetic gradient.
4. Latency test will be performed each day by walking the instrument over a known point in orthogonal directions and over a stationary test item in opposite directions while collecting data. Application of the correct latency value should result in identical locations for the two peaks over the test item.
5. An azimuth test will also be performed at the start of the project. For this test, the operator will keep the sensors stationary and rotate around them through 360 degrees to determine if dropouts are more likely in any particular direction based on the sensors' positions relative to the earth's magnetic field. If dropouts are noted in any particular

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orientation, magnetic transect lines will be walked so as to avoid this orientation to the extent possible.

5.5 Operating and Preventive Maintenance

Manufacturer's instructions shall be consulted for proper operation and preventive maintenance requirements. The QA/QC manager shall ensure that the survey team has read and understands all manufacturer's instructions.

6.0 RESTRICTIONS/LIMITATIONS

This procedure provides a description of the principles of operation, instrumentation, applicability, and implementation of magnetometer survey methods employing a G-858 magnetometer used during hazardous waste site investigations. The description is for methods and equipment that are readily available and typically applied; it is not intended to provide a complete discussion of the state-of-the-art.

**STANDARD OPERATING
PROCEDURE**

8.0

SURFACE DEBRIS REMOVAL AT LANDFILL SITES

Revision: 0

Date Effective: May 2009

PARSONS

US ARMY GARRISON YUMA PROVING GROUND

Yuma, Arizona

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1.0 OBJECTIVE

The objective of this procedure is to provide a general work description and guidance on conducting surface debris removal at landfill sites located on US Army Garrison Yuma Proving Ground (USAGYPG).

2.0 BACKGROUND

This standard operating procedure (SOP) describes the work elements and procedures that will be followed while conducting surface debris removal at USAGYPG. The removal of surface debris from a number of landfill sites on USAGYPG is required as per the *RCRA Facility Investigation Workplan for Inactive Landfills and Muggins Mountain OB/OD Sites for US Army Garrison Yuma Proving Ground Performance-Based Contract*, hereafter referred to as the *RFI Work Plan* (Parsons, 2009). While the guidance presented herein was developed particularly for surface waste removal at the six landfill sites addressed in the RFI Work Plan (Parsons, 2009), the general procedures outlined in this SOP may also be applied to the removal of surface debris and wastes at other USAGYPG sites.

For the six landfill sites addressed in the RFI Work Plan (Parsons, 2009), surface wastes will be removed in order to further evaluate each site for the presence of buried waste. Currently, surface wastes at these sites may be covering areas of buried wastes, and metallic wastes at the surface are a source of interference for geophysical survey instruments. Geophysical surveys are needed to identify the presence of buried wastes and delineate the extent of such wastes if they exist.

The removal of surface wastes at the Muggins Mountain open burn/open detonation (OB/OD) Facility at USAGYPG is not covered by this SOP, as some surface wastes at that site are suspected to contain munitions and explosives of concern (MEC), and may include unexploded ordnance (UXO). If removal of surface wastes is required at the Muggins Mountain OB/OD site, such removal will be conducted using UXO-qualified personnel and the removal will follow the procedures used by the USAGYPG Ammo Recovery Branch for range clearance activities.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager is responsible for ensuring that field personnel, including subcontractors, have been trained in the use of this procedure, and for verifying that all surface waste removal activities are performed safely and in compliance with this procedure.

Field Geologist/Scientist/Engineer: The Field Geologist/Scientist/Engineer is responsible for the collection of necessary waste characterization samples and documenting all field observations and the types and volumes of surface wastes removed. The Field

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Geologist/Scientist/Engineer position and the Field Operations Manager position may be performed by the same person.

UXO Personnel: As MEC may be present at any location on USAGYPG, UXO personnel will comprise a portion of the field team used for surface waste removal. UXO personnel are responsible for conducting UXO construction support and ensuring work areas are clear of MEC prior to initiating waste removal. The UXO escort is responsible for identifying MEC and munitions debris (MD) that may be present, and determining if these items pose a safety hazard to the field team. The UXO escort is responsible for reporting any MEC hazards to the Field Operations Manager and to USAGYPG.

4.0 REQUIRED EQUIPMENT

- Clipboard
- Applicable field forms and field logbook
- Indelible black ink pens and markers
- Stakes, pin flags, or other means of marking field locations
- Personal protective equipment and gear
- Sample jars or bags (cooler and ice required when collecting environmental samples)
- Camera
- Cell phone or handheld radio
- Appropriate surveying/measuring equipment for obtaining field measurements
- GPS mapping equipment
- Buckets or wheelbarrows for collection of dispersed wastes/debris
- Heavy equipment (loader, haul truck, etc) for loading and hauling surface wastes
- Roll-off soil bins, as needed

5.0 PROCEDURES

5.1 Preparation and Pre-Removal Site Survey

Prior to mobilizing for the surface waste removal effort, a site visit will be conducted and the lateral extent of surface wastes will be accurately mapped and marked in the field. The volume of surface wastes to be removed at each site will also be estimated. This pre-removal site survey is also addressed in the RFI Work Plan (Parsons, 2009).

1. The pre-removal site survey teams will consist of field scientists/engineers and UXO personnel.

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2. Workers will use stakes, pin flags, or other means to mark the general locations of surface wastes for removal. Field marking of wastes will focus on the general position of individual waste piles, or on the outer extents of areas where surface wastes may be more disseminated. Field marking will also occur, as needed, at isolated locations where individual pieces of surface waste (e.g., drums, or other significant waste pieces) may be present.
3. Workers will use existing geophysical survey maps, as available, to locate and mark the positions of metallic surface wastes.
4. As needed, GPS mapping of surface wastes will be conducted to improve existing site maps and record the areas/locations of surface wastes that will be removed. If MEC or other munitions-related debris is observed, the locations of such items will also be recorded using GPS.
5. An estimate will be made of the volume of surface wastes present at each site. Estimating the volume of waste piles can be made by multiplying the approximate height of the waste pile by the length and width. An estimation of the summed volume of isolated surface waste pieces will also be made. Estimated waste volumes will be recorded in cubic yards (cy) and documented on appropriate field forms, and in the field logbook.
6. Workers will provide a written description of the surface wastes at each site. The written description should include:
 - A general description of the waste type (e.g., construction debris, household garbage, burnt material, concrete, etc);
 - the identity of several pieces of waste that validate the general waste type. For example, if the waste type is described as household garbage, workers may note the presence of aluminum soda cans, glass jars, furniture, or other household items;
 - whether the surface wastes constitute hazardous wastes, potentially hazardous wastes, or non-hazardous solid wastes. For example, surface wastes consisting of metallic debris, concrete, or construction debris may be described as non-hazardous solid wastes, while an area of burned wastes may be described as potentially hazardous wastes, due to the potential presence of polycyclic aromatic hydrocarbons (PAHs), dioxins, furans, and other possible contaminants.
7. Workers will photograph the surface wastes at each site in order to document the types of waste present, and the general location of waste piles/waste areas. Individual, isolated waste pieces that are of significant size will also be photographed.
8. UXO personnel will assist in the site survey as needed, and will provide UXO construction support services for the field teams. If MEC or other munitions related

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debris are observed, UXO personnel will clearly mark the location of such items and report the find to USAGYPG.

5.2 Surface Waste Characterization Sampling

As needed, surface wastes may be sampled to determine if they constitute hazardous waste and warrant disposal in a hazardous waste disposal facility.

1. For most abandoned landfill sites at USAGYPG, visual observation shows that surface wastes comprise non-hazardous solid wastes and waste characterization sampling will not be performed for these types of surface wastes. These types of wastes may be disposed of at the USAGYPG landfill or other permitted solid waste disposal facility.
2. If surface wastes are of a nature that they may potentially be considered hazardous waste, then waste characterization sampling will be performed prior to determining the final disposition of the surface wastes. Waste characterization sampling may be performed prior to waste removal (i.e., in-situ pre-characterization sampling) or after removal when the waste is being stored while awaiting analysis.
3. Prior to characterization sampling, surface wastes containing material indicative of potentially hazardous waste will be segregated from non-hazardous solid wastes. If needed, surface wastes may be separated from other wastes or from surrounding rocks and soil by use of a screen or other equipment.
4. Once potentially hazardous surface wastes have been separated from non-hazardous solid wastes, they will be sampled and analyzed based on the waste type and the site history, if known. In most cases, analyses will be performed using toxicity characteristic leaching procedure (TCLP) methods, as is appropriate for waste disposal characterization. If TCLP methods are not available for a particular analyte or analyte group that is suspected, a non-TCLP analytical method will be used. As a general guideline, the following analyses will apply to potentially hazardous surface wastes:
 - Burned Surface Wastes: Representative samples of ash, soot, and charcoal will be collected from burned surface waste areas and analyzed for TCLP semivolatile organic compounds (SVOCs), TCLP metals, and total explosives. Additional analytes may be needed based on the nature of the original (non-burned) waste material, if known, or on historical information.
 - Liquid Filled Containers: These wastes may include drums, pails, buckets, or other containers that are filled or partially filled with residual liquids. Such material will be sampled and analyzed for TCLP VOCs and TCLP metals. Additional analytes may be needed based on other information, including markings on the liquid container, or on historical site information.

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- Other Unidentified Materials: Other unidentified materials may include crusts or coatings on solid wastes, or sludge materials in the bottom of otherwise empty containers. Unidentified materials that may represent potentially hazardous waste will be sampled for TCLP SVOCs and TCLP metals. Additional analytes may be needed based on the nature of the material, markings on containers, or on historical site information.
5. Each waste characterization sample collected will be representative of the waste material in question. If needed, composite sampling may be used to obtain a representative sample of the wastes.

5.3 Surface Waste Removal

Surface wastes will be removed using methods and equipment that are appropriate and applicable to the waste types and configuration of the surface wastes at a particular site.

1. In general, non-hazardous solid surface wastes that are piled or otherwise cohesively grouped may be removed using standard “scoop and haul” methods. Heavy equipment, such as a front-end loader, backhoe, excavator, or other may be used to collect the surface wastes and transfer them to a haul truck, storage bin, or designated temporary storage area.
2. As needed, heavy equipment may also be used to break up larger pieces of solid waste (e.g., concrete blocks or slabs) into smaller and more manageable sizes. Metallic surface wastes may also be cut into smaller pieces as needed. If a cutting torch is to be used, the necessary permits must be obtained from USAGYPG and in place prior to initiating torch cutting activities.
3. When heavy equipment is used, care will be taken to minimize dust production, and if needed, dust suppression techniques will be implemented. Field personnel will remain clear of the boom radius of operating heavy equipment, and spotters will be used whenever backing up heavy equipment.
4. Surface wastes that occur as isolated, widely spread, or disseminated pieces may be collected by use of hand equipment, such as a bucket, wheelbarrow, or other. These wastes may be brought to a central collection point where they are loaded into haul vehicles or temporary storage containers or areas.
5. In some instances, surface wastes may be mixed with surface rocks, gravel and soil due to past bulldozing or grading operations. In these cases, it may be necessary to use screens or hand separation methods to separate the solid wastes from the rock and soil materials.

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6. With the exception of minor amounts of residual soil that adheres to removed solid waste, the removal of site soils as waste products is not permitted under this SOP, nor is the removal of other environmental media, such as surface water or groundwater.

5.4 Surface Waste Transportation and Disposal

The final disposition of removed surface wastes will be determined based on whether the surface waste is hazardous or non-hazardous. This will be determined through visual observation of waste type, and as needed, on waste characterization sample results for wastes that may be suspect hazardous. Some non-hazardous solid waste types may be disposed of through recycling.

1. USAGYPG will determine the final disposition of surface wastes. Disposal of wastes will be in accordance with all applicable State of Arizona and Federal rules and regulations.
2. Haul trucks, dump trucks, pulled trailers, or other vehicles permitted and licensed to haul solid wastes may be used to transport removed surface wastes. Transport drivers will visually inspect vehicles after loading and prior to departing the site to ensure that loads are secure and that waste materials will not fall or blow off during transport.
3. Non-hazardous surface wastes may be removed immediately from the site and hauled to the USAGYPG landfill or other licensed solid waste disposal facility. As needed, these non-hazardous wastes may also be temporarily stored in stockpiles at temporary storage pads or in storage containers such as a roll-off storage bin. If non-hazardous wastes are temporarily stored on site, notification must be given to USAGYPG, and a plan and schedule for removing these wastes should be approved and in place prior to initiating surface waste removal actions.
4. Surface wastes that are suspected or known to be hazardous may be temporarily stored on site in locked and lined soil storage bins until analyses of waste characterization samples has been completed. Each soil bin will be properly marked in accordance with applicable regulations. Alternatively, pre-characterization samples may be collected from the surface wastes in-situ prior to initiating waste removal operations. In this way, surface wastes that are found to be hazardous may be immediately transported from the site for disposal in a licensed hazardous waste disposal facility. Transportation of hazardous wastes will require a hazardous waste manifest that will be approved and signed by USAGYPG. Waste manifests are generally not required for non-hazardous solid wastes, but individual waste hauling operators may require some type of manifest for internal record keeping.
5. During haul operations, dust levels will be kept to a minimum and dust suppression measures will be implemented as necessary. Field personnel will remain aware of

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moving equipment and spotters will be used whenever backing up heavy equipment and repositioning haul trucks.

6. Non-hazardous solid wastes, such as concrete and metal, may be recycled. Reasonable efforts will be made to identify potential recyclers for handling recyclable waste materials.

6.0 RESTRICTIONS/LIMITATIONS

This procedure provides a description of the operations and equipment for conducting the removal of solid surface wastes from suspected landfill sites at USAGYPG. This procedure does not cover removal of contaminated soils or groundwater, nor does the procedure cover the removal of munitions, munitions debris, or potentially explosive surface wastes. This procedure does not address surface waste removal at locations other than on USAGYPG.

**STANDARD OPERATING
PROCEDURE**

9.0

**TEST PIT / TRENCH
CONSTRUCTION AND SAMPLING**

**Revision: 0
Date Effective: April, 2010**

PARSONS

**US Army Garrison Yuma Proving Ground
Yuma, Arizona**

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1.0 OBJECTIVE

The objective of this procedure is to define the requirements for the construction of test pits or trenches. This procedure also defines the requirements and techniques for the collection of media samples during and after construction of the test pit and/or trench.

2.0 BACKGROUND

Test pits and trenches are open excavations used to determine the shallow subsurface conditions at a specified site. They are usually excavated along the boundaries or within a known or suspected hazardous site for engineering, geological, or soil chemistry exploration and/or sampling purposes.

Test pits and trenches are excavated manually with a shovel or by means of machinery such as a backhoe or trench excavator.

Test pits and trenches are excellent and relatively inexpensive methods for exploring the boundaries and within known or suspected dumps and landfills or for collecting and characterizing suspected subsurface disposal areas. Sampling may be required to determine the types and levels of contaminants within the area and to determine the migration of contaminants from the area.

3.0 RESPONSIBILITIES

Field Operations Manager: The Field Operations Manager will ensure that test pit/trench construction and sampling efforts are conducted in accordance with this procedure and SOPs pertaining to specific media sampling.

Field Geologist: The Field Geologist is responsible for ensuring that field personnel properly and safely construct test pits/trenches and collect samples in accordance with this and other relevant procedures.

QC Field Coordinator: The QC Field Coordinator is responsible for ensuring that this procedure is correctly implemented and that the quantity and quality of samples collected meet the requirements of the project QA/QC Plan.

4.0 SPECIAL REQUIREMENTS

4.1 UXO Construction Support for Intrusive Work

Intrusive work using test pits at this facility will be conducted where the potential of encountering UXO is considered remote or unlikely. Two UXO-qualified personnel will oversee the test pit operations and will carefully inspect any foreign material encountered during the test pit operations. If munitions of explosive concern (MEC) or munition debris (MD) are identified during the intrusive work, operations will be halted and the UXO safety officer will reevaluate the risk hazard assessment to determine if the potential for encountering UXO has changed. If the UXO safety officer determines the risk hazard assessment has not changed, work will continue.

Test pit operations at selected SWMUs will be completed at locations where geophysical anomalies have been identified. Historical information and visual observations made during

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surface waste removals indicates that the buried debris is likely construction and municipal waste. A risk hazard assessment has been completed for these sites as presented in the H&S Plan. Since this is a military weapons testing facility, the potential for MEC should always be considered and if MEC is identified, intrusive actions at the site will be discontinued. Test pit operations in these areas will follow the same procedures as identified in this SOP. A test pit may be terminated at the discretion of the UXO qualified technician, if MEC or UXO is suspected.

4.2 Chemical Warfare Agent Monitoring for Investigative Work

No chemical warfare agents are suspected at the site. If the UXO-qualified technician suspects that these materials may be present, then all intrusive activities will cease at the site.

4.3 Emergency Procedures

Before the commencement of any fieldwork, all Parsons's personnel and subcontractors will be trained in the emergency response if UXO is detected. Parsons will also monitor for volatile organics using a photoionization detector (PID).

5.0 REQUIRED MATERIAL/EQUIPMENT

- Site-specific test pit/trench plan, including sampling requirements
- Field activity and sampling forms, field logbook
- Waterproof black ink pens
- Camera with film and Dugway camera pass
- Backhoe and/or other specified excavating machinery
- Shovels, picks, or scoops
- Personal protective equipment as specified in site-specific Health and Safety Plan
- Photoionization detector
- Appropriate field measurement instruments
- Decontamination supplies and equipment
- Plastic sheeting
- Sample containers
- Sampling equipment
- Coolers and ice
- Rinse bottles of potable water
- 55-gallon or larger drums, if dewatering is required and/or for storage of uncovered hazardous materials

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6.0 PROCEDURES

6.1 Preparation

The following steps must be followed when preparing for test pit/trench construction and sampling:

1. Ensure that the test pit/trench site-specific plan is in place and understood by all personnel.
2. Ensure that the stop work procedures and evacuation routes are understood by all personnel.
3. Don the required PPE.
4. Calibrate all field measurement instruments and document on Equipment Calibration Log.
5. Obtain the appropriate field measurements, wind direction, weather, etc. Record data on field forms.
6. Ensure that operating equipment has free access and movement about the test site.

6.2 Test Pit/Trench Construction

Test pits will be used to investigate potential hazardous waste disposal areas at various locations. Test pits will be constructed by manually excavating or by means of mechanical equipment such as a backhoe. Mechanical equipment will be used when the area being investigated is large and readily accessible. In small areas or in areas where there is evidence that the suspected burial area is shallow, manual excavation with a shovel is preferred. Qualified UXO personnel will determine whether the excavation should be manually excavated or excavated with a backhoe. Using either method, the following steps must be taken for construction of the test pit/trench:

1. Obtain surface soil samples, if required by the site-specific plan.
2. Place plastic sheeting on ground adjacent to test pit location. Any excavated soil suspected to be contaminated, containing debris, or saturated must be placed on the plastic sheeting. Take all appropriate steps for the handling and containment of the soil until it is returned to a pit or trench. Native soils may be placed adjacent to the test pit and returned to the pit upon completion.
3. Make sure all personnel are away from the reach of the backhoe equipment prior to starting the excavation of the pit or trench.
4. (Backhoe Test Pits) Maximum depth of test pit will be 15 feet, where groundwater enters pit, or when the bottom of the disposal trench is clearly identified, whichever occurs first. The cross-section area of the pit may be the width of the backhoe bucket or wider. The length of each pit will be approximately 10 to 15 feet.
5. (Hand Dug Test Pits) Maximum depth of test pit will be 2 feet. The cross-section area of the pit may be 2 feet. Should it be determined that a hand dug test pit need to be completed to a deeper depth, a backhoe will be used.

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6. Field conditions may necessitate changes in the planned excavation. The on-site geologist will determine the exact depth and construction of the pit(s) or trench(es).
7. All excavations must be in compliance with the applicable safety regulations. The Site Health and Safety Officer (SHSO) must ensure compliance with the appropriate regulations.

Note: Entry into test pit/trench is prohibited.

8. Potentially hazardous waste (debris, containers, etc.) may be exposed during test pit activities. This material will not be removed from the excavation and trenching will be terminated. (See 7.0-3, 4)
9. Obtain samples during excavation as required by the site-specific plan. Sampling devices with extension handles or backhoe bucket should be used to collect media for samples. Samples collected from the backhoe bucket will be collected from the center of the bucket or biased towards suspected contamination.

Note: Entry into pits/trenches to collect samples during excavation is prohibited.

10. Obtain appropriate field measurements (depth, width, etc.) during excavation. Obtain and record PID readings in the breathing zone and 1 to 2 inches from the exposed soil. Estimate the distance from the probe to the exposed soil and also record on the field forms.
11. Water or other liquid removed from test pits/trenches must be assumed to be contaminated. If water or liquids are found during excavation then excavation will cease and the current depth of the pit will be considered the final depth and recorded accordingly. Record the depth to water.
12. If water enters test pit, a water sample will not be collected. Soil samples will be collected directly above the water table.
13. Photograph all significant features exposed by the test pit/trench. Record all pertinent information from each photograph.
14. Test pits should not be left open overnight unless absolutely necessary. If left open the area around the hole will be secured as appropriate.
15. Decontaminate sampling equipment.

6.3 Backfill of Test Pits and Trenches

The following steps must be followed when backfilling test pits and trenches:

1. Immediately after all data, photographs, and samples are collected return soil to the pit/trench.
2. If a low permeability layer has been penetrated during excavation, be sure that the backfill material represents the original conditions of the excavated material or is impermeable.
3. Complete backfilling.

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4. Cover site and grade to the original land contour. This includes the soil storage area.
5. Decontaminate all equipment and PPE.
6. Remove and dispose PPE.
7. Personnel must be contamination-free upon leaving the test site.

7.0 RESTRICTIONS/LIMITATIONS

Test pits/trenches are a relatively quick and inexpensive method of obtaining exploratory information along the boundaries of a known or suspected hazardous waste site. This method of constructing and sampling test pits/trenches has the following restrictions/limitations:

1. Sampling is usually conducted on a limited scale to determine the type(s) of contaminants, the level(s) of contamination, and the migration pattern(s) of the contaminants. This information may be used to refine site conceptual models and/or construct cross-sections, when possible. Extensive sampling can be pursued, but will increase the cost of test pits/trenches.
2. If soil data from depths >15 feet are required, mechanical borings are recommended over test pits/trenches.
3. The trenching procedure to be followed will be a “clean to contaminated” approach. Test pits will begin by starting each test pit in uncontaminated soil and excavate towards what is believed to be the disposal area. Upon discovery of waste materials, a minimum amount of waste material will be taken from the trench to achieve sampling of the waste. After trenching is terminated and appropriate samples are taken, the trench will be backfilled with the excavated material.
4. Test pit operations will cease immediately under the following conditions:
 - Ordnance material is suspected or uncovered
 - A potential chemical surety material is identified or suspected
 - Glass vials, discolored soils or other material representing an unknown condition is uncovered
 - Drums or liquids representing an unknown hazardous condition is uncovered
 - Other conditions indicating a potential health and safety hazard to persons using the designated OSHA personal protective equipment

8.0 ATTACHMENTS

Attachment 20-1 Test Pit Information Form

TEST PIT INFORMATION

Site ID: _____
 Geol./Eng. _____
 Date: _____

Depth: _____
 Width: _____
 Length: _____

North Stake

Northing _____
 Easting _____
 Elevation _____

South Stake

Test Pit Description and Sample Locations

Note: Not to scale.

Depth

Depth

Depth	Lithology	Depth	Lithology

Site ID	Field Sample #	Depth	Headspace	Sample Description	GC/MS (BN,AS)	GC/MS (Vols)	Explosives	TCL (Metals)	TOC	TPHC	MPA/EMPA	Thiodiglycol	DMP	pH	Asbestos	Gross A & B	Total Phos.	MT LAB

Location Map

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APPENDIX C

NOTICE FOR PUBLIC COMMENT



U.S. Army Garrison Yuma Proving Ground Yuma, Arizona

PUBLIC NOTICE OF DRAFT REMEDIAL ACTION PLAN FOR THE INACTIVE LANDFILL YPG-028

The U.S Army Garrison Yuma Proving Ground (USAGYPG) invites public comments on a draft remedial action plan (RAP) to address removal of contamination at the inactive landfill YPG-028.

The YPG-28 site is a relatively small (0.1 acres) site located approximately ½ mile north of the Main Administrative Area of USAGYPG. The 1998 RCRA Facility Assessment identified it as a landfill that was reportedly used for disposing waste in late the 1940s. The subsequent RCRA facility investigation performed in 2012 did not reveal hazardous waste disposal at this site. However, there was one location at which solid waste debris was encountered.

USAGYPG has elected to clean up the site by excavating the solid waste. The draft RAP describes the process for excavating the waste, taking confirmatory samples, transporting the excavated waste to the USAGYPG solid waste landfill for disposal, backfilling the pit with clean soil, and grading the soil to match the surrounding area.

This public notice provides the public an opportunity to submit comments on the draft RAP. The 30-day public comment period for the draft document begins February 6 and ends March 8, 2013. The draft RAP and other site-related documents are available for public review at USAGYPG Environmental Sciences Division. Please contact Donnett Brown for an appointment. Her contact information is listed below. Public comments must be postmarked no later than March 8, 2013 and sent to Donnett Brown. The ADEQ contact for this public notice is Anthony Leverock.

Contact Information

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