

FINAL

**REMEDIAL ACTION WORK PLAN
FOR RICOCHET AREA MUNITIONS RESPONSE SITE
IN STATE GAME LANDS 211, PENNSYLVANIA**

Contract No.: W912DR-09-D-0006

January 2014

Prepared for:



**U.S. Army Corps of Engineers
Baltimore District
Baltimore, MD 21203**



**Army National Guard Directorate
Arlington, VA 22204**

and

**Pennsylvania Army National Guard
Department of Military and Veterans Affairs
Fort Indiantown Gap Military Reservation
Annville, PA 17003**

Prepared by:



**Weston Solutions, Inc.
West Chester, PA 19380**

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**CONTRACT No.: W912DR-09-D-0006
DELIVERY ORDER No. 0009**

Prepared For:



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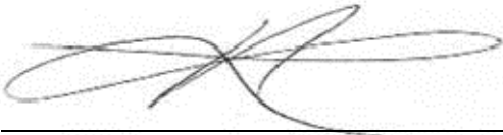
FINAL REMEDIAL ACTION WORK PLAN
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CONTRACT No.: W912DR-09-D-0006



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TABLE OF CONTENTS

Section	Page
1. INTRODUCTION.....	1-1
1.1 AUTHORIZATION.....	1-1
1.2 PURPOSE AND SCOPE.....	1-1
1.3 SITE DESCRIPTION	1-1
1.3.1 Site Location	1-1
1.3.2 Historical Information.....	1-2
1.3.3 Munitions and Explosives of Concern.....	1-2
1.4 SITE SETTING	1-2
1.4.1 Topography	1-2
1.4.2 Climate.....	1-3
1.4.3 Geological and Soil Conditions	1-3
1.4.4 Hydrology	1-3
1.4.5 Current and Future Site Use.....	1-3
1.5 WORK PLAN ORGANIZATION	1-4
2. TECHNICAL MANAGEMENT PLAN	2-1
2.1 TECHNICAL APPROACH OVERVIEW	2-1
2.1.1 Remedial Action Objective.....	2-1
2.1.2 Differing Site Conditions.....	2-1
2.2 PROJECT ORGANIZATION	2-2
2.2.1 Site Management	2-2
2.2.2 UXO Teams	2-2
2.3 PROJECT COMMUNICATION AND REPORTING.....	2-2
2.3.1 Monthly Status Reports.....	2-3
2.3.2 Daily and Weekly Status Reports	2-3
2.3.3 Phone Conferences/Informal Site Meetings	2-3
2.3.4 Regulatory Coordination.....	2-3
2.3.5 Administrative Record/Project Documents File	2-3
2.4 PROJECT SCHEDULE.....	2-3
2.5 PUBLIC INVOLVEMENT	2-4
2.6 SUBCONTRACTOR MANAGEMENT.....	2-4
3. FIELD PLAN	3-1
3.1 APPLICABLE GUIDANCE AND REGULATIONS.....	3-1
3.2 ANTICIPATED MEC	3-1
3.3 GEOGRAPHIC INFORMATION SYSTEM MANAGEMENT	3-1
3.4 MOBILIZATION	3-1
3.4.1 Site Office Establishment	3-2

TABLE OF CONTENTS (Continued)

Section		Page
	3.4.2 Site Utilities	3-2
	3.4.3 Grid Survey Activities and Removal Action Area Delineation.....	3-2
	3.4.4 Brush Clearing	3-4
3.5	GEOPHYSICAL INVESTIGATION PLAN	3-4
	3.5.1 Geophysical Instrumentation	3-5
	3.5.2 Geophysical System Verification	3-7
	3.5.3 Site Utilities	3-9
	3.5.4 Manmade Features Potentially Affecting Geophysical Operations....	3-10
	3.5.5 Overall Site Accessibility and Impediments.....	3-10
	3.5.6 Measurement Quality Objectives.....	3-10
	3.5.7 Instrument Standardization	3-10
	3.5.8 Records Management.....	3-11
	3.5.9 Digital Data Processing.....	3-12
3.6	GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS	3-15
	3.6.1 Geographic Information System Incorporation	3-15
	3.6.2 Plotting.....	3-16
	3.6.3 Mapping.....	3-16
	3.6.4 Electronic Submittal.....	3-16
3.7	SURFACE AND SUBSURFACE REMOVAL OPERATIONS	3-16
	3.7.1 Accountability and Records Management for Munitions and Explosives of Concern	3-16
	3.7.2 UXO Personnel Qualifications	3-17
	3.7.3 Removal Action Area Description.....	3-17
	3.7.4 Removal Action Procedures	3-17
	3.7.5 Munition with the Greatest Fragmentation Distance	3-19
	3.7.6 Minimum Separation Distances.....	3-19
	3.7.7 MEC Removal	3-20
	3.7.8 MEC Storage.....	3-21
	3.7.9 MEC Demolition and Disposal.....	3-21
	3.7.10 Material Potentially Presenting an Explosive Hazard	3-22
3.8	SITE RESTORATION	3-24
3.9	WORK SCHEDULE	3-24
4.	QUALITY CONTROL PLAN.....	4-1
	4.1 QUALITY MANAGEMENT STRUCTURE.....	4-1
	4.1.1 UXO Operations QC Manager.....	4-1
	4.1.2 Project Manager	4-1
	4.1.3 Senior UXO Supervisor	4-1
	4.1.4 UXO Quality Control Specialists.....	4-1
	4.1.5 Geophysics QC Manager	4-2

TABLE OF CONTENTS (Continued)

Section	Page
4.2 PERSONNEL QUALIFICATIONS AND TRAINING	4-2
4.2.1 Qualifications and Training for UXO Personnel	4-2
4.3 THREE PHASE INSPECTION PROCESS	4-2
4.3.1 Definable Features of Work.....	4-2
4.3.2 Preparatory Phase Inspection.....	4-3
4.3.3 Initial Phase Inspection	4-3
4.3.4 Follow-Up Phase Inspection (Surveillance)	4-4
4.3.5 Final Phase Inspection	4-4
4.4 DOCUMENTING DEFICIENCIES AND CORRECTIVE ACTIONS.....	4-5
4.4.1 Corrective Action Process.....	4-5
4.4.2 Continuous Improvement.....	4-5
4.4.3 Deficiency Identification and Resolution	4-5
4.4.4 Corrective Action Request.....	4-5
4.4.5 Corrective Action Tracking	4-6
4.4.6 Lessons Learned.....	4-6
4.5 PROJECT COMMUNICATION.....	4-6
4.5.1 Weekly Project Meeting	4-6
4.5.2 Project Documentation.....	4-6
4.5.3 Logs, Records, and Reports	4-7
5. EXPLOSIVES MANAGEMENT PLAN	5-1
5.1 GENERAL.....	5-1
5.2 LICENSES/PERMITS	5-1
5.3 ACQUISITIONS.....	5-1
5.4 INITIAL RECEIPT.....	5-1
5.5 STORAGE	5-2
5.6 TRANSPORTATION.....	5-2
5.7 DOCUMENTATION	5-3
5.8 RETURN OF UNUSED EXPLOSIVES	5-3
5.9 DISPOSAL OF REMAINING EXPLOSIVES	5-3
5.10 LOSS, THEFT, AND UNAUTHORIZED USE OF EXPLOSIVES	5-3
6. ENVIRONMENTAL PROTECTION PLAN	6-1
6.1 GENERAL.....	6-1
6.2 EXISTING CONDITION SURVEY	6-1
6.2.1 Biological Resources	6-1
6.2.2 Wetland Swamps	6-6
6.2.3 Water Resources	6-6
6.2.4 Cultural and Archeological Resources.....	6-6

TABLE OF CONTENTS (Continued)

Section	Page
6.3	PROCEDURES FOR PROTECTION OF RESOURCES..... 6-7
6.3.1	Trees and Shrubs..... 6-7
6.3.2	Waste Disposal..... 6-7
6.3.3	Security of Hazardous Materials..... 6-8
6.3.4	Burning Activities..... 6-8
6.3.5	Dust and Emission Control..... 6-8
6.3.6	Noise Control and Prevention..... 6-8
6.3.7	Spill Control and Prevention..... 6-9
6.3.8	Storage Areas..... 6-10
6.3.9	Access Routes..... 6-10
6.3.10	Control of Water Runon and Runoff..... 6-10
6.3.11	Temporary Facilities..... 6-10
6.3.12	Decontamination and Disposal of Equipment..... 6-11
6.3.13	Minimizing Areas of Disturbance..... 6-11
7.	PROPERTY MANAGEMENT PLAN..... 7-1
8.	INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS..... 8-1
9.	PHYSICAL SECURITY PLAN FOR RCWM PROJECTS..... 9-1
10.	REFERENCES..... 10-1

LIST OF APPENDICES

APPENDIX A	POINTS OF CONTACT
APPENDIX B	ACCIDENT PREVENTION PLAN
APPENDIX C	EXPLOSIVES SAFETY SUBMISSION
APPENDIX D	CONTRACTOR FORMS
APPENDIX E	DEMOLITION OPERATIONS SOP
APPENDIX F	SOP FOR MINIMIZING DISRUPTION OF SPECIAL PLANT AND ANIMAL SPECIES
APPENDIX G	FLOW CHART FOR INADVERTENT DISCOVERY OF CULTURAL REMAINS
APPENDIX H	PGC SPECIAL USE PERMIT

LIST OF TABLES

Title	Page
Table 2-1 Key Project Personnel and Responsibilities	2-5
Table 3-1 Boundary Control Points.....	3-25
Table 3-2 Grid Corner Coordinates.....	3-26
Table 3-3 Industry Standard Objects Characterized for Use as Munitions Surrogates (Adapted from NRL/MR/6110_09_99183)	3-61
Table 3-4 Digital Geophysical Mapping Measurement Quality Objectives	3-61
Table 3-5 Analog Geophysical Survey Measurements Quality Objectives	3-62
Table 3-6 DGM QC Test Frequency and Acceptance Criteria	3-63
Table 3-7 Minimum Separation Distances	3-63
Table 3-8 Demolition Notification Roster.....	3-64
Table 4-1 Definable Features of Work and Inspection Checklist	4-8
Table 4-2 Follow-Up Phase Inspection Methods and Failure Criteria.....	4-13
Table 4-3 Project Documentation Schedule	4-14
Table 4-4 QC Reporting Logs and Records	4-16
Table 5-1 Reporting Lost or Stolen Explosives	5-4

LIST OF FIGURES

Title

- Figure 1-1 Ricochet Area and Fort Indiantown Gap
- Figure 1-2 Ricochet Area MRS
- Figure 1-3 Ricochet Area MRS Topography
- Figure 2-1 Project Organization Chart
- Figure 3-1 Boundary Control Points
- Figure 3-2 Grid Layout
- Figure 3-3 Line and Fiducial Navigation
- Figure 3-4 Proposed IVS Layout and Process
- Figure 3-5 Surface Removal Action Areas
- Figure 3-6 Subsurface Removal Action Areas
- Figure 5-1 Procedures for Receipt of Explosives

LIST OF ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
amsl	above mean sea level
AP	armor piercing
APP/SSHP	Accident Prevention Plan/Site Safety and Health Plan
ARNG	Army National Guard
ASTM	American Society for Testing and Materials
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
BEM	Buried Explosion Module
bgs	below ground surface
BIP	blown-in-place
CAR	Corrective Action Request
CENAB	U.S. Army Corps of Engineers - Baltimore District
CFR	Code of Federal Regulations
CIG	Community Involvement Group
COR	Contracting Officer's Representative
DDESB	Department of Defense Explosives Safety Board
DFW	Definable Feature of Work
DGM	digital geophysical mapping
DID	Data Item Description
DMM	discarded military munitions
DoD	Department of Defense
DO	Delivery Order
DOT	U.S. Department of Transportation
DQCR	Daily Quality Control Report
DQO	data quality objective
DSC	differing site conditions
EM	electromagnetic
EMA	Emergency Management Agency
EOD	Explosive Ordnance Disposal
EPP	Environmental Protection Plan
ER	Environmental Review
ESRI	Environmental Systems Research Institute
ESS	Explosive Safety Submission
FIG	Fort Indiantown Gap
ft	feet
GIS	geographic information system
GPO	Geophysical Prove-Out
GPS	Global Positioning System
GSV	geophysical system verification
H&S	health and safety
HE	high explosive
HFD	hazardous fragment distance
ISO	industry standard object

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

IT	information technology
IVS	instrument verification strip
MAMMS	Multiple Award Military Munitions Services
MD	munitions debris
MDAS	materials documented as safe
MDEH	material documented as an explosive hazard
MEC	munitions and explosives of concern
MGFD	munition with the greatest fragmentation distance
mm	millimeter
MMRP	Military Munitions Response Program
mph	miles per hour
MPPEH	materials potentially presenting an explosive hazard
MQOs	measurement quality objectives
MRS	Munitions Response Site
MSD	minimum separation distance
mV	milliVolts
NAD	North American Datum
NCDC	National Climatic Data Center
NMEA	National Marine Electronics Association
NRL	Naval Research Laboratory
OE	Ordnance and Explosives
OESS	Ordnance and Explosive Safety Specialist
PAARNG	Pennsylvania Army National Guard
PADEP	Pennsylvania Department of Environmental Protection
PAO	Public Affairs Officer
PDA	personal data assistant
PGC	Pennsylvania Game Commission
PM	Project Manager
PNDI	Pennsylvania Natural Diversity Index
PNHP	Pennsylvania Natural Heritage Program
POC	point of contact
PPE	personal protective equipment
PVC	polyvinyl chloride
PWS	Performance Work Statement
QA	quality assurance
QC	quality control
QCP	quality control plan
Q-D	quantity-distance
RA	Remedial Action
RCWM	recovered chemical warfare materials
RI	remedial investigation
RMS	root mean square
RTK	Real-Time Kinematic

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

SGL	State Game Lands
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
SSHO	Safety and Health Officer
SUXOS	Senior UXO Supervisor
TM	Technical Manual
TNT	trinitrotoluene
TP	Technical Paper
TPI	three phase inspection
TPP	Technical Project Planning
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
WESTON®	Weston Solutions, Inc.
WP	Work Plan

1. INTRODUCTION

The Work Plan describes the approach for the Munitions and Explosives of Concern (MEC) Remedial Action (RA) of the Fort Indiantown Gap (FIG) Ricochet Area Munitions Response Site (MRS) (FTIG-003-R-01). The Ricochet Area MRS is located in State Game Lands (SGL) 211 in Dauphin and Lebanon Counties, Pennsylvania.

1.1 AUTHORIZATION

Weston Solutions, Inc. (WESTON[®]) is performing this work for the United States Army Corps of Engineers (USACE) – Baltimore District (CENAB), under the authority of the Multiple Award Military Munitions Services (MAMMS) Contract W912DR-09-D-0006, Delivery Order (DO) 0009. This Work Plan was prepared in accordance with the USACE Performance Work Statement (PWS) for, dated 9 January 2013, Revision 01. The Army National Guard (ARNG) is the lead agency for investigating, reporting, making cleanup decisions, and conducting cleanup actions regarding MEC at this MRS with support from Pennsylvania Army National Guard (PAARNG). In addition, technical support will be provided by CENAB.

1.2 PURPOSE AND SCOPE

As documented in the Final Record of Decision for the Ricochet Area MRS signed on May 26, 2013 (WESTON, 2013a), an RA is necessary to reduce the risk associated with MEC to human health and the environment based on the current and intended future land use. The remedies chosen to achieve the remedial response for the Ricochet Area MRS include the following:

- Focused surface and subsurface removal of MEC.
- Containment and controls.

Surface removal of MEC will be conducted in 1,334 acres of the Ricochet Area MRS. Focused subsurface MEC removals will be performed at the Cold Spring and Yellow Spring herbaceous openings located within the Ricochet Area MRS. Containment and controls will include unexploded ordnance (UXO) construction support activities for the timber harvesting activities within the Ricochet Area, specifically the construction of access roads, building of log landings, and other soil-moving activities. The UXO construction support activities are not part of this contract with WESTON. Containment and controls will be addressed under the Land Use Controls Implementation Plan (WESTON, 2013b, in preparation).

1.3 SITE DESCRIPTION

1.3.1 Site Location

The Ricochet Area (FTIG-003-R-01) MRS is located in State Game Lands (SGL) 211, Pennsylvania, which is owned by the Commonwealth of Pennsylvania and managed by the Pennsylvania Game Commission (PGC). The Ricochet Area MRS lies within East Hanover Township in Dauphin County and Cold Spring Township in Lebanon County (**Figure 1-1**). The MRS area is 3,262 acres (**Figure 1-2**).

The southern boundary of the Ricochet Area MRS abuts the FIG Military Reservation property, located in Annville, Pennsylvania, and follows the ridgeline of Second Mountain. The northern MRS boundary follows the southern facing slope of Sharp Mountain. The east and west boundaries correspond to the area documented as Restricted Airspace R5802A or as Restricted Area R5802A in the United States (U.S.) Army Garrison Safety Range Regulation (Army Regulation 385-1) for FIG (URS, 2008). This regulation describes the area as “a fall area for spent ordnance which ricochets north of Second Mountain” (U.S. Army Garrison, 1995).

1.3.2 Historical Information

In the early 1800s, the area in and around the MRS was used for coal mining and timber harvesting. In the late 1800s, mining operations declined, and recreational development (e.g., hiking, hunting, camping) increased through the early 1900s.

FIG was established in 1931 when the Commonwealth of Pennsylvania purchased approximately 18,000 acres as a military training facility for the PAARNG, with training maneuvers starting in 1933. Historical records indicate that surface danger zones extended from FIG into the current area known as the Ricochet Area MRS. The Cold Spring portion of the MRS (referred to as the Cold Spring herbaceous opening) was also used as a firing point and bivouac area.

The Ricochet Area MRS was not intentionally used as a target area for military activities conducted at FIG’s operational range areas. The presence of munitions within the Ricochet Area MRS is the result of unintentional overshots and/or ricochets from the former FIG operational ranges used from 1933 to 1998. Current FIG range designs incorporate firing angles that prevent ricochets into SGL 211.

FIG remained the Army’s responsibility until October 1998 when ARNG took control as part of the 1995 Base Realignment and Closure. FIG then became an ARNG and Army Reserve training center.

1.3.3 Munitions and Explosives of Concern

Specific UXO present at the Ricochet Area MRS include 75- and 155-millimeter (mm) high explosive (HE) projectiles and 75mm armor piercing (AP) HE projectile. Other munitions that may be present are detailed in Section 3.2.

1.4 SITE SETTING

1.4.1 Topography

The topography of the Ricochet Area MRS is that of the Valley and Ridge System (**Figure 1-3**). Inspection of a U.S. Geological Survey (USGS) Topographic Quadrangle Map (USGS, 1981) shows the study area is bounded to the north by Sharp Mountain with ridgeline elevations between 1,500 and 1,580 feet (ft) above mean sea level (amsl). Second Mountain, with ridgeline elevations between 1,200 and 1,400 ft amsl, marks the southern boundary of the MRS. Stony Creek is at an approximate elevation of 700 ft and flows from northeast to southwest in the valley between the two mountains towards the Susquehanna River.

1.4.2 Climate

The average annual temperature in this area is 51.3 degrees Fahrenheit (°F), ranging from a minimum winter mean temperature of 21 °F, to a maximum summer mean temperature of 83 °F. The average annual precipitation is 42 inches, including an average annual snowfall of 32 inches. Wind speed averages vary from 5.9 to 9.5 miles per hour (mph) from the west and northwest (World Climate, 2009; National Climatic Data Center [NCDC], 2009).

1.4.3 Geological and Soil Conditions

The Ricochet Area MRS is located within the Valley and Ridge physiographic province and for the most part underlain by Paleozoic age sedimentary rocks that have undergone extensive faulting and folding. The ridges within the Ricochet Area MRS are predominantly made up of weather-resistant rocks such as sandstone and conglomerates. The valleys between the ridges consist of the less weather-resistant rocks such as limestone and shale. The occurrence of bedrock within the valley is typically 5 to 8 ft below ground surface (bgs) (USGS, 1981).

Three major geological formations are present at the site: the Pocono Formation, Mauch Chunk Formation, and Pottsville Formation. Second Mountain is formed by the Pocono Formation, consisting of conglomerates, massive sandstone, shale, and thin lenticular coal. Underlying Sharp Mountain is the Pottsville Formation that consists of conglomerate and sandstone. The Stony Valley consists of thin sandstone, siltstone, limestone, and red shales of the Mauch Chunk Formation (U.S. Department of Agriculture [USDA], 2009).

Four major soil associations are present across the Ricochet Area MRS: Dekalb-Lehew, Calvin-Klinesville, Berks-Weikert-Bedington, and Laidig-Hazelton-Leck Kill. The soil in the area can be summarized as being generally thin and rocky. The soil on the steep slopes of the mountains consists mostly of very stony sandy loams with channery subsoil. The valleys contain alluvial materials—from the well-drained stony sandy loams on the foot slope to shaley silt loams found along the streams (USDA, 2009). Based on the U.S. Department of Commerce weather map, frost lines range from 20 to 25 inches bgs.

1.4.4 Hydrology

The Stony Creek watershed is primarily within the Ricochet Area MRS and contains three major tributaries to Stony Creek: Rausch Creek, which is not in the Ricochet Area MRS; Yellow Spring in the center; and Rattling Run on the west side of the MRS. Stony Creek flows from northeast to southwest and drains into the Susquehanna River approximately 10 miles to the west of the western boundary of the Ricochet Area MRS.

1.4.5 Current and Future Site Use

The Ricochet Area MRS is located in SGL 211. Current land use includes a number of recreational activities, such as fishing, hunting, hiking, running, bicycle riding, snow shoeing, dog sledding, cross-country skiing, snowmobiling, horseback riding, Fall-Drive-Thru, and bird watching. The Horse-Shoe Trail and Appalachian National Scenic Trail are adjacent to the MRS. Non-

recreational activities within the MRS include trail, game, and forest maintenance performed by PGC employees or their contractors and organizations associated with the other trails.

The PGC plan for current and future land use includes continued recreational use, road construction and maintenance, special wildlife area management, timber management, prescribed burns, and preservation area maintenance. Regular maintenance is performed in herbaceous openings maintained for wild game such as turkey and deer. These herbaceous openings are located within the Cold Spring Firing Point area (approximately 7 acres) and an open area (approximately 4 acres) within the central portion of the MRS near Yellow Spring. The areas are prepared for planting by using agricultural tractors, plows, and disking. Intrusive depth for this work is estimated at 1 ft.

Timber harvests are also periodically conducted within SGL 211. In general, there is a timber harvest every 4 to 5 years, but the frequency or schedule can vary based on timber conditions. The locations of harvests are selected based on timber surveys/inventories to identify manageable timber and areas where potential habitat improvement projects will be completed. Following the selection of harvestable areas, timber harvests are completed in a multiple-phase process.

1.5 WORK PLAN ORGANIZATION

This Work Plan was prepared following components of the USACE Data Item Description (DID) WERS-001.01, Work Plans (USACE, 2010a). Content in the DID that is not applicable to this DO has been omitted from the Work Plan and related sections. Specifically, Sections 8 and 9 are not applicable to this project because there is no evidence to suggest that Recovered Chemical Warfare Materials (RCWMs) are present on the site. The sections and appendices are organized as follows:

- Section 1 Introduction
- Section 2 Technical Management Plan
- Section 3 Field Plan
- Section 4 Quality Control Plan
- Section 5 Explosives Management Plan
- Section 6 Environmental Protection Plan
- Section 7 Property Management Plan
- Section 8 Interim Holding Facility Siting Plan for RCWM Projects
- Section 9 Physical Security Plan for RCWM Projects
- Section 10 References

Appendices:

Appendix A Points of Contact

Appendix B Accident Prevention Plan

Appendix C Explosives Safety Submission

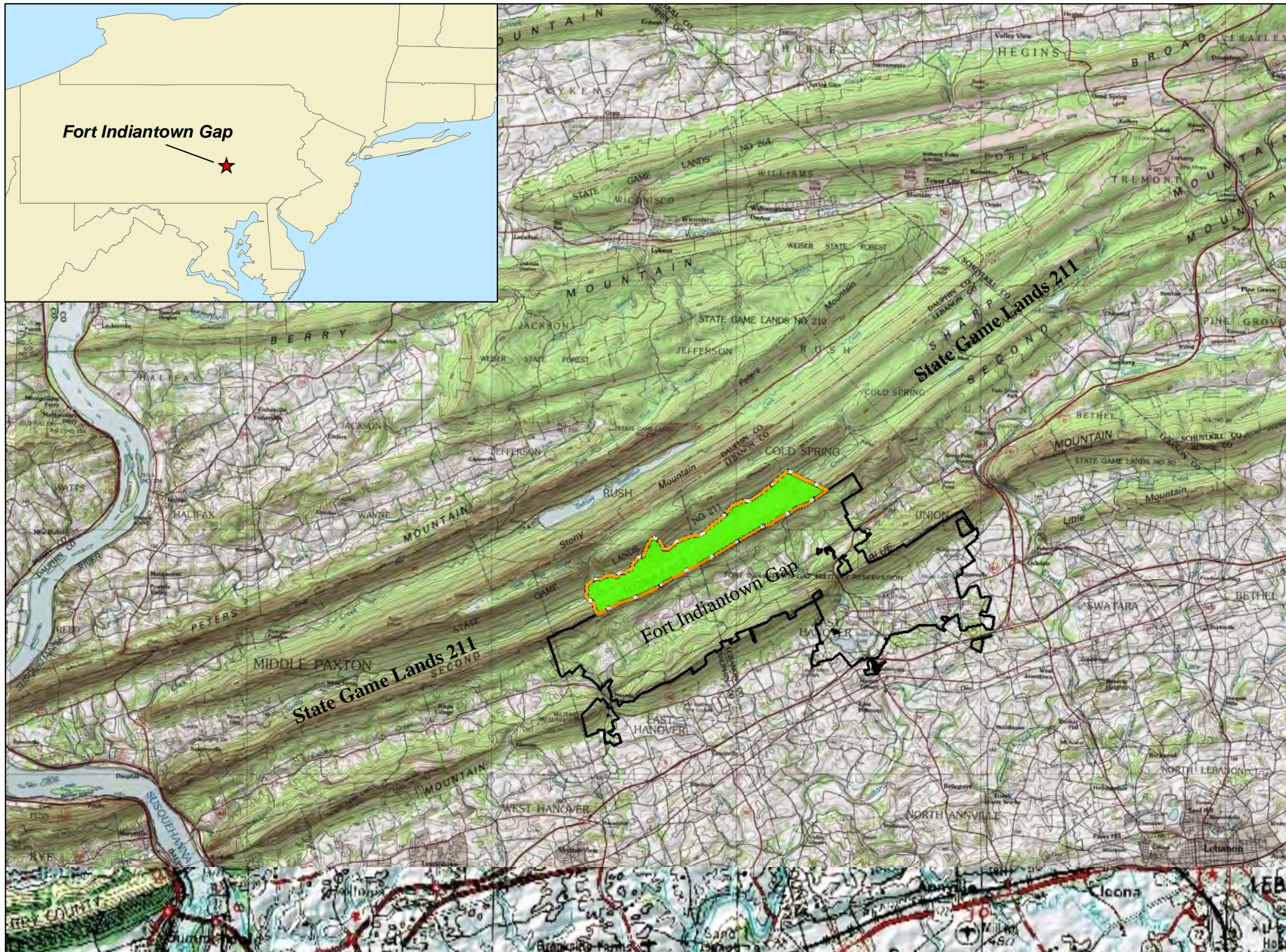
Appendix D Contractor Forms

Appendix E Demolition Operations Standard Operating Procedure (SOP)

Appendix F Fact Sheets for Species of Special Concern

Appendix G Flow Chart for Inadvertent Discovery of Cultural Remains

Appendix H PGC Special Use Permit



Legend

- FIG Installation Boundary
- █ Ricochet Area MRS Boundary

Source: PA USGS 7.5 minute Topographic Maps, 1996

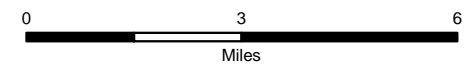
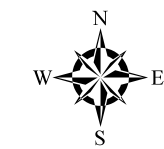
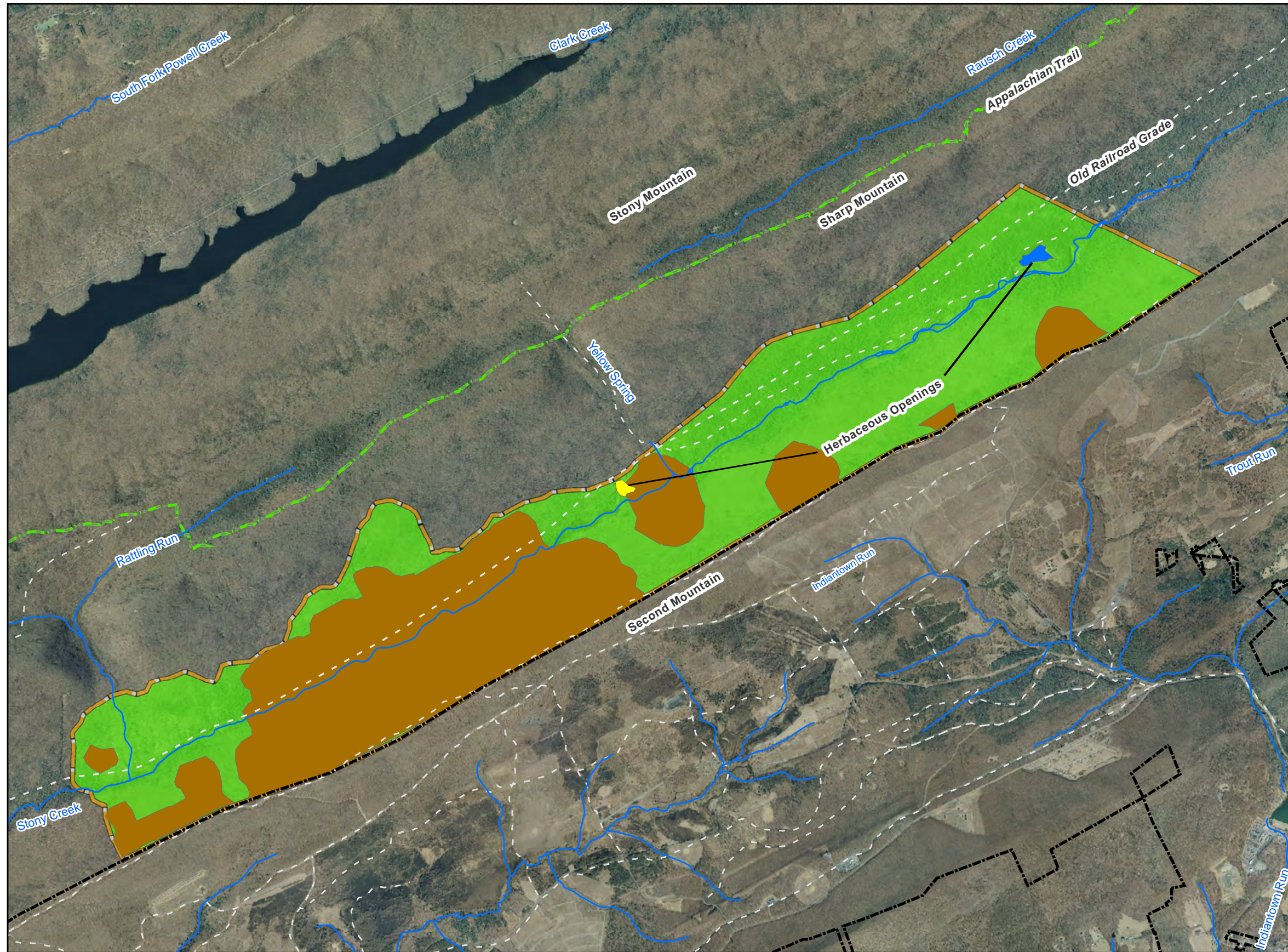


Figure 1-1
Ricochet Area and
Fort Indiantown Gap, Annville, PA



- Legend**
- FIG Installation Boundary
 - Water
 - - - Appalachian Trail
 - · - Trails
 - Ricochet Area MRS (3,262 Acres)
 - Surface Removal Action Area Boundaries
- Herbaceous Openings**
- Cold Spring
 - Yellow Spring

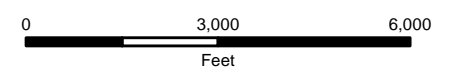


Figure 1-2
Ricochet Area MRS
State Game Lands 211, PA

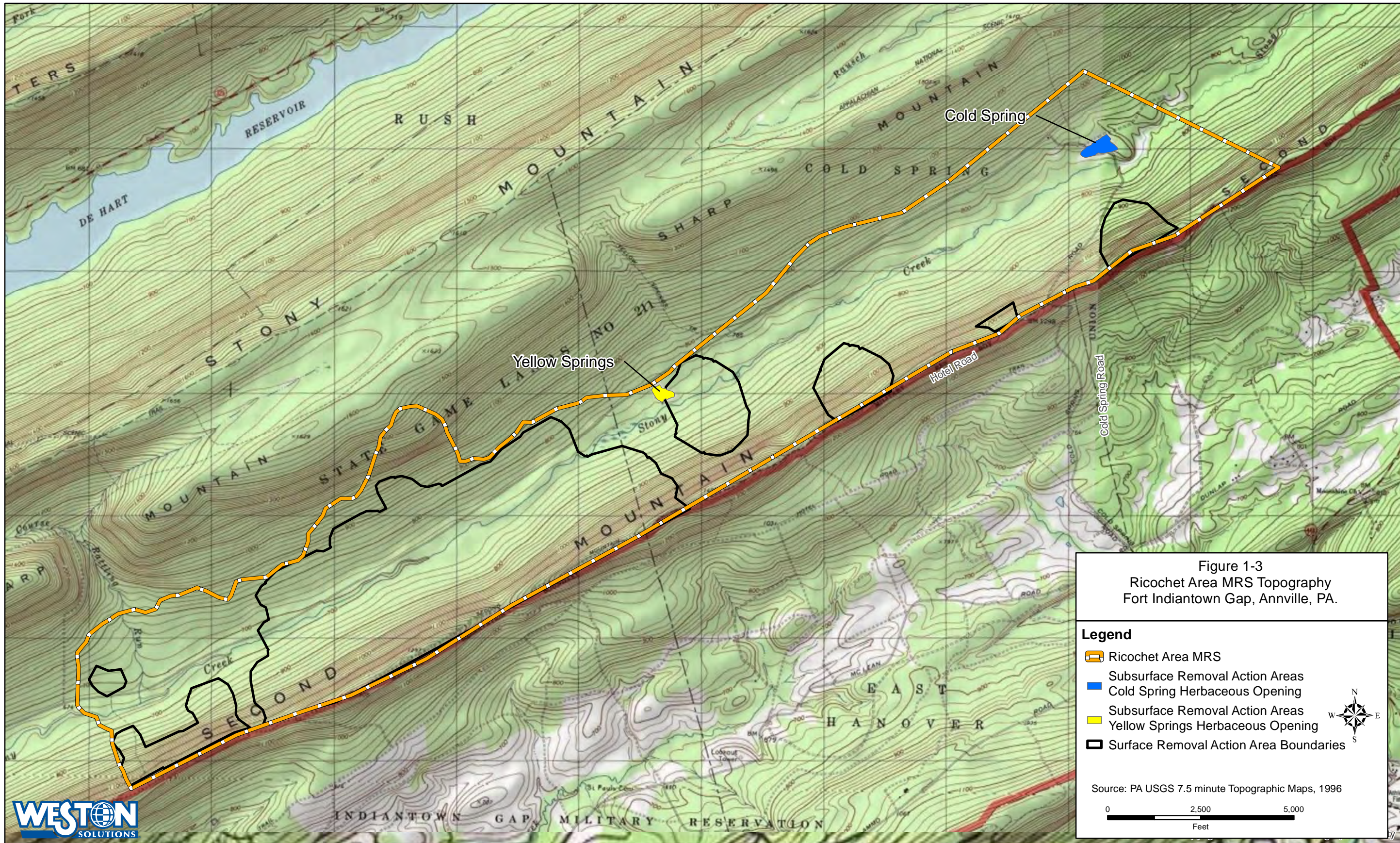




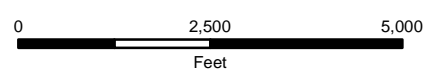


Figure 1-3
 Ricochet Area MRS Topography
 Fort Indiantown Gap, Anville, PA.

- Legend**
-  Ricochet Area MRS
 -  Subsurface Removal Action Areas
Cold Spring Herbaceous Opening
 -  Subsurface Removal Action Areas
Yellow Springs Herbaceous Opening
 -  Surface Removal Action Area Boundaries



Source: PA USGS 7.5 minute Topographic Maps, 1996



2. TECHNICAL MANAGEMENT PLAN

2.1 TECHNICAL APPROACH OVERVIEW

2.1.1 Remedial Action Objective

The objective of this RA is the removal of surface and subsurface MEC with containment and controls. The technical approach of this project involves the following:

- **Mobilization** - Includes mobilization of field staff, equipment and consumable materials to the site; setup, maintenance, and testing of equipment and facilities; familiarizing project personnel with the site; and safety requirements. See Section 3.4 for details.
- **Grid Survey Activities** - A grid system will be established before intrusive activities are conducted. See Section 3.4.3 for details.
- **Brush Clearing** - Vegetation removal will be minimized and will be conducted only when necessary to ensure personnel safety and to achieve quality removal results during operations. See Section 3.4.4 for details.
- **Surface Removal of MEC** - Removal of MEC detected over 1,334 acres of the ground surface in the Ricochet Area MRS that are either fully or partially exposed using analog detection instruments like the Schonstedt magnetometer that uses flux-gate technology. See Section 3.7.4.1 for details.
- **Subsurface Removal of MEC** - Geophysical data will be collected and evaluated to identify anomalies in the subsurface on 11 acres of the Cold Spring and Yellow Spring herbaceous openings. See Section 3.7.4.2 for details.
- **Demolition and Disposal** - Demolition actions will be initiated when MEC and material documented as an explosive hazard (MDEH) are identified in accordance with the Work Plan and Explosives Safety Submission (ESS). See Section 3.7.9 for details of demolition and disposal procedures.

2.1.2 Differing Site Conditions

WESTON will keep USACE updated regularly via daily reporting and weekly communications of site conditions. In the event extreme adverse weather conditions exist or a change in site condition is identified, WESTON will notify USACE immediately. WESTON will use the following procedures for changed or differing site conditions (DSC):

- Within 24 hours of the discovery of a DSC, the WESTON Project Manager will notify the USACE Project Manager. Within 7 days of the discovery, the WESTON Project Manager will submit a letter detailing the DSC to USACE.

- Activities that are directly related to the DSC will cease. Field personnel will continue working on other items that are within the contract's scope.
- Upon approval and direction from the Contracting Officer's Representative (COR), WESTON will schedule and execute the work related to the DSC.
- The direction and resultant actions will be formalized through an appropriate contract modification.

2.2 PROJECT ORGANIZATION

WESTON has developed an experienced project team with the technical and administrative abilities required to safely and efficiently execute this DO. Mr. John Gerhard is the WESTON Project Manager and will be responsible for WESTON's performance from project inception to completion. WESTON will coordinate directly with the CENAB point of contacts (POCs)—Mr. Wayne Davis, Project Manager; Mr. Paul Greene, Ordnance and Explosives (OE) Safety Manager; and the assigned USACE on-site Ordnance and Explosives Safety Specialist (OESS).

The following sections describe the roles and responsibilities of the project personnel shown on the organization chart (**Figure 2-1**). The project support staff also includes administrative personnel, contract administrators, cost controllers, risk assessors, technical editors, and information management specialists. Subcontractors will provide support to the project, as necessary. **Table 2-1** provides a summary of the key project personnel and lists their responsibilities. A list of contact information for project personnel is provided in **Appendix A**.

2.2.1 Site Management

The Senior UXO Supervisor (SUXOS) will serve as the Site Manager for field operations. Field operation safety and quality will be monitored by the UXO Safety Officer (UXOSO) and the UXO Quality Control Specialist (UXOQCS), respectively.

2.2.2 UXO Teams

For this project, WESTON will use a 6-man or 7-man team configuration in accordance with EM 385-1-97. UXO technicians will meet the requirements of U.S. Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18, Minimum Qualifications for Unexploded Ordnance Technicians and Personnel (DDESB, 2004).

2.3 PROJECT COMMUNICATION AND REPORTING

WESTON will share project information with the project team and stakeholders by using the secure, web-based TeamLink[®] system to facilitate electronic data-sharing/communication. TeamLink provides an organized site for all stakeholders to post and view project information; provides a means by which to track project action items; and establishes various security levels to control which team members can view, access, and/or manipulate posted information. TeamLink will provide USACE, PAARNG, ARNG, Pennsylvania Department of Environmental Protection (PADEP), PGC, and other stakeholders with direct, secure, and reliable electronic access to project-specific documents and data from anywhere they have Internet access. If

information technology (IT) security requirements present a problem, an ftp site will be used for data-sharing/communication.

2.3.1 Monthly Status Reports

WESTON will provide monthly status reports to USACE, ARNG, and PAARNG. Monthly status reports will be submitted to the COR or designee (USACE Project Manager) by the 10th of the following month and will provide summary information that includes, but is not limited to, work completed, work scheduled, technical issues, regulatory challenges/issues, issues that may hamper project schedule, and any other project-related issues raised by the stakeholders.

2.3.2 Daily and Weekly Status Reports

Progress status reports will be provided to USACE, ARNG, and PAARNG on a daily and weekly basis while conducting field work. The SUXOS/Site Manager will provide daily reports that will be posted to the FIG Ricochet Area MRS TeamLink site on the next business day. Weekly status reports will be provided electronically to the USACE Project Manager by the first work day of the following work week and will include a summary of the previous week's daily reports.

2.3.3 Phone Conferences/Informal Site Meetings

Phone conferences and informal site meetings with project team members or stakeholders will be documented through follow-up emails and summarized in the monthly status reports. Only the Contracting Officer, COR, or designee can provide official direction to WESTON.

2.3.4 Regulatory Coordination

Regulatory coordination must be approved through the COR or designee. The WESTON Project Manager will provide the necessary support to initiate, schedule, and address regulatory aspects of the project. Any informal site conversations/meetings will be documented through email and/or status reports.

2.3.5 Administrative Record/Project Documents File

WESTON will maintain and update the Administrative Record/Project Documents File located in the Annville Free Library in Annville, PA and will submit the Administrative Record/Project Documents File to the PAARNG Public Affairs Office for upload onto the project website. Updates will be made when final documents are issued under this DO.

2.4 PROJECT SCHEDULE

Changes to the project schedule are likely to occur, and updated schedules will be submitted to USACE, ARNG, and PAARNG with the monthly status reports. Updated schedules will be made available to the project team at all times. Copies of the schedules will be kept at the site trailer and posted to TeamLink.

2.5 PUBLIC INVOLVEMENT

Public involvement activities will be coordinated through the PAARNG Public Affairs Officer (PAO) and the WESTON community relations specialist. WESTON will not make available or publicly disclose any data or report generated under this contract unless specifically authorized by the COR or designee. If any person or entity requests information about the subject of this PWS or work being conducted hereunder, WESTON will refer them to the COR or designee.

WESTON will provide the necessary support to initiate, schedule, and address public participation aspects of the project (e.g., preparation of briefings, presentations, fact sheets, newsletters, and articles/public notices to news media, and notifications to Community Involvement Group [CIG] members). WESTON will request and address public comments consistent with applicable regulatory drivers. The COR, or designee, will attend and represent the National Guard at meetings with the public.

2.6 SUBCONTRACTOR MANAGEMENT

Subcontractor services that may be used for this project include UXO technicians and other supply vendors.

Table 2-1 Key Project Personnel and Responsibilities

Project Personnel	Responsibilities
Project Manager John Gerhard	<ul style="list-style-type: none"> ▪ Overall management and responsibility for the project. ▪ Primary POC and directly interacts with the CENAB Project Manager. ▪ Maintains the Project Management Plan. ▪ Ensures on time completion and approval of deliverables. ▪ Ensures implementation of project health and safety (H&S) and quality control (QC) procedures.
Senior UXO Supervisor (SUXOS) Bruce Moe	<ul style="list-style-type: none"> ▪ Primary on-site POC. Functions as Site Manager. ▪ Coordinates with OESS. ▪ Plans, coordinates, and supervises on-site activities. ▪ Implements procedures and guidance for UXO operations. ▪ Certifies materials documented as safe (MDAS) and signs Form 1348-1A. ▪ Prepares daily field report. ▪ Maintains field records for the project. ▪ Supervises multiple project teams during the performance of field activities. ▪ Provides subject matter expertise and leadership to ensure the team's safety and the project's quality.
UXO Safety Officer (UXOSO)/Site Safety and Health Officer (SSHO) Bruce Carnal	<ul style="list-style-type: none"> ▪ Coordinates with OESS. ▪ Monitors site activities for compliance with plans, procedures, and regulations relative to the H&S of project members, visitors, and land users. ▪ Monitors field activities and enforces compliance with H&S requirements as established in plans and procedures. ▪ Provides site safety training and daily safety briefing. ▪ Prepares daily field reports. ▪ Provides subject matter expertise and leadership to ensure the team's safety.
UXO Quality Control Specialist (UXOQCS) Jake McCloskey	<ul style="list-style-type: none"> ▪ POC for quality procedures pertaining to UXO operations. ▪ Coordinates with the OESS. ▪ Monitors activities affecting quality during RA activities. ▪ Performs QC to ensure that procedures are carried out in accordance with established requirements and protocols. ▪ Prepares the Daily Quality Control Report (DQCR). ▪ Provides subject matter expertise and leadership to ensure the project's quality.
UXO Technician III	<ul style="list-style-type: none"> ▪ Supervises the team to which he/she is assigned. ▪ Ensures the team's actions are accomplished safely and efficiently. ▪ Maintains field records related to the team's operations. ▪ Implements the work, safety, and quality plans for this project. ▪ Supervises the conduct of on-site evaluations related to UXO operations. ▪ Is familiar with the duties of all assigned personnel and is able to perform the functions enumerated for UXO Technicians I and II. ▪ Provides subject matter expertise and leadership to ensure the team's safety and the project's quality. <p>If assigned as Demolition Supervisor, additional responsibilities include:</p> <ul style="list-style-type: none"> ▪ Trains personnel regarding the nature of the materials, hazards, and precautions. ▪ Coordinates with the SUXOS and UXOSO to ensure required notifications are completed prior to demolition. ▪ Is present and in direct control during on-site disposal operations.
UXO Technicians II and I	<ul style="list-style-type: none"> ▪ Primary workers on-site and report directly to the UXO Technician III. ▪ Perform UXO operations, analog surveys, reacquisition, removal, and disposal operations. ▪ Will meet the qualifications of a UXO Technician I at a minimum and be under the direct supervision of a UXO Technician III.

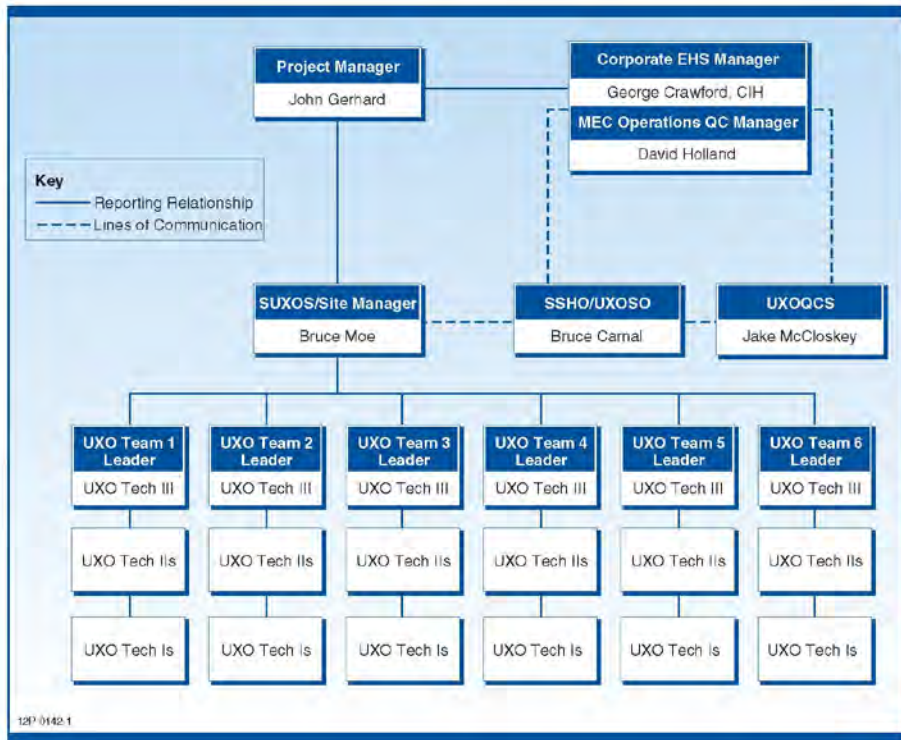


Figure 2-1 Project Organization Chart

3. FIELD PLAN

3.1 APPLICABLE GUIDANCE AND REGULATIONS

Munitions response activities will be performed in accordance with local, state, and federal regulations and will include PWS requirements. Persons engaged in the handling and transport of explosives will comply with Title 18 United States Code (U.S.C.) 842 and 29 Code of Federal Regulations (CFR) 1910.120.

Intrusive activities and demolition will be conducted in accordance with the project Accident Prevention Plan (**Appendix B**) and the government-approved ESS provided in **Appendix C**.

3.2 ANTICIPATED MEC

Based on previous investigations and removal actions, the MEC anticipated includes:

- 75mm HE projectile
- 75mm armor piercing HE
- 155mm HE projectile
- MK-2A4 primers

3.3 GEOGRAPHIC INFORMATION SYSTEM MANAGEMENT

WESTON will establish and manage a project Geographic Information System (GIS) to meet applicable federal, DOD, and Army geospatial standards. RA results, including grid progress and dig information, and UXO recovery information will be tracked using the project GIS. WESTON's TeamLink web-based file-sharing site will be used to electronically track and share project documents, results, and status maps with project team. GIS data will be created and managed in compliance with the following requirements:

- Data will adhere to all applicable federal, Department of Defense (DoD), and Army geospatial standards, and be provided in Universal Transverse Mercator (UTM), Zone 18N, and WGS84 coordinate system.
- Spatial data and metadata will conform to the Federal Geographic Data Committee National Standards for Spatial Data Accuracy.
- Data will work seamlessly with existing systems and protocols, such as Army MAPPER and Army Repository of Environmental Documents.

3.4 MOBILIZATION

This task will include mobilization of field staff; equipment (e.g., computers, detectors, vehicles) and consumable materials (e.g., flagging, stakes, spray paint, personal protective equipment [PPE]); setup, maintenance, and testing of equipment and facilities (e.g., personal data assistants [PDAs], computers, all-terrain vehicles, radios); and familiarizing project personnel with the site and with work and safety requirements.

The site management staff will provide early notification of activities to PGC SGL 211 Land Supervisor and staff, Dauphin and Lebanon County Emergency Management Agency (EMA), and the local hospital. WESTON will communicate work schedules and subsurface removal action locations with USACE and Fort Indiantown Gap range control daily. The SUXOS will attend the FIG range control morning safety briefing each day. Mobilization will be a phased approach and include:

- First phase of mobilization – Limited project personnel (i.e., site management) will set up site infrastructure, including office trailer, equipment container, lockable storage containers, supplies, and equipment.
- Second phase of mobilization – Remaining project personnel (i.e., UXO teams) to begin field operations. First with installation of grid system. Additionally the digital geophysical mapping will take place prior to other major field activities.

3.4.1 Site Office Establishment

A temporary office space will be established for this task order along Toms Town Road in the range corridor at FIG. This area will also be used to secure equipment and materials and to provide sanitary facilities and office space for WESTON and USACE personnel. Phone and Internet connections will be provided to enhance electronic communications and transmit data. In addition, WESTON personnel will coordinate with SGL 211 management to have a storage container and store project equipment on SGL 211 property if necessary.

3.4.2 Site Utilities

The Ricochet Area MRS is located in remote, heavily forested areas of SGL 211. Underground utilities are not present in these areas.

3.4.3 Grid Survey Activities and Removal Action Area Delineation

A grid system will be established across the removal action area before munitions response activities are conducted. The grid system will span each surface removal area as well as the Yellow Spring and Cold Spring herbaceous openings. The grid system is used to ensure full coverage is achieved in each removal action area and to provide UXO team navigation and results tracking during the course of the project. The grid layout includes the following three primary steps; (1) establish boundary control points, (2) grid corner location survey, and (3) removal action boundary location survey. Each step is discussed in detail below.

3.4.3.1 Establish Boundary Control Points

- Boundary control points will be placed to accurately identify the bounds of each removal action area. The boundary control points will also confirm that the surveyed boundary entirely overlaps each removal action area. The overlap will ensure full coverage of the removal action areas.
- Boundary control points will be at selected removal action area boundary locations.

- A PA-licensed professional surveyor escorted by a UXO Technician II or higher performing anomaly avoidance will establish boundary control points. Horizontal control is referenced to the UTM, North American Datum (NAD) 84, with units of U.S. Survey Feet.
- The location of each boundary control point is presented in **Figure 3-1**. A list of boundary control point coordinates is presented in **Table 3-1**. A total of 62 boundary control points will be established.
- Each boundary control point located by the surveyor will be marked by installing a 6-inch steel spike flush with the ground surface. The steel spike will allow for future relocation. The location of the steel spike will be marked by a wooden stake with fluorescent flagging. The wooden stake will have the unique boundary control point ID (see **Table 3-1**).
- If the pre-planned location of a boundary control point needs to be moved due to vegetation, terrain, or subsurface anomaly, the closest accessible removal action boundary location will be selected and the new location added to the project GIS for tracking.

3.4.3.2 Grid Corner Location Survey

- The grid system will be used to track progress and results and to ensure complete coverage is achieved during the surface and subsurface removal actions.
- The grid layout is a continuous 200-ft by 200-ft alphanumeric grid system and is shown on **Figure 3-2**. A list of grid corner coordinates is presented in **Table 3-2**.
- Grid corners associated with the surface removal areas will be reacquired using a Trimble GeoXH 6000 Global Positioning System (GPS) (or similar).
- Grid corners associated with the subsurface investigations in the herbaceous openings will be surveyed by a Trimble RTK GPS or equivalent laser total station. Corner locations will be marked using a 6-inch spike that is detectable during the digital geophysical mapping (DGM) surveys.
- Grid corner positions will be marked with a wooden stake denoted by a unique ID (see **Table 3-2**).
- The grid corner location survey team will be escorted by a UXO Technician II or higher.
- The grid corner location will then be uploaded to the project GIS.

3.4.3.3 Removal Action Boundary Location Survey

- Removal action boundary points will be placed to identify the bounds of each removal action area.
- Removal action boundary locations associated with the surface removal areas will be reacquired using a Trimble GeoXH 6000 Global Positioning System (GPS) (or similar).
- Removal action boundary locations associated with the subsurface removal areas will be reacquired using a Trimble RTK GPS or an instrument with equivalent accuracy.
- Removal action boundary locations will be marked with a wooden stake denoted by a unique ID.
- The removal action boundary survey team will be escorted by a UXO Technician II or higher.
- The removal action boundary locations will be uploaded to the project GIS.
- Pre-planned removal action boundary locations will be compared against the measured location in the project GIS to determine offsets. Measured locations will also be evaluated against boundary control points. This assessment will determine whether measured boundaries completely overlap the removal action area boundaries.
- If measured boundaries do not overlap with removal action boundaries, removal action boundary locations will be adjusted to ensure that 100% coverage of the removal action area is achieved.

3.4.4 Brush Clearing

Brush clearing will be conducted within the investigation areas as necessary to perform surface removal grids and DGM activities. Minimal vegetation will be removed to facilitate the surface removal and geophysical activities. There are no plans to remove any trees; however, no trees larger than 4 inches will be removed unless specifically approved by PGC in accordance with the Special Use Permit (see Section 6.3.1). The goal is to collect the necessary data without significant impact to the surrounding environment. Natural debris (i.e., fallen trees) that will interfere with activities will be cut and moved from the areas to be cleared as necessary. Brush clearing will be conducted immediately following the grid survey activities. A UXO Technician II or higher will escort the brush clearing crew. All areas designated for brush clearance will be approved by ARNG, PAARNG, and USACE prior to any clearing activities.

3.5 GEOPHYSICAL INVESTIGATION PLAN

The Geophysical Investigation Plan details the operating procedures and quality control (QC) protocols, as well as identifies the appropriate equipment that will be used for the investigations to be performed during the surface and subsurface removal action activities at the Ricochet Area MRS.

3.5.1 Geophysical Instrumentation

DGM and analog instruments will be used at the Ricochet Area MRS during the removal action field activities. Full coverage DGM grid surveys using the Geonics EM61-MK2 will be performed over 11 acres associated with the Cold Spring and Yellow Spring herbaceous openings. Full coverage surface removal over 1,344 acres of the Ricochet Area MRS will be performed using the Schonstedt GA-52Cx magnetic locator or similar device.

3.5.1.1 Geonics EM61-MK2

The EM61-MK2 sensor is a high resolution time-domain metal detector system manufactured by Geonics. The system transmits a time-varying electromagnetic pulse in the subsurface capable of detecting, with high spatial resolution, ferrous and non-ferrous objects. The EM61-MK2 is battery-powered, consists of air-cored coincident transmitter and receiver coils (1.0 x 0.5 meter coils), and operates at a maximum output of 10,000 milliVolts (mV). The transmitter generates a pulsed magnetic field that induces eddy currents in conductive objects within the subsurface. These currents are proportional to the conductive nature of the material below the instrument. When conductive objects are present below the instrument, the amplitude and decay time of the induced eddy currents vary in response to the size, mass, and orientation of the objects. The receiver measures the amplitude of these eddy currents at 216, 366, 660, and 1260 micro-second intervals during the decay period.

A single EM61-MK2 sensor will be hand-pulled on a wheel-mounted cart. A GPS antenna/receiver will be mounted over the center of the sensor. The receiver captures the real-time differential corrections from a fixed local base station and outputs a National Marine Electronics Association (NMEA) GGA (a code used by NMEA that provides 3D location and accuracy data from the GPS unit) message directly into the Allegro Data Logger[®] at one-second intervals. Direct interfacing between the GPS and EM61-MK2 uses a single clock and streams position information directly into the raw MK2 data file. A sampling frequency will be set at no less than 10Hz, resulting in an average sampling rate of between 3 to 4 measurements per linear foot. Measurements of the four time gates of the bottom coil will be digitally recorded and stored in memory using the Allegro Data Logger. The instrument system will be validated using a test strip, as described in Section 3.5.2.1.

3.5.1.2 Schonstedt GA-52Cx

The Schonstedt GA-52Cx magnetic locator is a hand-held unit that detects changes in the Earth's ambient magnetic field caused by ferrous metal. Two fluxgate sensors are mounted a fixed distance apart and aligned in gradiometer configuration to eliminate a response to the Earth's ambient field. The magnetic locators generate an audio output and a meter deflection when either 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. Schonstedt detectors will be used by UXO-qualified personnel for all surface removal operations, the reacquisition of DGM anomalies, and as a screening and avoidance tool. Schonstedt detectors will be checked and tested at the instrument verification strip (IVS) each day they are used. Documentation of these checks will be included in the QC log. A sample log is provided in **Appendix D**. In the event geology is causing ambient noise issues with Schonstedt magnetic locators, WESTON will use the White's XTL all-metals detectors.

3.5.1.3 White's XTL All-Metals Detector

The White's XLT all-metals detector is a hand-held, two-coil design metal detector that uses the electromagnetic method to detect ferrous and non-ferrous metals. An audible signal sounds when the sensors are swept over conductive material. The volume and frequency of the signal changes as the sensor pinpoints the center of the source body. The instrument sensitivity can be adjusted to increase or decrease the capability to detect small, metallic materials. The instrument's sensitivity will be adjusted as needed to achieve the IVS requirements.

3.5.1.4 Navigation and Positioning Systems

Several types of navigation and positioning systems will be used by the project team during the RA. The systems include:

- Trimble RTK GPS – Increases the accuracy of GPS readings by using a stationary receiver that sends real-time corrections to the rover (EM61- MK2 full coverage surveys). The RTK-GPS will be used to place grid corner locations and removal action boundary locations associated with subsurface removal areas. The RTK-GPS will also be used for anomaly reacquisition and to place IVS and grid seed items.
- Trimble Robotic Total Station – Used in the event that RTK GPS coverage is inadequate due to canopy cover.
- Trimble GeoXH 6000 GPS (or similar) – Capable of sub-meter accuracy and will be used for locating grid corner positions and removal action boundary locations associated with surface removal areas. The Trimble GeoXH 6000 GPS will also be used during surface removal activities to capture positions of MEC items discovered.

3.5.1.4.1 Local Navigation Methodology (Line and Fiducial)

Line and fiducial DGM surveying (using the Cartesian X, Y grid system) may be required in areas of inadequate GPS coverage along the boundaries/wood line around the herbaceous openings. Geo-referencing the geophysical data will be accomplished using the information recorded in a field log/notebook (e.g., start and end of line stations, lane spacing, and fiducial mark intervals) and the information digitally recorded in each geophysical survey data file. An example of line and fiducial navigation is presented in **Figure 3-3**.

The procedure for collecting geophysical data using the line and fiducial method will include the following:

- The geodetic coordinates of the grid corners will be used to geo-reference the geophysical data after data collection.
- The surveyor's tapes (or graduated static ropes) will be laid out in an east-west or north-south direction as the terrain allows, establishing the baselines. Typically, the southwestern corner of the grid surveyed is assigned a relative coordinate of 0E, 0N.
- Ropes will then be laid out between the base lines to establish survey lanes and will provide the geophysical operator with a navigation aid, allowing him or her to

traverse the line in a linear manner. This setup will allow the geophysical operator to maintain full coverage (no data gaps).

- Fiducial data markers will be inserted by the operator at intervals not to exceed 20 ft. These markers will be used to accurately locate each data measurement point during the post-processing stages.
- A 20-ft fiducial spacing will be used in grids that have an open to moderately level terrain. The Site Geophysicist will dictate a smaller fiducial interval to account for the varying terrain. This decision will be made on-site based on the field conditions and following grid placement.

The geodetic coordinates of the grid corners will be used to transform or “warp” the Cartesian coordinates and the associated geophysical data to the UTM coordinates in the post-processing step.

3.5.2 Geophysical System Verification

The geophysical system verification (GSV) approach will be used to monitor and verify analog and DGM equipment functionality during the geophysical mapping activities. The GSV approach uses an IVS and is a USACE-accepted alternative to the traditional Geophysical Prove-Out (GPO). The GSV approach capitalizes on the known performance of the geophysical sensors (Naval Research Laboratory [NRL], 2009). It provides the advantage of reallocating resources traditionally devoted to a GPO to support a simplified, yet more rigorous, verification method for geophysical system operations. In addition, it incorporates a blind seeding program to continually monitor production mapping work within the MRS. A description of the blind seeding program is provided in Section 3.5.2.2. The IVS will also be used to test analog instrumentation (Schonstedts).

3.5.2.1 Instrument Verification Strip for EM61-MK2 and Schonstedts

The objective of the IVS is to provide a means to verify that the geophysical detection system is operating properly. The IVS will be used to test both the digital and analog equipment.

- **Applicable Instrumentation:** The IVS will be used to evaluate the Geonics EM61-MK2, the Schonstedt GA-52Cx, RTK-GPS positioning, and instrument operators performing DGM and analog surveys. The seed items placed within the IVS should be observed in the geophysical data with a signal consistent with the physics-based sensor response curves developed for the EM61-MK2.
- **Location of the IVS:** The IVS will be established in an area that is near the project site and equipment storage location and that has been checked and identified as relatively clear of major anomalies. If an area free of anomalies that may interfere with the IVS cannot be found, then digging and removal of the anomaly source may be required. The specific location of the IVS will be determined at the start of field operations. The area will be large enough to accommodate the IVS design and procedures and will be consistent with the geophysical conditions of the MRS. If logistics require, more than one IVS may be established.

- **Pre-Seed Survey:** A background survey will be performed using an EM61-MK2 at the proposed IVS location. The results from the background survey will determine the suitability of the site and assist the Site Geophysicist in the placement of the seed items. Seeds will not be placed near existing anomalies. Ambient site noise will be measured and evaluated against sensor response curves to determine the detection depths of the items of interest anticipated for the MRS.
- **Seed Item Placement:** Following the pre-seed survey, the IVS will be linearly seeded with three medium industry standard objects (ISOs), one small ISO (schedule 80), and one inert item such as a 75mm. The ISO descriptions are listed in **Table 3-3**.

The seeds will be placed in the IVS and separated by at least 10 ft to prevent overlapping signals. The ISOs will be placed at horizontal orientations. The one small ISO will be placed 5.3 inches bgs. The inert 75mm and three medium ISOs will be placed 12.0 inches bgs. In addition, one large survey nail will be placed at the end of the IVS and buried vertically. Final placement will be at the discretion of the Site Geophysicist and the USACE Quality Assurance (QA) Geophysicist. **Figure 3-4** shows a diagram of the proposed IVS.

Seed locations will be surveyed using the RTK GPS or equivalent. The item parameters (i.e., the surveyed location, depth, and orientation) will be recorded and entered into the project database. The start and end points of the IVS will be marked at the surface with wood stakes and polyvinyl chloride (PVC) flags. All IVS seeds will be marked with PVC flags to ensure that the operator traverses directly over the seeds.

- **Test Strip Procedures – DGM:** A DGM survey will be performed over the IVS using the EM61-MK2. This process will be performed twice daily before and after production surveying. The data collected will then be evaluated to determine a seed item response and positioning baseline to compare against production surveys. Response values will also be monitored against the instrument response curves for the ISOs.
- **Test Strip Procedures – Analog:** Each UXO technician will traverse the IVS daily prior to starting survey work and at the completion of the work day to verify proper sensor operation. Mid-day tests will be conducted by placing one small ISO on the ground surface. The mid-day test will be used to verify proper sensor operation. If interference is suspected during certain times of the day, or instrument signals and operators notice any type of discrepancy, then the test strip should be immediately revisited to evaluate operation. The operators will tune the instruments to ensure detection of all seed items. The instruments will be swept side to side while the operator traverses over the seeded line. The SUXOS, UXOQCS, Site Geophysicist, or a designated representative will ensure that each operator clearly verifies proper sensor operation by detecting all items in the strip. Results of each test will be documented by user name and instrument identification. **Appendix D** provides the analog instrument checkout list, which will be used to document each operator's name, instrument identification, and test strip verification on a daily basis. The checkout list will be maintained in the project file located on-site, and reviewed daily by the UXOQCS to evaluate equipment and operator performance.

- **GSV Results:** The initial results of the IVS will be discussed between the WESTON Project and Site Geophysicist and the USACE QA Geophysicist. The peak responses from the IVS seed items will be plotted against their respective instrument response curves. The blind seed items will also be monitored for positional accuracy and response and compared to the IVS results. All seed item responses should plot higher than the calculated response curve for the least favorable orientation response curve. The average noise values across the unseeded test strip and the geophysical grids will be calculated and monitored during the life of the project. The GSV results will be included for the digital geophysical data packages. The IVS results will include the following:
 - As-built drawings of the IVS, including depth and orientation of seeded items.
 - Representative photographs of the surrogate ISO seed items (initial results).
 - Color plots of the DGM data.
 - Instrument response curves.
 - Seed target list showing comprehensive results.

3.5.2.2 Blind Seed Item Procedures

The objective of the blind seeding program will be to provide ongoing monitoring of the quality of the geophysical data collection and the target selection process related to the production survey for the Ricochet Area MRS. DGM survey areas within the herbaceous openings will contain an ISO seed item similar to the items used within the IVS at a frequency of 10% of the surveyed acreage or at least one ISO per dataset. The seed locations will be surveyed with RTK GPS or equivalent by the UXOQCS and a UXO technician prior to field work in the area and will be blind to the data collection teams. The depths for seeds should be such that the seed items are easily detectable, approximately 6 inches below ground surface. The location of each seed item will be marked and recorded with RespondFast-UXO Investigation (RespondFast[®]) data collection tool, and will be reported along with all other data collected at the end of the field event.

After each dataset is collected, the Project Geophysicist will overlay the locations of the blind seeds on the processed data and verify that the detection and navigation data quality objectives (DQOs) are met in the dataset. The response of each ISO will be compared in relation to the IVS results and the instrument response curves.

For analog survey areas, a small ISO will be placed on the ground surface at a rate of one seed per day or one per 3 acres. The seed locations will be surveyed with a Trimble GeoXH 6000 GPS or equivalent (sub-meter accuracy) by the UXOQCS prior to field work in the area and will be blind to the UXO teams. The location of each seed item will be marked and recorded with RespondFast[®], and will be reported along with other data collected at the end of the field event.

3.5.3 Site Utilities

There are no known utilities within the SGL 211. The Pennsylvania One Call Center for public utility notification will be contacted and appropriate procedures will be followed.

3.5.4 Manmade Features Potentially Affecting Geophysical Operations

Remnants of historic structures with cultural significance are within the Ricochet Area MRS and include:

- Bed of former Schuylkill and Susquehanna Railroad that parallels Stony Creek.
- Abandoned shafts associated with coal mining, which occurred during the 1880s; however, these areas are predominantly outside the surface removal areas.
- Old trails associated with historic lumber operations.
- Building foundations associated with the historic Cold Spring Resort.

With the exception of potential remnant metal (i.e., railroad spikes, tie plates, rail sections) in the old railroad bed, these features are not expected to impact the instrumentation.

3.5.5 Overall Site Accessibility and Impediments

The Ricochet Area MRS is located in a remote area with limited access points and is situated between two mountains: Sharp Mountain to the north and Second Mountain to the south. Cold Spring Road provides access to the Ricochet Area MRS from FIG to the south. Hotel Road is located on the ridge of Second Mountain and will provide access to most of the RA areas. One seasonal road (Old Railroad Grade) runs east to west the entire length of the Ricochet Area MRS and will provide access to the Yellow Spring herbaceous area and analog RA areas. The site is heavily forested with old growth trees and contains several streams and impediments such as steep and rocky areas, dead fall, and wetlands.

3.5.6 Measurement Quality Objectives

The geophysical performance criteria provided in **Tables 3-4** and **3-5** are based on the most recent version of Performance Requirements for RA Using DGM and Analog Methods (USACE, 2010b). The geophysical quality measurement criteria establish the specific metrics concerning the sensor performance, navigation accuracy, data density, data processing standard, and anomaly selection criteria to meet the minimum goals for the investigation. The metrics will be confirmed or appropriately adjusted based on the Technical Project Planning (TPP) process and the results of the IVS.

3.5.7 Instrument Standardization

To verify the instrument accuracy, digital geophysical survey instrumentation will be checked at the beginning and end of each workday based on the tests and frequencies identified in **Table 3-6**. Dynamic data will be collected over the IVS daily.

Additional function checks may be performed throughout the day, as the operator deems necessary. The data from each system test will be compared with the data collected on previous days. If there is a significant change in the results, the instrument will be rechecked. If the

difference in the data cannot be accounted for, the instrument will be taken out of service until repaired.

3.5.7.1 Instrument Function Checks

Prior to conducting the QC function tests, spot measurements will be taken at various locations around the proposed DGM survey area to identify the most suitable area to establish a QC station. The IVS, static background, static spike, and cable connection tests will be performed daily before and after surveying at the fixed QC station identified from the spot measurements.

The QC test statistics will be entered and saved to a database, which will be electronically submitted with each data package.

- **Static Background Test:** Performed twice daily to record background response at the “QC Stand” to determine whether drift, interference, or equipment malfunction was occurring during the day. Instrument functionality and ambient electromagnetic (EM) cultural noise are the likely sources of non-repeatable readings.
- **Static Spike Test:** Performed twice daily to record instrument response over a conductive spike item of appropriate size. The static spike test demonstrates the sensor’s sensitivity to a chosen test object, quantifies the instrument response, and documents its ability to collect stable readings.
- **Cable Connection Test:** Performed twice daily to test all cable connections. The cable connection test is used to identify mechanical and electrical problems with the EM61-MK2 instrumentation. Large anomalous spikes within the test data indicate poor connectivity between the cables and the field data logger.
- **IVS:** The IVS is used to demonstrate the EM61-MK2 instrumentation repeatability and accuracy, and to determine latency. The peak response from the IVS seed items will be plotted against their respective instrument response curves. Seed item responses should plot at or above the least favorable orientation response curve.

3.5.7.2 Corrective Measures

One of the main goals throughout the RA will be to achieve and maintain a high standard of data quality. This will be accomplished by a vigilant compilation of QC checks and QA reviews on data collection and processing procedures. Any deficiencies identified will require a corrective measure, and a root-cause analysis will be performed to document the issue, analysis, and corrective action. Such root-cause analyses will be submitted to USACE as memorandums.

3.5.8 Records Management

The data related to the DGM surveys will be managed using Geosoft™ Oasis montaj software. Spatial data will be managed using GIS, and will be stored in Environmental Systems Research Institute (ESRI)-compatible GIS file formats, primarily ArcInfo coverages and ArcView shape files.

The data will be stored in site-specific folders that indicate the individual field efforts, data type, and file extension. The DGM data will be submitted in accordance with DID WERS-004.01 (USACE, 2010c). The data will be provided electronically to the USACE QA Geophysicist on compact disc or via the WESTON TeamLink Website and will be backed up on WESTON's internal network and project workstation.

3.5.9 Digital Data Processing

3.5.9.1 Data Storage and Preliminary Processing

The digital geophysical data will be downloaded directly from the data-logger to a work station for processing. Sensor manufacturer software (NavMaker61 and Geonics DAT61) will be used to pre-process, review, and edit the data as necessary; normalize the data to the fiducial control marks; generate profile lines; and convert the DGM data to (x,y) coordinates for contouring, map generation, and interpretation.

3.5.9.2 Standard Data Analysis

The geophysical teams will provide the raw digital data, digital records, and field notes to the Project Geophysicist after the completion of the day's field activities. The digital data will be submitted in an ASCII-delimited file (XYZ) suitable for input into the Geosoft™ analysis software.

The field crews will initially process the data to correct the file names, line numbers, survey direction, start and end line locations, and grid identification. Data spikes artificially induced from cultural interference unrelated to subsurface material will be documented and removed where appropriate. The pre- and post-survey QC data will be reviewed real-time and during the data download to identify any abnormal readings.

3.5.9.3 Advanced Data Processing, Corrections, Digital Filtering and Enhancement

Once the initial data processing procedures are complete, Geosoft's UX-Detect and QC Geophysical Mapping modules will be used to further reduce the data. The following data processes will be performed where appropriate:

- **Instrument Latency:** Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions from the IVS test. Corrections will be applied using an appropriate correction routine that accounts for instrument latency time and sensor velocity. Chevron effects should not be visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for a given MEC/materials potentially presenting an explosive hazard (MPPEH) item.
- **Instrument Drift Correction:** A drift correction process will be applied to the EM61-MK2 geophysical data to remove any unwanted signal indicative of instrument drift.

In addition to the standard geophysical data processing procedures, the following statistics will be calculated for each dataset to ensure that the data collection is meeting measurement quality objectives (MQOs).

- **Background Noise:** The standard deviation will be calculated in areas free of anomalous responses to identify the background noise levels.
- **Along-Track Sampling:** The along-track sampling will be evaluated with respect to the mean speed. For the EM61-MK2, the average along-track sampling will not exceed 0.6 ft between the data points. It is anticipated that the along-track sampling will average approximately 0.35 ft based on the sampling frequency.
- **Across-Track Sampling:** The across-track sampling for the EM61-MK2 grid survey will not exceed 2.0 ft. Minor data gaps may occur if obstructions exist in the DGM grid. The data gaps due to obstructions will be excluded from this metric; however, data gaps will be cumulatively tracked.

3.5.9.4 Preliminary Anomaly Selection Criteria

The Project Geophysicist will use the UX-Detect Blakely Test to perform preliminary anomaly selection from DGM data.

The target picks will be compiled into a dig sheet through an anomaly selection process. The Geosoft™ Oasis montaj UX-Detect software will be used as the DGM processing platform. The anomaly selection process will involve the following steps:

- Initial target selection - An initial cut-off threshold value will be established based on the IVS results. The cut-off threshold value will be determined by evaluating instrument response curves and noise. Targets will include all signals above 5 to 7 times the root mean square (RMS) noise. The WESTON and USACE Geophysicists will evaluate the feasibility of an increase or decrease to the threshold value based upon preliminary field results.
- Perform a manual review of all targets for validity:
 - Perform manual review of decay profiles for all four channels at all suspect and/or low amplitude anomalies.
 - Remove anomalies not exhibiting response characteristics of buried metallic objects from the target list. This process may be performed using a scripted routine that will find the nearest peak and compare the values for all associated channels in order to compute, identify, and flag negative time constraints.
 - Dummy out known operator and equipment-induced targets.
 - Select appropriate targets.
- Conduct a manual review of remaining data to center the anomaly response as needed.
- Add additional QA picks at/or below the cut-off threshold.

- Finalize preliminary target selection after QC check by the Project Geophysicist, create and format database, and generate preliminary target plot to run classification scheme.

All corrected geophysical data and anomaly locations will be exported to a database. Throughout the geophysical survey, the field personnel will use logbooks to record observations such as variances in the background interference/noise when collecting data, and/or note changes in the soil characteristics. Such observations will provide valuable insights during the selection of anomalies in the areas where significant variations in background interference/noise exist. The DGM coverage maps and anomaly results will be presented to the project team, including USACE for review.

3.5.9.5 Dig Sheet Development

Following the identification of the potential target anomalies from the geophysical data evaluation listed above, the anomaly locations will be digitized based on the position of the target in UTM Zone 18 NAD coordinates in U.S. Survey Feet on Target Dig Sheets (**Appendix D**). The Project Geophysicist will assign each anomaly a unique target identifier and will enter the corresponding information for the target into the database. The Dig Sheets will also include the QC target anomalies. At a minimum, the following information will be included in the database for each target anomaly:

- Unique Target ID and grid/transect ID (e.g., CS-G04-01, {Cold Spring-grid ID-target number}).
- Unique Polygon ID for the potential discarded military munitions (DMM) burial areas.
- Easting and northing position.
- Channel ID.
- Response amplitude of the peak response.

Dig lists will be generated for all anomalies, including any burial pits that may have been identified from EM61-MK2 surveys at Cold Spring or Yellow Spring. Each polygon will have a unique ID that can be input to the target list consistent with the individual anomalies. The GPS waypoints for polygon anomalies will be presented in a separate table.

3.5.9.6 Anomaly Reacquisition and Marking

Anomaly reacquisition will be performed once the geophysical and location data are processed. The selected targets will be located in the field using an RTK GPS or the Trimble Robotic Total Station. The geophysical target location will be marked with a non-metallic pin flag with the unique anomaly ID. Potential burial pits will be marked with non-metallic pin flags with GPS waypoint information and placed along the perimeter of the potential pit. A UXO technician will refine the location prior to excavation using the peak response detected by the handheld all-metals detector. Offsets between the reacquired location and the excavated location will be

entered into the database. In the event that the Schonstedt is unable to resolve the DGM anomaly location, the EM61-MK2 may be used in this situation.

3.5.9.7 Anomaly Excavation and Reporting

The project team lead will maintain records of all material recovered on the project. These records will be kept using the RespondFast electronic data entry program on a hand-held PDA. The data entered into the PDA will be transferred to a computer and project database each day and subsequently loaded into the project GIS so that all anomaly information is contained in the project GIS.

3.5.9.8 Feedback Process

The Senior Geophysicist or his designee will review the RespondFast database to assess whether the physical characteristics of the item(s) found are consistent or appropriate relative to the size and amplitude of the detected geophysical anomaly.

If it is determined that the item was likely not the entire source of the anomaly, the anomaly location will be reinvestigated using the same instrument as during the initial survey. Anomalies of this type will be tracked separately in the database in the event that future analysis is required. In addition, the information derived from the feedback process of comparing the dig results to the predicted results will be continually evaluated to identify the improvements that can be incorporated into the anomaly selection process.

The measured response values will be compared only with the excavated item characteristics. The UXO team will confirm that a reduction in signal exists with the hand-held instrumentation used during the anomaly investigation.

3.6 GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

WESTON will be performing location survey activities at the Ricochet Area MRS. All boundary control points will be provided by a contracted Pennsylvania-licensed surveyor. The RTK GPS will be used to mark the location of each of the survey grid corners intended for DGM in herbaceous openings. The Trimble GeoXH 6000 GPS, or equivalent, will be used to locate grid corners in the surface removal areas. The Ricochet Area MRS will have a numeric grid system (see **Figure 3-2**) that will be established in GIS to provide control and reference for mapping and excavation activities. If large cultural features are observed in a grid location, the location of the features will be recorded. Data related to the DGM and analog surveys will be managed in WESTON's central database, RespondFast. Spatial data will be managed using GIS, and will be stored in ESRI-compatible GIS file formats, primarily ArcInfo coverages and ArcView shape files. The data will be stored in site-specific folders that indicate the individual field efforts, data type, and file extension. All data will be referenced to the UTM Zone 18 projection, NAD 84 datum, with units of U.S. Survey Feet.

3.6.1 Geographic Information System Incorporation

MEC surface and subsurface removal action results will be referenced to the geographic coordinates and grid where the item was recovered. File names for the electromagnetic data will be referenced to the grid in which the data were collected. MRS information will be logged using

WESTON's RespondFast – UXO Investigation field data software for seamless integration into a GIS database.

3.6.2 Plotting

The X/Y locations and the descriptions of all MEC, MPPEH, munitions debris (MD), discarded military munitions (DMM), and non-MD items identified during the course of the RA will be recorded electronically on a field computer. All locations will be compiled, tracked, and plotted in a GIS database. In addition to the MEC, MPPEH locations, grid corners, and inaccessible areas will be stored in the GIS database. Maps will be generated on a weekly basis to track results. The information overlaid on the base maps will include, at a minimum, a point referencing the location of the MEC or MPPEH and the grid ID. Because of the extensive number of points anticipated, all other data (such as northing, easting, anomaly ID, anomaly description, depth) will be recorded in the Dig Sheet (**Appendix D**) and stored in a database for retrieval at a later date.

3.6.3 Mapping

The GIS data are being stored and managed using ESRI ArcGIS software, and are spatially referenced to the UTM Zone 18 projection, NAD 84, and U.S. Survey Feet units. Metadata are created for all GIS layers managed by WESTON on this project, and conform to Federal Geographic Data Committee metadata standards.

3.6.4 Electronic Submittal

At the close of the project, the DGM data will be submitted in accordance to DID WERS-004.01 (USACE, 2010c). The GIS data will be submitted in non-proprietary Spatial Data Transfer Standard format, as well as in the proprietary format used for the execution of the project, specifically AutoCAD 2000 and ESRI ArcGIS geodatabases. The final DGM data will be submitted in accordance with DID WERS-004.01 (USACE, 2010c) in electronic format on digital video disk. The daily or weekly submittals will be performed via the TeamLink project website. The pertinent in-progress and field GIS data, design drawings, survey data, relational databases, and other related data will be made available online to the government on the project's TeamLink website. The formal GIS data submittals will be made on PC-compatible compact disk. Each submittal will be accompanied by a freeware viewer application appropriate for reviewing the proprietary formatted GIS data (e.g., ArcExplorer for ESRI format geodatabases). Instructions will be included with each submittal for loading the data and the viewer application. No other additional software is required, and no data modification is required for viewing the submittal.

3.7 SURFACE AND SUBSURFACE REMOVAL OPERATIONS

3.7.1 Accountability and Records Management for Munitions and Explosives of Concern

WESTON will maintain records of all items recovered on the project. These records will be kept using an electronic data entry program on a hand-held PDA. The software program is WESTON's RespondFast – UXO Investigation, which has modules for surface and subsurface

recoveries. Data kept are in accordance with the data requirements specified in DID WERS-004.01 (USACE, 2010c). Data entered into the PDA will be transferred to a computer and the project database each day and subsequently loaded into the project GIS so that all anomaly information is contained in the project GIS.

3.7.2 UXO Personnel Qualifications

Roles and responsibilities of key personnel are provided in **Table 2-1**. All UXO personnel will meet or exceed the requirements of DDESB TP 18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel (DDESB, 2004), for their respective project function. The UXOSO/QCS will review and approve all UXO personnel resumes and certifications prior to performing work.

3.7.3 Removal Action Area Description

Surface removal of MEC will be conducted only in a focused area limited to the portions of the MRS with MEC/MD densities greater than 0.5 surface items per acre (**Figure 3-5**). This area is estimated to be 1,334 acres of the Ricochet Area MRS. In addition, all trails running through the MRS will have a surface removal completed. A focused subsurface MEC removal to detection depth will be performed at the herbaceous openings located within the Ricochet Area MRS (see **Figure 3-6**). The subsurface removal area is estimated to be 11 acres.

3.7.4 Removal Action Procedures

3.7.4.1 Surface Removal Action Procedures

Focused surface removal of MEC includes removal of MEC detected at ground surface either fully exposed or partially exposed using analog detection instruments like the Schonstedt magnetometer that uses flux-gate technology. Leaf litter and detritus will be removed down to the ground surface to investigate anomalies detected. If a detected anomaly is not exposed or partially exposed after moving leaf litter and detritus down to ground surface, investigation of the detected anomaly will cease and UXO personnel will continue with surface removal activities.

A 6-man or 7-man UXO team, led by a UXO Technician III, will methodically clear each grid using a method that will provide an overlap of individual lanes. The team members will sweep the grid and mark their progress to ensure there is overlap. The team leader will ensure that 100% coverage is achieved. Upon detection of an anomaly as evidenced by an audible signal and visual confirmation of either a fully or partially exposed item, the UXO technician will investigate the anomaly.

It is anticipated that minimal brush clearing will be required to facilitate surface removal activities. Based on WESTON's experience at the MRS, equipment operators will be able to extend their metal detectors under and around trees and brush to achieve full coverage surveys. This method has been deemed acceptable on previous removal actions at the Tobyhanna Artillery Range Formerly Used Defense Site. If necessary, UXO technicians will thin areas of dense vegetation using hand tools to gain access. Natural debris (e.g., fallen trees) that prohibit the detection of surface material will be cut and moved as necessary to gain access. Sensitive

habitat and cultural features or obstructions that are observed during the operations will be logged by the UXO teams and presented on the grid maps.

The grid layout is a continuous 200-ft by 200-ft numeric grid system with wooden stakes installed at grid corners. The grid boundaries will be established prior to performing surface removal activities. Surface removal surveys will be performed using a Schonstedt GA-52cX following daily QC testing. The following grid survey approach will be performed by the UXO team:

- UXO technicians will travel along individual search lanes spaced 5 ft apart (a maximum of 2.5 ft to each side of sweep personnel).
- A Schonstedt GA-52cX will be used to detect anomalies in a manner to ensure complete coverage within the 5-ft-wide lane for each instrument operator.
- Each lane will be surveyed to achieve complete coverage within the established grid boundaries.
- Visual observations will also be made by the team and recorded in RespondFast as each transect is traversed.
- Leaf litter and detritus will be removed to the ground surface to investigate items. If a metallic item is observed, the UXO technician will investigate the item and remove it. Non-munitions-related debris not movable or too numerous in quantity (i.e., abandoned vehicles, rail sections, trash piles) will be left in place but inspected for MEC and MD by UXO technicians.
- Investigation results will be documented in RespondFast.
- The item location will be recorded using a GPS and transferred to the project GIS.
- Inaccessible areas within grids will be noted in RespondFast.

3.7.4.2 Subsurface Removal Action Procedures

A focused subsurface MEC removal to detection depth will be performed at the herbaceous openings located within the Ricochet Area MRS. This component includes the removal of MEC detected on the ground surface and to detection depth using DGM instrumentation like the EM61-MK2 that uses Time-Domain Electromagnetic Induction technology. The EM61-MK2 sensor can typically detect the type of MEC anticipated to be encountered at the Ricochet Area MRS from 4 inches to 67 inches bgs. The depth of detection is highly dependent upon site-specific conditions, including munitions item type and size, geology, and overall geophysical conditions.

It is anticipated that minimal brush clearing will be required to facilitate subsurface removal activities. If necessary, brush clearing will be conducted. Sensitive habitat and cultural features or obstructions that are observed during the operations will be logged by the geophysical team and presented on the DGM grid maps for evaluation during the target selection process.

Anomaly reacquisition will be performed once the grid digital geophysical data are processed and approved. The following anomaly reacquisition and investigation approach will be performed by the UXO team:

- The selected DGM anomalies will be located in the field using an RTK GPS or equivalent.
- The anomaly location will be marked using a non-metallic pin flag with the unique anomaly ID.
- Multiple pin flags will be used to mark the boundary of potential burial pits.
- A UXO technician will use a Schonstedt GA-52cX to pinpoint the anomaly, and the location will be investigated to determine the anomaly source.
- Intrusive investigation results will be documented in RespondFast. Offsets between the reacquired location and the actual item location will also be entered into RespondFast.
- An EM61-MK2 will be used in the event that the Schonstedt GA-52cX is unable to resolve the DGM anomaly location.

3.7.5 Munition with the Greatest Fragmentation Distance

The 155mm M107 HE projectile with trinitrotoluene (TNT) filler is the munition with the greatest fragmentation distance (MGFD). The maximum fragment distance of this projectile is 2,894 ft. However, if a munition with a greater fragmentation distance is encountered during operations, then the USACE representative will be notified to determine new quantity-distance (Q-D) arcs in accordance with DDESB TP 16 (DDESB, 2012). Operations will continue, and an amendment to the ESS will be promptly submitted by USACE for DDESB approval.

3.7.6 Minimum Separation Distances

The minimum separation distance (MSD) for the MRS is designated in the project ESS. Anomalies will be investigated by UXO teams only when an exclusion zone has been established around the anomaly location. The exclusion zone is based on the MGFD (see **Table 3-7**). The hazardous fragment distance (HFD) for the MGFD will be used as the exclusion zone distance. No intrusive work will be performed until non-essential personnel are separated from the anomaly location by the HFD.

The exclusion zone will be maintained by the UXO team until the excavation is complete. If an area cannot be blocked, spotters will alert the UXO team when non-essential personnel need to enter the exclusion zone. In this case, intrusive operations will be discontinued until the non-essential personnel leave the area.

3.7.7 MEC Removal

The following investigation procedures will be used when investigating anomalies:

- The item will be considered MEC or MPPEH until it is identified. The appropriate exclusion zone (**Table 3-7**) for the MRS will be maintained during excavation.
- For surface anomalies, leaf litter and detritus will be removed down to the ground surface to investigate items. If a detected anomaly is not exposed or partially exposed after moving leaf litter and detritus down to ground surface, investigation of the detected anomaly will cease and UXO personnel will continue with surface removal activities.
- For subsurface anomalies, excavation will commence adjacent to the anomaly and will continue until the depth of the anomaly has been reached.
- Excavations will be continually checked using a Schonstedt GA-52cX to avoid direct contact with the item.
- The sidewall of excavations will then be expanded to expose the item for inspection and identification.
- Earthmoving equipment (mini-excavator) may be used when the depth of the item cannot be managed by manual excavation. Excavations will be performed in shallow lifts while UXO technicians perform anomaly avoidance procedures. Mechanical excavations will be used only until the excavation is within 12 inches from the item. Manual excavations will be used to remove the remaining soil cover.
- The item will be identified only when two qualified UXO technicians have performed an inspection. Field activities at the investigation location will stop when MEC or MPPEH is identified. The item will be marked with pin flags or flagging and the disposal of the item will be coordinated and scheduled for later that same day. If the item is not disposed of that day, the item will be guarded until disposal can be scheduled and performed.
- If the subsurface contact proves to be MD or non-munitions related, the item will be removed and the hole rechecked with a Schonstedt GA-52cX.
- When the anomaly has been resolved or the hole is deemed “clear” of additional metallic material, the excavation will be refilled and tamped. Restoration procedures are provided in Section 3.8.

If an item is discovered to be at depths below 4 ft, the UXO team will conspicuously mark the location with flagging and continue to the next anomaly. The item greater than 4 ft will be reported to the SUXOS for documentation, and the Ordnance and Explosive Safety Specialist (OESS) and project team will be notified to determine appropriate future actions.

3.7.8 MEC Storage

No MEC will be stored.

3.7.9 MEC Demolition and Disposal

WESTON will conduct the demolition activities on an as-needed basis and in accordance with the ESS (**Appendix C**) and the Demolition Operating Procedure (**Appendix E**). The demolition activities will follow the requirements of Technical Manual (TM) 60A-1-1-31 (USACE, 1994); EM 385-1-97, Explosives Safety and Health Requirements (USACE, 2013); and applicable ATF, federal, state, and local regulations.

MEC and MPPEH will be disposed of in one of three ways: (1) blown-in-place (BIP) (2) transported to a safe area within the MRS to be destroyed, or (3) Explosive Ordnance Disposal (EOD) will respond.

Demil by explosive demolition of any item will not occur until it has been positively identified. The SUXOS or designee will notify the USACE OESS, PAARNG Safety Officer, and FIG Range Control who may request EOD support if the following scenarios are encountered during the course of this project:

- MEC cannot be identified as a conventional explosive.
- The fuze cannot be identified by type or function.
- Chemical warfare materiel is suspected.

MEC and MPPEH that is not acceptable to move will be BIP within the MRS. MEC and MPPEH that is deemed acceptable to move by the SUXOS and UXOSO, the item will be relocated to the most advantageous area or the area that will minimize impacts within the MRS. WESTON will coordinate with USACE and local authorities prior to demolition activities. The demolition activities will not commence until all parties on the notification roster have been informed. The Demolition Notification Roster is provided in **Table 3-8**.

The designated demolition supervisor will possess a Pennsylvania Blaster's License and will be responsible for all aspects of conducting demolition operations. A minimum of three UXO-qualified personnel, one of whom will be the Team Leader, will conduct demolition operations.

Detonations will be scheduled by the SUXOS in conjunction with the USACE OESS on the basis of the weather and logistical considerations. Prevailing weather condition information will be obtained from a reliable source. These data will be logged before each on-site detonation. The demolition charges will not be primed or connected for electrical firing during the approach or presence of a thunderstorm. Other weather conditions (high winds, dust storms, temperature inversions, low altitude clouds, or cloud coverage of more than 50%) may adversely impact planned demolition operations. The SUXOS will consider these conditions when determining whether or not to conduct demolition operations. If the weather conditions preclude the detonation, WESTON personnel will secure and cover the item with sandbags and properly mark the area, until favorable conditions allow the demolition. The personnel will remain at the MRS as long as the possibility of fire exists as the result of a demolition operation.

The control of the demolition site must be maintained during the demolition operations. Non-essential personnel, including all residents or workers within the MSD, must evacuate to a safe area. The access roads entering the detonation area will be blocked during the explosive disposal operations to ensure that unsuspecting individuals are not placed in jeopardy by the explosion.

The UXOSO and Demolition Team Leader will ensure that the area is clear of unauthorized personnel and equipment prior to permitting the attachment of the initiation devices to the priming charge. The control of the initiation devices will remain with the Demolition Team Leader until attachment to the firing circuit. An observer will be stationed where there is a good view of the approaches to the demolition site. It will be the responsibility of the observer to notify the Team Leader to suspend firing if a vehicle or person is seen approaching the general demolition site.

The demolition materials will be accounted for by the demolition team at all times. Only the estimated amount needed to complete the day's demolition operations will be transported to the work area.

Sandbag mitigation may be used for intentional detonations as delineated in the Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions, HNC-ED-CS-S-98-7 (Army, 1998) and Amendment 1 dated February 2011, EM-CX safety advisory dated 7 November 2011, and DDESB Memo of November 29, 2010 Clarifications Regarding Use of Sandbags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions (DDESB, 2010). This engineering control may be applied to mitigate fragmentation and blast hazards to the MSD identified in TP 16 for the item being destroyed. A copy of HNC-ED-CS-S-98-7, Amendment 1, and the DDESB Memo will be available on-site if this engineering control is applied. Only one MEC item will be destroyed at a time using this technique.

The unique demolition sites will be photographed with a digital camera prior to and after firing of the shot, and the photograph(s) will be saved electronically for the Site Specific Final Report. At a minimum after each detonation, the detonation points and general demolition site will be inspected to ensure that a misfire, low order, or kick-out has not occurred. The area where demolition operations are being conducted will remain secured until the SUXOS, in consultation with the USACE OESS and UXOSO, gives the "all clear."

In the event of a fire or unplanned explosion, site personnel will be responsible for extinguishing the fire. If they are unable to do so, they will notify the FIG Range Control Fire Desk and evacuate the area. **NOTE: Do not attempt to fight explosive fires.**

3.7.10 Material Potentially Presenting an Explosive Hazard

WESTON UXO technicians will classify recovered items as MPPEH, MD, UXO, or DMM. WESTON UXO technicians will inspect MPPEH to determine whether it is material documented as an explosive hazard (MDEH) or material documented as safe (MDAS). UXO, DMM, and MDEH will be disposed of by detonation using the standard demolition procedures outlined in TM 60A-1-1-31 (USACE, 1994) and the Demolition SOP in **Appendix E**.

WESTON ensures that the materials are inspected on the exterior and interior surfaces to be certain that these items do not present an explosive hazard. WESTON employs a four-level process for the inspection of MPPEH.

1. 100% inspection and 100% re-inspection by the UXO team, once by a UXO Technician II and once by the UXO Team Leader (Technician III). Both inspections will include the signatures of the UXO personnel conducting the inspections and the inspection dates.
2. Inspection by the UXOQCS during daily audits of the procedures used by UXO teams for processing MPPEH.
3. The UXOQCS ensures the procedures and responsibilities for processing MPPEH for certification as MDAS are being followed and performs random checks of processed MDAS and metal debris.
4. The SUXOS/UXOQCS is responsible for ensuring the Work Plan and the QC Plan detail the specifics of the procedures to be followed to process MPPEH. The SUXOS will perform or witness a 100% re-inspection and sign the DD Form 1348-1A. The UXOQCS or other technically qualified personnel will perform or witness the 100% inspection or an independent QA inspection of processed material using an approved sampling method.

Cultural debris and MDAS will be transported to a secure area prior to final disposition off-site. As the material is being loaded, a UXO Technician III will perform a second inspection of the material to ensure it is segregated correctly.

When certified and verified as free of explosive hazards, the material collected during the RA will be placed in containers and sealed. Each container will be closed in a manner that requires that the seal be broken to gain access to the interior of the container. The containers will be labeled with a unique identification as follows:

- USACE/Ricochet/Weston Solutions, Inc./Container number (e.g., 0001)/Seal number.

The DD Form 1348-1A (**Appendix D**) will be used as the certification/verification documentation for MDAS. The DD Form 1348-1A will clearly show the printed names of the SUXOS and USACE OESS, organization, signature, and contractor's home office and field office phone numbers of the SUXOS. The DD Form 1348-1A will list the following:

- Basic material content.
- Estimated weight.
- Unique identification of each of the container and seal number.
- Location where the MDAS was obtained.

Pennsylvania's Department of Military and Veterans Affairs cultural resources manager will be given the opportunity to assess whether the MDAS and non-munitions related debris have a cultural resources/historical significance and may be donated to the Fort Indiantown Gap Museum or local museums. Remaining non-munitions related debris will be made available to

Community Interest Group members to give the public the opportunity to claim prior to recycling.

Certified MDAS will be transferred to a certified recycling center with the completed DD Form 1348-1A. The SUXOS will sign the Certificate as follows: *“This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, is inert and/or free of explosive hazards.”*

In accordance with 40 CFR 261.6(a)(3), scrap metal, if recycled, is not subject to Parts 262-266, or 268, 270, or 124. WESTON will recycle scrap metal generated as a result of necessary removal and will maintain records of recycling.

3.8 SITE RESTORATION

Excavation/detonation holes will be backfilled with the soils excavated from the location or additional fill as necessary.

3.9 WORK SCHEDULE

Project activities may be performed throughout the year, and intrusive operations are anticipated to run from June through September. The UXO teams will be working up to a 50-hour work week to ensure that field activities are completed on schedule.

Table 3-1 Boundary Control Points

Boundary Control Point ID	Point_x	Point_Y
A-1	1161401.6930	14690446.3551
A-2	1161663.5242	14690133.9670
A-3	1162216.8675	14690210.7969
A-4	1162264.7802	14690694.0492
A-5	1161885.0660	14690713.0049
A-6	1161586.6631	14690834.8022
B-1	1162500.4890	14687626.3171
B-10	1162048.6369	14688859.5040
B-2	1163393.1867	14688078.3553
B-3	1164639.4204	14688717.6762
B-4	1165713.9521	14689177.9810
B-5	1165310.4138	14689861.5860
B-6	1164616.0347	14690416.5721
B-7	1164011.4620	14689856.0000
B-8	1163961.3650	14689117.3365
B-9	1162902.4590	14688662.9735
C-1	1166144.2265	14689302.2318
C-10	1172106.0955	14696299.3280
C-11	1170620.5413	14695679.8279
C-12	1169167.5049	14695415.4456
C-13	1167850.5295	14694232.1399
C-14	1166581.7013	14693476.4180
C-15	1166187.1431	14692172.5098
C-16	1165725.3047	14690547.2788
C-2	1168094.9116	14689906.6699
C-3	1169857.8545	14690851.4488
C-4	1171617.6145	14691801.9974
C-5	1173369.6362	14692766.5739
C-6	1175121.6580	14693731.1504
C-7	1177518.3927	14695050.6740
C-8	1176411.8195	14696442.2841
C-9	1174189.3807	14697272.0196
D-1	1177108.2882	14696986.3660
D-12	1177078.6101	14698046.4495
D-2	1178170.1886	14696498.5953
D-3	1179031.1984	14696991.1744
D-4	1179096.6313	14697466.4713
D-5	1178821.8822	14698456.9671
D-6	1177926.4188	14699105.0580
D-7	1177044.5610	14698522.2396
E-1	1181528.3696	14697437.4386
E-2	1182228.8584	14697823.8496
E-3	1182930.7894	14698439.4671
E-4	1182571.0988	14699154.6953
E-5	1181781.2113	14699463.4788

Table 3-1 Boundary Control Points (Continued)

E-6	1181255.3895	14699174.4961
E-7	1180920.9873	14698538.5063
E-8	1181063.4394	14697866.2025
F-1	1185704.1916	14699805.0487
F-2	1186053.5105	14699999.9318
F-3	1186280.3722	14700287.1983
F-4	1186019.9423	14700474.8505
F-5	1185682.2261	14700258.9336
F-6	1185238.1394	14699940.6823
G-1	1188914.4838	14701584.5527
G-2	1189602.1533	14701994.2021
G-3	1190289.8229	14702403.8516
G-4	1189989.4373	14703057.2394
G-4	1190295.8189	14702769.4263
G-6	1189095.3531	14703326.9993
G-7	1188666.9360	14702861.4402
G-8	1188539.0226	14702028.7355

Note: Coordinates reported in WGS 1984, UTM Zone 18N, Feet.

Table 3-2 Grid Corner Coordinates

Alphanumeric Grid ID	Point_X	Point_Y
A-27	1167615.1983	14689534.1014
A-28	1167790.3206	14689630.7039
A-29	1167965.4427	14689727.3067
A-30	1168140.5650	14689823.9092
A-31	1168315.6870	14689920.5120
A-32	1168490.8094	14690017.1145
A-33	1168665.9314	14690113.7174
A-34	1168841.0534	14690210.3202
A-35	1169016.1758	14690306.9227
A-36	1169191.2978	14690403.5255
A-37	1169366.4202	14690500.1280
A-38	1169541.5422	14690596.7308
A-39	1169716.6645	14690693.3336
A-40	1169891.7866	14690789.9361
A-41	1170066.9089	14690886.5390
A-42	1170242.0309	14690983.1415
A-43	1170417.1533	14691079.7443
A-44	1170592.2753	14691176.3471
A-45	1170767.3973	14691272.9496
A-46	1170942.5197	14691369.5524
A-47	1171117.6417	14691466.1549
A-48	1171292.7641	14691562.7578
A-49	1171467.8861	14691659.3606
A-50	1171643.0085	14691755.9631
A-51	1171818.1305	14691852.5659
A-52	1171993.2528	14691949.1684
A-53	1172168.3749	14692045.7712
A-54	1172343.4972	14692142.3737
A-55	1172518.6192	14692238.9766
A-56	1172693.7413	14692335.5794
A-57	1172868.8636	14692432.1819
A-58	1173043.9856	14692528.7847
A-59	1173219.1080	14692625.3872
A-60	1173394.2300	14692721.9900
A-61	1173569.3524	14692818.5928
A-62	1173744.4744	14692915.1953
A-63	1173919.5968	14693011.7982
A-64	1174094.7188	14693108.4007
A-65	1174269.8411	14693205.0035
A-66	1174444.9632	14693301.6063
A-67	1174620.0852	14693398.2088
A-68	1174795.2075	14693494.8116
A-69	1174970.3296	14693591.4141
A-70	1175145.4519	14693688.0170
A-71	1175320.5739	14693784.6198
A-72	1175495.6963	14693881.2223
A-73	1175670.8183	14693977.8251

Table 3-2 Grid Corner Coordinates (Continued)

A-74	1175845.9407	14694074.4276
A-75	1176021.0627	14694171.0304
A-76	1176196.1850	14694267.6329
A-77	1176371.3071	14694364.2358
A-78	1176546.4291	14694460.8386
A-79	1176721.5515	14694557.4411
A-80	1176896.6735	14694654.0439
A-81	1177071.7958	14694750.6464
A-82	1177246.9179	14694847.2492
A-83	1177422.0402	14694943.8521
B-22	1166642.9847	14689226.2099
B-23	1166818.1070	14689322.8128
B-24	1166993.2290	14689419.4153
B-25	1167168.3514	14689516.0181
B-26	1167343.4734	14689612.6206
B-27	1167518.5958	14689709.2234
B-28	1167693.7178	14689805.8262
B-29	1167868.8402	14689902.4287
B-30	1168043.9622	14689999.0316
B-31	1168219.0845	14690095.6341
B-32	1168394.2066	14690192.2369
B-33	1168569.3286	14690288.8397
B-34	1168744.4509	14690385.4422
B-35	1168919.5730	14690482.0450
B-36	1169094.6953	14690578.6475
B-37	1169269.8173	14690675.2504
B-38	1169444.9397	14690771.8528
B-39	1169620.0617	14690868.4557
B-40	1169795.1841	14690965.0585
B-41	1169970.3061	14691061.6610
B-42	1170145.4284	14691158.2638
B-43	1170320.5505	14691254.8663
B-44	1170495.6725	14691351.4691
B-45	1170670.7949	14691448.0720
B-46	1170845.9169	14691544.6745
B-47	1171021.0392	14691641.2773
B-48	1171196.1613	14691737.8798
B-49	1171371.2836	14691834.4826
B-50	1171546.4056	14691931.0854
B-51	1171721.5280	14692027.6879
B-52	1171896.6500	14692124.2908
B-53	1172071.7720	14692220.8933
B-54	1172246.8944	14692317.4961
B-55	1172422.0164	14692414.0989
B-56	1172597.1388	14692510.7014
B-57	1172772.2608	14692607.3042
B-58	1172947.3831	14692703.9067
B-59	1173122.5052	14692800.5096

Table 3-2 Grid Corner Coordinates (Continued)

B-60	1173297.6275	14692897.1120
B-61	1173472.7496	14692993.7149
B-62	1173647.8719	14693090.3177
B-63	1173822.9939	14693186.9202
B-64	1173998.1160	14693283.5230
B-65	1174173.2383	14693380.1255
B-66	1174348.3603	14693476.7283
B-67	1174523.4827	14693573.3312
B-68	1174698.6047	14693669.9337
B-69	1174873.7271	14693766.5365
B-70	1175048.8491	14693863.1390
B-71	1175223.9714	14693959.7418
B-72	1175399.0935	14694056.3446
B-73	1175574.2158	14694152.9471
B-74	1175749.3378	14694249.5500
B-75	1175924.4599	14694346.1525
B-76	1176099.5822	14694442.7553
B-77	1176274.7042	14694539.3581
B-78	1176449.8266	14694635.9606
B-79	1176624.9486	14694732.5634
B-80	1176800.0710	14694829.1659
B-81	1176975.1930	14694925.7688
B-82	1177150.3154	14695022.3713
B-83	1177325.4374	14695118.9741
C-106	1181353.2476	14697340.8361
C-107	1181528.3696	14697437.4386
C-108	1181703.4916	14697534.0414
C-109	1181878.6140	14697630.6439
C-110	1182053.7360	14697727.2467
C-111	1182228.8584	14697823.8496
C-112	1182403.9804	14697920.4521
C-113	1182579.1027	14698017.0549
C-114	1182754.2248	14698113.6574
C-115	1182929.3471	14698210.2602
C-130	1185556.1795	14699659.3006
C-131	1185731.3018	14699755.9031
C-132	1185906.4238	14699852.5059
C-133	1186081.5462	14699949.1088
C-134	1186256.6682	14700045.7113
C-148	1188753.7137	14701461.9322
C-149	1188928.8358	14701558.5350
C-150	1189103.9581	14701655.1378
C-151	1189279.0801	14701751.7403
C-152	1189454.2025	14701848.3432
C-153	1189629.3245	14701944.9457
C-154	1189804.4469	14702041.5485
C-155	1189979.5689	14702138.1510
C-156	1190154.6913	14702234.7538

Table 3-2 Grid Corner Coordinates (Continued)

C-157	1190329.8133	14702331.3566
C-158	1190504.9356	14702427.9591
C-19	1166021.0154	14689111.5241
C-20	1166196.1378	14689208.1266
C-21	1166371.2598	14689304.7295
C-22	1166546.3822	14689401.3320
C-23	1166721.5042	14689497.9348
C-24	1166896.6265	14689594.5376
C-25	1167071.7486	14689691.1401
C-26	1167246.8709	14689787.7429
C-27	1167421.9930	14689884.3454
C-28	1167597.1153	14689980.9483
C-29	1167772.2373	14690077.5511
C-30	1167947.3594	14690174.1536
C-31	1168122.4817	14690270.7564
C-32	1168297.6037	14690367.3589
C-33	1168472.7261	14690463.9617
C-34	1168647.8481	14690560.5646
C-35	1168822.9705	14690657.1671
C-36	1168998.0925	14690753.7699
C-37	1169173.2148	14690850.3724
C-38	1169348.3369	14690946.9752
C-39	1169523.4592	14691043.5780
C-40	1169698.5812	14691140.1805
C-41	1169873.7033	14691236.7833
C-42	1170048.8256	14691333.3858
C-43	1170223.9476	14691429.9887
C-44	1170399.0700	14691526.5912
C-45	1170574.1920	14691623.1940
C-46	1170749.3144	14691719.7968
C-47	1170924.4364	14691816.3993
C-48	1171099.5588	14691913.0021
C-49	1171274.6808	14692009.6046
C-50	1171449.8031	14692106.2075
C-51	1171624.9252	14692202.8103
C-52	1171800.0472	14692299.4128
C-53	1171975.1695	14692396.0156
C-54	1172150.2916	14692492.6181
C-55	1172325.4139	14692589.2209
C-56	1172500.5359	14692685.8238
C-57	1172675.6583	14692782.4263
C-58	1172850.7803	14692879.0291
C-59	1173025.9027	14692975.6316
C-60	1173201.0247	14693072.2344
C-61	1173376.1471	14693168.8372
C-62	1173551.2691	14693265.4397
C-63	1173726.3911	14693362.0426
C-64	1173901.5135	14693458.6450

Table 3-2 Grid Corner Coordinates (Continued)

C-65	1174076.6355	14693555.2479
C-66	1174251.7578	14693651.8504
C-67	1174426.8799	14693748.4532
C-68	1174602.0022	14693845.0560
C-69	1174777.1242	14693941.6585
C-70	1174952.2466	14694038.2613
C-71	1175127.3686	14694134.8638
C-72	1175302.4910	14694231.4667
C-73	1175477.6130	14694328.0695
C-74	1175652.7350	14694424.6720
C-75	1175827.8574	14694521.2748
C-76	1176002.9794	14694617.8773
C-77	1176178.1018	14694714.4801
C-78	1176353.2238	14694811.0830
C-79	1176528.3461	14694907.6855
C-80	1176703.4682	14695004.2883
C-81	1176878.5905	14695100.8908
C-82	1177053.7125	14695197.4936
D-10	1164173.1910	14688320.6192
D-106	1181256.6447	14697515.9581
D-107	1181431.7668	14697612.5610
D-108	1181606.8891	14697709.1634
D-109	1181782.0111	14697805.7663
D-11	1164348.3134	14688417.2221
D-110	1181957.1335	14697902.3688
D-111	1182132.2555	14697998.9716
D-112	1182307.3779	14698095.5744
D-113	1182482.4999	14698192.1769
D-114	1182657.6223	14698288.7797
D-115	1182832.7443	14698385.3822
D-116	1183007.8663	14698481.9851
D-12	1164523.4354	14688513.8246
D-129	1185284.4546	14699737.8202
D-13	1164698.5578	14688610.4274
D-130	1185459.5770	14699834.4227
D-131	1185634.6990	14699931.0255
D-132	1185809.8213	14700027.6280
D-133	1185984.9434	14700124.2308
D-134	1186160.0657	14700220.8336
D-14	1164873.6798	14688707.0302
D-148	1188657.1109	14701637.0545
D-149	1188832.2333	14701733.6570
D-15	1165048.8022	14688803.6327
D-150	1189007.3553	14701830.2599
D-151	1189182.4776	14701926.8627
D-152	1189357.5997	14702023.4652
D-153	1189532.7220	14702120.0680
D-154	1189707.8440	14702216.6705

Table 3-2 Grid Corner Coordinates (Continued)

D-155	1189882.9664	14702313.2733
D-156	1190058.0884	14702409.8762
D-157	1190233.2105	14702506.4787
D-158	1190408.3328	14702603.0815
D-16	1165223.9242	14688900.2355
D-17	1165399.0465	14688996.8380
D-18	1165574.1686	14689093.4409
D-20	1166099.5350	14689383.2490
D-21	1166274.6573	14689479.8515
D-22	1166449.7793	14689576.4543
D-23	1166624.9017	14689673.0571
D-24	1166800.0237	14689769.6596
D-25	1166975.1461	14689866.2625
D-26	1167150.2681	14689962.8650
D-27	1167325.3905	14690059.4678
D-28	1167500.5125	14690156.0703
D-29	1167675.6345	14690252.6731
D-30	1167850.7569	14690349.2759
D-31	1168025.8789	14690445.8784
D-32	1168201.0012	14690542.4813
D-33	1168376.1233	14690639.0838
D-34	1168551.2456	14690735.6866
D-35	1168726.3676	14690832.2894
D-36	1168901.4900	14690928.8919
D-37	1169076.6120	14691025.4947
D-38	1169251.7344	14691122.0972
D-39	1169426.8564	14691218.7001
D-40	1169601.9784	14691315.3029
D-41	1169777.1008	14691411.9054
D-42	1169952.2228	14691508.5082
D-43	1170127.3452	14691605.1107
D-44	1170302.4672	14691701.7135
D-45	1170477.5895	14691798.3163
D-46	1170652.7116	14691894.9188
D-47	1170827.8339	14691991.5217
D-48	1171002.9559	14692088.1242
D-49	1171178.0783	14692184.7270
D-50	1171353.2003	14692281.3295
D-51	1171528.3223	14692377.9323
D-52	1171703.4447	14692474.5351
D-53	1171878.5667	14692571.1376
D-54	1172053.6891	14692667.7405
D-55	1172228.8111	14692764.3430
D-56	1172403.9334	14692860.9458
D-57	1172579.0555	14692957.5486
D-58	1172754.1778	14693054.1511
D-59	1172929.2998	14693150.7539
D-6	1163472.7026	14687934.2086

Table 3-2 Grid Corner Coordinates (Continued)

D-60	1173104.4219	14693247.3564
D-61	1173279.5442	14693343.9593
D-62	1173454.6663	14693440.5621
D-63	1173629.7886	14693537.1646
D-64	1173804.9106	14693633.7674
D-65	1173980.0330	14693730.3699
D-66	1174155.1550	14693826.9727
D-67	1174330.2774	14693923.5755
D-68	1174505.3994	14694020.1780
D-69	1174680.5217	14694116.7809
D-7	1163647.8246	14688030.8111
D-70	1174855.6438	14694213.3834
D-71	1175030.7658	14694309.9862
D-72	1175205.8881	14694406.5887
D-73	1175381.0102	14694503.1915
D-74	1175556.1325	14694599.7943
D-75	1175731.2545	14694696.3968
D-76	1175906.3769	14694792.9997
D-77	1176081.4989	14694889.6022
D-78	1176256.6213	14694986.2050
D-79	1176431.7433	14695082.8078
D-8	1163822.9467	14688127.4139
D-80	1176606.8657	14695179.4103
D-81	1176781.9877	14695276.0131
D-82	1176957.1097	14695372.6156
D-83	1177132.2321	14695469.2185
D-9	1163998.0690	14688224.0167
E-1	1162500.4890	14687626.3171
E-10	1164076.5886	14688495.7416
E-106	1181160.0419	14697691.0805
E-107	1181335.1643	14697787.6830
E-108	1181510.2863	14697884.2858
E-109	1181685.4086	14697980.8883
E-11	1164251.7106	14688592.3441
E-110	1181860.5307	14698077.4911
E-111	1182035.6530	14698174.0936
E-112	1182210.7751	14698270.6964
E-113	1182385.8974	14698367.2993
E-114	1182561.0194	14698463.9018
E-115	1182736.1415	14698560.5046
E-116	1182911.2638	14698657.1071
E-12	1164426.8329	14688688.9469
E-129	1185187.8623	14699912.9238
E-13	1164601.9550	14688785.5494
E-130	1185362.9741	14700009.5450
E-131	1185538.0965	14700106.1475
E-132	1185713.2185	14700202.7503
E-133	1185888.3409	14700299.3528

Table 3-2 Grid Corner Coordinates (Continued)

E-134	1186063.4629	14700395.9556
E-14	1164777.0773	14688882.1522
E-148	1188560.5084	14701812.1766
E-149	1188735.6304	14701908.7794
E-15	1164952.1993	14688978.7551
E-150	1188910.7528	14702005.3819
E-151	1189085.8748	14702101.9847
E-152	1189260.9972	14702198.5875
E-153	1189436.1192	14702295.1900
E-154	1189611.2416	14702391.7929
E-155	1189786.3636	14702488.3954
E-156	1189961.4856	14702584.9982
E-157	1190136.6080	14702681.6010
E-16	1165127.3214	14689075.3576
E-17	1165302.4437	14689171.9604
E-18	1165477.5657	14689268.5629
E-2	1162675.6110	14687722.9200
E-20	1166002.9325	14689558.3710
E-21	1166178.0545	14689654.9738
E-22	1166353.1768	14689751.5763
E-23	1166528.2989	14689848.1792
E-24	1166703.4212	14689944.7820
E-25	1166878.5433	14690041.3845
E-26	1167053.6653	14690137.9873
E-27	1167228.7876	14690234.5898
E-28	1167403.9097	14690331.1926
E-29	1167579.0320	14690427.7955
E-3	1162850.7334	14687819.5228
E-30	1167754.1540	14690524.3980
E-31	1167929.2764	14690621.0008
E-32	1168104.3984	14690717.6033
E-33	1168279.5208	14690814.2061
E-34	1168454.6428	14690910.8086
E-35	1168629.7651	14691007.4114
E-36	1168804.8872	14691104.0143
E-37	1168980.0092	14691200.6168
E-38	1169155.1315	14691297.2196
E-39	1169330.2536	14691393.8221
E-4	1163025.8554	14687916.1253
E-40	1169505.3759	14691490.4249
E-41	1169680.4979	14691587.0277
E-42	1169855.6203	14691683.6302
E-43	1170030.7423	14691780.2331
E-44	1170205.8647	14691876.8355
E-45	1170380.9867	14691973.4384
E-46	1170556.1091	14692070.0412
E-47	1170731.2311	14692166.6437
E-48	1170906.3531	14692263.2465

Table 3-2 Grid Corner Coordinates (Continued)

E-49	1171081.4755	14692359.8490
E-5	1163200.9774	14688012.7281
E-50	1171256.5975	14692456.4518
E-51	1171431.7198	14692553.0547
E-52	1171606.8419	14692649.6572
E-53	1171781.9642	14692746.2600
E-54	1171957.0862	14692842.8625
E-55	1172132.2086	14692939.4653
E-56	1172307.3306	14693036.0678
E-57	1172482.4530	14693132.6706
E-58	1172657.5750	14693229.2735
E-59	1172832.6970	14693325.8760
E-6	1163376.0998	14688109.3306
E-60	1173007.8194	14693422.4788
E-61	1173182.9414	14693519.0813
E-62	1173358.0638	14693615.6841
E-63	1173533.1858	14693712.2869
E-64	1173708.3081	14693808.8894
E-65	1173883.4302	14693905.4923
E-66	1174058.5525	14694002.0947
E-67	1174233.6745	14694098.6976
E-68	1174408.7969	14694195.3004
E-69	1174583.9189	14694291.9029
E-7	1163551.2218	14688205.9334
E-70	1174759.0409	14694388.5057
E-71	1174934.1633	14694485.1082
E-72	1175109.2853	14694581.7110
E-73	1175284.4077	14694678.3139
E-74	1175459.5297	14694774.9164
E-75	1175634.6521	14694871.5192
E-76	1175809.7741	14694968.1217
E-77	1175984.8964	14695064.7245
E-78	1176160.0185	14695161.3270
E-79	1176335.1408	14695257.9298
E-8	1163726.3442	14688302.5363
E-80	1176510.2628	14695354.5327
E-81	1176685.3849	14695451.1352
E-82	1176860.5072	14695547.7380
E-83	1177035.6292	14695644.3405
E-9	1163901.4662	14688399.1388
E-90	1178259.6448	14696319.5475
E-91	1178434.7669	14696416.1503
E-92	1178609.8892	14696512.7528
E-93	1178785.0112	14696609.3556
E-94	1178960.1333	14696705.9584
F-1	1162407.3271	14687803.3375
F-10	1163979.9857	14688670.8636
F-106	1181063.4394	14697866.2025

Table 3-2 Grid Corner Coordinates (Continued)

F-107	1181238.5614	14697962.8053
F-108	1181413.6838	14698059.4078
F-109	1181588.8058	14698156.0107
F-11	1164155.1081	14688767.4664
F-110	1181763.9282	14698252.6131
F-111	1181939.0502	14698349.2160
F-112	1182114.1722	14698445.8188
F-113	1182289.2946	14698542.4213
F-114	1182464.4166	14698639.0241
F-115	1182639.5390	14698735.6266
F-116	1182814.6610	14698832.2294
F-12	1164330.2301	14688864.0689
F-13	1164505.3525	14688960.6718
F-14	1164680.4745	14689057.2746
F-148	1188463.9056	14701987.2989
F-149	1188639.0279	14702083.9014
F-15	1164855.5965	14689153.8771
F-150	1188814.1500	14702180.5042
F-151	1188989.2723	14702277.1067
F-152	1189164.3943	14702373.7096
F-153	1189339.5164	14702470.3124
F-154	1189514.6387	14702566.9149
F-155	1189689.7608	14702663.5177
F-156	1189864.8831	14702760.1202
F-157	1190040.0051	14702856.7230
F-16	1165030.7189	14689250.4799
F-17	1165205.8409	14689347.0824
F-18	1165381.0154	14689443.5747
F-2	1162579.0085	14687898.0420
F-20	1165906.3296	14689733.4934
F-21	1166081.4520	14689830.0959
F-22	1166256.5740	14689926.6987
F-23	1166431.6964	14690023.3012
F-24	1166606.8184	14690119.9040
F-25	1166781.9404	14690216.5068
F-26	1166957.0628	14690313.1093
F-27	1167132.1848	14690409.7122
F-28	1167307.3072	14690506.3147
F-29	1167482.4292	14690602.9175
F-3	1162754.1306	14687994.6448
F-30	1167657.5515	14690699.5203
F-31	1167832.6736	14690796.1228
F-32	1168007.7959	14690892.7256
F-33	1168182.9179	14690989.3281
F-34	1168358.0403	14691085.9310
F-35	1168533.1623	14691182.5338
F-36	1168708.2843	14691279.1363
F-37	1168883.4067	14691375.7391

Table 3-2 Grid Corner Coordinates (Continued)

F-38	1169058.5287	14691472.3416
F-39	1169233.6511	14691568.9444
F-4	1162929.2526	14688091.2476
F-40	1169408.7731	14691665.5469
F-41	1169583.8955	14691762.1498
F-42	1169759.0175	14691858.7526
F-43	1169934.1398	14691955.3551
F-44	1170109.2619	14692051.9579
F-45	1170284.3842	14692148.5604
F-46	1170459.5062	14692245.1632
F-47	1170634.6283	14692341.7660
F-48	1170809.7506	14692438.3685
F-49	1170984.8726	14692534.9714
F-5	1163104.3749	14688187.8501
F-50	1171159.9950	14692631.5739
F-51	1171335.1170	14692728.1767
F-52	1171510.2394	14692824.7795
F-53	1171685.3614	14692921.3820
F-54	1171860.4837	14693017.9848
F-55	1172035.6058	14693114.5873
F-56	1172210.7278	14693211.1902
F-57	1172385.8501	14693307.7930
F-58	1172560.9722	14693404.3955
F-59	1172736.0945	14693500.9983
F-6	1163279.4970	14688284.4530
F-60	1172911.2166	14693597.6008
F-61	1173086.3389	14693694.2036
F-62	1173261.4609	14693790.8061
F-63	1173436.5833	14693887.4090
F-64	1173611.7053	14693984.0118
F-65	1173786.8277	14694080.6143
F-66	1173961.9497	14694177.2171
F-67	1174137.0717	14694273.8196
F-68	1174312.1941	14694370.4224
F-69	1174487.3161	14694467.0252
F-7	1163454.6193	14688381.0555
F-70	1174662.4384	14694563.6277
F-71	1174837.5605	14694660.2306
F-72	1175012.6828	14694756.8331
F-73	1175187.8048	14694853.4359
F-74	1175362.9272	14694950.0387
F-75	1175538.0492	14695046.6412
F-76	1175713.1716	14695143.2440
F-77	1175888.2936	14695239.8465
F-78	1176063.4156	14695336.4494
F-79	1176238.5380	14695433.0522
F-8	1163629.7413	14688477.6583
F-80	1176413.6600	14695529.6547

Table 3-2 Grid Corner Coordinates (Continued)

F-81	1176588.7824	14695626.2575
F-82	1176763.9044	14695722.8600
F-83	1176939.0267	14695819.4628
F-89	1177987.9200	14696398.0670
F-9	1163804.8637	14688574.2611
F-90	1178163.0420	14696494.6698
F-91	1178338.1617	14696591.2543
F-92	1178513.2841	14696687.8571
F-93	1178688.4061	14696784.4599
F-94	1178863.5285	14696881.0624
F-95	1179038.6528	14696977.6833
G-1	1162307.2834	14687976.5615
G-10	1163883.3832	14688845.9860
G-106	1180966.8366	14698041.3245
G-107	1181141.9589	14698137.9274
G-108	1181317.0810	14698234.5302
G-109	1181492.2033	14698331.1327
G-11	1164058.5053	14688942.5885
G-110	1181667.3254	14698427.7355
G-111	1181842.4474	14698524.3380
G-112	1182017.5697	14698620.9408
G-113	1182192.6918	14698717.5437
G-114	1182367.8141	14698814.1461
G-115	1182542.9361	14698910.7490
G-116	1182718.0585	14699007.3515
G-12	1164233.6273	14689039.1913
G-13	1164408.7496	14689135.7938
G-14	1164583.8717	14689232.3966
G-149	1188542.6351	14702258.8873
G-15	1164758.9940	14689328.9994
G-150	1188717.5475	14702355.6263
G-151	1188892.6695	14702452.2291
G-152	1189067.7915	14702548.8319
G-153	1189242.9139	14702645.4344
G-154	1189418.0359	14702742.0372
G-155	1189593.1583	14702838.6397
G-156	1189768.2803	14702935.2426
G-157	1189943.4026	14703031.8451
G-16	1164934.1160	14689425.6019
G-17	1165109.2384	14689522.2048
G-18	1165284.3604	14689618.8073
G-2	1162482.4057	14688073.1643
G-20	1165809.7271	14689908.6154
G-21	1165984.8492	14690005.2182
G-22	1166159.9712	14690101.8207
G-23	1166335.0936	14690198.4235
G-24	1166510.2156	14690295.0260
G-25	1166685.3379	14690391.6289

Table 3-2 Grid Corner Coordinates (Continued)

G-26	1166860.4600	14690488.2317
G-27	1167035.5823	14690584.8342
G-28	1167210.7043	14690681.4370
G-29	1167385.8267	14690778.0395
G-3	1162657.5277	14688169.7668
G-30	1167560.9487	14690874.6423
G-31	1167736.0711	14690971.2452
G-32	1167911.1931	14691067.8477
G-33	1168086.3151	14691164.4505
G-34	1168261.4375	14691261.0530
G-35	1168436.5595	14691357.6558
G-36	1168611.6818	14691454.2586
G-37	1168786.8039	14691550.8611
G-38	1168961.9262	14691647.4640
G-39	1169137.0482	14691744.0665
G-4	1162832.6501	14688266.3697
G-40	1169312.1706	14691840.6693
G-41	1169487.2926	14691937.2721
G-42	1169662.4150	14692033.8746
G-43	1169837.5370	14692130.4774
G-44	1170012.6590	14692227.0799
G-45	1170187.7814	14692323.6828
G-46	1170362.9034	14692420.2852
G-47	1170538.0258	14692516.8881
G-48	1170713.1478	14692613.4909
G-49	1170888.2701	14692710.0934
G-5	1163007.7721	14688362.9725
G-50	1171063.3922	14692806.6962
G-51	1171238.5145	14692903.2987
G-52	1171413.6365	14692999.9015
G-53	1171588.7589	14693096.5044
G-54	1171763.8809	14693193.1069
G-55	1171939.0029	14693289.7097
G-56	1172114.1253	14693386.3122
G-57	1172289.2473	14693482.9150
G-58	1172464.3697	14693579.5178
G-59	1172639.4917	14693676.1203
G-6	1163182.8945	14688459.5750
G-60	1172814.6141	14693772.7232
G-61	1172989.7361	14693869.3257
G-62	1173164.8584	14693965.9285
G-63	1173339.9805	14694062.5313
G-64	1173515.1028	14694159.1338
G-65	1173690.2248	14694255.7366
G-66	1173865.3469	14694352.3391
G-67	1174040.4692	14694448.9420
G-68	1174215.5912	14694545.5444
G-69	1174390.7136	14694642.1473

Table 3-2 Grid Corner Coordinates (Continued)

G-7	1163358.0165	14688556.1778
G-70	1174565.8356	14694738.7501
G-71	1174740.9580	14694835.3526
G-72	1174916.0800	14694931.9554
G-73	1175091.2024	14695028.5579
G-74	1175266.3244	14695125.1607
G-75	1175441.4467	14695221.7636
G-76	1175616.5688	14695318.3661
G-77	1175791.6908	14695414.9689
G-78	1175966.8131	14695511.5714
G-79	1176141.9352	14695608.1742
G-8	1163533.1389	14688652.7803
G-80	1176317.0575	14695704.7770
G-81	1176492.1795	14695801.3795
G-82	1176667.3019	14695897.9824
G-88	1177716.1951	14696476.5865
G-89	1177891.3244	14696573.1762
G-9	1163708.2609	14688749.3831
G-90	1178066.4369	14696669.7738
G-91	1178241.5592	14696766.3766
G-92	1178416.6813	14696862.9791
G-93	1178591.8036	14696959.5819
G-94	1178766.9256	14697056.1848
G-95	1178942.0480	14697152.7873
G-96	1179117.1723	14697249.4081
H-1	1162210.6809	14688151.6839
H-10	1163786.7804	14689021.1080
H-106	1180870.8568	14698216.7904
H-107	1181045.3561	14698313.0494
H-108	1181220.4785	14698409.6522
H-109	1181395.6005	14698506.2550
H-110	1181570.7225	14698602.8575
H-111	1181745.8449	14698699.4604
H-112	1181920.9669	14698796.0629
H-113	1182096.0893	14698892.6657
H-114	1182271.2113	14698989.2685
H-115	1182446.3336	14699085.8710
H-13	1164312.1468	14689310.9161
H-14	1164487.2692	14689407.5186
H-149	1188445.8223	14702434.1458
H-15	1164662.3912	14689504.1215
H-150	1188620.9446	14702530.7486
H-151	1188796.0667	14702627.3511
H-152	1188971.1890	14702723.9539
H-153	1189146.3111	14702820.5568
H-154	1189321.4334	14702917.1593
H-155	1189496.5554	14703013.7621
H-156	1189671.6778	14703110.3646

Table 3-2 Grid Corner Coordinates (Continued)

H-16	1164837.5135	14689600.7243
H-17	1165012.6356	14689697.3268
H-18	1165187.7579	14689793.9296
H-2	1162385.8029	14688248.2864
H-20	1165713.1243	14690083.7378
H-21	1165888.2463	14690180.3403
H-22	1166063.3687	14690276.9431
H-23	1166238.4907	14690373.5456
H-24	1166413.6131	14690470.1484
H-25	1166588.7351	14690566.7512
H-26	1166763.8575	14690663.3537
H-27	1166938.9795	14690759.9565
H-28	1167114.1018	14690856.5590
H-29	1167289.2239	14690953.1619
H-3	1162560.9252	14688344.8892
H-30	1167464.3462	14691049.7644
H-31	1167639.4682	14691146.3672
H-32	1167814.5903	14691242.9700
H-33	1167989.7126	14691339.5725
H-34	1168164.8346	14691436.1753
H-35	1168339.9570	14691532.7778
H-36	1168515.0790	14691629.3807
H-37	1168690.2014	14691725.9835
H-38	1168865.3234	14691822.5860
H-39	1169040.4458	14691919.1888
H-4	1162736.0473	14688441.4920
H-40	1169215.5678	14692015.7913
H-41	1169390.6901	14692112.3941
H-42	1169565.8122	14692208.9970
H-43	1169740.9342	14692305.5995
H-44	1169916.0565	14692402.2023
H-45	1170091.1786	14692498.8048
H-46	1170266.3009	14692595.4076
H-47	1170441.4229	14692692.0104
H-48	1170616.5453	14692788.6129
H-49	1170791.6673	14692885.2157
H-5	1162911.1696	14688538.0945
H-50	1170966.7897	14692981.8182
H-51	1171141.9117	14693078.4211
H-52	1171317.0340	14693175.0236
H-53	1171492.1561	14693271.6264
H-54	1171667.2781	14693368.2292
H-55	1171842.4004	14693464.8317
H-56	1172017.5225	14693561.4345
H-57	1172192.6448	14693658.0370
H-58	1172367.7669	14693754.6399
H-59	1172542.8892	14693851.2427
H-6	1163086.2916	14688634.6973

Table 3-2 Grid Corner Coordinates (Continued)

H-60	1172718.0112	14693947.8452
H-61	1172893.1336	14694044.4480
H-62	1173068.2556	14694141.0505
H-63	1173243.3776	14694237.6533
H-64	1173418.5000	14694334.2562
H-65	1173593.6220	14694430.8587
H-66	1173768.7444	14694527.4615
H-67	1173943.8664	14694624.0640
H-68	1174118.9887	14694720.6668
H-69	1174294.1108	14694817.2696
H-7	1163261.4140	14688731.2998
H-70	1174469.2331	14694913.8721
H-71	1174644.3551	14695010.4749
H-72	1174819.4775	14695107.0774
H-73	1174994.5995	14695203.6803
H-74	1175169.7216	14695300.2828
H-75	1175344.8439	14695396.8856
H-76	1175519.9659	14695493.4884
H-77	1175695.0883	14695590.0909
H-78	1175870.2103	14695686.6937
H-79	1176045.3327	14695783.2962
H-8	1163436.5360	14688827.9027
H-80	1176220.4547	14695879.8991
H-81	1176395.5770	14695976.5019
H-82	1176570.6991	14696073.1044
H-87	1177444.4703	14696555.1060
H-88	1177619.5923	14696651.7085
H-89	1177794.7120	14696748.2933
H-9	1163611.6584	14688924.5052
H-90	1177969.8344	14696844.8961
H-91	1178144.9564	14696941.4986
H-92	1178320.0788	14697038.1015
H-93	1178495.2008	14697134.7040
H-94	1178670.3231	14697231.3068
H-95	1178845.4452	14697327.9096
H-96	1179020.5672	14697424.5121
I-106	1180773.6313	14698391.5689
I-107	1180948.7533	14698488.1717
I-108	1181123.8757	14698584.7746
I-109	1181298.9977	14698681.3771
I-110	1181474.1200	14698777.9799
I-111	1181649.2421	14698874.5824
I-112	1181824.3644	14698971.1852
I-113	1181999.4864	14699067.7877
I-114	1182174.6088	14699164.3905
I-12	1164040.4220	14689389.4357
I-13	1164215.6145	14689486.0769
I-14	1164390.6663	14689582.6410

Table 3-2 Grid Corner Coordinates (Continued)

I-15	1164565.7887	14689679.2435
I-150	1188524.3418	14702705.8706
I-151	1188699.4642	14702802.4735
I-152	1188874.5862	14702899.0760
I-153	1189049.7086	14702995.6788
I-154	1189224.8306	14703092.2816
I-155	1189399.9529	14703188.8841
I-16	1164740.9107	14689775.8463
I-17	1164916.0331	14689872.4491
I-18	1165091.1551	14689969.0516
I-2	1162289.2004	14688423.4087
I-20	1165616.5215	14690258.8598
I-21	1165791.6438	14690355.4626
I-22	1165966.7659	14690452.0651
I-23	1166141.8882	14690548.6679
I-24	1166317.0103	14690645.2704
I-25	1166492.1326	14690741.8733
I-26	1166667.2546	14690838.4761
I-27	1166842.3770	14690935.0786
I-28	1167017.4990	14691031.6814
I-29	1167192.6210	14691128.2839
I-3	1162464.3211	14688520.0135
I-30	1167367.7434	14691224.8867
I-31	1167542.8654	14691321.4895
I-32	1167717.9878	14691418.0920
I-33	1167893.1098	14691514.6949
I-34	1168068.2321	14691611.2974
I-35	1168243.3542	14691707.9002
I-36	1168418.4765	14691804.5027
I-37	1168593.5985	14691901.1055
I-38	1168768.7209	14691997.7083
I-39	1168943.8429	14692094.3108
I-4	1162639.4448	14688616.6140
I-40	1169118.9650	14692190.9137
I-41	1169294.0873	14692287.5162
I-42	1169469.2093	14692384.1190
I-43	1169644.3317	14692480.7218
I-44	1169819.4537	14692577.3243
I-45	1169994.5761	14692673.9271
I-46	1170169.6981	14692770.5296
I-47	1170344.8204	14692867.1325
I-48	1170519.9425	14692963.7353
I-49	1170695.0648	14693060.3378
I-5	1162814.5668	14688713.2169
I-50	1170870.1868	14693156.9406
I-51	1171045.3089	14693253.5431
I-52	1171220.4312	14693350.1459
I-53	1171395.5532	14693446.7487

Table 3-2 Grid Corner Coordinates (Continued)

I-54	1171570.6756	14693543.3512
I-55	1171745.7976	14693639.9541
I-56	1171920.9200	14693736.5566
I-57	1172096.0420	14693833.1594
I-58	1172271.1644	14693929.7619
I-59	1172446.2864	14694026.3647
I-60	1172621.4087	14694122.9675
I-61	1172796.5308	14694219.5700
I-62	1172971.6528	14694316.1729
I-63	1173146.7751	14694412.7754
I-64	1173321.8972	14694509.3782
I-65	1173497.0195	14694605.9810
I-66	1173672.1415	14694702.5835
I-67	1173847.2639	14694799.1863
I-68	1174022.3859	14694895.7888
I-69	1174197.5083	14694992.3917
I-70	1174372.6303	14695088.9945
I-71	1174547.7526	14695185.5970
I-72	1174722.8747	14695282.1998
I-73	1174897.9967	14695378.8023
I-74	1175073.1191	14695475.4051
I-75	1175248.2411	14695572.0079
I-76	1175423.3634	14695668.6104
I-77	1175598.4855	14695765.2133
I-78	1175773.6078	14695861.8158
I-79	1175948.7298	14695958.4186
I-80	1176123.8522	14696055.0211
I-81	1176298.9742	14696151.6239
I-82	1176474.0966	14696248.2267
I-87	1177347.8675	14696730.2281
I-88	1177522.9872	14696826.8129
I-89	1177698.1095	14696923.4157
I-90	1177873.2316	14697020.0182
I-91	1178048.3539	14697116.6210
I-92	1178223.4759	14697213.2235
I-93	1178398.5980	14697309.8263
I-94	1178573.7203	14697406.4291
I-95	1178748.8423	14697503.0316
I-96	1178923.9670	14697599.6525
J-1	1162017.4755	14688501.9283
J-108	1181027.2728	14698759.8966
J-109	1181202.3952	14698856.4994
J-110	1181377.5172	14698953.1019
J-111	1181552.6396	14699049.7047
J-112	1181727.7616	14699146.3072
J-113	1181902.8839	14699242.9101
J-12	1163943.8195	14689564.5577
J-13	1164118.9415	14689661.1605

Table 3-2 Grid Corner Coordinates (Continued)

J-14	1164294.0638	14689757.7630
J-15	1164469.1859	14689854.3658
J-152	1188777.9837	14703074.1983
J-153	1188953.1057	14703170.8008
J-154	1189128.2281	14703267.4036
J-16	1164644.3082	14689950.9687
J-17	1164819.4302	14690047.5712
J-18	1164994.5523	14690144.1740
J-2	1162192.5976	14688598.5308
J-21	1165695.0410	14690530.5846
J-22	1165870.1634	14690627.1875
J-23	1166045.2854	14690723.7900
J-24	1166220.4078	14690820.3928
J-25	1166395.5298	14690916.9953
J-26	1166570.6521	14691013.5981
J-27	1166745.7742	14691110.2009
J-28	1166920.8962	14691206.8034
J-29	1167096.0185	14691303.4062
J-3	1162367.7199	14688695.1336
J-30	1167271.1406	14691400.0087
J-31	1167446.2629	14691496.6116
J-32	1167621.3849	14691593.2144
J-33	1167796.5073	14691689.8169
J-34	1167971.6293	14691786.4197
J-35	1168146.7517	14691883.0222
J-36	1168321.8737	14691979.6250
J-37	1168496.9961	14692076.2279
J-38	1168672.1181	14692172.8304
J-39	1168847.2401	14692269.4332
J-4	1162542.8419	14688791.7361
J-40	1169022.3625	14692366.0357
J-41	1169197.4845	14692462.6385
J-42	1169372.6068	14692559.2410
J-43	1169547.7289	14692655.8438
J-44	1169722.8512	14692752.4467
J-45	1169897.9732	14692849.0492
J-46	1170073.0956	14692945.6520
J-47	1170248.2176	14693042.2545
J-48	1170423.3400	14693138.8573
J-49	1170598.4620	14693235.4601
J-5	1162717.9643	14688888.3389
J-50	1170773.5840	14693332.0626
J-51	1170948.7064	14693428.6654
J-52	1171123.8284	14693525.2679
J-53	1171298.9507	14693621.8708
J-54	1171474.0728	14693718.4736
J-55	1171649.1951	14693815.0761
J-56	1171824.3172	14693911.6789

Table 3-2 Grid Corner Coordinates (Continued)

J-57	1171999.4395	14694008.2814
J-58	1172174.5615	14694104.8842
J-59	1172349.6836	14694201.4871
J-60	1172524.8059	14694298.0896
J-61	1172699.9279	14694394.6924
J-62	1172875.0503	14694491.2949
J-63	1173050.1723	14694587.8977
J-64	1173225.2947	14694684.5002
J-65	1173400.4167	14694781.1030
J-66	1173575.5390	14694877.7059
J-67	1173750.6611	14694974.3084
J-68	1173925.7834	14695070.9112
J-69	1174100.9054	14695167.5137
J-70	1174276.0275	14695264.1165
J-71	1174451.1498	14695360.7193
J-72	1174626.2718	14695457.3218
J-73	1174801.3942	14695553.9246
J-74	1174976.5162	14695650.5271
J-75	1175151.6386	14695747.1300
J-76	1175326.7606	14695843.7328
J-77	1175501.8830	14695940.3353
J-78	1175677.0050	14696036.9381
J-79	1175852.1273	14696133.5406
J-80	1176027.2494	14696230.1434
J-81	1176202.3714	14696326.7463
J-86	1177076.1426	14696808.7476
J-87	1177251.2646	14696905.3504
J-88	1177426.3847	14697001.9349
J-89	1177601.5067	14697098.5377
J-90	1177776.6291	14697195.1405
J-91	1177951.7511	14697291.7430
J-92	1178126.8731	14697388.3458
J-93	1178301.9955	14697484.9483
J-94	1178477.1175	14697581.5512
J-95	1178652.2398	14697678.1540
J-96	1178827.3619	14697774.7565
J-97	1179002.4842	14697871.3593
K-1	1161920.8727	14688677.0503
K-109	1181105.7924	14699031.6214
K-110	1181280.9147	14699128.2243
K-111	1181456.0367	14699224.8268
K-112	1181631.1591	14699321.4296
K-13	1164022.3390	14689836.2825
K-14	1164197.4610	14689932.8854
K-15	1164372.5830	14690029.4879
K-16	1164547.7054	14690126.0907
K-17	1164722.8274	14690222.6935
K-18	1164897.9498	14690319.2960

Table 3-2 Grid Corner Coordinates (Continued)

K-2	1162095.9951	14688773.6531
K-22	1165773.5606	14690802.3095
K-23	1165948.6829	14690898.9123
K-24	1166123.8049	14690995.5148
K-25	1166298.9270	14691092.1176
K-26	1166474.0493	14691188.7201
K-27	1166649.1713	14691285.3230
K-28	1166824.2937	14691381.9258
K-29	1166999.4157	14691478.5283
K-3	1162271.1171	14688870.2556
K-30	1167174.5381	14691575.1311
K-31	1167349.6601	14691671.7336
K-32	1167524.7824	14691768.3364
K-33	1167699.9045	14691864.9392
K-34	1167875.0268	14691961.5417
K-35	1168050.1488	14692058.1446
K-36	1168225.2709	14692154.7471
K-37	1168400.3932	14692251.3499
K-38	1168575.5153	14692347.9527
K-39	1168750.6376	14692444.5552
K-4	1162446.2391	14688966.8584
K-40	1168925.7596	14692541.1580
K-41	1169100.8820	14692637.7605
K-42	1169276.0040	14692734.3634
K-43	1169451.1264	14692830.9662
K-44	1169626.2484	14692927.5687
K-45	1169801.3707	14693024.1715
K-46	1169976.4928	14693120.7740
K-47	1170151.6148	14693217.3768
K-48	1170326.7371	14693313.9793
K-49	1170501.8592	14693410.5822
K-5	1162621.3615	14689063.4609
K-50	1170676.9815	14693507.1850
K-51	1170852.1035	14693603.7875
K-52	1171027.2259	14693700.3903
K-53	1171202.3479	14693796.9928
K-54	1171377.4703	14693893.5956
K-55	1171552.5923	14693990.1984
K-56	1171727.7147	14694086.8009
K-57	1171902.8367	14694183.4038
K-58	1172077.9587	14694280.0063
K-59	1172253.0811	14694376.6091
K-60	1172428.2031	14694473.2119
K-61	1172603.3254	14694569.8144
K-62	1172778.4475	14694666.4172
K-63	1172953.5698	14694763.0197
K-64	1173128.6918	14694859.6226
K-65	1173303.8142	14694956.2254

Table 3-2 Grid Corner Coordinates (Continued)

K-66	1173478.9362	14695052.8279
K-67	1173654.0586	14695149.4307
K-68	1173829.1806	14695246.0332
K-69	1174004.3026	14695342.6360
K-70	1174179.4250	14695439.2385
K-71	1174354.5470	14695535.8414
K-72	1174529.6694	14695632.4442
K-73	1174704.7914	14695729.0467
K-74	1174879.9137	14695825.6495
K-75	1175055.0358	14695922.2520
K-76	1175230.1581	14696018.8548
K-77	1175405.2801	14696115.4576
K-78	1175580.4025	14696212.0601
K-79	1175755.5245	14696308.6630
K-80	1175930.6465	14696405.2655
K-81	1176105.7689	14696501.8683
K-87	1177154.6526	14697080.4672
K-88	1177329.7914	14697177.0625
K-89	1177504.9039	14697273.6597
K-90	1177680.0262	14697370.2626
K-91	1177855.1483	14697466.8654
K-92	1178030.2706	14697563.4679
K-93	1178205.3926	14697660.0707
K-94	1178380.5173	14697756.6912
K-95	1178555.6393	14697853.2941
K-96	1178730.7594	14697949.8788
K-97	1178905.8814	14698046.4813
L-14	1164100.8582	14690108.0074
L-15	1164275.9805	14690204.6102
L-16	1164451.1026	14690301.2127
L-17	1164626.2249	14690397.8155
L-25	1166202.3245	14691267.2397
L-26	1166377.4465	14691363.8425
L-27	1166552.5688	14691460.4453
L-28	1166727.6909	14691557.0478
L-29	1166902.8132	14691653.6506
L-30	1167077.9352	14691750.2531
L-31	1167253.0576	14691846.8559
L-32	1167428.1796	14691943.4584
L-33	1167603.3020	14692040.0613
L-34	1167778.4240	14692136.6641
L-35	1167953.5460	14692233.2666
L-36	1168128.6684	14692329.8694
L-37	1168303.7904	14692426.4719
L-38	1168478.9128	14692523.0747
L-39	1168654.0348	14692619.6776
L-40	1168829.1571	14692716.2801
L-41	1169004.2792	14692812.8829

Table 3-2 Grid Corner Coordinates (Continued)

L-42	1169179.4015	14692909.4854
L-43	1169354.5235	14693006.0882
L-44	1169529.6459	14693102.6910
L-45	1169704.7679	14693199.2935
L-46	1169879.8899	14693295.8964
L-47	1170055.0123	14693392.4989
L-48	1170230.1343	14693489.1017
L-49	1170405.2567	14693585.7045
L-50	1170580.3787	14693682.3070
L-51	1170755.5010	14693778.9098
L-52	1170930.6231	14693875.5123
L-53	1171105.7454	14693972.1151
L-54	1171280.8675	14694068.7176
L-55	1171455.9898	14694165.3205
L-56	1171631.1118	14694261.9233
L-57	1171806.2339	14694358.5258
L-58	1171981.3562	14694455.1286
L-59	1172156.4782	14694551.7311
L-60	1172331.6006	14694648.3339
L-61	1172506.7226	14694744.9368
L-62	1172681.8450	14694841.5393
L-63	1172856.9670	14694938.1421
L-64	1173032.0893	14695034.7446
L-65	1173207.2114	14695131.3474
L-66	1173382.3334	14695227.9502
L-67	1173557.4557	14695324.5527
L-68	1173732.5778	14695421.1556
L-69	1173907.7001	14695517.7581
L-70	1174082.8221	14695614.3609
L-71	1174257.9445	14695710.9637
L-72	1174433.0665	14695807.5662
L-73	1174608.1889	14695904.1690
L-74	1174783.3109	14696000.7715
L-75	1174958.4333	14696097.3744
L-76	1175133.5553	14696193.9768
L-77	1175308.6773	14696290.5797
L-78	1175483.7997	14696387.1825
L-79	1175658.9217	14696483.7850
L-80	1175834.0440	14696580.3878
L-87	1177058.0593	14697255.5948
L-88	1177233.1886	14697352.1845
L-89	1177408.3014	14697448.7821
L-90	1177583.4234	14697545.3849
L-91	1177758.5458	14697641.9874
L-92	1177933.6678	14697738.5902
L-93	1178108.7901	14697835.1927
L-94	1178283.9122	14697931.7956
L-95	1178459.0345	14698028.3980

Table 3-2 Grid Corner Coordinates (Continued)

L-96	1178634.1566	14698125.0009
L-97	1178809.2789	14698221.6037
M-25	1166105.7216	14691442.3620
M-26	1166280.8440	14691538.9645
M-27	1166455.9660	14691635.5673
M-28	1166631.0884	14691732.1702
M-29	1166806.2104	14691828.7727
M-30	1166981.3327	14691925.3755
M-31	1167156.4548	14692021.9780
M-32	1167331.5768	14692118.5808
M-33	1167506.6991	14692215.1836
M-34	1167681.8212	14692311.7861
M-35	1167856.9435	14692408.3889
M-36	1168032.0655	14692504.9914
M-37	1168207.1879	14692601.5943
M-38	1168382.3099	14692698.1968
M-39	1168557.4323	14692794.7996
M-40	1168732.5543	14692891.4024
M-41	1168907.6767	14692988.0049
M-42	1169082.7987	14693084.6077
M-43	1169257.9207	14693181.2102
M-44	1169433.0431	14693277.8131
M-45	1169608.1651	14693374.4159
M-46	1169783.2874	14693471.0184
M-47	1169958.4095	14693567.6212
M-48	1170133.5318	14693664.2237
M-49	1170308.6538	14693760.8265
M-50	1170483.7762	14693857.4294
M-51	1170658.8982	14693954.0319
M-52	1170834.0206	14694050.6347
M-53	1171009.1426	14694147.2372
M-54	1171184.2646	14694243.8400
M-55	1171359.3870	14694340.4428
M-56	1171534.5090	14694437.0453
M-57	1171709.6314	14694533.6481
M-58	1171884.7534	14694630.2506
M-59	1172059.8757	14694726.8535
M-60	1172234.9978	14694823.4560
M-61	1172410.1201	14694920.0588
M-62	1172585.2421	14695016.6616
M-63	1172760.3645	14695113.2641
M-64	1172935.4865	14695209.8669
M-65	1173110.6085	14695306.4694
M-66	1173285.7309	14695403.0723
M-67	1173460.8529	14695499.6751
M-68	1173635.9753	14695596.2776
M-69	1173811.0973	14695692.8804
M-70	1173986.2197	14695789.4829

Table 3-2 Grid Corner Coordinates (Continued)

M-71	1174161.3417	14695886.0857
M-72	1174336.4640	14695982.6886
M-73	1174511.5861	14696079.2911
M-74	1174686.7084	14696175.8939
M-75	1174861.8304	14696272.4964
M-76	1175036.9525	14696369.0992
M-77	1175212.0748	14696465.7020
M-78	1175387.1968	14696562.3045
M-79	1175562.3192	14696658.9073
M-87	1176961.4568	14697430.7168
M-88	1177136.5861	14697527.3069
M-89	1177311.6986	14697623.9041
M-90	1177486.8209	14697720.5069
M-91	1177661.9429	14697817.1098
M-92	1177837.0653	14697913.7123
M-93	1178012.1873	14698010.3151
M-94	1178187.3097	14698106.9176
M-95	1178362.4317	14698203.5204
M-96	1178537.5537	14698300.1232
M-97	1178712.6761	14698396.7257
N-25	1166009.1191	14691617.4840
N-26	1166184.2412	14691714.0869
N-27	1166359.3635	14691810.6894
N-28	1166534.4855	14691907.2922
N-29	1166709.6079	14692003.8950
N-30	1166884.7299	14692100.4975
N-31	1167059.8519	14692197.1003
N-32	1167234.9743	14692293.7028
N-33	1167410.0963	14692390.3056
N-34	1167585.2187	14692486.9085
N-35	1167760.3407	14692583.5110
N-36	1167935.4631	14692680.1138
N-37	1168110.5851	14692776.7163
N-38	1168285.7074	14692873.3191
N-39	1168460.8295	14692969.9219
N-40	1168635.9518	14693066.5244
N-41	1168811.0738	14693163.1273
N-42	1168986.1959	14693259.7298
N-43	1169161.3182	14693356.3326
N-44	1169336.4402	14693452.9351
N-45	1169511.5626	14693549.5379
N-46	1169686.6846	14693646.1407
N-47	1169861.8070	14693742.7432
N-48	1170036.9290	14693839.3461
N-49	1170212.0513	14693935.9486
N-50	1170387.1734	14694032.5514
N-51	1170562.2957	14694129.1542
N-52	1170737.4178	14694225.7567

Table 3-2 Grid Corner Coordinates (Continued)

N-53	1170912.5398	14694322.3595
N-54	1171087.6621	14694418.9620
N-55	1171262.7842	14694515.5648
N-56	1171437.9065	14694612.1677
N-57	1171613.0285	14694708.7702
N-58	1171788.1509	14694805.3730
N-59	1171963.2729	14694901.9755
N-60	1172138.3953	14694998.5783
N-61	1172313.5173	14695095.1811
N-62	1172488.6393	14695191.7836
N-63	1172663.7617	14695288.3865
N-64	1172838.8837	14695384.9890
N-65	1173014.0060	14695481.5918
N-66	1173189.1281	14695578.1943
N-67	1173364.2504	14695674.7971
N-68	1173539.3724	14695771.3999
N-69	1173714.4948	14695868.0024
N-70	1173889.6168	14695964.6053
N-71	1174064.7392	14696061.2078
N-72	1174239.8612	14696157.8106
N-73	1174414.9832	14696254.4134
N-74	1174590.1056	14696351.0159
N-87	1176864.8540	14697605.8392
N-88	1177039.9832	14697702.4289
N-89	1177215.0961	14697799.0265
N-90	1177390.2276	14697895.6342
N-91	1177565.3404	14697992.2318
N-92	1177740.4625	14698088.8346
N-93	1177915.5848	14698185.4371
N-94	1178090.7068	14698282.0399
N-95	1178265.8289	14698378.6424
N-96	1178440.9512	14698475.2453
N-97	1178616.0733	14698571.8481
O-154	1188542.8310	14704341.9005
O-155	1188717.9359	14704438.4098
O-156	1188893.0468	14704535.0330
O-25	1165912.5163	14691792.6064
O-26	1166087.6387	14691889.2089
O-27	1166262.7607	14691985.8117
O-28	1166437.8827	14692082.4142
O-29	1166613.0051	14692179.0170
O-30	1166788.1271	14692275.6199
O-31	1166963.2494	14692372.2224
O-32	1167138.3715	14692468.8252
O-33	1167313.4938	14692565.4277
O-34	1167488.6158	14692662.0305
O-35	1167663.7382	14692758.6333
O-36	1167838.8602	14692855.2358

Table 3-2 Grid Corner Coordinates (Continued)

O-37	1168013.9826	14692951.8386
O-38	1168189.1046	14693048.4411
O-39	1168364.2266	14693145.0440
O-40	1168539.3490	14693241.6468
O-41	1168714.4710	14693338.2493
O-42	1168889.5934	14693434.8521
O-43	1169064.7154	14693531.4546
O-44	1169239.8377	14693628.0574
O-45	1169414.9598	14693724.6603
O-46	1169590.0821	14693821.2628
O-47	1169765.2041	14693917.8656
O-48	1169940.3265	14694014.4681
O-49	1170115.4485	14694111.0709
O-50	1170290.5705	14694207.6734
O-51	1170465.6929	14694304.2762
O-52	1170640.8149	14694400.8791
O-53	1170815.9373	14694497.4816
O-54	1170991.0593	14694594.0844
O-55	1171166.1817	14694690.6869
O-56	1171341.3037	14694787.2897
O-57	1171516.4260	14694883.8925
O-58	1171691.5481	14694980.4950
O-59	1171866.6704	14695077.0978
O-60	1172041.7924	14695173.7003
O-61	1172216.9145	14695270.3032
O-62	1172392.0368	14695366.9060
O-63	1172567.1588	14695463.5085
O-64	1172742.2812	14695560.1113
O-65	1172917.4032	14695656.7138
O-66	1173092.5256	14695753.3166
O-67	1173267.6476	14695849.9195
O-68	1173442.7700	14695946.5220
O-69	1173617.8920	14696043.1248
O-70	1173793.0143	14696139.7273
O-71	1173968.1364	14696236.3301
O-72	1174143.2584	14696332.9326
O-73	1174318.3807	14696429.5354
O-74	1174493.5028	14696526.1383
O-87	1176768.2512	14697780.9612
O-88	1176943.3804	14697877.5512
O-89	1177118.4932	14697974.1485
O-90	1177293.6156	14698070.7513
O-91	1177468.7376	14698167.3538
O-92	1177643.8596	14698263.9566
O-93	1177818.9820	14698360.5595
O-94	1177994.1040	14698457.1620
O-95	1178169.2264	14698553.7648
O-96	1178344.3484	14698650.3673

Table 3-2 Grid Corner Coordinates (Continued)

O-97	1178519.4799	14698746.9754
P-152	1188095.9437	14704323.7381
P-153	1188271.0661	14704420.3410
P-154	1188446.1881	14704516.9435
P-155	1188621.3105	14704613.5463
P-156	1188796.4328	14704710.1488
P-27	1166166.1579	14692160.9337
P-28	1166341.2802	14692257.5366
P-29	1166516.4022	14692354.1394
P-30	1166691.5246	14692450.7419
P-31	1166866.6466	14692547.3447
P-32	1167041.7690	14692643.9472
P-33	1167216.8910	14692740.5500
P-34	1167392.0134	14692837.1525
P-35	1167567.1354	14692933.7553
P-36	1167742.2577	14693030.3582
P-37	1167917.3798	14693126.9607
P-38	1168092.5018	14693223.5635
P-39	1168267.6241	14693320.1660
P-40	1168442.7462	14693416.7688
P-41	1168617.8685	14693513.3716
P-42	1168792.9905	14693609.9741
P-43	1168968.1129	14693706.5770
P-44	1169143.2349	14693803.1795
P-45	1169318.3573	14693899.7823
P-46	1169493.4793	14693996.3851
P-47	1169668.6016	14694092.9876
P-48	1169843.7237	14694189.5904
P-49	1170018.8457	14694286.1929
P-50	1170193.9681	14694382.7958
P-51	1170369.0901	14694479.3986
P-52	1170544.2124	14694576.0011
P-53	1170719.3345	14694672.6039
P-54	1170894.4568	14694769.2064
P-55	1171069.5788	14694865.8092
P-56	1171244.7012	14694962.4117
P-57	1171419.8232	14695059.0146
P-58	1171594.9456	14695155.6174
P-59	1171770.0676	14695252.2199
P-60	1171945.1896	14695348.8227
P-61	1172120.3120	14695445.4252
P-62	1172295.4340	14695542.0280
P-63	1172470.5563	14695638.6308
P-64	1172645.6784	14695735.2333
P-65	1172820.8007	14695831.8362
P-66	1172995.9227	14695928.4387
P-67	1173171.0451	14696025.0415
P-68	1173346.1671	14696121.6443

Table 3-2 Grid Corner Coordinates (Continued)

P-69	1173521.2892	14696218.2468
P-70	1173696.4115	14696314.8496
P-71	1173871.5335	14696411.4521
P-72	1174046.6559	14696508.0550
P-73	1174221.7779	14696604.6578
P-74	1174396.9003	14696701.2603
P-86	1176496.5398	14697859.4594
P-87	1176671.6615	14697956.0619
P-88	1176846.7684	14698052.6680
P-89	1177021.8999	14698149.2761
P-90	1177197.0223	14698245.8786
P-91	1177372.1348	14698342.4762
P-92	1177547.2571	14698439.0790
P-93	1177722.3792	14698535.6815
P-94	1177897.5015	14698632.2843
P-95	1178072.6236	14698728.8868
P-96	1178247.7459	14698825.4896
Q-152	1187999.3412	14704498.8602
Q-153	1188174.4636	14704595.4630
Q-154	1188349.5856	14704692.0658
Q-155	1188524.7076	14704788.6683
Q-156	1188699.8300	14704885.2711
Q-27	1166069.5554	14692336.0561
Q-28	1166244.6774	14692432.6586
Q-29	1166419.7997	14692529.2614
Q-3	1161691.5011	14689920.9887
Q-30	1166594.9218	14692625.8642
Q-31	1166770.0441	14692722.4667
Q-32	1166945.1661	14692819.0696
Q-33	1167120.2885	14692915.6721
Q-34	1167295.4105	14693012.2749
Q-35	1167470.5326	14693108.8777
Q-36	1167645.6549	14693205.4802
Q-37	1167820.7769	14693302.0830
Q-38	1167995.8993	14693398.6855
Q-39	1168171.0213	14693495.2883
Q-4	1161866.6232	14690017.5916
Q-40	1168346.1437	14693591.8908
Q-41	1168521.2657	14693688.4937
Q-42	1168696.3880	14693785.0965
Q-43	1168871.5101	14693881.6990
Q-44	1169046.6324	14693978.3018
Q-45	1169221.7544	14694074.9043
Q-46	1169396.8765	14694171.5071
Q-47	1169571.9988	14694268.1100
Q-48	1169747.1208	14694364.7125
Q-49	1169922.2432	14694461.3153
Q-5	1162041.7452	14690114.1941

Table 3-2 Grid Corner Coordinates (Continued)

Q-50	1170097.3652	14694557.9178
Q-51	1170272.4876	14694654.5206
Q-52	1170447.6096	14694751.1234
Q-53	1170622.7320	14694847.7259
Q-54	1170797.8540	14694944.3288
Q-55	1170972.9763	14695040.9313
Q-56	1171148.0984	14695137.5341
Q-57	1171323.2204	14695234.1369
Q-58	1171498.3427	14695330.7394
Q-59	1171673.4648	14695427.3422
Q-6	1162216.8675	14690210.7969
Q-60	1171848.5871	14695523.9447
Q-61	1172023.7091	14695620.5475
Q-62	1172198.8315	14695717.1500
Q-63	1172373.9535	14695813.7529
Q-64	1172549.0759	14695910.3557
Q-65	1172724.1979	14696006.9582
Q-66	1172899.3203	14696103.5610
Q-67	1173074.4423	14696200.1635
Q-68	1173249.5643	14696296.7663
Q-69	1173424.6867	14696393.3692
Q-7	1162391.9896	14690307.3994
Q-70	1173599.8087	14696489.9717
Q-71	1173774.9310	14696586.5745
Q-72	1173950.0531	14696683.1770
Q-73	1174125.1754	14696779.7798
Q-74	1174300.2974	14696876.3826
Q-86	1176399.9156	14698034.5913
Q-87	1176575.0521	14698131.1925
Q-88	1176750.1656	14698227.7904
Q-89	1176925.2879	14698324.3929
Q-90	1177100.4099	14698420.9957
Q-91	1177275.5323	14698517.5982
Q-92	1177450.6638	14698614.2063
Q-93	1177625.7767	14698710.8038
Q-94	1177800.8987	14698807.4063
Q-95	1177976.0211	14698904.0092
R-27	1165977.1796	14692513.5098
R-28	1166148.0749	14692607.7809
R-29	1166323.1969	14692704.3834
R-3	1161594.8983	14690096.1108
R-30	1166498.3193	14692800.9863
R-31	1166673.4413	14692897.5891
R-32	1166848.5637	14692994.1916
R-33	1167023.6857	14693090.7944
R-34	1167198.8077	14693187.3969
R-35	1167373.9301	14693283.9997
R-36	1167549.0521	14693380.6026

Table 3-2 Grid Corner Coordinates (Continued)

R-37	1167724.1744	14693477.2050
R-38	1167899.2965	14693573.8079
R-39	1168074.4188	14693670.4104
R-4	1161770.0203	14690192.7136
R-40	1168249.5408	14693767.0132
R-41	1168424.6632	14693863.6160
R-42	1168599.7852	14693960.2185
R-43	1168774.9076	14694056.8213
R-44	1168950.0296	14694153.4238
R-45	1169125.1516	14694250.0267
R-46	1169300.2740	14694346.6292
R-47	1169475.3960	14694443.2320
R-48	1169650.5183	14694539.8348
R-49	1169825.6404	14694636.4373
R-5	1161945.1427	14690289.3164
R-50	1170000.7627	14694733.0401
R-51	1170175.8848	14694829.6426
R-52	1170351.0071	14694926.2455
R-53	1170526.1291	14695022.8483
R-54	1170701.2515	14695119.4508
R-55	1170876.3735	14695216.0536
R-56	1171051.4955	14695312.6561
R-57	1171226.6179	14695409.2589
R-58	1171401.7399	14695505.8618
R-59	1171576.8623	14695602.4643
R-6	1162120.2647	14690385.9189
R-60	1171751.9843	14695699.0671
R-61	1171927.1066	14695795.6696
R-62	1172102.2287	14695892.2724
R-63	1172277.3510	14695988.8752
R-64	1172452.4730	14696085.4777
R-65	1172627.5951	14696182.0805
R-66	1172802.7174	14696278.6830
R-67	1172977.8395	14696375.2859
R-68	1173152.9618	14696471.8884
R-69	1173328.0838	14696568.4912
R-7	1162295.3871	14690482.5217
R-70	1173503.2062	14696665.0940
R-71	1173678.3282	14696761.6965
R-72	1173853.4506	14696858.2993
R-73	1174028.5726	14696954.9018
R-74	1174203.6949	14697051.5047
R-91	1177178.9318	14698692.7386
R-92	1177354.0541	14698789.3411
R-93	1177529.1670	14698885.9387
R-94	1177704.2890	14698982.5415
S-27	1165876.3500	14692686.3005
S-28	1166051.4721	14692782.9030

Table 3-2 Grid Corner Coordinates (Continued)

S-29	1166226.5944	14692879.5058
S-3	1161498.2955	14690271.2331
S-30	1166401.7164	14692976.1083
S-31	1166576.8385	14693072.7111
S-32	1166751.9608	14693169.3139
S-33	1166927.0829	14693265.9164
S-34	1167102.2052	14693362.5193
S-35	1167277.3272	14693459.1218
S-36	1167452.4496	14693555.7246
S-37	1167627.5716	14693652.3274
S-38	1167802.6566	14693748.9096
S-39	1167977.8160	14693845.5327
S-4	1161673.4178	14690367.8359
S-40	1168152.9383	14693942.1352
S-41	1168328.0604	14694038.7380
S-42	1168503.1824	14694135.3409
S-43	1168678.3047	14694231.9434
S-44	1168853.4268	14694328.5462
S-45	1169028.5491	14694425.1487
S-46	1169203.6711	14694521.7515
S-47	1169378.7935	14694618.3543
S-48	1169553.9155	14694714.9568
S-49	1169729.0379	14694811.5597
S-5	1161848.5399	14690464.4384
S-50	1169904.1599	14694908.1622
S-51	1170079.2823	14695004.7650
S-52	1170254.4043	14695101.3675
S-53	1170429.5263	14695197.9703
S-54	1170604.6487	14695294.5731
S-55	1170779.7707	14695391.1756
S-56	1170954.8930	14695487.7785
S-57	1171130.0151	14695584.3810
S-58	1171305.1374	14695680.9838
S-59	1171480.2594	14695777.5866
S-6	1162023.6622	14690561.0413
S-60	1171655.3818	14695874.1891
S-61	1171830.5038	14695970.7919
S-62	1172005.6262	14696067.3944
S-63	1172180.7482	14696163.9972
S-64	1172355.8702	14696260.6001
S-65	1172530.9926	14696357.2026
S-66	1172706.1146	14696453.8054
S-67	1172881.2370	14696550.4079
S-68	1173056.3590	14696647.0107
S-69	1173231.4813	14696743.6135
S-7	1162198.7842	14690657.6438
S-70	1173406.6034	14696840.2160
S-71	1173581.7257	14696936.8189

Table 3-2 Grid Corner Coordinates (Continued)

S-72	1173756.8477	14697033.4214
S-73	1173931.9701	14697130.0242
S-74	1174107.0921	14697226.6267
T-29	1166129.9916	14693054.6278
T-3	1161401.6930	14690446.3551
T-30	1166305.1136	14693151.2306
T-31	1166480.2360	14693247.8335
T-32	1166655.2120	14693344.3552
T-33	1166830.4804	14693441.0388
T-34	1167005.6906	14693537.6902
T-35	1167180.7743	14693634.2713
T-36	1167355.8468	14693730.8466
T-37	1167530.9691	14693827.4494
T-39	1167881.2135	14694020.6548
T-4	1161576.8150	14690542.9580
T-40	1168056.3355	14694117.2576
T-41	1168231.4575	14694213.8601
T-42	1168406.5799	14694310.4629
T-43	1168581.7019	14694407.0657
T-44	1168756.8243	14694503.6682
T-45	1168931.9463	14694600.2710
T-46	1169107.0686	14694696.8735
T-47	1169282.1897	14694793.4787
T-48	1169457.3114	14694890.0818
T-49	1169632.4351	14694986.6817
T-5	1161751.9374	14690639.5608
T-50	1169807.5574	14695083.2845
T-51	1169982.6794	14695179.8870
T-52	1170157.8015	14695276.4898
T-53	1170332.9238	14695373.0927
T-54	1170508.0458	14695469.6952
T-55	1170683.1682	14695566.2980
T-64	1172259.2677	14696435.7221
T-65	1172434.3898	14696532.3249
T-66	1172609.5121	14696628.9274
T-67	1172784.6341	14696725.5302
T-68	1172959.7565	14696822.1327
T-69	1173134.8785	14696918.7356
T-70	1173310.0009	14697015.3384
T-71	1173485.1229	14697111.9409
T-72	1173660.2449	14697208.5437
T-73	1173835.3673	14697305.1462
U-39	1167784.6107	14694195.7771
U-4	1161480.2125	14690718.0800
U-40	1167959.7327	14694292.3796
U-41	1168134.8550	14694388.9824
U-42	1168309.9771	14694485.5849
U-43	1168485.0994	14694582.1877

Table 3-2 Grid Corner Coordinates (Continued)

U-44	1168660.2214	14694678.7906
U-45	1168835.3438	14694775.3931
U-46	1169010.4658	14694871.9959
U-48	1169360.7102	14695065.2012
U-49	1169535.8322	14695161.8040
U-50	1169710.9546	14695258.4065
U-51	1169886.0766	14695355.0094
U-52	1170061.1990	14695451.6119
U-53	1170236.3210	14695548.2147
V-48	1169264.1074	14695240.3232
V-49	1169439.2297	14695336.9261
V-50	1169614.3518	14695433.5289
V-51	1169789.4741	14695530.1314
V-52	1169964.5961	14695626.7342
V-53	1170139.7185	14695723.3367
W-48	1169167.5049	14695415.4456
W-49	1169342.6269	14695512.0484
W-50	1169517.7493	14695608.6509
W-51	1169692.8713	14695705.2537
W-52	1169867.9936	14695801.8562
X-48	1169070.9021	14695590.5676
X-49	1169246.0244	14695687.1704
X-50	1169421.1464	14695783.7733

reported in WGS 1984, UTM Zone 18N, Feet.

Table 3-3 Industry Standard Objects Characterized for Use as Munitions Surrogates (Adapted from NRL/MR/6110_09_99183)

Item	Nominal Pipe Size	Outside Diameter	Length	Part Number*	ASTM Specification
Small ISO	1 inch	1.135 inches (33 mm)	4 inches (102 mm)	44615K466	A53/A773
Medium ISO	2 inch	2.375 inches (60 mm)	8 inches (204 mm)	44615K529	A53/A773

*Part number from the McMaster-Carr catalog.

Inert munitions will be seeded based on the known munitions for the MRS.

ASTM – American Society for Testing and Materials

Table 3-4 Digital Geophysical Mapping Measurement Quality Objectives

Measurement Quality Objective	Measurement Performance Criteria	Testing Method	Consequence of Failure
Along-line measurement spacing – evaluated per dataset or grid.	EM61-MK2 transect and grid surveys: 98% of data along-line will be spaced ≤ 0.6 ft.	Use Geosoft and spatial analysis tools to identify locations where data density does not achieve measurement performance criteria.	Prepare root cause analysis. Re-collect data.
Across-line measurement spacing – evaluated per dataset or grid.	EM61-MK2 grid surveys: 95% of across track data ≤ 2.0 ft.	Use Geosoft, spatial analysis tools to identify locations where data density does not achieve measurement performance criteria.	Prepare root cause analysis. Re-collect data.
Coverage – evaluated per dataset or grid.	EM61-MK2 grid surveys: Coverage at project design line spacing is achieved at $> 95\%$. Excludes inaccessible areas.	Use Geosoft and spatial analysis tools to identify locations where data density does not achieve measurement performance criteria.	Prepare root cause analysis. Collect additional data in data gaps.
Detection repeatability – evaluated per grid and IVS survey.	EM61-MK2 grid surveys: Consistent and comparable ISO responses are observed daily at IVS and in grids.	Evaluate peak responses from all ISOs throughout the project.	Grid(s) fail. Prepare root cause analysis. Project team to determine if data recollection is required.
Positioning repeatability – evaluated per anomaly/ recovered item and IVS survey.	EM61-MK2 grid surveys: Measured position of anomaly and reacquisition location ≤ 3.3 ft (0.5 ft + $\frac{1}{2}$ across-line spacing).	Evaluate ISO surveyed location and measured position. Assess offset for each investigated anomaly to observe trends and deviations from metric.	Grid(s) fail. Prepare root cause analysis. Project team to determine if data recollection is required.

Table 3-5 Analog Geophysical Survey Measurements Quality Objectives

Measurement Quality Objectives	Measurement Performance Criteria	Testing Method
Instrument functionality — Demonstrate Schonstedts are operating properly prior to performing surveys.	Items in the IVS will be detected daily. IVS will be visited prior to performing survey work, after battery change, or any other modifications.	All instrumentation will be demonstrated at the IVS. If equipment failure – instrument will be taken out of service until repaired and retested. If operator failure – perform remedial training on equipment use and survey procedures.
Coverage – Equipment operators are traversing full coverage grids.	Surface removal surveys will be 5-ft wide per instrument operator.	UXOQCS will monitor each operator as they traverse the grid.
Detection and recovery – Operators will traverse grids, detect anomalies and recover MEC.	Remove exposed and partially exposed MEC and MD that are either visible or under leaf litter and detritus during surface removal activities. During subsurface removal activities, all detected anomalies will be investigated and metallic material will be removed from excavation.	UXOQCS will check 10% of the grid. UXOQCS will check 10% of excavation locations prior to backfill to confirm metallic debris was removed from hole. UXOQCS will plant blind seed item at a frequency of 1 item per day per dig team.

Table 3-6 DGM QC Test Frequency and Acceptance Criteria

Test Description	Acceptance Criteria	Power On	Start of Day	End of Day
Equipment Warm-Up	Equipment Specific (5-8 minutes)	X		
Personnel Test	EM61-MK2: 0 to 2mVp-p		X	
Vibration Test (Cable Shake)	Data profile does not exhibit spikes		X	X
Static Background	EM61-MK2: <2.5mV std dev		X	X
Static Spike	+/-20% of standard item response		X	X
Repeat Data	Repeatable +/- 20 % of response amplitude. +/- 20 cm for positional accuracy		X	X

Table 3-7 Minimum Separation Distances

Munitions Response Site (MRS)	Munition with the Greatest Fragmentation Distance (MGFD)	MSD (ft) ¹			
		Unintentional Detonations		Intentional Detonations	
		Hazardous Fragment Distance (HFD)	Team Separation Distance (K40)	Without Engineering Controls (MFD-H)	Using Engineering Controls
Ricochet Area	Projectile, 155mm, M107, HE ² and ³	450 ²	105 ²	2,894 ³	220 ¹

¹ Sandbag mitigation will be used for M107 Composition B. Buried Explosion Module (BEM) will be used for M107 TNT. BEM results in an MSD of 0 ft, but 220 ft will be adhered to during all disposal operations.

² 155mm, M107 (Composition B filled).

³ 155mm, M107 (Trinitrotoluene [TNT] filled).

Table 3-8 Demolition Notification Roster

Joan Anderson PAARNG - PA Department of Military & Veterans Affairs Bureau of Environmental Management Environmental Compliance Division	(717) 861-9414 (office) joanderso@pa.gov Building 0-11, Ft. Indiantown Gap Annville, PA 17003
Paul Greene U.S. Army Corps of Engineers (USACE), Baltimore District OE Safety Manager	(410) 962-6741 (office) Baltimore District, USACE 10 South Howard Street ATTN: CENAB-EN-HI Baltimore, MD 21201-1715
TBD U.S. Army Corps of Engineers (USACE), Baltimore District OESS	TBD Baltimore District, USACE 10 South Howard Street ATTN: CENAB-EN-HI Baltimore, MD 21201-1715
Scott Bills Pennsylvania Game Commission Southeast Region Land Management Group Supervisor	(610) 926-3136 (office) sbills@pa.gov 448 Snyder Road Reading, PA 19605
John Fitzgerald PADEP Project Manager Pennsylvania Department of Environmental Protection (PADEP) Bureau of Environmental Cleanup and Brownfields Site Remediation Division	(717) 783-9475 (office) jfitzgeral@pa.gov Rachel Carson State Office Building PO Box 8471 Harrisburg, PA 17105-8471
Lebanon County Emergency Management	(717) 272-7621 400 South 8 th Street Room 12 Lebanon, PA 17042
Stephen J. Shaver Director Dauphin County Emergency Management	(717) 558-6800 sshaver@dauphinc.org 911 Gibson Blvd. Steelton, PA 17113
MAJ Charles Kim, PAARNG-Range Operations	(717) 861-2975 charles.m.kim.mil@mail.mil Ft. Indiantown Gap, Bldg. 11-9 Annville, PA 17003
John Gerhard WESTON Project Manager	(610) 701-3793 J.Gerhard@westonsolutions.com Weston Solutions, Inc. West Chester, PA 19380
Wayne Davis USACE Project Manager	(410) 962-3506 wayne.f.davis@usace.army.mil U. S. Army Corps of Engineers, Baltimore District 10 South Howard Street Baltimore, MD 21201-1715
Range Control Fire Desk PAARNG – Fort Indiantown Gap	Radio- (717) 861-2152 Ft. Indiantown Gap Annville, PA 17003

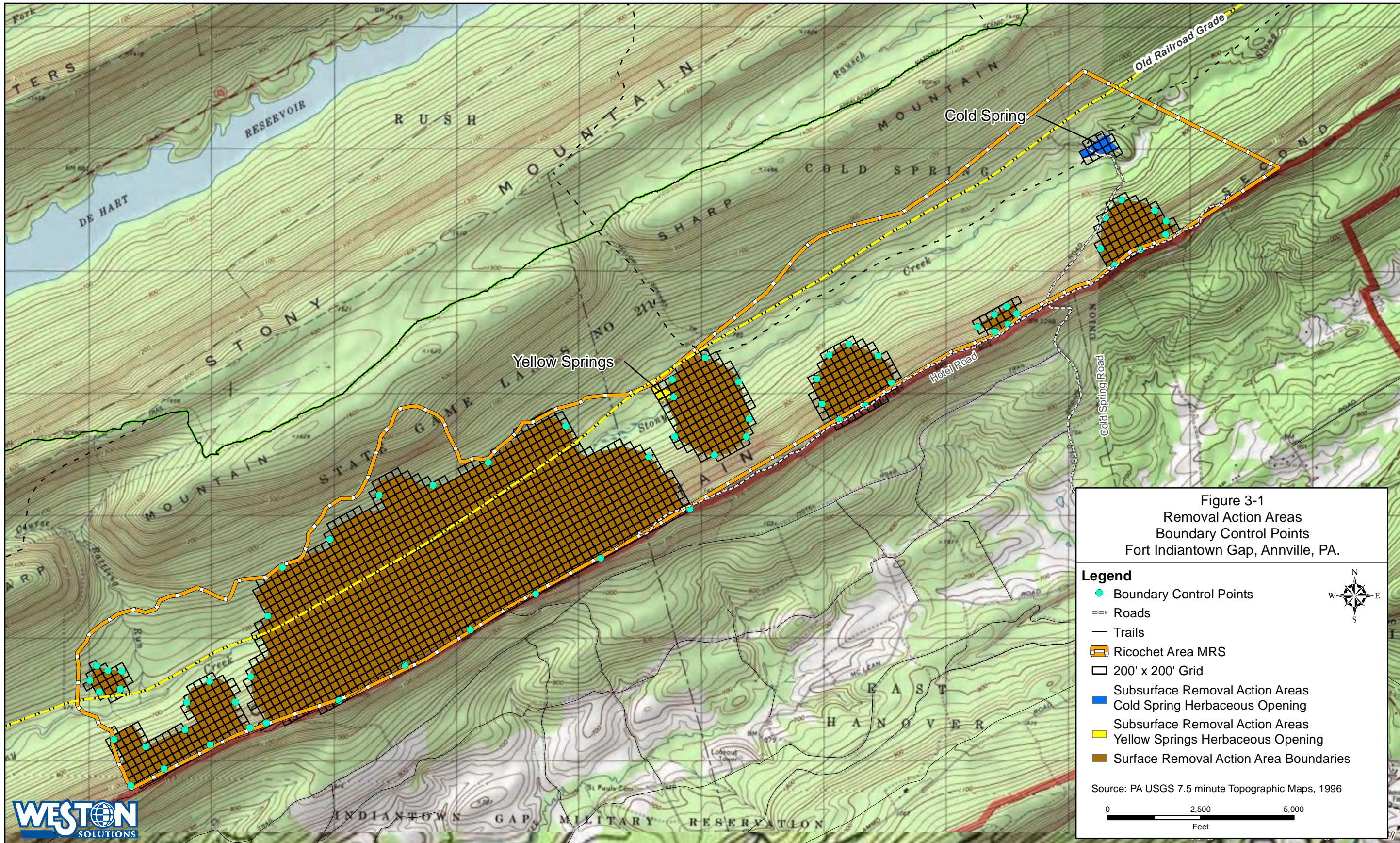


Figure 3-1
Removal Action Areas
Boundary Control Points
Fort Indiantown Gap, Annville, PA.

Legend

- Boundary Control Points
- Roads
- Trails
- Ricochet Area MRS
- 200' x 200' Grid
- Subsurface Removal Action Areas
- Cold Spring Herbaceous Opening
- Yellow Springs Herbaceous Opening
- Surface Removal Action Area Boundaries

Source: PA USGS 7.5 minute Topographic Maps, 1996

0 2,500 5,000
Feet



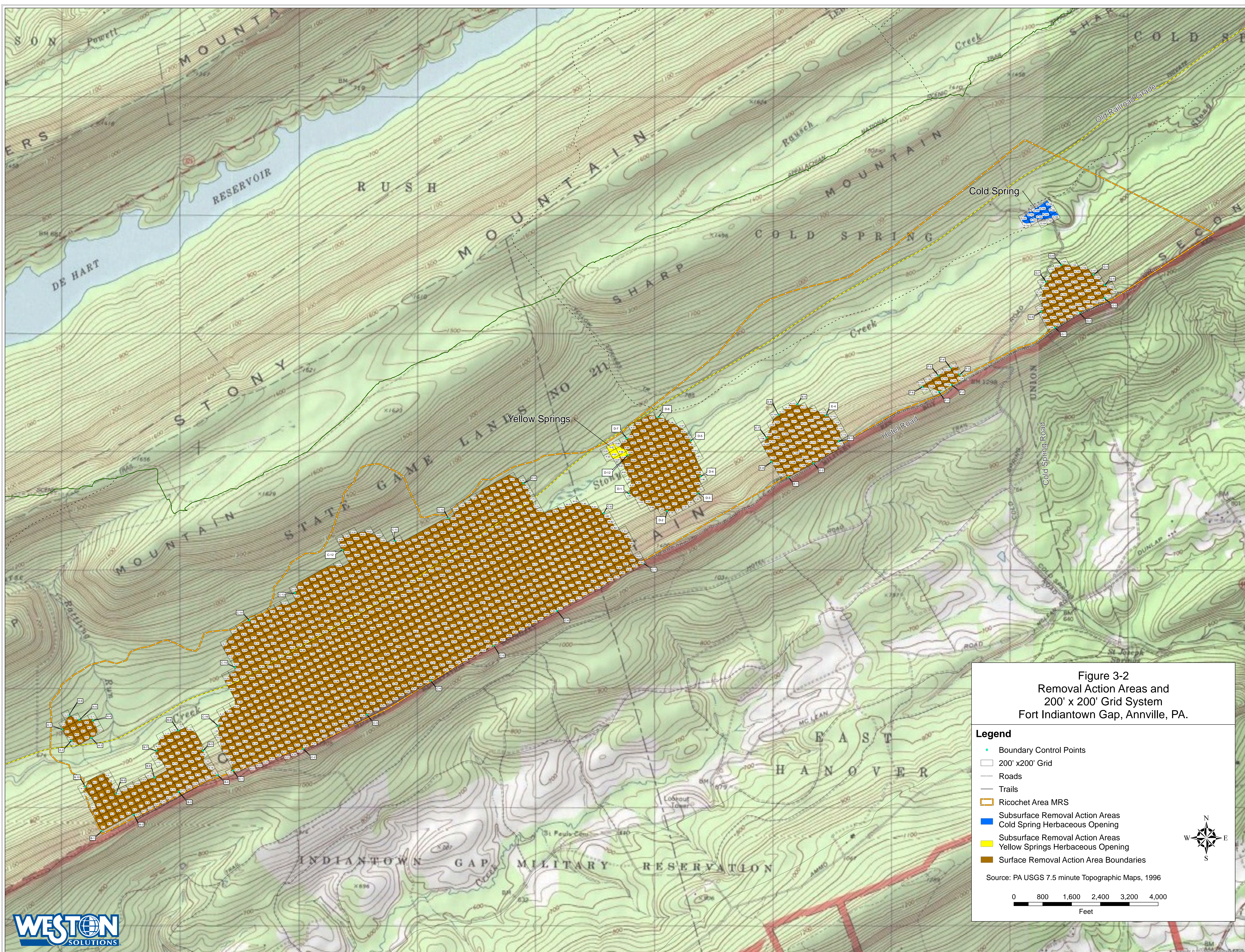


Figure 3-2
 Removal Action Areas and
 200' x 200' Grid System
 Fort Indiantown Gap, Anville, PA.

Legend

- Boundary Control Points
- 200' x 200' Grid
- Roads
- Trails
- ▭ Ricochet Area MRS
- Subsurface Removal Action Areas
- Cold Spring Herbaceous Opening
- Subsurface Removal Action Areas
- Yellow Springs Herbaceous Opening
- Surface Removal Action Area Boundaries

Source: PA USGS 7.5 minute Topographic Maps, 1996

0 800 1,600 2,400 3,200 4,000
 Feet



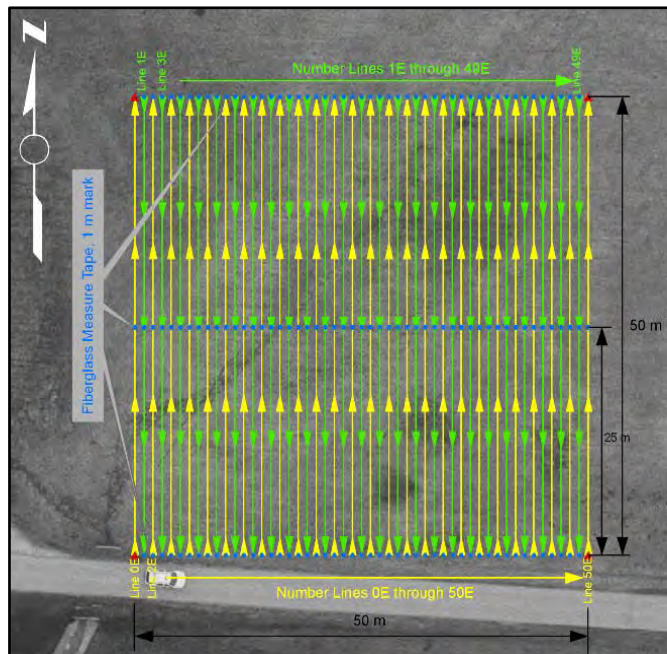
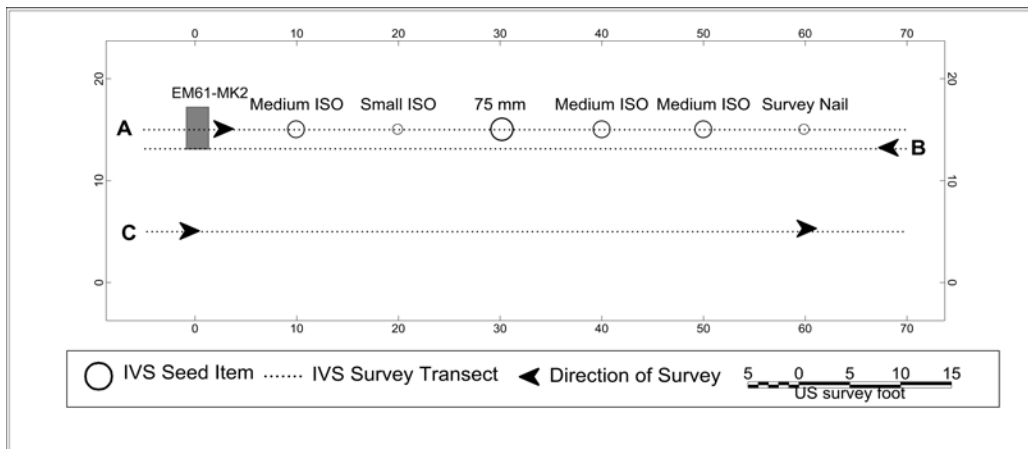


Figure 3-3 Line and Fiducial Navigation



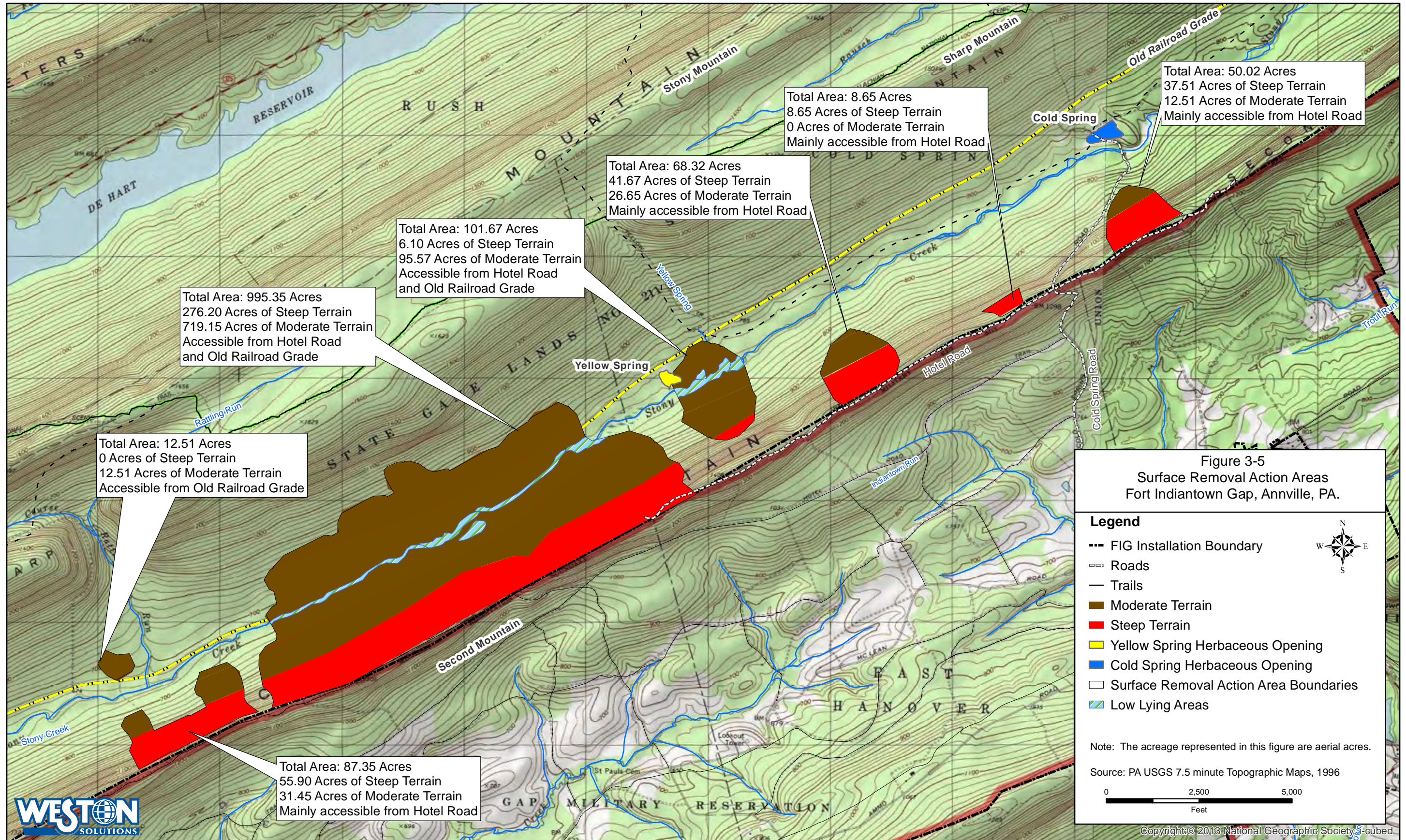
Notes:

Line A: Directly over IVS seeds; used to verify that instrument response is within established response curve metrics.

Line B: Adjacent to Line A; used to detect offset and evaluate latency.

Line C: 10-ft offset from seeded IVS transect; used to measure local background noise.

Figure 3-4 Proposed IVS Layout and Process



Total Area: 995.35 Acres
276.20 Acres of Steep Terrain
719.15 Acres of Moderate Terrain
Accessible from Hotel Road
and Old Railroad Grade

Total Area: 101.67 Acres
6.10 Acres of Steep Terrain
95.57 Acres of Moderate Terrain
Accessible from Hotel Road
and Old Railroad Grade

Total Area: 68.32 Acres
41.67 Acres of Steep Terrain
26.65 Acres of Moderate Terrain
Mainly accessible from Hotel Road

Total Area: 8.65 Acres
8.65 Acres of Steep Terrain
0 Acres of Moderate Terrain
Mainly accessible from Hotel Road

Total Area: 50.02 Acres
37.51 Acres of Steep Terrain
12.51 Acres of Moderate Terrain
Mainly accessible from Hotel Road

Total Area: 12.51 Acres
0 Acres of Steep Terrain
12.51 Acres of Moderate Terrain
Accessible from Old Railroad Grade

Total Area: 87.35 Acres
55.90 Acres of Steep Terrain
31.45 Acres of Moderate Terrain
Mainly accessible from Hotel Road



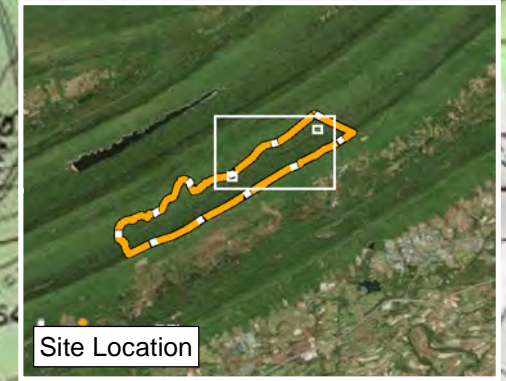
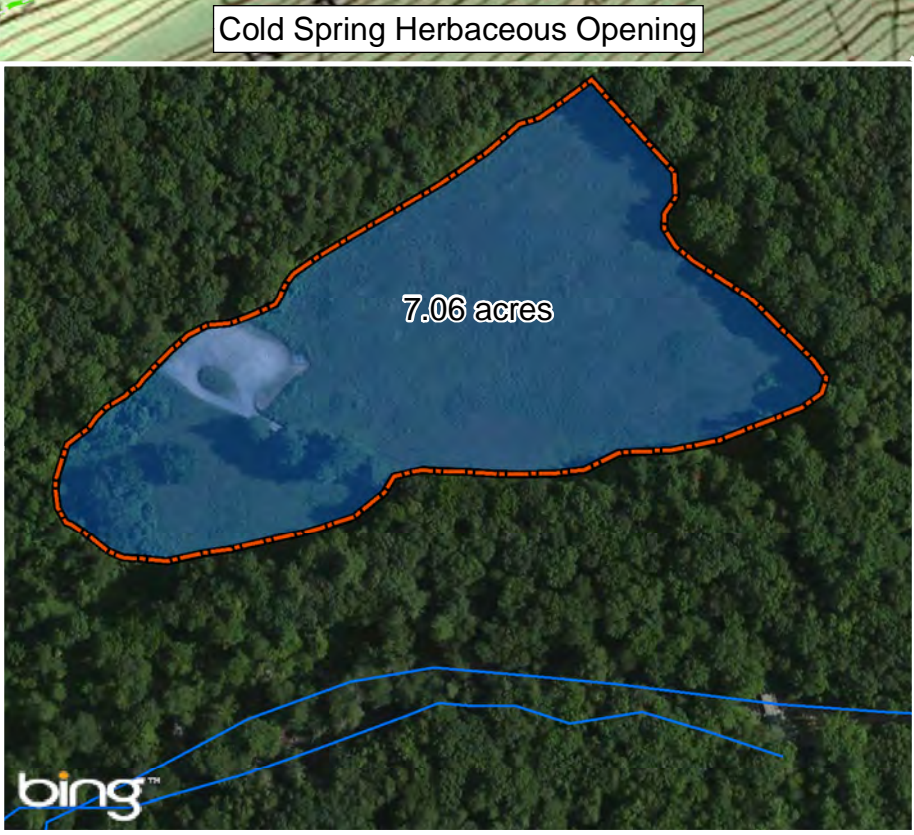
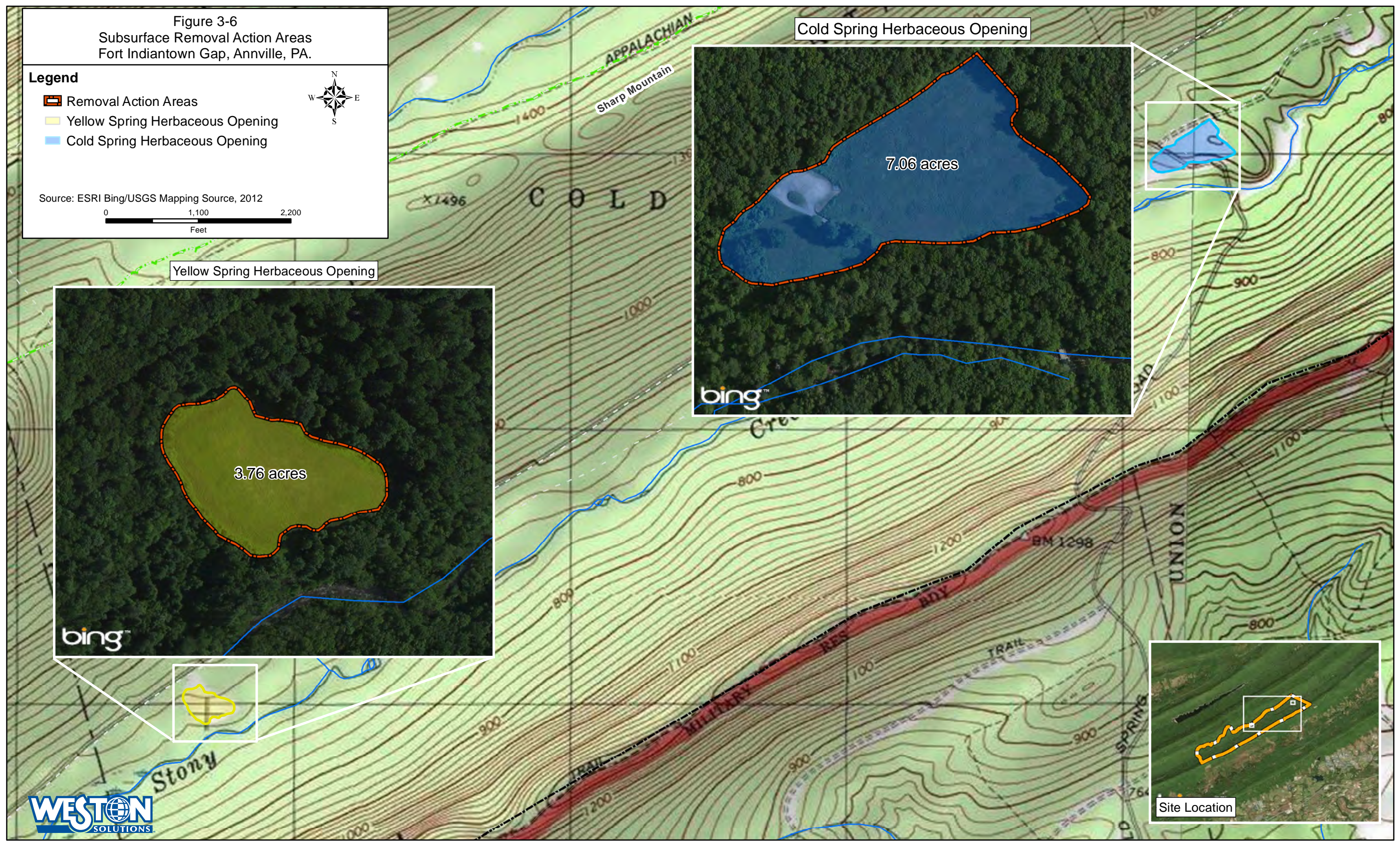
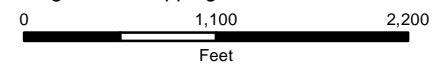
Figure 3-6
Subsurface Removal Action Areas
Fort Indiantown Gap, Annville, PA.

Legend

- Removal Action Areas
- Yellow Spring Herbaceous Opening
- Cold Spring Herbaceous Opening



Source: ESRI Bing/USGS Mapping Source, 2012



4. QUALITY CONTROL PLAN

This Quality Control Plan (QCP) identifies quality requirements to be implemented to ensure that overall project activities are accomplished using internal controls and review procedures. The intent of such controls is to eliminate conflicts, errors, and omissions and to ensure the technical accuracy of deliverables. This QCP is applicable to the Ricochet Area MRS project activities that will be performed by WESTON and its subcontractors, as described in the Work Plan.

4.1 QUALITY MANAGEMENT STRUCTURE

WESTON's staff of experienced technical professionals and subcontractors will execute the project. Project personnel will be responsible for ensuring that quality methods and procedures are implemented. The quality management structure and specific quality duties are detailed in the following subsections.

4.1.1 UXO Operations QC Manager

The UXO Operations QC Manager is responsible for providing corporate QC oversight of MEC activities on the project. Responsibilities include providing technical support as needed and performing scheduled and unscheduled audits of the project. The UXO Operations QC Manager will provide technical assistance to the Project Manager and guidance to the SUXOS. The UXOQCS will communicate directly with the UXO Operations QC Manager on quality issues, findings, and recommendations.

4.1.2 Project Manager

The Project Manager is responsible for project activities and for ensuring that contractual requirements are met and that the project is performed in an efficient, safe, and quality manner. Additional responsibilities include implementing project QC procedures, analyzing QC failures with the QC Managers and field managers (SUXOS, UXOQCS, and UXOSO), and ensuring that corrective actions are implemented and lessons learned are documented.

4.1.3 Senior UXO Supervisor

The SUXOS is responsible for managing, overseeing, and guiding MEC operations and UXO teams. The SUXOS is responsible for ensuring that field personnel are properly trained and indoctrinated, and that they have the necessary experience and skills to perform the assigned task. The SUXOS will ensure that the RA activities are in compliance with DoD directives and federal, state, and local statutes and codes. Additionally, the SUXOS is responsible for providing subject matter expertise and leadership to ensure the team's safety and the quality of the project.

4.1.4 UXO Quality Control Specialists

The UXOQCS reports independently to the UXO Operations QC Manager on quality-related matters. The UXOQCS is responsible for monitoring site activities affecting quality and for ensuring that these activities are being carried out in accordance with established requirements

and protocols in this QCP. The UXOQCS is responsible for conducting QC inspections of intrusive and explosives operations for compliance with the established procedures. The UXOQCS will perform daily surveillance of the work activities and issue corrective actions as necessary. The UXOQCS will prepare DQCR documenting QC processes and results. The UXOQCS will perform the inspection process based on definable features of work (DFW) in Section 4.3.1.

4.1.5 Geophysics QC Manager

The Geophysics QC Manager is responsible for the quality of the digital geophysical data. Responsibilities include performing reviews of raw and processed geophysical data and audits of geophysical team procedures, and recommending actions to be taken in the event of geophysical data QC nonconformance. The Geophysics QC Manager will recommend and provide solutions to quality problems.

4.2 PERSONNEL QUALIFICATIONS AND TRAINING

Project staff will be qualified to perform the specific tasks they are assigned on the project, as discussed in Section 2 of the Work Plan. At the beginning of the project, personnel will provide their training and qualification records to the UXOQCS for approval. The records will be available on-site and will be reviewed periodically so that current records are maintained.

4.2.1 Qualifications and Training for UXO Personnel

UXO-qualified personnel and/or UXO technicians will meet the requirements of DDESB TP-18, Minimum Qualifications for Unexploded Ordnance Technicians and Personnel (DDESB, 2004). Prior to beginning field work or new phases of work, the UXOQCS will review the work processes with project personnel to ensure that they are adequately trained/versed in the phase of work requirements, standards, and procedures. The health and safety training requirements will be documented in the Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP) (see **Appendix B**).

4.3 THREE PHASE INSPECTION PROCESS

The UXOQCS or a designee is responsible for verifying compliance with this portion of the QCP. A three phase inspection (TPI) process will be used to ensure that project activities comply with approved procedures and methods. The TPI process includes a preparatory, initial, and follow-up phase inspection for each project DFW. A final inspection will be performed at the completion of a DFW. The DFWs, inspection descriptions, responsible personnel, and potential failure actions are provided in **Table 4-1**. Specific magnetometer inspection methods and failure criteria are presented in **Table 4-2**. The TPI process elements are presented in the following sections.

4.3.1 Definable Features of Work

DFWs have been developed for each aspect of the project from planning to implementation to reporting. The primary DFWs are as follows:

1. Site setup/mobilization of personnel, equipment, and supplies.
2. Grid survey activities.
3. Brush clearing.
4. Geophysical equipment testing and verification.
5. DGM operations.
6. Surface and subsurface removal operations.
7. Demolition/disposal.
8. MPPEH and MDAS accountability.
9. Demobilization.

The DFWs, inspection descriptions, responsible personnel, and potential failure actions are provided in **Table 4-1**.

4.3.2 Preparatory Phase Inspection

The preparatory phase inspection comprises the planning and design process leading up to the field activities. The preparatory phase inspection will be performed prior to initiating each DFW. The UXOQCS or a designee will review the appropriate documentation to ensure the requirements to carry out each DFW are in place and compliant.

The UXOQCS will verify that required planning documentation, including the Work Plan and appendices, have been approved and available for site personnel. Equipment, sensors, and materials delivered to the site will be inspected to ensure that they are functional and that all required components are inventoried. Personnel certifications will be reviewed to ensure that appropriate training has been provided and that medical clearance and licenses are available based on assigned responsibilities and site-specific requirements. The UXOQCS or a designee will determine whether the personnel needed to carry out the DFW are identified, are available, and meet the qualifications of the position and to ensure that positions are filled accordingly.

Where site conditions or constraints prohibit carrying out a specific DFW, a UXOQCS will designate personnel to correct or resolve discrepancies. Work plan discrepancies will be corrected and subsequently verified by the UXOQCS or a designee before beginning the DFW.

4.3.3 Initial Phase Inspection

The initial phase inspection will begin at the startup of a DFW. The work performed as part of the DFW will be inspected for compliance with established procedures so that a high level of quality can be obtained from task commencement to completion. The UXOQCS will document the inspection results in the QC logbook that will be transcribed daily to the DQCR. The DQCR will list the DFW(s), QC requirements, and inspection processes performed that day based on the DFW checklist (**Table 4-1**). An example of the QC Report is provided in **Appendix D**.

If the inspection results identify discrepancies between the approved plans and site practices, a discrepancy resolution process will be implemented. The appropriate expert based on discipline (chemistry, safety, munitions) will be engaged to support the Project Manager and project team in resolving discrepancies immediately after they are identified. The ultimate resolution will be

made by the Project Manager. If the discrepancy cannot be resolved, the nonconformance will be documented in a Corrective Action Request (CAR). A discussion of the CAR process is presented in Section 4.4.4. When an unresolved discrepancy is identified as potentially causing a nonconformance, the work activities will be recommended to stop until a resolution can be documented and approved.

4.3.4 Follow-Up Phase Inspection (Surveillance)

Scheduled and unscheduled inspections will be performed as part of the follow-up phase. The purpose of these inspections is to ensure that a high level of quality is maintained by monitoring compliance that the project plans and procedures on an ongoing basis. The UXOQCS has primary responsibility for on-site verification of the work practices in relation to the DFW inspection requirements. However, the SUXOS is also responsible for monitoring performance. The following will be performed for each DFW:

- Inspections and surveillance to ensure compliance with project plans.
- Inspections and surveillance to ensure a high level of workmanship is maintained.
- Inspections and surveillance to ensure log books are complete.
- Inspections and surveillance to ensure compliance with the inspection frequency and requirements documented in **Table 4-1**.

Checks for the process and procedures used during execution of this Work Plan will be conducted by the Project Manager, SUXOS, UXOQCS, UXOSO, and/or geophysicist. Process integrity is defined as conformance to specifications and requirements in the Work Plan including regulations and standards such as QC metrics established in Section 3. Specific inspection methods and failure criteria are presented in **Table 4-2**. These checks will consist of visual observations of the methods used and are part of the Follow-Up Inspections conducted during the performance of each DFW.

Results of the follow-up phase inspections will be documented in the UXOQCS log book and summarized in the DQCR.

4.3.5 Final Phase Inspection

At the completion of all work associated with a DFW, the UXOQCS will conduct an inspection of the work. The work should be inspected for conformance to plans, specifications, quality, workmanship, and completeness. An itemized list will be compiled that includes a summary of work not properly completed, inferior workmanship, and work not conforming to plans and specifications. The list will be documented as a nonconformance in the DQCR with an estimated date for correction of each discrepancy. If the discrepancy cannot be reconciled, a CAR will be prepared as discussed in Section 4.4.4.

Following correction of work, a second inspection will be conducted by the UXOQCS to ensure that all deficiencies have been corrected. The inspections and resolutions will be completed within the schedule stated for completion of the entire work, or any particular increment thereof if the project is divided into increments by separate completion dates.

4.4 DOCUMENTING DEFICIENCIES AND CORRECTIVE ACTIONS

The UXOQCS is responsible for verifying compliance with this QCP through audits and inspections of the DFWs. The Project Manager will also coordinate with the UXO Operations QC Manager as deemed necessary following reviews, audits, and inspections at the project level to confirm that work is progressing in accordance with the Work Plan. Discrepancies are to be communicated to the responsible individual and documented in the DQCRs.

4.4.1 Corrective Action Process

The Project Manager and UXOQCS are responsible for ensuring that the procedures for reporting, evaluating, and correcting nonconformance are addressed through the planned QC procedures. The determination of any nonconforming conditions must be supported with objective evidence. The nonconforming conditions will be evaluated and corrected and may be considered as opportunities to improve the process during the RA.

4.4.2 Continuous Improvement

Personnel are encouraged to continuously review their processes and to suggest changes that improve the process; provide benefits; or improve project efficiency, safety, and quality. These suggestions can be submitted either formally through a written memorandum to the SUXOS or to the UXOQCS or informally through verbal discussions at project meetings.

4.4.3 Deficiency Identification and Resolution

Personnel have the responsibility to identify and report conditions adverse to quality. The deficiencies will be identified, documented, investigated, and corrected appropriately. The Project Manager and UXOQCS are responsible for evaluating the causes of the deficiencies or the nonconformance and for recommending solutions to correct the deficiency identified. The UXOQCS will be responsible for verifying implementation of the corrective action and for monitoring the effectiveness of the corrective action for each DFW (**Table 4-1**).

4.4.4 Corrective Action Request

A CAR can be issued by any member of the project team, including subcontractor personnel. The CAR is also issued by the UXOQCS when a discrepancy is identified that cannot be resolved following the DFW inspection (at any phase). The CAR will be provided to the Project Manager, who will evaluate the request based on input from the UXOQCS and subject matter experts. If the CAR is accepted, the Project Manager will develop a corrective strategy, assign resources, and specify a schedule for corrective actions. The UXOQCS will verify the effectiveness of the corrective action once it has been implemented and completed. Reoccurring reviews of the CAR will be performed to ensure that the established protocols for corrective actions are being implemented properly and the desired intent is being achieved.

As part of the CAR, a root cause analysis will be conducted to identify the factors that led to the problem. Criteria to be considered in the analysis will include personnel qualifications, training, adequacy of procedures, adequacy of equipment, and adequacy of QC inspections and measures. Input will be obtained from field personnel as necessary and technical experts to support the analysis. The nonconformance will be traced back to the problem using reverse engineering as applicable.

An example of the CAR form is provided in **Appendix D**. At a minimum, the nonconformance will be documented on the CAR within 24 hours of occurrence. The date when the corrective action will need to be completed and integrated will be discussed with the project team and documented on the CAR and DQCR.

4.4.5 Corrective Action Tracking

Each CAR will be tracked with a unique identifier for the duration of the field activities. The review, approval, implementation, and completion dates will be tracked in a tabular format in the project file.

4.4.6 Lessons Learned

CARs will be attached to the DQCRs. The intent is to document discrepancies and corrective actions to share lessons learned with the project team. CARs will be made topics of daily tailgate meetings as appropriate to ensure that project staff are aware of the situation and the corrective strategy.

4.5 PROJECT COMMUNICATION

Daily briefings will be held with the field personnel to review the project activities and to discuss technical and safety issues. The SUXOS and UXOQCS will conduct the meetings and ensure that the Daily Summary Report is completed and signed by the field personnel. The UXOQCS may schedule additional meetings to discuss technical and quality issues at any time. The SUXOS will maintain communications with the project management team and report any significant problems or decisions to the Project Manager for assistance. The project QC aspects will also be documented in the UXOQCS Log and DQCR for specific DFWs.

4.5.1 Weekly Project Meeting

A project team meeting will be held at least once per week during the RA field activities with the field operations and project management personnel. The meeting will be used to discuss project progress and QC related issues. An agenda will be distributed prior to the meeting. Notes from the meeting will be captured and distributed for review and approval.

4.5.2 Project Documentation

The Project Manager will control the project documentation to ensure that the documents are prepared and approved as part of the contractual requirements. The Project Manager will monitor and track the submission of the project documentation and delegate reviews to the appropriate quality management staff based on the document type, the content, and DFW. Digital records of status reports will be kept on the project's TeamLink website for secure access of authorized

users. Digital records of all reports will be kept in a WESTON project file. **Table 4-3** lists the documents that will be field generated and maintained in the project file. Example documents are provided in **Appendix D**.

The comments received during the documentation review will be tracked in the project file and disseminated to the project team to ensure that corrective actions are incorporated for the life of the project. A response to comments document will be prepared and submitted to the reviewer for approval. After approval, the comments and responses will be incorporated into the document and it will be resubmitted.

4.5.3 Logs, Records, and Reports

The documentation and minimum required content are described in **Table 4-4**. Examples of the documentation are provided in **Appendix D**.

Table 4-1 Definable Features of Work and Inspection Checklist

Inspection Description	Frequency of Inspection	Inspection Responsibility	Possible Action if Failure Occurs
1. Site Setup/Mobilization of Personnel, Equipment, and Supplies			
Verify planning documents have been approved and are available onsite.	Once at mobilization and as required if new documents are generated or revised.	UXOQCS	Do not proceed with field activities until approval has been granted.
Verify work personnel are available and are qualified to perform the work.	Once at mobilization and follow-up as new employees mobilize.	Project Manager, SUXOS, UXOQCS	Do not allow personnel onsite until qualifications are confirmed.
Verify all personnel have read and understand the planning documentation.	Once at mobilization and follow-up as new employees mobilize.	UXOQCS	Do not proceed with field activities until inspection is passed.
Confirm all personnel have signed the Work Plan and APP acknowledgement forms.	Once at mobilization and follow-up as new employees mobilize.	UXOQCS	Do not proceed with field activities until inspection is passed.
Calibrate and test equipment initially to confirm it is functional.	Once as equipment arrives on site.	UXOQCS	Do not proceed with field activities until inspection is passed.
2. Grid Survey Activities			
Verify survey team has appropriate qualifications including safety/training and state licensing.	Once at start of survey activity.	Project Manager, SUXOS, UXOQCS, UXOSO	Surveyor must provide qualifications, training certificates, and licensing prior to starting work or change surveyor.
Confirm location of established boundary control points are suitable for use (located in proximity to work area, no tree canopy) with the RTK base station.	As boundary control points are being established.	Geophysicist	Move boundary control point to the closest accessible removal action boundary location and resurvey.
Grid corner points for surface removal grids have been located and marked as described in the Work Plan.	As grid points are being surveyed.	Geophysicist	Resurvey and mark corner points.
Grid corner points for subsurface removal grids requiring professional survey have been located and marked as described in the Work Plan.	As grid points are being surveyed.	Geophysicist	Resurvey and mark corner points.
Each grid has at least one seed item as described in the Work Plan (location, depth, orientation and seed type are recorded).	As grid points are being surveyed.	UXOQCS or UXO escort	Return to grid, place seed item and survey.

Table 4-1 Definable Features of Work and Inspection Checklist (Continued)

Inspection Description	Frequency of Inspection	Inspection Responsibility	Possible Action if Failure Occurs
Grid corners and boundary control points are of suitable quantity and location to be used during line and fiducial data positioning if necessary.	As grid points are being surveyed.	Geophysicist	Add additional control.
3. Brush Clearing			
Ensure equipment is available, properly operated, and maintained.	Once and follow up through duration of vegetation clearance activities.	UXOQCS	Do not proceed with field activities until inspection is passed.
Personal protective equipment (PPE) is properly worn and maintained.	Daily.	UXOQCS, UXOSO	Do not proceed with field activities until inspection is passed.
Confirm brush is sufficiently thinned so that surveys can be conducted while compliance of the environmental protection plan is maintained.	Once following clearance of a grid or area. Follow up as needed.	UXOQCS	Return to location and clear vegetation as necessary to pass inspection.
4. Geophysical Equipment Testing and Verification			
IVS was constructed in accordance with the Work Plan (type and number of seed items, depth, and separation).	Once during IVS construction.	Geophysicist	Re-seed and re-survey seed items.
Confirm geophysical sensors (digital and analog) selected for the project are capable of achieving detection performance requirements based on noise levels and depths of items to be encountered.	Once after initial IVS surveys.	UXOQCS, Geophysicist	Repair sensors or recommend changing instrumentation/method. Rerun IVS.
Positioning systems are capable of achieving accuracy requirements documented in the Work Plan.	Once after initial IVS surveys.	Geophysicist	Repair equipment or recommend changing positioning system. Rerun IVS.
Responses for seed items fall on or above the least favorable orientation sensor response curves within the appropriate tolerance as documented in the Work Plan.	Once after initial IVS surveys.	Geophysicist	Repair sensors or recommend changing instrumentation/method. Rerun IVS.

Table 4-1 Definable Features of Work and Inspection Checklist (Continued)

Inspection Description	Frequency of Inspection	Inspection Responsibility	Possible Action if Failure Occurs
Noise levels, anomaly selection thresholds, and appropriate processes are documented and approved by the USACE Geophysicist prior to performing production surveys.	Once after initial IVS surveys.	Project Manager, UXOQCS, Geophysicist	Do not allow production surveys to commence before approval.
Confirm digital functionality tests are performed before and after surveys and results are verified against metrics established in the Work Plan.	Daily and following repair or maintenance.	Geophysicist	Recollect data between tests where discrepancies were observed if a resolution cannot be determined.
The IVS procedures documented in the Work Plan are being performed by each DGM team before and after surveys.	Daily.	Geophysicist	If data quality is poor and IVS data is not available to support a resolution, data may need to be recollected for the time period in question.
Analog instruments are tested on the IVS to confirm functionality before surface and subsurface removal activities and at end of day.	Daily and following repair or maintenance.	UXOQCS	Replace/repair instrument if functionality is questionable.
Analog instruments are tested mid-day to confirm functionality.	Daily and following repair or maintenance.	UXOQCS	Replace/repair instrument if functionality is questionable.
5. DGM Operations <i>(Detailed QC requirements for DGM operations are provided in Section 3 of the Work Plan)</i>			
Confirm processes detailed in Section 3 are being performed and MQOs are being achieved.	Daily during DGM.	UXOQCS, Geophysicist	Data may need to be repackaged, reprocessed, or recollected.
Confirm digital data packages are submitted for USACE review.	Weekly and as needed.	Project Manager, UXOQCS, Geophysicist	Data may need to be repackaged, reprocessed, or recollected based on results from USACE review.
6. Surface and Subsurface Removal Operations			
Ensure the appropriate exclusion zones are established and maintained in active work areas.	Daily.	SUXOS, UXOQCS, UXOSO	Stop activities until the appropriate exclusion zones have been established and maintained.
Verify team separation distances during subsurface removal operations.	Daily.	SUXOS, UXOQCS, UXOSO	Stop activities until the appropriate separation distance is being followed.

Table 4-1 Definable Features of Work and Inspection Checklist (Continued)

Inspection Description	Frequency of Inspection	Inspection Responsibility	Possible Action if Failure Occurs
Confirm all personnel have the appropriate PPE and supplies.	Daily.	SUXOS, UXOQCS, UXOSO	Stop activities until PPE and supplies are in place.
Observe anomaly reacquisition/ intrusive work accuracy and completeness.	Daily and as required.	UXOQCS	Stop activities until Work Plan procedures are being followed and any activities not performed within compliance are reevaluated and re-performed if necessary.
Observe surface removal operations for accuracy and completeness.	Daily and as required.	UXOQCS	Stop activities until Work Plan procedures are being followed and any activities not performed within compliance are reevaluated and re-performed if necessary.
Confirm UXO teams are recording/ logging all required parameters during item recovery.	Daily.	UXOQCS	Retrain or replace personnel.
Verify all seed items have been recovered within a specific grid or area.	At completion of grid.	UXOQCS, Geophysicist	Resurvey grid and resubmit for QC.
Conduct anomaly/ area verification sampling when removal activities are complete in a grid or area.	At completion of grid/ area.	UXOQCS	Resurvey grid/ area and resubmit for QC.
Verify excavations have been backfilled and properly restored.	Daily.	UXOQCS	Return to excavation to perform necessary restoration.
7. Demolition/Disposal			
Verify the determination of acceptable to move MEC, MPPEH as appropriate.	Each UXO/MPPEH item, as required.	SUXOS, UXOSO	MEC or MPPEH item will be BIP. Retrain or replace personnel.
Ensure appropriate notifications and procedures are in place to transport MEC, MPPEH for demolition.	Each MEC, MPPEH item, as required.	SUXOS, UXOSO	Do not move MEC or MPPEH item until inspection passes. Retrain or replace personnel.
Verify disposal procedures are being conducted in accordance with the Work Plan.	Each UXO item, as required.	UXOQCS	Stop activities until Work Plan procedures are being followed and any activities not performed within compliance are reevaluated and re-performed if necessary.

Table 4-1 Definable Features of Work and Inspection Checklist (Continued)

Inspection Description	Frequency of Inspection	Inspection Responsibility	Possible Action if Failure Occurs
<p>8. MPPEH and MDAS Accountability <i>(Detailed procedures for MPPEH and MDAS certification and verification are provided in Section 3 of the Work Plan.)</i></p>			
Verify personnel qualifications.	Once.	UXOQCS	Replace unqualified personnel with qualified personnel.
Perform inspections on accumulated MDAS.	Daily as accumulated.	SUXOS, UXOQCS, Or Qualified Person (i.e. Tech III)	Stop activities until Work Plan procedures are being followed and any activities not performed within compliance are reevaluated and re-performed if necessary.
<p>9. Demobilization</p>			
Confirm all site features, equipment, supplies and personnel are removed and all work locations are restored as documented in the Work Plan.	Completion of project.	Project Manager, SUXOS, UXOQCS	Perform inspection following completion of DFW.

Table 4-2 Follow-Up Phase Inspection Methods and Failure Criteria

Activity	Inspection Method	Failure Criteria
Equipment and instrument checks	<ul style="list-style-type: none"> ▪ Inspect equipment and instrumentation at IVS. ▪ Observe operation by personnel. ▪ Record results on appropriate forms/ reports. 	<ul style="list-style-type: none"> ▪ Equipment is not operational. ▪ Personnel are not proficient with operation.
Process and procedure inspections	<ul style="list-style-type: none"> ▪ Visual observations of personnel and accuracy of methods being employed. ▪ Part of the follow-up inspection phase. ▪ Confirm the requirements of the Work Plan, inspections for DFWs, regulations and industry standards comply with project objectives. 	<ul style="list-style-type: none"> ▪ Any discrepancies identified will need to be resolved as discussed in the QCP. ▪ Unresolved discrepancies or nonconformance will require a CAR. ▪ If the same discrepancy is reoccurring, prepare a CAR.
Grid survey activities	<ul style="list-style-type: none"> ▪ Visually compare staked removal action boundary locations against boundary control points to confirm that the grid system entirely overlaps each removal action area. 	<ul style="list-style-type: none"> ▪ If grids do not overlap with removal action boundaries.
Surface removal grids	<ul style="list-style-type: none"> ▪ Visual observations during operations to confirm procedures documented in the Work Plan are being properly executed. ▪ Conduct random inspections of at least 10% of the grid with the same type of instrumentation used for surface removal to determine if metallic anomalies remain on the surface. ▪ Verify seed items were recovered, as applicable. 	<ul style="list-style-type: none"> ▪ Failure to investigate surface anomalies. ▪ One seed item is missed. ▪ MEC or MPPEH of the same or greater size of what was anticipated remains in grids.
DGM operations	<ul style="list-style-type: none"> ▪ Discussed in Section 3 of the Work Plan. 	<ul style="list-style-type: none"> ▪ Discussed in Section 3 of the Work Plan.
Anomaly reacquisition and investigation	<ul style="list-style-type: none"> ▪ Respond to grid or transect following excavation for inspection. ▪ Inspect at least 10% of anomaly locations to confirm metal has been removed from a 3.3-ft radius. ▪ Confirm excavations have been restored to Work Plan specified conditions. ▪ Verify seed items were recovered, as applicable. 	<ul style="list-style-type: none"> ▪ Failure to reacquire all anomalies on dig list. ▪ Failure to investigate subsurface anomalies that were reacquired. ▪ One seed item is missed. ▪ MEC, MPPEH of the same or greater size of what was anticipated remains in grids. ▪ Restoration not performed in is incomplete.

Table 4-3 Project Documentation Schedule

Definable Feature of Work	Primary Documentation Associated with the DFW
Site setup/ mobilization of personnel, equipment, and supplies	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ Work Plan Acknowledgement ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ SUXOS Logbook ▪ UXOQCS Logbook ▪ Weekly Report (as required)
Grid survey activities	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ Weekly Report (as required)
Brush clearing	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ Weekly Report (as required)
Geophysical equipment testing and verification	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ DGM Processing Form ▪ Analog Equipment Checkout ▪ Weekly Report
DGM operations	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ DGM Processing Form ▪ Dig List ▪ Weekly Report

Table 4-3 Project Documentation Schedule (Continued)

Definable Feature of Work	Primary Documentation Associated with the DFW
Surface and subsurface removal operations	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ SUXOS Logbook ▪ UXOQCS Logbook ▪ Dig List ▪ Weekly Report
Demolition/disposal	<ul style="list-style-type: none"> ▪ Demolition Notification Contact List ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ SUXOS Logbook ▪ UXOQCS Logbook ▪ Dig List ▪ Weekly Report
MPPEH and MDAS accountability	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ SUXOS Logbook ▪ UXOQCS Logbook ▪ Dig List ▪ DoD Form 1348-1A ▪ Weekly Report
Demobilization	<ul style="list-style-type: none"> ▪ Daily Safety and QC Tailgate Meeting ▪ Daily Summary Report ▪ APP/SSHP Acknowledgement ▪ QC Report ▪ SUXOS Logbook ▪ UXOQCS Logbook ▪ Weekly Report (as required)

Table 4-4 QC Reporting Logs and Records

Report/Form/Log Name	Description and Minimum Requirements
Work Plan Acknowledgement Manager: UXOQCS	All WESTON employees and applicable subcontractors will read and acknowledge by signature they have read and understand the Work Plan.
APP/SSHP Acknowledgement Manager: UXOQCS/UXOSO	All WESTON employees and subcontractors will read and acknowledge by signature they have read and understand the APP/SSHP. This form will be used as the daily sign in sheet and tailgate safety brief acknowledgement.
Daily Summary Report Manager: SUXOS, UXOQCS/UXOSO	<p>This report will summarize the day's activities and tasks performed for any and all DFWs and may include the following as required:</p> <ul style="list-style-type: none"> ▪ QC findings ▪ Safety and health findings ▪ Intrusive progress and activities ▪ SUXOS activity summary ▪ UXO/MPPEH recovery information ▪ MD recovery information ▪ Records of site work and progress
DQCR Manager: UXOQCS	<p>The DQCR will provide inspection results for each activity that was monitored. It will generally document and summarize the information recorded in the UXOQCS log. The QC Report includes:</p> <ul style="list-style-type: none"> ▪ Each DFW undergoing inspection ▪ Phase of inspection ▪ Results of inspection ▪ Summary of discrepancies ▪ Summary of nonconformance ▪ Resulting actions
SUXOS Log Manager: SUXOS	<p>This log is maintained by the SUXOS and records at a minimum the following:</p> <ul style="list-style-type: none"> ▪ Activities started and completed ▪ Work stoppage ▪ Official correspondence ▪ Personnel list ▪ Team location and assigned activities ▪ Demolition activity ▪ Visitors
UXOQCS Log Manager: UXOQCS	<p>This log is maintained by the UXOQCS and records at a minimum the following:</p> <ul style="list-style-type: none"> ▪ Equipment testing and results ▪ QC inspections and documentation as required by the DQCR ▪ Work stoppage due to QC issues ▪ Date and personnel observed/checked
Magnetometer Equipment Checkout Manager: UXOQCS	Magnetometer instrument testing results at the test plot will be documented daily. Instruments will be taken out of service until repaired and functionality can be demonstrated. Serial numbers, date of test, and operability will be recorded.
DGM Processing Form Manager: Geophysicist	DGM processing parameters and results will be recorded. The form also includes IVS results and descriptions of field conditions, dates of survey, instrument type, and results of the QC function tests.

Table 4-4 QC Reporting Logs and Records (Continued)

Report/Form/Log Name	Description and Minimum Requirements
Dig List Manager: SUXOS	Dig lists will be generated as anomalies are investigated during intrusive operations. Records include the following: <ul style="list-style-type: none"> ▪ Date of intrusive activity ▪ Grid location and ID ▪ Waypoint coordinates ▪ Depth of item ▪ Item classification, type and description ▪ Dig team ID ▪ Disposition
Demolition Notification List Manager: SUXOS/Site Manager	The demolition notification list is provided in Section 3.7.9 of the Work Plan. All parties will be notified prior to performing demolition.
DoD Form 1348-1A Manager: SUXOS	Form will be completed when MD is transferred for recycling as required. Process and instructions for the form are provided in Section 3.7.10 of the Work Plan.

5. EXPLOSIVES MANAGEMENT PLAN

5.1 GENERAL

The Explosives Management Plan outlines the procedures to be used by WESTON personnel to acquire, receive, store, transport, issue, and report the loss of explosives used during this project. All personnel involved with explosives will comply with federal, state, and local laws as required.

5.2 LICENSES/PERMITS

WESTON has acquired the following permits and license for explosive purchase, storage, and demolition for this site:

- Type 33-User of High Explosives Permit (Department of Justice – Bureau of Alcohol, Tobacco, Firearms and Explosives [ATF]).
- Explosives Purchase Permit (PADEP).
- Pennsylvania Blaster's License.

5.3 ACQUISITIONS

WESTON will purchase explosives on an as-needed-basis from a licensed commercial vendor for same-day delivery. If same-day delivery is not possible, on-site security will be provided for those MEC items that cannot be demolished the same day as identified. Vendor information will be provided as required. Prior to bringing the explosives on-site to private property, the SUXOS will coordinate with the USACE OESS, ARNG, PAARNG, and FIG and local law enforcement.

5.4 INITIAL RECEIPT

For this field effort, a magazine will not be established on-site. Explosives that are delivered to the site will be placed in a Day Box mounted in the beds of a truck and will be used the same day. The following procedures will be adhered to upon initial receipt of explosive materials (see **Figure 5-1**):

- Upon arrival at the site, the SUXOS will escort the vendor/supplier to a designated area for loading/unloading.
- An individual authorized to receive the explosives will compare the explosives delivery record to the actual quantity delivered prior to accepting custody for the explosives.
- Once the quantity has been confirmed, the explosive delivery record will be signed and the explosives transferred to and stored in the approved Day Box mounted on the trucks. Explosives will be recorded on a magazine data card, such as DA Form 3020.
- All material introduced or removed from the Day Boxes will be entered on stack

cards and explosive records will be updated.

- If it is determined that there is a discrepancy between the quantity delivered and the quantity shipped, the following will occur:
 - The UXOSO will be notified.
 - The shipment will not be accepted.
 - The shipper will be contacted immediately to resolve the discrepancy.

Note: If the discrepancy cannot be resolved within 24 hours, the local law enforcement agency, ATF, WESTON Program H&S Manager, WESTON MEC QC Manager, and WESTON Project Manager will be notified.

All original receipts, shipping documents, or invoices will be retained on-site as part of records management. Copies of the documentation will be provided in the final report as an appendix.

5.5 STORAGE

No explosives magazine will be established on-site. All explosives will be consumed the same day received.

5.6 TRANSPORTATION

All vehicles transporting explosives will be properly inspected, equipped, and placarded prior to loading the explosives onto the vehicle, in accordance with Section 29 of EM 385-1-1, *Safety and Health Requirements Manual* (USACE, 2008). The transportation of explosives from the point of receipt to locations requiring demolition operations will be conducted in the following manner:

1. Vehicles will be inspected prior to each use and will be properly placarded.
2. Explosives will be transported in closed vehicles whenever possible. When using an open vehicle, explosives will be covered with a flame-resistant tarpaulin (except when loading/unloading) or transported in an approved container.
3. The vehicle engine will not be running, and wheel chocks and brakes will be set when loading/unloading explosives.
4. Beds of vehicles will have dunnage, plastic bed liner, or sandbags to protect the explosives from contact with the metal bed and fittings.
5. Vehicles transporting explosives will have a first aid kit, two 10-ABC-rated fire extinguishers, and communication capabilities.
6. Initiating explosives, such as detonators, will remain separated from other high explosives during loading, unloading, and while on vehicles.

7. Compatibility requirements will be observed.
8. Operators transporting explosives will have a valid driver's license.
9. Drivers will comply with posted speed limits, but will not exceed a safe and reasonable speed for conditions.
10. Vehicles transporting explosives off-road will not exceed 20 mph.

5.7 DOCUMENTATION

Any time explosives are being transported, completed copies of the documents described below will be in the vehicle:

- ***Instructions for Motor Vehicle Owners - Emergency Response Information***—Only those items that are being transported will be entered on the form (provided in **Appendix D**) with the applicable quantity/units and weight columns completed. All required data will be entered.
- ***Explosives Purchase/Receipt/Transport Authorization List***—This list (provided in **Appendix D**) will be completed to ensure that the pertinent data for personnel transporting explosives are included on the form. As with the other required forms, this form will be part of the transport paperwork. Only the route shown will be used unless there is an emergency or the route is blocked.
- ***Motor Vehicle Inspection Checklist***—The checklist (provided in **Appendix D**) will be completed before explosives are placed in the vehicle and will accompany the shipment.

A copy of the current ATF permit/license will be maintained in the field office.

5.8 RETURN OF UNUSED EXPLOSIVES

All explosives ordered on an as-needed-basis will be consumed on the same day received.

5.9 DISPOSAL OF REMAINING EXPLOSIVES

All explosives ordered and received will be consumed on the same day received.

5.10 LOSS, THEFT, AND UNAUTHORIZED USE OF EXPLOSIVES

Loss or theft of explosives will be reported as stated in 27 CFR on Commerce in Explosives. **Table 5-1** lists the individuals or organizations to be notified upon the discovery of theft or loss of explosives.

Table 5-1 Reporting Lost or Stolen Explosives

Title	Name	Telephone Number
WESTON SUXOS	Bruce Moe	(920) 636-6494
WESTON UXO Safety Officer	Bruce Carnal	(502) 664-7926
WESTON Project Manager	John Gerhard	(610) 701-3793
WESTON MEC QC Manager	David Holland	(727) 772-3087
USACE OESS	TBD	TBD
USACE Project Manager	Wayne Davis	(410) 962-3506
ARNG	Rob Halla	(703) 607-7995
PAARNG	Joan Anderson	(717) 861-9414
Local Authorities as directed		911
ATF		(800) 461-8841

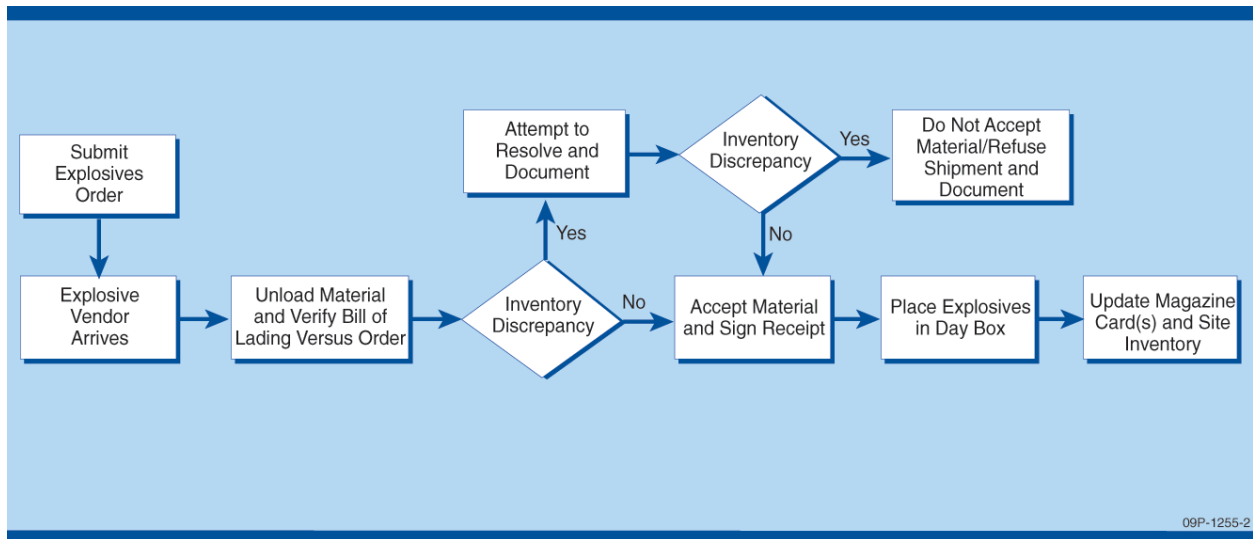


Figure 5-1 Procedures for Receipt of Explosives

6. ENVIRONMENTAL PROTECTION PLAN

6.1 GENERAL

Environmental protection is defined as maintaining the environment in its natural state as much as possible during project execution. The Environmental Protection Plan (EPP) has been specifically developed to document site-specific environmental conditions in and adjacent to the Ricochet Area MRS project work area (located in SGL 211). The EPP addresses the potential impacts that the proposed action may have on the surrounding environment and suggests measures to be implemented during the proposed actions to protect identified environmentally sensitive areas. The goals of the EPP include:

- Present a methodology to minimize the pollution of air, water, and land resources.
- Protect identified, site-specific, environmentally sensitive, cultural and/or historical resources.
- Safely and efficiently execute the RA at the project work area, in accordance with all applicable federal, state, and local regulations.

In addition to the EPP, an SOP was developed (**Appendix F**) to provide guidance for minimizing/eliminating the disruption to special plant and animal species within the Ricochet Area MRS. Before field activities commence, a training will be held for site personnel to review the SOP and the EPP.

6.2 EXISTING CONDITION SURVEY

Prior to the start of any field activities, an existing conditions survey will be conducted to document and mark natural resources, such as wetlands and species of special concern, which require protection or avoidance. Data collection will commence during survey activities to record the status of initial site conditions for activities, if applicable. This process is intended to by-pass protected areas and to determine existing conditions. A discussion of the existing environmental conditions believed to be present in the Ricochet Area MRS is presented in the following sections.

6.2.1 Biological Resources

WESTON will follow the requirements of the Pennsylvania Natural Heritage Program (PNHP), formerly known as the Pennsylvania Natural Diversity Index (PNDI), to determine whether there may be potential impacts to threatened and endangered and/or special concern species and resources within the Ricochet Area MRS.

The term PNDI remains a valid term for the Environmental Review (ER) Tool used to conduct an environmental review. The PNDI tool search results required further review. WESTON submitted a signed copy of the Project Environmental Review Receipt, a project narrative with a

description of the overall project and a USGS 7.5-minute quadrangle with the project boundaries and quad name marked on the map to the following agencies:

- Department of Conservation and Natural Resource Bureau of Forestry, Ecological Services Section.
- Pennsylvania Game Commission, Bureau of Land Management.
- Pennsylvania Fish and Boat Commission, Natural Diversity Section.
- U.S. Fish and Wildlife Service, Endangered Species Biologist.

The estimated response for the environmental review request is a minimum of 30 days. Based on agency responses, the information in this section will be confirmed and updated, if necessary.

6.2.1.1 Plant Communities

The Ricochet Area MRS consists primarily of montane hardwood-conifer forests in upland areas, with northern hardwood-conifer forests along the lower slopes (mostly north-facing slopes). These northern hardwood-conifer forests are also often found in small ravines and along stream courses, such as Stony Creek. Forming the major subdominant plant community in the lower slopes of Stony Creek Valley are chestnut oak (*Quercus prinus*) with black birch (*Betula lenta*). The red maple (*Acer rubrum*) becomes more significant farther up the slope with the chestnut oak remaining the major subdominant plant. At the ridge tops, the chestnut oaks, striped maple (*Acer pennsylvanicum*), and chestnut oak (*Quercus prinus*) are the dominant species.

6.2.1.1.1 Federally Threatened or Endangered Species

The Ricochet Area MRS does not contain federally listed threatened or endangered plant species.

6.2.1.1.2 Special Status Species

American holly (*Ilex opaca*) – Pennsylvania Natural Diversity Inventory (PNDI) listed Threatened Species. The American holly is an evergreen shrub or small tree that grows to 50 ft in height. It can be easily recognized by its semi-thick, evergreen leaves with a sharp spine at the tip and additional spines along the margin. The flowers, which appear in May and June, are unisexual, so that the familiar berry-like fruit, red at maturity, can be found only on female plants. American holly has a distribution from coastal New England south and west into Florida and Texas. In Pennsylvania, it is near the northern end of its range, and occurs mostly in the southeastern counties. The species grows on wooded slopes and stream banks.



Photo source: John Kunsman (PNHP)

Netted chainfern (*Woodwardia areolata*) – PNDI listed Special Concern Species. The netted chainfern grows from 1½ to 2½ ft in height, and may form small colonies as a result of the presence of creeping underground stems. The leaves are easily distinguishable into vegetative and fertile types. The vegetative leaves have a typical fern-like appearance, being green, flattened, and divided into 7 to 12 very deep lobes (or distinct leaflets on the lower part of the leaf). The leaf veins are conspicuous and have a net-like or chain-like arrangement, as the common name implies. The fertile leaves of netted chainfern are dark colored, much narrower, not flattened and leaf-like, and have spore-producing structures on their underside. The vegetative leaf of this species resembles the leaf of the sensitive fern (*Onoclea sensibilis*), a common species in Pennsylvania, but the lobes in netted chainfern tend to be alternately arranged along the leaf stalk whereas the lobes of sensitive fern tend to be oppositely arranged. The distribution is mainly on the Atlantic coastal plain from Nova Scotia south and west into Texas and Florida. In Pennsylvania, the species has been documented historically in scattered counties, particularly in the Delaware River drainage. It grows in swamps, seepages, wet woods, boggy wetlands, and along the margins of streamlets.



Photo source: Andrew Strassman

Minniebush (*Menziesia pilosa*) – Potential Species of Concern (although not listed in the current PNDI request and response). More common in the southern Appalachians, a relative of the blueberry, the minniebush has a limited distribution in Pennsylvania. Although historically reported from a few counties in western Pennsylvania, this shrub is currently known to occur only in Cumberland, Dauphin, Lebanon, and Schuylkill Counties. The minniebush is also found in high elevations and has distinctive small apricot colored bell-like flowers, blooming in summer. The minniebush was not listed in the PNDI request and response and no minniebush were observed during the RI fieldwork. However, potential forested stream bank habitat exists for this species within the project area so it is being considered as a potential species of concern.

Fact sheets presenting additional information about these three special status species are provided in **Appendix F**.



Photo Source: Peter Linehan



Menziesia pilosa

Gary P. Fleming

6.2.1.2 Wildlife

The habitat of the Ricochet Area MRS supports a diverse mix of mammals, birds, reptiles, amphibians, insects, and benthic macroinvertebrates, including insects Spiny Oakworm Moth (*Anisota stigma*), Leonard's Skipper (*Hesperia leonardus*), Black-waved Flannel Moth (*Lagoa crispate*), and Regal Fritillary (*Speyeria idalia*). The Ricochet Area MRS acts as a migration corridor for hawks on the ridgelines and serves as a wintering and breeding habitat for bluebird species.

6.2.1.2.1 Federally Threatened or Endangered Species

The Ricochet Area MRS does not contain federally listed threatened or endangered wildlife species.

6.2.1.2.2 Special Status Species

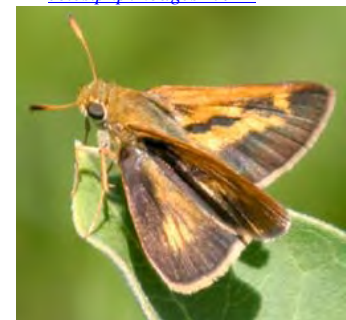
Hand-Maid Moth (*Datana ranaecephs*) – A PNDI listed Special Concern Species, the hand-maid moth has a wing span of 1 to 1 ½ inches with dark-brown forewings and light brown hindwings. This moth is known to occur primarily in Pennsylvania, New Jersey, and New York but may reside in other states. Larvae are known to feed on staggerbushes (*Lyonia* spp.) as a host plant, and nocturnal adults do not feed. It requires mixed hardwood forests, hardwood-pine mixes, and scrubland-grassland-woodland mixes. Information on behavior and general biology are lacking at this time.



photo source: Jim Vargo

<http://mothphotographersgroup.msstate.edu/species.php?hodges=7911>

Black Dash (*Euphyes conspicua*) – A PNDI listed Special Concern Species, the Black Dash has a wingspan of 1 to 1 3/8 inches, is richly colored, has a medium-sized skipper and is best distinguished by its hindwing pattern. In both males and the dark females, both above and below, there is a distinctive vaguely diamond-shape patch of yellow surrounded by the much more extensive darker background. The forewing pattern above in males is dominated by a thick, sooty-black stigma under a patch of yellow. The female's forewing above has a bold crescent of yellow spots, some of them translucent. Its distribution is Southern Ontario, Minnesota, and eastern Nebraska around the southern periphery of the Great Lakes; southern New England south through eastern Pennsylvania, New Jersey, Maryland, and Virginia. Larval food plants consist of Tussock-Sedge (*Carex stricta*), and adults can be found nectaring on flowering plants, and common and swamp milkweeds. The habitat of the Black Dash consists of wetlands where its food plant occurs, including marshy edges, river meadows, and bogs as well as in nearby uplands with nectaring sources.



Source: unknown

Pine Barrens Zale (*Zale sp.1 nr. lunifera*) – is a PNDI listed Special Concern Species. Information on behavior and general biology are lacking at this time.



photo source: Cal Butchkowski

Allegheny woodrat (*Neotoma magister*) –A PNDI listed Threatened Species, the Allegheny woodrat ranges in size from 14 to 17 inches in total length (including tail). The fur is brownish-gray with slightly darker coloration in the middle of the back. The belly and paws are white and the sides are buff. The Allegheny woodrat has large ears and a furry, bi-colored tail. Its habitat includes cliff faces, boulder piles, talus slopes, and sometimes limestone caves. Nests composed of shredded plant fibers are found in dry cave entrances, along narrow ledges, and in rock crevices. This species feeds on nuts, bark, grasses, fruits, and berries. Allegheny woodrats are nocturnal and a relatively shy species. The distribution of the Allegheny woodrat is primarily along the Appalachian Mountains from New York to Georgia and

west to Indiana.

Timber rattlesnake (*Crotalus h. horridus*) – Potential Species of Concern (although not listed in the current PNDI request and response). This snake occurs in the forested, mountainous regions of the Commonwealth. The timber rattlesnake prefers forested areas to forage for small mammals (e.g., mice and chipmunks) and talus, south to southeastern facing rocky slopes for hibernating and other thermoregulatory activities. The timber rattlesnake is threatened by overhunting, poaching, and habitat alteration. The timber rattlesnake was not listed in the PNDI request and response.



However, timber rattlesnakes were commonly found among the scattered boulder areas of the MRS during the RI fieldwork so it is being considered as a potential species of concern.

6.2.1.3 Aquatic Species

6.2.1.3.1 Federally Threatened or Endangered Species

Water resources within the Ricochet Area MRS do not contain federally listed threatened or endangered wildlife species.

6.2.1.3.2 Special Status Species

One macroinvertebrate, the Allegheny Cave Amphipod (*Stygobromus allegheniensis*), may occur in the Ricochet Area MRS and is a PNDI listed Special Concern Species. Amphipods are small invertebrate species (crustaceans) that inhabit cold water springs, seeps, on hillsides and in caves. Allegheny Cave Amphipod has one of the broadest ranges of any species in the genus. Yet, species is still relatively uncommon. These rare invertebrate species are threatened by habitat destruction and poor water quality.

6.2.2 Wetland Swamps

Wetland boundaries will be initially delineated spatially on GIS-generated maps using results referenced from the National Wetlands Inventory Report. In the field, project team personnel will carefully observe any grade changes and the presence of sphagnum moss on the ground surface when approaching these wetland areas. When nearing wetland areas, no additional pruning or trimming of vegetation will occur. Rare species, if found, will be avoided and will be documented in the field log.

6.2.3 Water Resources

6.2.3.1 Surface Water

The Stony Creek watershed is primarily within the Ricochet MRS and contains three major tributaries to Stony Creek: Rausch Creek (not within the MRS); Yellow Springs in the center; and Rattling Run on the west side of the MRS. Stony Creek flows from northeast to southwest and drains into the Susquehanna River approximately 10 miles to the west of the western boundary of FIG. No natural lakes or ponds exist within the Ricochet Area MRS. The project team will work to cross the stream at existing stream crossovers to minimize impacts to Stony Creek.

6.2.3.2 Groundwater

The Mauch Chunk Formation provides the most reliable source of groundwater with high yields capable of supporting public water suppliers and industry. Depths to adequate drinking water supplies for domestic use can usually be reached at less than 200 ft. Groundwater occurrence in the mountains may be associated with old coal mine workings and in the numerous fractures associated with the faults, folds, and jointing of the sedimentary rocks (PADER, 1979). Depth to the groundwater in this region averages 20 ft bgs. Groundwater is not likely to be impacted during the MEC RA.

6.2.4 Cultural and Archeological Resources

Many prehistoric and historic archaeological cultural resources are located within the Ricochet Area MRS footprint. Based on available records, including the St. Anthony's Wilderness website (Via, 2011), these include, but are not limited to, the following:

- Eleven house foundations west of the Rattling Run tributary associated with the mining and railroad communities from the 1800s.
- An American Indian encampment near a spring on the south side of Sharp Mountain (artifacts dated to 4500-5500 BC).
- Rattling Run includes remnants of a stone inclined plane used for coal transport and structural foundations, including a well at the top and bottom of the incline. The mines at Rattling Run were in active use from about 1825 to 1850.

- Yellow Spring includes remnants of sawmill machinery near Stony Creek in the area of the Yellow Spring tributary. In addition, there is a stone tower/chimney at the top of a mine shaft. There is also a stone inclined plane used for coal transport. The minehead at Yellow Spring closed about 1859.
- Remnants of structural foundations associated with the historic Cold Spring resort. The Cold Spring Resort and facilities date back to 1800s. This area was also noted for its cold spring water.

As part of the remedial investigation (RI) planning effort, the Pennsylvania State Historic Preservation Office (SHPO) was contacted to identify historic places within the MRS worthy of preservation. The National Register of Historic Places listed the Fort Indiantown Gap Historic District as the closest place of historic significance. This historic district is located outside the MRS. In cooperation with the SHPO, field personnel will avoid conducting field activities within identified areas of significant historical and/or cultural significance and will follow the procedure outlined in the flow chart for Inadvertent Discovery of Cultural Remains (**Appendix G**). Before field activities commence, a training will be held for site personnel to review the flow chart for Inadvertent Discovery of Cultural Remains and the identification of historical/cultural items.

6.3 PROCEDURES FOR PROTECTION OF RESOURCES

6.3.1 Trees and Shrubs

6.3.1.1 Tree and Shrub Removal

Limited vegetation removal will be necessary in the MRS to aid survey and removal activities. The vegetation to be removed may include immature trees (less than 4 inches in diameter), low-lying tree branches, brush, and field grasses. All items will be cut to a level that allows clearance activities to proceed, but allows re-growth of the vegetation with time. Trees that are 4 inches in diameter or greater, measured from chest height, will not be cut unless specifically approved by the ARNG, PAARNG, USACE, and PGC. Activities will be in accordance with PGC Special Use Permit in **Appendix H**.

WESTON will take all actions necessary to protect and prevent unnecessary damage to vegetation. WESTON personnel will disturb only the vegetation necessary for safe and effective access for clearance activities.

6.3.1.2 Tree and Shrub Restoration

Because of the limited vegetation removal activities planned in the MRS, no tree or shrub restoration is planned after removal activities are completed.

6.3.2 Waste Disposal

Waste generated will be properly characterized and disposed of in accordance with applicable regulations and through approved channels. It is expected that only uncontaminated scrap metal

and trash will be generated as the result of this project. Generation of hazardous waste is not anticipated.

WESTON will arrange for recycling of scrap metal. In accordance with 40 CFR 261.6(a)(3), scrap metal, if recycled, is not subject to Parts 262-266, or 268, 270, or 124. WESTON will recycle all scrap metal generated as a result of necessary removal and maintain records of all recycling.

6.3.2.1 Nonhazardous Wastes

Nonhazardous solid waste materials, such as trash and general debris, will be removed from the project site and transported off-site for disposal through the municipal waste system.

6.3.2.2 Hazardous Wastes

WESTON does not anticipate generating contaminated wastes in the execution of this project and is not tasked to dispose of hazardous wastes under this DO.

6.3.3 Security of Hazardous Materials

WESTON personnel will provide security to control the work area. Hazardous materials associated with the project (primarily explosives) will be secured as discussed in Section 5, Explosives Management Plan.

6.3.4 Burning Activities

No burning activities are planned for this project.

6.3.5 Dust and Emission Control

It is not anticipated that field activities will have any significant effect on air quality because demolition activities and normal vehicle use are considered minor mobile sources of air emissions.

6.3.6 Noise Control and Prevention

A source of noise will be pulse noises resulting from demolition activities. Both tamping the demolition shot with earth (sand bag enclosure and buried explosion module) and observing weather conditions on the day of the shot will control this noise. For example, a day with a low cloud ceiling will transmit the nuisance noise more effectively than a clear day. To reduce the nuisance noise on a cloudy day, various options will be assessed. They include possibilities such as not conducting the demolition shot, waiting for a shift in prevailing winds, reducing the net explosive weight of the shot, or some combination of controls. The UXOSO, SUXOS and the Demolition Supervisor will determine the applicable method of noise control.

6.3.7 Spill Control and Prevention

6.3.7.1 General

WESTON plans to conduct fueling and repair of vehicles off-site if possible. This practice will decrease the amount of pollutants that need to be stored on-site. Hazardous liquids that are absolutely necessary to conduct work activities will be stored in small quantities.

WESTON anticipates that unleaded gasoline, diesel fuel No. 2, and motor oil will be the only substances with hazardous constituents that may be stored on-site, and they will be stored in quantities less than 5 gallons. If a discharge should occur, WESTON will provide spill kits on-site for the immediate cleanup of any petroleum product that may be inadvertently spilled.

6.3.7.2 Spill Potential

The potential for a spill of pollutants during operations is unlikely based on the planned work activities. The highest probability for a spill will occur during re-fueling operations of equipment (e.g., filling a chainsaw's gas and oil tanks). In the event of a spill during this fueling operation, the largest quantity of a pollutant that can be lost at any one time is likely less than 1 gallon of gasoline.

6.3.7.3 Preventative Spill Control Measures

All containers of liquids containing petroleum products or other chemicals with potentially hazardous constituents will be managed carefully and kept closed. The containers will be stored away from the main operations to decrease the chances of container damage and the chances of spillage.

Vehicles will be maintained in good operating condition and left running only when necessary. All vehicles will be fueled, maintained, and serviced at an off-site location. No routine cleaning or washing of vehicles or equipment will be permitted on-site.

When refueling heavy equipment and/or small power tools on-site, the following measures will be taken:

- Spill pans will be placed on the ground under the fill cap to catch any spillage.
- The operator will not leave the fueling operation and will not latch the fueling nozzle into a continual flow position.
- The operator will continually monitor the fueling operation.
- When the equipment is full, the fuel flow will be stopped, the operator will wait at least 5 seconds for the fuel to drain from the nozzle, and then the nozzle will be withdrawn and turned open end up while being transported back to the fuel source for stowage.

6.3.7.4 Spill Response

If fuel or oil is spilled, the following measures will be taken:

- The spill area will be isolated and contained.
- USACE, Dauphin County EMA, and Lebanon County EMA will be notified during a spill response.
- The liquid and affected soil will be shoveled into a plastic bag and subsequently placed into a U.S. Department of Transportation (DOT)-approved shipping container.
- Each container will be labeled to identify its contents.
- The container(s) will be shipped off-site and disposed of at a permitted facility in accordance with the CFR 260 – 270.

6.3.8 Storage Areas

WESTON does not anticipate the construction or use of a temporary storage area.

6.3.9 Access Routes

WESTON will use the existing road/trail network inside the MRS, and county and private community roads outside the MRS to gain access. No environmental impact is anticipated from the use of existing roads and trails because they are currently in use by personnel or from the use of county and private roads because they are used by the general public and private residents.

For safety purposes, a main ingress/egress route will be established through the MRS. This route will allow utility terrain vehicle (UTV) access for emergency situations. Tree and shrub pruning will be avoided as much as possible.

6.3.10 Control of Water Runon and Runoff

Runon and runoff water controls are not necessary because there is no expectation that contaminated soils, water, or waste are present on-site or that such materials will be generated while conducting activities on-site. Project activities will be conducted in a manner that prevents the discharge of pollutants into adjacent waterways. If any areas are adjacent to wetlands, sandbags or other barrier devices will be used to prevent the spread of potentially contaminated soil or water.

6.3.11 Temporary Facilities

Temporary and support facilities (e.g., office trailers, Conex boxes) will be erected in coordination with ARNG, PAARNG, USACE, and PGC. The temporary facilities will be removed at the end of the project.

6.3.12 Decontamination and Disposal of Equipment

Field operations of this project will be conducted in Level D PPE. No decontamination of personnel or equipment is anticipated to be performed.

6.3.13 Minimizing Areas of Disturbance

Activities associated with this project will be conducted, where possible, in a manner that will minimize impacts to land resources. Areas impacted by the project will be restored, as practical, to a condition that appears to be natural and does not detract from the overall appearance of the site. Some type of site restoration may be performed in areas where earth has been disturbed during demolition operations. WESTON will work directly with PGC officials to determine whether restoration is warranted and what type of restoration may be required.

The area of soil that will be disturbed on this project is not anticipated to be above the threshold that requires an erosion and sediment control plan and provisions.

7. PROPERTY MANAGEMENT PLAN

A Property Management Plan is used to describe how government furnished/owned equipment, materials, tools, and other supplies will be managed for a specific munitions response or other munitions-related project. This does not apply to firm fixed price task orders. No government equipment will be borrowed for use on this project.

8. INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS

An interim holding facility for RCWM is not applicable to this project. There is no evidence to suggest that RCWMs are present on the site.

9. PHYSICAL SECURITY PLAN FOR RCWM PROJECTS

A Physical Security Plan is intended for use on RCWM projects; however, this plan is not applicable to the project. There is no evidence to suggest that RCWMs are present on the site.

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APPENDIX A

POINTS OF CONTACT

Points of Contact Information

Name/Project Function	Contact Information
Department of Emergency Services (Ambulance, Fire, Police)	911
FIG Police (non-emergency)	(717) 861-2727
FIG Fire Department (non-emergency)	(717) 861-2111
Kathryn Brown USACE Contracting Officer (KO)	(401) 962-2585 (office) Kathryn.E.Brown@usace.army.mil U.S. Army Corps of Engineers, Baltimore District ATTN: CENAB-CT 10 South Howard Street Baltimore, MD 21201-1715
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APPENDIX B

ACCIDENT PREVENTION PLAN

ACCIDENT PREVENTION PLAN

MUNITIONS AND EXPLOSIVES OF CONCERN REMEDIAL ACTION FOR RICOCHET AREA MUNITIONS RESPONSE SITE IN STATE GAME LANDS 211, PENNSYLVANIA

Contract No.: W912DR-09-D-0006

October 2013

Prepared by:



Weston Solutions, Inc.
West Chester, PA 19380

ACCIDENT PREVENTION PLAN

MUNITIONS AND EXPLOSIVES OF CONCERN REMEDIAL ACTION FOR RICOCHET AREA MUNITIONS RESPONSE SITE IN STATE GAME LANDS 211, PENNSYLVANIA

Contract No.: W912DR-09-D-0006
Delivery Order No.: 0009

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October 2013

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TABLE OF CONTENTS

Section	Page
1. SIGNATURE SHEET	1-1
2. BACKGROUND INFORMATION	2-1
2.1 INTRODUCTION	2-1
2.2 SITE LOCATION AND DESCRIPTION	2-2
2.3 PROJECT AND WORK DESCRIPTION	2-3
2.4 CONTRACTOR ACCIDENT EXPERIENCE MODIFICATION RATE (EMR)	2-4
3. HEALTH AND SAFETY POLICY	3-1
3.1 HEALTH AND SAFETY POLICY	3-1
3.1.1 100% Safe-Work and Stop-Work Policy Statement	3-1
3.2 PROGRAM GOALS	3-2
3.3 PROGRAM OBJECTIVES	3-2
3.4 ACCIDENT EXPERIENCE GOAL	3-3
4. RESPONSIBILITIES AND LINES OF AUTHORITIES.....	4-1
4.1 STATEMENT OF EMPLOYER'S RESPONSIBILITY	4-1
4.2 IDENTIFICATION OF PERSONNEL RESPONSIBLE FOR SAFETY	4-1
4.3 COMPETENT PERSON	4-3
4.3.1 Qualified Person.....	4-4
4.4 PRE-TASK HEALTH AND SAFETY ANALYSIS	4-5
4.5 LINES OF AUTHORITY	4-5
4.6 NONCOMPLIANCE, DISCIPLINARY ACTIONS, AND COMPANY SAFETY INCENTIVE PROGRAMS	4-5
4.6.1 Noncompliance	4-5
4.6.2 Disciplinary Actions	4-5
4.6.3 Incentive Programs	4-6
4.7 MANAGEMENT ACCOUNTABILITY FOR SAFETY	4-6
5. SUBCONTRACTORS AND SUPPLIERS	5-1
5.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS	5-1
5.2 CONTROL AND COORDINATION OF SUBCONTRACTORS AND SUPPLIERS	5-1
5.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS	5-1
5.4 SUBCONTRACTOR SAFETY PLANS	5-2

TABLE OF CONTENTS (CONTINUED)

Section	Page
6. TRAINING	6-1
6.1 GENERAL	6-1
6.2 SAFETY INDOCTRINATION	6-1
6.3 MANDATORY TRAINING AND CERTIFICATIONS	6-2
6.3.1 OSHA Training	6-2
6.3.2 OSHA 30-Hour Construction Safety	6-2
6.4 PERIODIC SAFETY AND HEALTH TRAINING	6-3
6.5 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING	6-3
7. SAFETY AND HEALTH INSPECTIONS	7-1
7.1 SPECIFIC ASSIGNMENTS OF RESPONSIBILITIES	7-1
7.2 INSPECTIONS/AUDIT FREQUENCIES	7-1
7.3 DEFICIENCY TRACKING	7-1
7.4 EXTERNAL INSPECTIONS/CERTIFICATIONS	7-2
8. ACCIDENT REPORTING	8-1
8.1 EXPOSURE DATA (MAN-HOURS WORKED)	8-1
8.1.1 Accident Investigations, Reports, and Logs	8-1
8.2 IMMEDIATE ACCIDENT NOTIFICATION	8-1
8.3 NOITRACK PROCEDURE	8-2
8.4 ACCIDENT REVIEW	8-2
9. MEDICAL SUPPORT	9-1
9.1 ON-SITE MEDICAL SUPPORT	9-1
9.2 OFF-SITE MEDICAL SUPPORT	9-1
9.3 DIRECTIONS AND MAP TO NEAREST HOSPITAL	9-3
9.4 FIRST AID AND CPR TRAINING	9-3
9.5 BLOODBORNE PATHOGENS	9-3
9.6 MEDICAL SURVEILLANCE	9-3
9.6.1 Occupational Health Program	9-3
10. PERSONAL PROTECTIVE EQUIPMENT	10-1
10.1 HAZARD ASSESSMENTS	10-1
10.2 IDENTIFYING WHEN HAZARD ASSESSMENTS WILL BE CONDUCTED	10-1
10.3 IDENTIFYING HOW HAZARD ASSESSMENTS WILL BE CONDUCTED	10-1
10.4 PERSONAL PROTECTIVE EQUIPMENT TRAINING	10-2

TABLE OF CONTENTS (CONTINUED)

Section	Page
10.5 PPE RETRAINING	10-3
10.6 WRITTEN CERTIFICATION OF EMPLOYEE PPE TRAINING.....	10-3
11. PLANS REQUIRED BY EM 385-1-1	11-1
11.1 SITE LAYOUT PLAN	11-3
12. RISK MANAGEMENT PROCESSES	12-1

LIST OF ATTACHMENTS

Attachment A	Site Safety and Health Plan (SSHP)
Attachment B	Resumes and Certifications for Identified Safety Personnel
Attachment C	Environmental Health and Safety Inspection Checklist
Attachment D	Deficiency Tracking Form
Attachment E	Preliminary Accident Notification (PAN) Form and USACE ENG Form 3394 Accident Investigation Report
Attachment F	Bloodborne Pathogens Exposure Control Plan – First Aid Providers

LIST OF TABLES

Title	Page
Table 2-1 WESTON’s Intrastate EMR since 2008*	2-4
Table 4-1 Project Safety Team.....	4-1
Table 4-2 Position Descriptions	4-2
Table 4-3 Competent Person Requirements.....	4-4
Table 4-4 Qualified Person Requirement.....	4-4
Table 5-1 Subcontractor Responsibilities.....	5-1
Table 9-1 Emergency Contact Numbers	9-1
Table 9-2 WESTON Emergency Contact Numbers.....	9-2
Table 9-3 Other Emergency Contact Numbers	9-2
Table 9-4 First Aid and CPR Training for Key Personnel.....	9-3
Table 10-1 Current Key Site Personnel Training/Certifications	10-3
Table 11-1 Plans Required by EM 385-1-1.....	11-1
Table 12-1 Activity Hazard Analysis.....	12-2

LIST OF FIGURES

Title

Figure 2-1 Ricochet Area and Fort Indiantown Gap

Figure 2-2 Ricochet Area MRS

Figure 2-3 Site Layout Plan

Figure 4-1 Health and Safety Organization Chart and Lines of Authority

Figure 9-1 Emergency Hospital Route from Ricochet Area MRS

Figure 9-2 Non-Emergency Hospital Route from Ricochet Area MRS

LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AHA	activity hazard analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ARNG	Army National Guard
BBP	bloodborne pathogen
BBS	Behavior-Based Safety
bgs	below ground surface
BRAC	Base Realignment and Closure
CFR	Code of Federal Regulations
CHST	Construction Health and Safety Technician
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CSP	Certified Safety Professional
CWM	chemical warfare materiel
dB	decibel
DDESB	Department of Defense Explosives Safety Board
DOT	U.S. Department of Transportation
EHS	Environmental Health and Safety
EM	Engineering Manual
EMR	Experience Modification Rate
EMT	emergency medical technician
EPA	U.S. Environmental Protection Agency
ESS	Explosive Safety Submission
FAR	Federal Acquisition Regulations
FIG	Fort Indiantown Gap
GFCI	ground fault circuit interrupter
GPS	Global Positioning System
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HE	high explosive
KO	Contracting Officer
MD	munitions debris
MEC	munitions and explosives of concern
MGFD	munition with greatest fragmentation distance
mm	millimeter
MRS	Munitions Response Site

LIST OF ACRONYMS (Continued)

MSDS	Material Safety Data Sheet
NCP	National Oil and Hazardous Substances Contingency Plan
NFPA	National Fire Protection Association
NGB	National Guard Bureau
NIOSH	National Institute for Occupational Safety and Health
NOI	Notice of Incident
OESS	Ordnance and Explosives Safety Specialist
OHP	Occupational Health Program
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAARNG	Pennsylvania Army National Guard
PADEP	Pennsylvania Department of Environmental Protection
PAN	Preliminary Accident Notification
PM	Project Manager
POC	point of contact
PPE	personal protective equipment
QC	quality control
RA	Remedial Action
RAC	Risk Assessment Code
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SGL	State Game Lands
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SUXOS	Senior UXO Supervisor
TP	Technical Paper
UFGS	Unified Facilities Guide Specifications
USACE	U.S. Army Corps of Engineers
UTV	utility terrain vehicle
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
WESTON®	Weston Solutions, Inc.


ACCIDENT PREVENTION PLAN

Munitions and Explosives of Concern Remedial Action
for Ricochet Area Munitions Response Site
in State Game Lands 211, Pennsylvania

Contract No.: W912DR-09-D-0006
Delivery Order No.: 0009

1. SIGNATURE SHEET

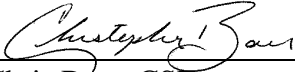
Plan Prepared by:



Louise Kritzberger, CHST
Federal Team Safety Officer
(610) 701-3618

10/11/2013
Date

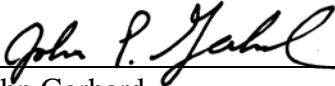
Plan Approved by:



Chris Baer, CSP
Federal Team Health and Safety Officer
(610) 701-3653

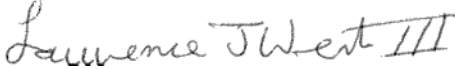
10/11/2013
Date

Plan Review and Concurrence by:



John Gerhard
Project Manager
(610) 701-3793

10/11/2013
Date



Larry Werts
Division Environmental Health and Safety Officer
(610) 701-3912

10/11/2013
Date

ACCIDENT PREVENTION PLAN CONCURRENCE/SIGNOFF

Site Name: Munitions and Explosives of Concern Remedial Action for
Ricochet Area Munitions Response Site in State Game Lands 211,
Pennsylvania

Work Location Address: Ricochet Area Munitions Response Site in State Game Lands 211
Adjacent to Fort Indiantown Gap, Pennsylvania

I have read, understood, and agree to abide by the information set forth in this Accident
Prevention Plan (APP) and discussed in the Personnel Health and Safety briefing.

Name	Signature	Date
_____ Name	_____ Signature	_____ Date
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2. BACKGROUND INFORMATION

Contractor Name: Weston Solutions, Inc. (WESTON®)
Contract Number: W912DR-09-D-0006; Delivery Order Number: 0009
Project Name: Munitions and Explosives of Concern Remedial Action for Ricochet Area Munitions Response Site in State Game Lands 211, Pennsylvania

2.1 INTRODUCTION

The Accident Prevention Plan (APP) presents the minimum requirements for safety and health that must be met by site personnel working on the contract for the Munitions and Explosives of Concern (MEC) Remedial Action (RA) of the Fort Indiantown Gap (FIG) Ricochet Area Munitions Response Site (MRS) (FTIG-003-R-01). The Ricochet Area MRS is located in State Game Lands (SGL) 211 in Dauphin and Lebanon Counties, Pennsylvania. The APP does not in any way relieve site personnel, contractors, or subcontractors from responsibility for the safety and health of their personnel. Contractors shall be required to review the site conditions and the work to be performed to determine specific safety and health requirements for their personnel. Site personnel will document in their logbook any on-site visitors. Any visitors to the site shall be required to read, understand, and comply with the approved APP.

The APP is the interface with WESTON's Environmental Health and Safety (EHS) manual and is prepared to be consistent with applicable Army, federal, state, and local health and safety requirements, which include the following:

- 29 Code of Federal Regulations (CFR) 1904, 1910 and 1926 (Occupational Safety and Health Administration [OSHA] General Industry and Construction Standards, respectively).
- 40 CFR 260-270 (U.S. Environmental Protection Agency [EPA] Solid Waste Standard).
- Engineering Manual (EM) 385-1-1, U.S. Army Corps of Engineers (USACE) Health and Safety Requirements Manual, 15 September 2008.
- Federal Acquisition Regulations (FAR).

- Unified Facilities Guide Specifications (UFGS), 01 35 26, Safety and Occupational Health requirements.
- WESTON Corporate Environmental Compliance, EHS Program.

2.2 SITE LOCATION AND DESCRIPTION

FIG is located in Dauphin and Lebanon Counties in south-central Pennsylvania (**Figure 2-1**). The FIG cantonment area (i.e., support and logistical coordination area) and the FIG training corridor are separated by Blue Mountain (also called First Mountain). The Ricochet Area MRS is located in SGL 211 and is adjacent to FIG (**Figure 2-2**).

FIG was established in 1931 when the Commonwealth of Pennsylvania purchased approximately 18,000 acres as a military training facility for the Pennsylvania Army National Guard (PAARNG), with training maneuvers starting in 1933. The training area consisted of approximately 16,000 acres located northwest of the cantonment area. In 1940, the land was leased to the federal government for training U.S. Army Infantry and Armor Divisions. In 1942, the installation was put under the command of New York Port of Embarkation and served as a staging area for troops preparing for transport overseas. From 1942 to the end of World War II, the facility supported the Transportation Corps Training Center and served as a prisoner of war camp for captured German soldiers.

Between 1946 and 1951, FIG was placed on deactivated status as a federal base and served as the National Guard Training Site. FIG was returned to active status for the Korean conflict (1951-1953) and back to deactivated status in 1953, when it was returned to the Pennsylvania Military District (URS, 2008). During the late 1960s and early 1970s, the installation served as the Reserve Officers Training Corps summer camps.

FIG remained the Army's responsibility until October 1998 when the National Guard Bureau (NGB) took control as part of the 1995 Base Realignment and Closure (BRAC). The site then became a National Guard and Army Reserves training center. FIG now serves as headquarters for the Pennsylvania Department of Military and Veterans Affairs and the Pennsylvania Army and Air National Guard, and as the primary training site in the Commonwealth of Pennsylvania for individual and collective weapons training qualification.

The Ricochet Area MRS (FTIG-003-R-01) is a 3,262-acre area that includes a former firing point at Cold Spring and a ricochet/overshot area from historical training activities at the Fort Indiantown Gap impact area. Direct fire and indirect fire weapon systems contributed to the MEC and munitions debris (MD) within the Ricochet Area MRS. The Ricochet Area MRS lies within SGL 211 and is used recreationally for such activities as hunting, hiking, and bird watching. **Figure 2-2** presents the Ricochet Area MRS, and **Figure 2-3** presents a site layout plan.

Based on historical information, remedial investigation (RI) results, and WESTON's site experience, the munitions expected at the Ricochet Area MRS include the following: 75 millimeter (mm) projectiles (armor piercing, high-explosive, and armor-piercing high explosive); 155mm projectiles; 155mm illumination canisters; and MK-2A4 primers.

2.3 PROJECT AND WORK DESCRIPTION

The objective of the RA is the removal of surface and subsurface MEC with containment and controls. The tasks identified include the following specific activities:

- Activity 1: Mobilization/Demobilization
- Activity 2: Grid Survey Activities
- Activity 3: Brush Clearing
- Activity 4: Focused Surface and Subsurface Removal of MEC
- Activity 5: Digital Geophysical Mapping
- Activity 6: Utility Terrain Vehicle (UTV) Usage

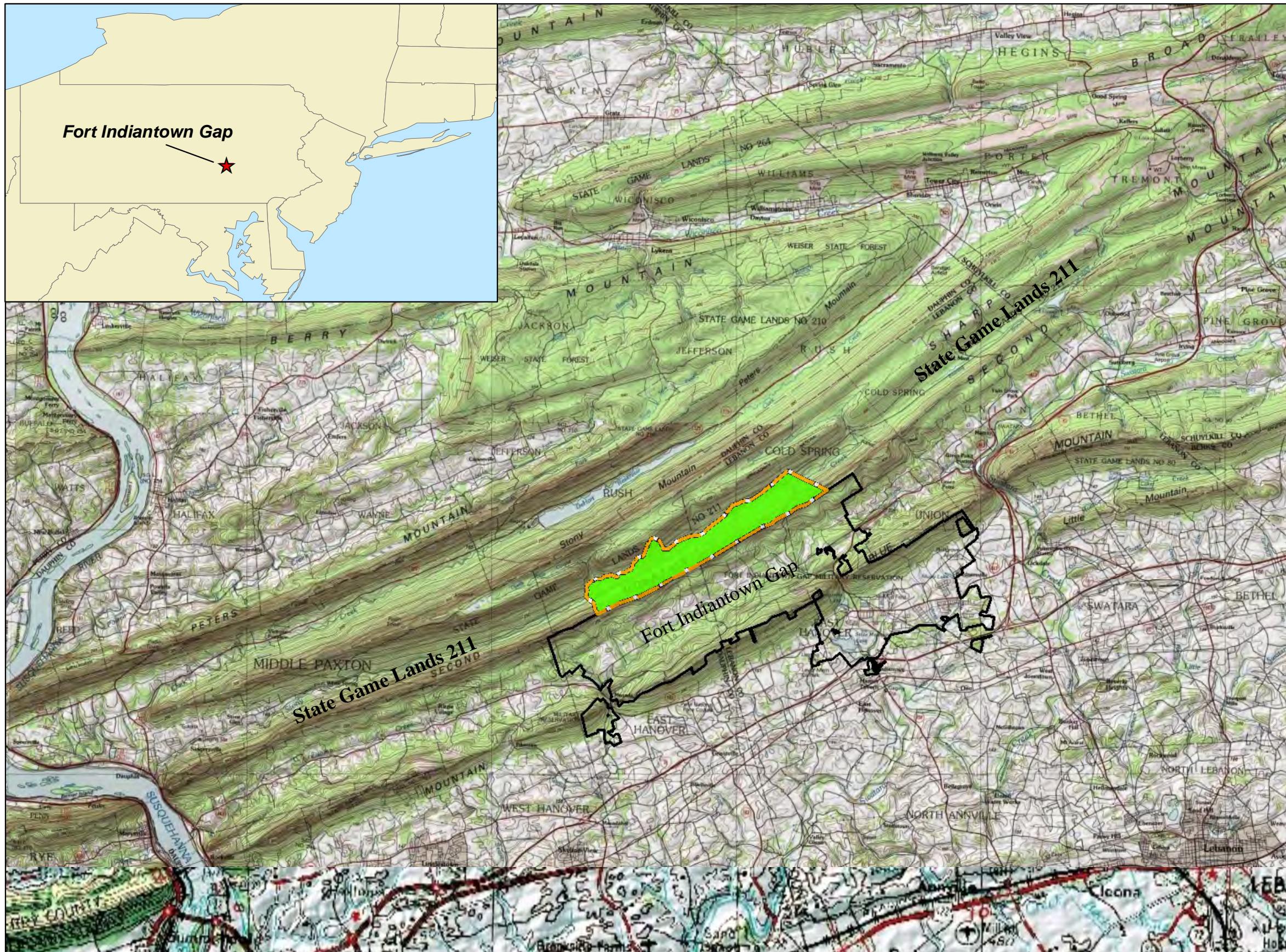
Specific activity hazard analyses (AHAs) for the above activities are described in Section 12 of the APP.

2.4 CONTRACTOR ACCIDENT EXPERIENCE MODIFICATION RATE (EMR)

Table 2-1 WESTON's Intrastate EMR since 2008*

Year	EMR
2012	.51
2011	.54
2010	.52
2009	.44
2008	.38

* Calculated by measuring the difference between a company's actual past workers' compensation claims compared to the average expected claims experience for companies performing the same type of work. An EMR is calculated using a rolling 3-year period.



Legend

- FIG Installation Boundary
- Ricochet Area MRS Boundary

Source: PA USGS 7.5 minute Topographic Maps, 1996

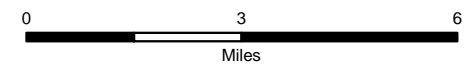
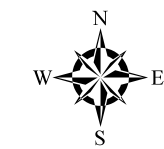
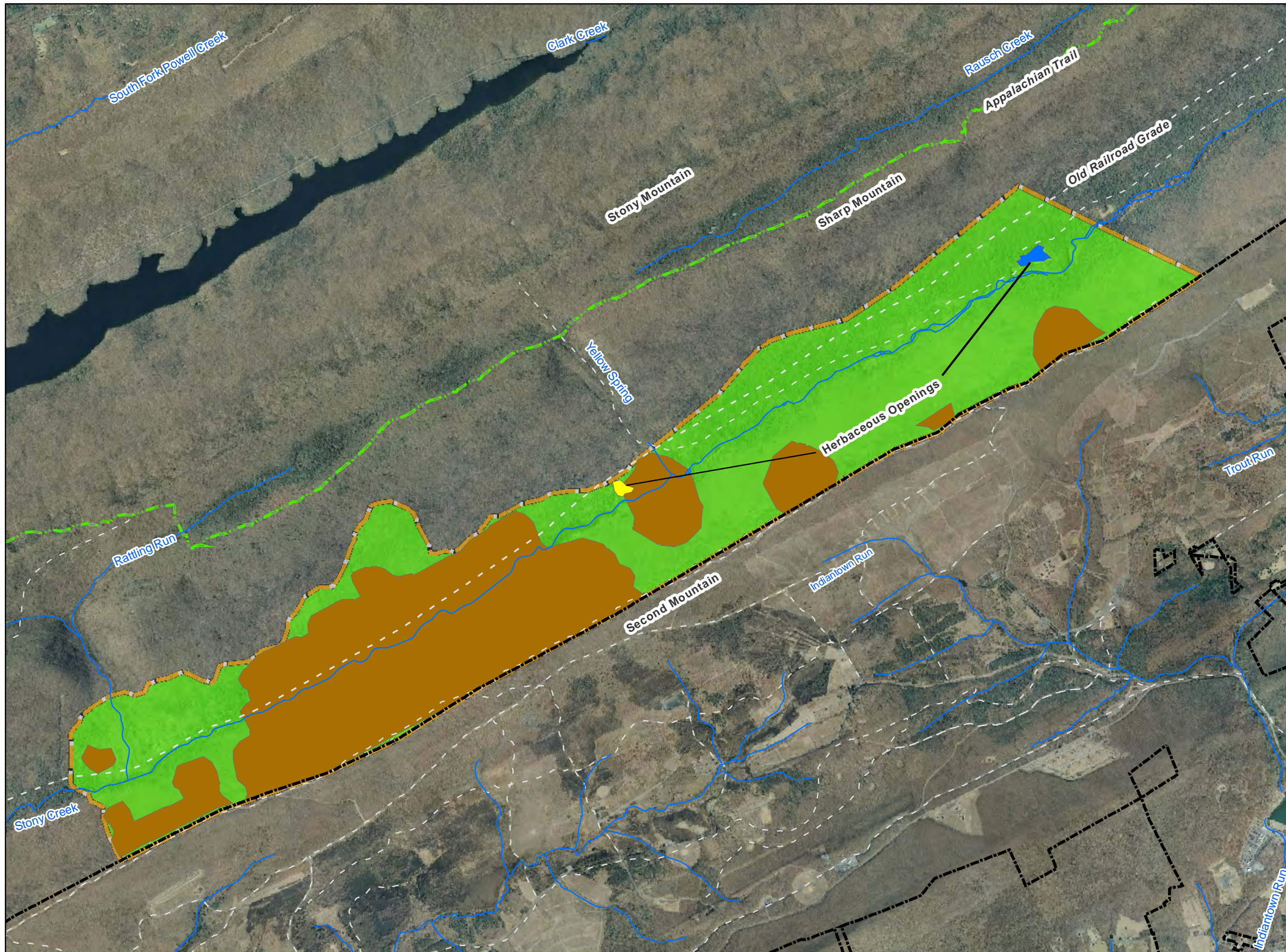


Figure 2-1
Ricochet Area and
Fort Indiantown Gap, Annville, PA



Legend

- FIG Installation Boundary
- Water
- Appalachian Trail
- - Trails
- ▭ Ricochet Area MRS (3,262 Acres)
- ▭ Surface Removal Action Area Boundaries
- Herbaceous Openings**
- ▭ Cold Spring
- ▭ Yellow Spring

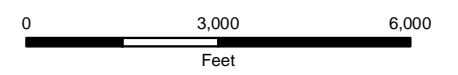
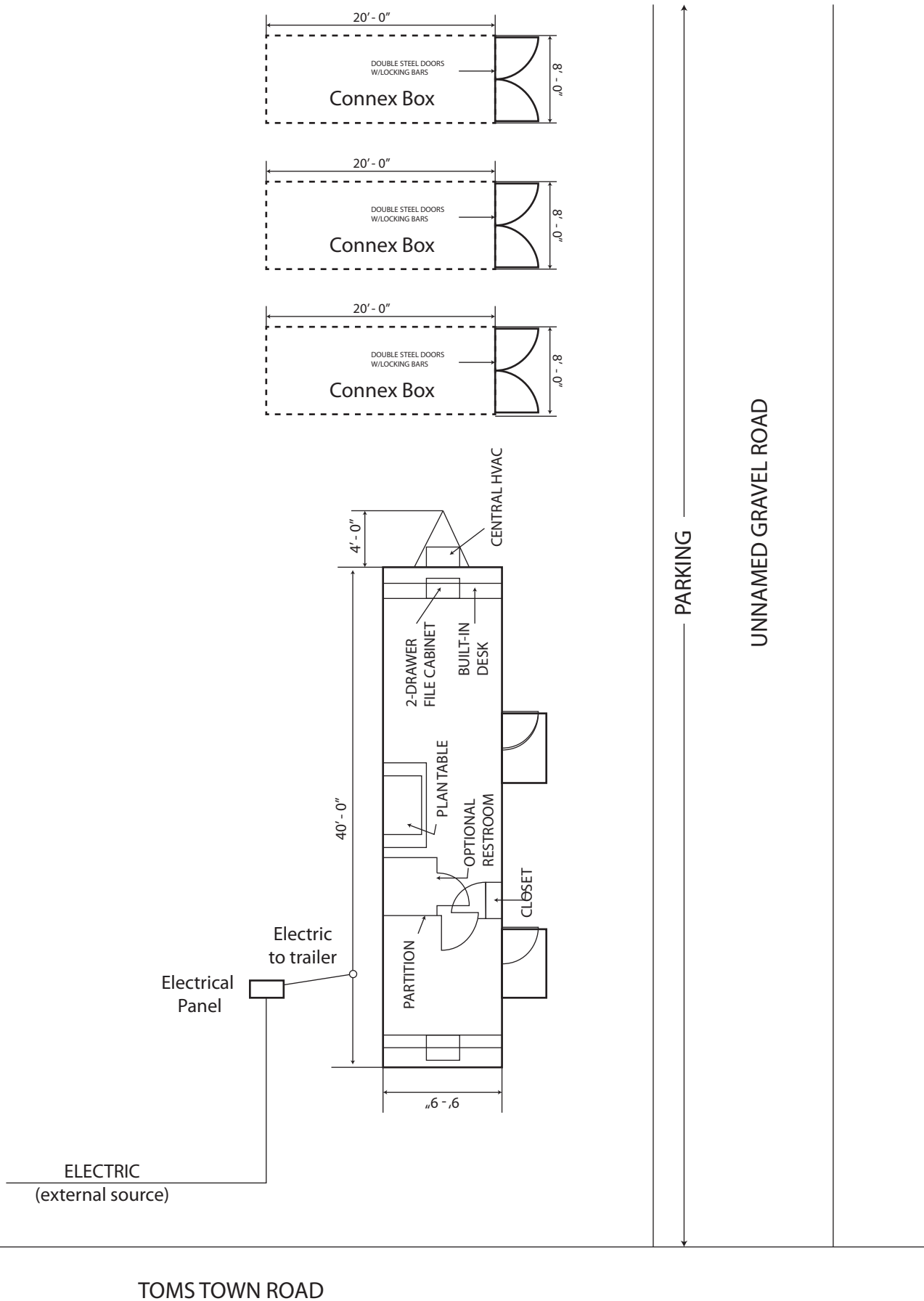


Figure 2-2
Ricochet Area MRS
State Game Lands 211, PA



**Figure 2-3 Site Layout Plan
State Game Lands 211, PA**

3. HEALTH AND SAFETY POLICY

3.1 HEALTH AND SAFETY POLICY

WESTON personnel operate in a culture where safety, health, and protection of personnel and the environment take precedence over expediency. A fundamental premise of our Behavior-Based Safety (BBS) culture is that accidents are preventable through choosing safe, proactive behaviors. WESTON's policy on Health and Safety emphasizes several important points:

- WESTON has established a goal of working safely 100% of the time (employees and contractors) with the expected outcome being zero incidents that result in injuries, illnesses, property damage, or environmental damage or contamination.
- Managers and workers accept the responsibility of a concerted and sustained effort to achieve a goal of Safety Every Minute of Every Day.
- Managers and workers assume a safety leadership role.
- Managers and workers take action for safety, coach peers in safe practices, and share experiences, successes, and failures.
- Workers are involved in the identification and the control of workplace hazards during work planning, work execution, and feedback activities.
- Management is committed to a work environment that allows free and open expression of safety concerns and where workers fear no reprisals or retaliation.
- Workers are the most important asset to WESTON and are critical in the process of establishing, implementing, and observing safe work practices.

3.1.1 100% Safe-Work and Stop-Work Policy Statement

For each activity and contract under which WESTON performs work, a policy is implemented clearly stating that WESTON employees have the responsibility and the right to stop or curtail any work they perceive to be unsafe (a threat to public health, the safety and health of workers, or the environment). Employees must be free to voice concerns about safety and health without fear of reprisal, retaliation, or harassment. This policy is implemented by a clear, straightforward, contract-specific procedure as part of the WESTON Integrated Safety Management System.

To support the WESTON goal of all employees and subcontractors working safely 100% of the time, managers will use every available resource to maintain safe, hazard-controlled work

environments characterized by a vigorous emphasis on accident prevention. Standards, requirements, and best practices will be implemented to avoid accidents. Managers will ensure that employees are familiar with the standards, requirements, and best practices that pertain to their safety.

WESTON managers and supervisors are held directly accountable for the health and safety of their employees, subcontractor activities, and other resources employed to maintain employee health and safety, and the continual communication of hazards and hazard controls to the workforce.

3.2 PROGRAM GOALS

WESTON has implemented a BBS program in which employees assume a safety leadership role and are responsible for the safety of coworkers, team members, and stakeholders. Employees focus on behaviors and intervention techniques to improve behavioral processes. As part of WESTON's BBS program, employees create high-quality connections with one another, team members, and stakeholders to foster an active, caring culture. Commitment is high, and employees help each other be Safe Every Minute of Every Day to achieve the corporate goal of *Zero Accidents* involving personnel and the environment.

3.3 PROGRAM OBJECTIVES

The WESTON EHS Program has the following objectives:

1. EHS staff, resources, and procedures are provided as necessary and used in an efficient and cost-effective manner to establish a safe work environment for WESTON employees, subcontractors, clients, and the general public.
2. Compliance with environmental, health, and safety regulations is assured, and risk is managed and minimized for employees, as well as the corporation.
3. Management involvement is established and maintained within the EHS Program.
4. Clear lines of reporting, authorities, responsibilities, and performance expectations are established.
5. World-class EHS culture is attained at our places of employment, in our homes, and in our communities through the elimination of at-risk behavior.

3.4 ACCIDENT EXPERIENCE GOAL

The accident experience goal for this project, as well as for every WESTON project, is zero.

Work shall not be performed in a manner that conflicts with the safety, health, or environmental precautions outlined in the APP or in the Site Safety and Health Plan (SSHP) (**Attachment A**). Site personnel, including any WESTON subcontractors, who have the potential for exposure to site hazards, are subject to the requirements of the APP and SSHP. Personnel violating safety procedures are subject to dismissal/removal from the project site.

WESTON gathers information on incidents in an electronic database that allows assessment of trends and causes of incidents. By learning from past experience, WESTON staff avoids the recurrence of incidents. This information is available to every WESTON employee and is used in training as well as in the development of APPs, SSHPs, and AHAs. The availability of this information assists in achieving WESTON's goal of working safely 100% of the time.

4. RESPONSIBILITIES AND LINES OF AUTHORITIES

4.1 STATEMENT OF EMPLOYER'S RESPONSIBILITY

WESTON is ultimately responsible for the implementation of the EHS Program through enforcing the safety and occupational health for this project as stated in the APP and SSHP. WESTON's senior management is committed to operating projects in a manner consistent with controlling EHS, legislative, regulatory, and client requirements, and other applicable requirements administered by federal agencies.

4.2 IDENTIFICATION OF PERSONNEL RESPONSIBLE FOR SAFETY

Table 4-1 presents the key project personnel responsible for Safety Program implementation on the Ricochet Area MRS project. Resumes for key WESTON safety personnel are presented in **Attachment B**. Key responsibilities of each position are provided in **Table 4-2**.

Table 4-1 Project Safety Team

Name	Title	Phone No.
John Gerhard	Project Manager (PM)	(610) 701-3793 – office (610) 513-6897 - cell
Larry Werts	East Division EHS Officer	(610) 701-3912 - office (215) 815-6237 - cell
Chris Baer, CSP	East Division Federal Team Safety Officer	(610) 701-3653 – office (484) 239-4249 - cell
Bruce Carnal	Site Safety and Health Officer (SSHO)/ UXO Safety Officer (UXOSO)	(502) 664-7926 – cell

Notes:

CSP = Certified Safety Professional

Table 4-2 Position Descriptions

Position	Description of Key Responsibilities
Project Manager (PM) John Gerhard	<ul style="list-style-type: none"> ▪ Overall responsibility for the management and completion of the project. ▪ Responsible and accountable for project safety. ▪ Overall responsibility for ensuring that project personnel (including subcontractor personnel) comply with EHS regulations, program requirements, and procedures. ▪ Ensure development and implementation of project SSHPs and indicate concurrence with final plans after required EHS reviews. ▪ Ensure project personnel meet applicable safety certification requirements. ▪ Ensure project support is acquired from appropriately qualified safety personnel such as the East Division EHS Officer and SSO. ▪ Ensure project personnel comply with applicable EHS requirements and corporate or client procedures. ▪ Halt any project work activities that represent an imminent hazard. ▪ Ensure appropriate safety equipment and materials are provided to the project. ▪ Ensure timely and accurate reporting and investigation of incidents, accidents, or injuries involving project personnel, with support from the risk management department. Ensure corrective actions are implemented completely. ▪ Ensure proper response and internal notification regarding inspections by regulatory agencies. ▪ Ensure all project personnel have met the site-specific experience and training requirements.
East Division EHS Officer Larry Werts	<ul style="list-style-type: none"> ▪ Approve and ensure the implementation of the WESTON EHS Program, the APP, SSHP, and any amendments. ▪ Conduct field visits to assess the effectiveness and the implementation of the APP and SSHP. ▪ Evaluate and authorize changes to the APP and SSHP based on field and occupational exposure, as necessary. ▪ Function as a quality control (QC) staff member.
East Division Federal Team Safety Officer Chris Baer, Certified Safety Professional (CSP)	<ul style="list-style-type: none"> ▪ Develop the APP and SSHP. ▪ Develop modifications to the APP and SSHP as necessary.

Table 4-2 Position Descriptions (Continued)

Position	Description of Key Responsibilities
SSHO/UXOSO Bruce Carnal	<ul style="list-style-type: none"> ▪ Ensure that all project personnel follow the requirements of the APP and SSHP. ▪ Be present during operations. ▪ Directly communicate with the PM and EHS Officer. ▪ Conduct daily safety meetings for site personnel to discuss the day’s activities, associated hazards. ▪ Review site personnel training and experience documentation to ensure compliance with the APP and SSHP. ▪ Coordinate changes/modifications to the APP with the appropriate site personnel. ▪ Conduct or coordinate project-specific training. ▪ Report any incidents that occur on-site to the PM and the Division EHS Officer. ▪ Implement safety corrective actions through training and reinforced awareness. ▪ Maintain exposure data. ▪ Has stop-work authority for all safety issues.

4.3 COMPETENT PERSON

At a minimum, in accordance with OSHA Regulation 29 CFR 1910.120(e), site personnel will include a Competent Person (i.e., a person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and who has the authorization to take prompt corrective measures to eliminate these hazards). **No work will be performed without a Competent Person on-site.** Table 4-3 presents the competent person requirement and regulatory reference.

Mr. Carnal is the competent persons as defined by OSHA 29 CFR 1926.32. As required by EM 385-1-1, Mr. Carnal has at least 5 years of applicable safety experience and has successfully completed the OSHA 30-hour construction safety course. Mr. Carnal has performed work on a site(s) of similar hazard, risk, and complexity to the task assignment and is certified in first aid and cardiopulmonary resuscitation (CPR). Mr. Carnal also has 5 years of experience implementing safety and occupational health procedures and experience conducting exposure monitoring to select and to adjust personal protective equipment (PPE); however, it is unlikely

that such adjustments will be needed. **Attachment B** includes Mr. Carnal’s resume and copies of his certifications.

The qualifications of site personnel will be maintained at the project site. The certifications and overall qualifications of WESTON personnel are maintained in a database supported by WESTON.

Table 4-3 Competent Person Requirements

Competent Person Requirement	Regulatory Reference	Person Designated
SSHO Identification	EM 385-1-1 Sec. 01.A.17	Bruce Carnal
Hearing Protection	29 CFR 1926.101	Bruce Carnal
Mechanized Equipment	29 CFR 1926.600	Bruce Carnal

Note: EM 385-1-1 is the USACE Health and Safety Requirements Manual.

4.3.1 Qualified Person

Site personnel will also include a Qualified Person. WESTON will permit only those employees qualified by training or experience to conduct unexploded ordnance (UXO) operations, or operate equipment and machinery in compliance with OSHA 29 CFR 1926.20(b)(4). According to OSHA 29 CFR 1926.32, “qualified” means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project. **Table 4-4** presents the qualified person’s requirement list.

The Senior UXO Supervisor (SUXOS), UXOSO, UXO Quality Control Specialist (UXOQCS), and UXO Technicians III, II, and I will meet the requirements of the Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18 for the positions assigned.

Table 4-4 Qualified Person Requirement

Qualified Person Requirement	Designated Person(s)
Brief Visitors on Site Hazards and PPE	Bruce Carnal
Licensed Blaster for the State of PA	Jason McCloskey

The qualifications of all site-specific personnel will be maintained on-site. The certifications and overall qualifications of WESTON personnel are maintained in a database supported by WESTON. Documentation will be reviewed and maintained by the SSHO/UXOSO.

4.4 PRE-TASK HEALTH AND SAFETY ANALYSIS

Prior to each phase of work, the applicable AHAs will be reviewed with the supervisors responsible for the activity. Based on this pre-task safety and health analysis, the AHAs will be updated as necessary. WESTON has extensive experience performing similar site work.

During the walk-through survey, the SSHO and other project staff determined the level of PPE required for the work areas and specific activities. They will evaluate potential physical hazards associated with the work areas and specific work activities (e.g., walking/working surfaces, electrical installations/lines, and noise exposure) and select PPE to mitigate identified hazards. Consideration will be given to biological and climatic conditions, and PPE will be selected to accommodate the conditions (e.g., cooling units, insulated clothing/footwear, snake chaps).

4.5 LINES OF AUTHORITY

Lines of authority are provided in **Figure 4-1**, which is presented at the end of this section.

4.6 NONCOMPLIANCE, DISCIPLINARY ACTIONS, AND COMPANY SAFETY INCENTIVE PROGRAMS

4.6.1 Noncompliance

Although noncompliance is not expected, safety and health program violations can, and will, result in disciplinary action up to, and including, dismissal. Employees understand that safety is of the utmost importance at WESTON. Personnel understand the importance of compliance with applicable regulations and project requirements.

4.6.2 Disciplinary Actions

Personnel violating safety procedures are subject to dismissal/removal from the project site.

4.6.3 Incentive Programs

Project-specific financial and other incentive plans are developed and integrated with safety and health goals as an overriding component.

4.6.3.1 Safety Solutions Program

The Safety Solutions Program provides WESTON employees with opportunities to become engaged in the Safety and Health Program. Employees are encouraged to use the Safety Solutions Program to report near incidents or to identify workplace hazards and their proposed solutions. The submitted Safety Solutions are evaluated, and the authors of the most highly regarded solutions are eligible for a financial bonus and other rewards.

4.7 MANAGEMENT ACCOUNTABILITY FOR SAFETY

WESTON managers and supervisors are held directly accountable for the health and safety of their employees, for subcontractor activities, and for the continual communication of hazards and hazard controls to the workforce. The SSHO and the Division EHS Officer assess the health and safety performance of employees.

The accountability of supervisors and managers for the implementation of the health and safety program is ensured through monthly project life cycle reviews with senior management and through annual employee performance reviews.

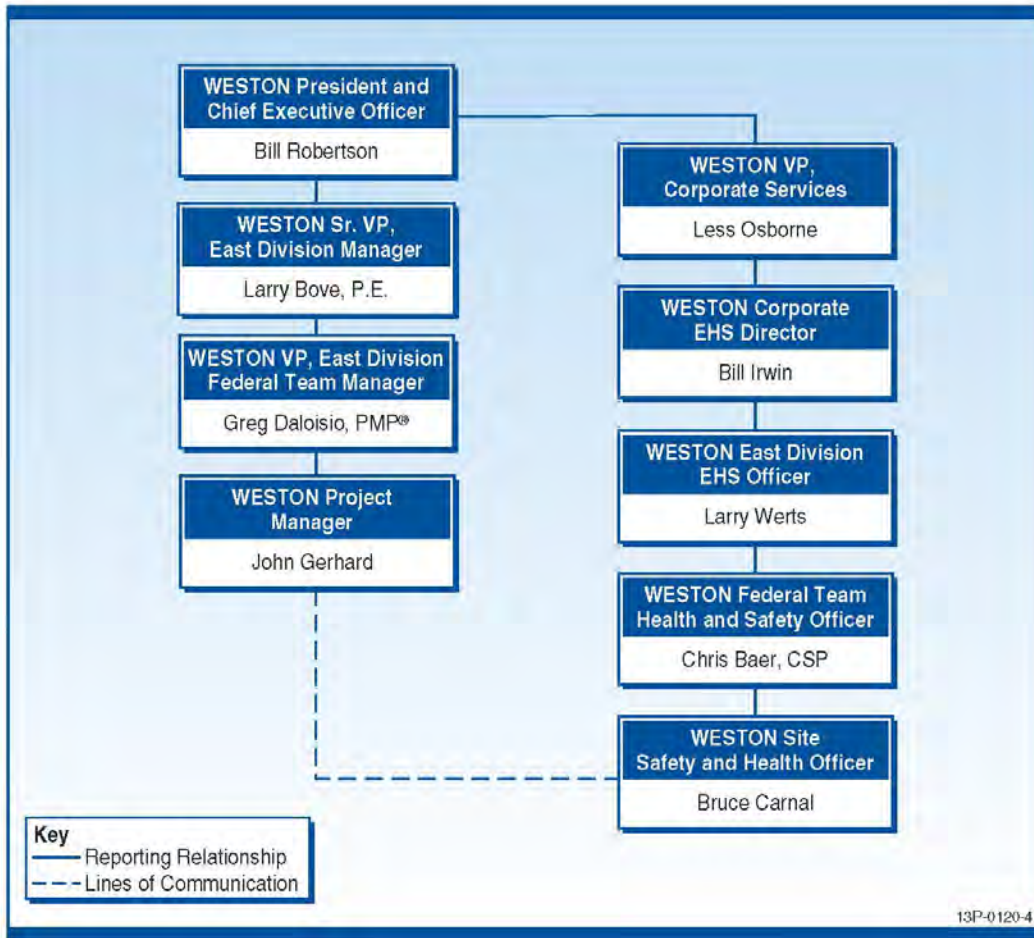


Figure 4-1 Health and Safety Organization Chart and Lines of Authority

5. SUBCONTRACTORS AND SUPPLIERS

5.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS

For health and safety issues, subcontractors (see **Table 5-1**) will be under the ultimate direction of the SSHO and are required to adhere to all aspects of the APP.

Table 5-1 Subcontractor Responsibilities

Subcontractor	Activity
TBD	Professional survey support

5.2 CONTROL AND COORDINATION OF SUBCONTRACTORS AND SUPPLIERS

The subcontractor will assign a Site Safety Representative who will be responsible for coordinating projects and safety responsibilities for their personnel as designated and directed by the WESTON SSHO. WESTON is ultimately responsible for ensuring subcontractor compliance with the APP and SSHP. Non-compliance with this plan will result in a stop-work order, as determined by the SSHO.

5.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

The Site Safety Representative will interact with the SSHO to ensure compliance with this APP. Subcontractor employees are expected to comply with this APP, USACE EM 385-1-1, and other applicable regulations governing their safety while on the project. In the event of a conflict, the more stringent requirements will apply.

The Site Safety Representative will:

- Attend health and safety briefings.
- Address worker issues and immediately stop work if unsafe acts/conditions exist or if uncertainty associated with how a task is to be performed exists.
- Coordinate corrective action with the SSHO prior to resuming operations.
- Participate in any incident investigations.
- Inspect operations and work areas daily in conjunction with the SSHO.

- Ensure subcontract workers have the proper PPE.
- Control hazardous material brought on-site.

5.4 SUBCONTRACTOR SAFETY PLANS

WESTON subcontractor employees are covered by this APP and will be required to sign the Acknowledgement Form in the SSHP indicating that they have read and understand both the APP and SSHP and agree to follow the requirements in these documents.

WESTON will obtain and verify the subcontractor personnel training records prior to work beginning.

6. TRAINING

6.1 GENERAL

Personnel assigned to the Ricochet Area MRS RA project have received the required training. Records of the required training are maintained in the WESTON EHS database, and records of required training also will be available on-site at all times.

6.2 SAFETY INDOCTRINATION

When hired, WESTON staff members are required to complete EHS training appropriate to their role and responsibility level. New hires that have previously completed such training are required to provide documentation of training. All training, including refresher training, is documented in WESTON's corporate recordkeeping software, EHSTrack.

New employees also participate in WESTON's orientation training program. Personnel receive training on WESTON's EHS policies, including environmental aspects, emergency action plans, security plans, ergonomics, incident reporting procedures software, BBS, and site-/job-specific training. Site-specific topics will include:

- Accident prevention.
- Accident reporting (how and to whom).
- Location of medical facilities for emergency treatment and/or assistance.
- Reporting and correcting unsafe conditions.
- Job hazards/hazard control.
- Site-specific biological, physical, chemical, and/or ionizing/nonionizing radiation hazards as listed in the AHAs.
- Company safety policies.
- Site briefings conducted prior to being granted site access.
- Site layout.
- Hazard control.
- Emergency response and notification.
- Hearing conservation.
- PPE.
- Buddy system.
- Spills.
- Fires.
- Hazard communication.
- Visitor access.

- Public communication guidelines.
- Specific training required by regulations.

6.3 MANDATORY TRAINING AND CERTIFICATIONS

WESTON will staff the project with individuals who have the following training and certifications:

- OSHA 30-hour Construction Safety Training – At a minimum, the SSHO will have this training.
- First-Aid/CPR/Bloodborne Pathogens (BBP) – A minimum of two people will have this training
- 40-hour HAZWOPER training and current 8-hour refresher – All site personnel.

A copy of applicable training records for project personnel will be available on-site and maintained by the SSHO. **Table 10-1**, in Section 10.6, lists current key site personnel training and certifications.

6.3.1 OSHA Training

General site workers are required to have had 3 days of field experience under the direct supervision of a trained experienced supervisor. On-site management personnel will have had an additional 8 hours of specialized supervisory training. All training, including project-specific training, is documented, and training records are maintained at the site by the SSHO.

6.3.2 OSHA 30-Hour Construction Safety

Site qualifications include personnel trained in accordance with the OSHA 30-Hour Construction Safety course or equivalent course areas as listed below:

- Occupational Safety and Health (OSH) Act/General Duties Clauses.
- 29 CFR 1904, Recordkeeping.
- Subpart C: General Safety and Health Provisions, Competent Person.
- Subpart D: Occupational Health and Environmental Controls.
- Subpart E: PPE, types and requirements for use.
- Subpart F: Understanding fire protection in the workplace.

- Subpart K: Electrical.
- Subpart M: Fall Protection.
- Rigging, welding, and cutting, scaffolding, excavations, concrete and masonry, demolition; health hazards in construction, materials handling, storage and disposal, hand and power tools, motor vehicles, mechanized equipment, marine operations, steel erection, stairways and ladders, confined spaces, or any other safety procedures applicable to the work being performed.

6.4 PERIODIC SAFETY AND HEALTH TRAINING

The SSHO will present daily site safety briefings (i.e., tailgate meetings) to on-site personnel prior to the start of the work shift. The purpose of the briefings is to assist personnel in safely conducting the scheduled work activities. The briefings will include the following:

- Tasks to be performed and work method and general description of job scope.
- Work location.
- Equipment usage.
- Control of hazards.
- Weather conditions.
- Emergency response review.

The briefings will provide an opportunity for individuals to share observed safety deficiencies and recognitions. Documented attendance at these daily safety briefings will be maintained by the SSHO.

In addition to the daily site safety briefings, a formal safety meeting will be conducted at least monthly for SSHOs within their respective divisions. A safety manager or designee will be invited to attend this monthly meeting.

6.5 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING

WESTON provides training by the American Red Cross or an equivalent organization in Standard First Aid, Adult CPR, and BBP for the field staff. At least two personnel with such training and also trained in the use of fire extinguishers will be on-site to provide emergency response. In the event specialized/elevated care is necessary, either WESTON or the on-call emergency medical technician (EMT)/ambulance service will transport the injured person to the appropriate medical facility.

Outside assistance will be requested as detailed in the Emergency Response procedures included in the SSHP.

WESTON personnel involved with responding to an on-site emergency will be briefed in their roles and responsibilities as part of the initial indoctrination training discussed above. During this training, personnel will be briefed on the Hazard Communication (HAZCOM) Program, emergency equipment, and first-aid procedures, as described in the SSHP. Personnel will also be briefed on the emergency response and contingency procedures, which include:

- Procedures and tests.
- Spill prevention.
- Firefighting.
- Posting of emergency telephone numbers.
- Medical support.

This training will be documented and will also involve a drill of the emergency response procedures prior to the start of site activities. During this training, the route to and the location of the evacuation point and the location of medical support will be discussed with each staff member.

7. SAFETY AND HEALTH INSPECTIONS

7.1 SPECIFIC ASSIGNMENTS OF RESPONSIBILITIES

The SSHO will conduct and document daily safety and health observations on the project log. Inspections will be conducted by the SSHO using the Environmental Health, Safety Inspection Checklist presented in **Attachment C**. The qualifications and certifications of the inspector (e.g., the SSHO or CSP) are provided in **Attachment B** of this APP.

7.2 INSPECTIONS/AUDIT FREQUENCIES

Inspected by	Daily	Weekly	Monthly
SSHO	X	X	
CSP			X

7.3 DEFICIENCY TRACKING

A deficiency tracking form, presented in **Attachment D**, will be used to document unacceptable work practices. The deficiency tracking form lists and monitors the status of safety and health deficiencies in chronological order. The form displays the type and description of the deficiency; the risk rating; code reference; the corrective action taken and the projected resolution date; the date resolved; and the person responsible for the corrective action. The deficiency tracking system will be posted on the safety bulletin board and will be updated daily. In most cases, discrepancies of greater severity are corrected immediately, or within 24 hours if they are of lower severity.

When a deficiency is identified, the SSHO will follow up by updating the deficiency tracking form to indicate the specific corrective action, the person(s) responsible for the corrections, and the date by which the action needs to be accomplished. The SSHO will also follow up by ensuring that the corrective action is accomplished in the timeframe indicated. During health and safety audits, the deficiency log is reviewed to ensure that the corrective action process has been implemented. The information from the deficiency tracking form is presented in daily safety meetings and monthly supervisor meetings so that lessons learned are disseminated.

7.4 EXTERNAL INSPECTIONS/CERTIFICATIONS

Although no external inspection is expected, regulatory agencies do conduct inspections from time to time. An inspector should be treated professionally and with courtesy. The regulatory agency inspector should introduce himself/herself to the manager in charge of the operation and present credentials to verify that he/she is representing a recognized regulatory agency, such as OSHA or the Department of Transportation (DOT). Personnel who cannot demonstrate their affiliation with a recognized regulatory agency should not be allowed access to the project site or office.

Any pre-inspection conference will be attended by the SSHO, at a minimum. At that time, the scope of the inspection should clearly be described by the inspector. If the inspector has not described the scope of the inspection during the pre-inspection conference, the inspector should be asked to provide such a description.

Prior to taking the inspector on-site or into the office, it is necessary to contact the PM, the Army National Guard (ARNG), PAARNG, and USACE points of contact (POCs), and the East Division EHS Officer. The inspector will perform the inspection, which may include a walk-through inspection of the work site or a targeted file/records review. The site or office inspection typically will end with a close-out conference during which the inspector may provide tentative findings. In some cases, the inspector may forego the close-out conference and issue a written citation after leaving the site. On occasion, inspections may require more than one day.

Regulatory agency inspectors seldom issue citations during the inspection. However, if an OSHA or EPA inspector observes an imminent hazard, he/she can order a work stoppage.

It is WESTON's practice to cooperate with investigations. Information that is requested should be provided; however, requests for copies of documents, safety and health plans, and training records should not be provided without first obtaining approval from WESTON's Law Department. Under no circumstances should any attempt be made to mislead the inspector.

Coordination of any regulatory agency inspection is the responsibility of the SSHO, who will accompany the inspector during all stages of the inspection.

8. ACCIDENT REPORTING

8.1 EXPOSURE DATA (MAN-HOURS WORKED)

The SSHO and PM will track exposure hours. The hours will be presented as a spreadsheet compilation of WESTON and subcontractor hours worked, reportable accidents that occurred during the month, and accidents that have occurred since the start of the project. WESTON's Risk Management Administrators compile weekly corporate totals that are distributed to the Division Safety Officers for posting.

8.1.1 Accident Investigations, Reports, and Logs

All incidents, near incidents, spills, thefts, or other site issues will be reported to the WESTON Division EHS Officer within 1 hour of the occurrence, or as soon as physically possible. The Preliminary Accident Notification Report (PAN) (see **Attachment E**) and the WESTON electronic incident reporting and notification process (Notice of Incident [NOI] Track) must be submitted to the East Division EHS Officer within 24 hours of the incident. Incidents will be reported to the Contracting Officer (KO)/Contracting Officer's Representative (COR) within 24 hours, with written follow-up using USACE ENG Form 3394 within 5 days after the incident.

WESTON's NOITrack is used to document incidents, corrective action plans, and investigations involving WESTON-managed work. Incidents meeting the OSHA definitions of recordable incidents are documented on the WESTON 300 logs, and the SSHO also records these incidents on the site OSHA 300 log.

WESTON investigates incidents, including near incidents or "near misses." Corrective actions will be implemented as soon as reasonably possible.

8.2 IMMEDIATE ACCIDENT NOTIFICATION

The following incidents require immediate notification, no later than 1 hour, to the KO/COR, or designee:

- Fatalities.
- Permanent total disability.

- Permanent partial disability.
- Hospitalization of three or more people resulting from a single occurrence.
- Property damage of \$500,000 or more.

The written follow-up will use the USACE ENG Form 3394 Accident Investigation Report (see **Attachment E**).

WESTON will notify OSHA within 8 hours of any fatality or single incident that results in hospitalization of three or more persons.

8.3 NOITRACK PROCEDURE

In June 2009, WESTON's EHS released a new NOI reporting system. NOITrack replaces the NOI Form for reporting incidents, although the form may still be used if access to a computer is unavailable. NOITrack can be accessed on the WESTON Portal, EHS homepage. The NOITrack information must be completed within 24 hours of the incident, accident, or near incident. The requirement and general procedure for reporting incidents has not changed; only the method of submitting them, as described below, has altered. Anyone involved in the incident can complete an NOI.

The NOI must be used to report ALL incidents and near-incidents. Incidents include the following: employee accidents, injuries, auto accidents, property damage/loss, utility damage, information/data breaches, security concerns/breaches, break-ins, subcontractor injuries /accidents/events, or any other liability situation or circumstance that could give rise to a claim. For example, spills/discharges resulting from the installation of equipment or systems by WESTON or WESTON subcontractors should be reported using the NOITrack system. An NOI must be submitted if something happens on a project that was not intended and could result in liability for WESTON.

8.4 ACCIDENT REVIEW

Any accident that occurs while an employee is driving on Company business, or operating a WESTON-owned, leased, rental, or allowance vehicle at any time will be reviewed and investigated. Drug and/or alcohol testing will be conducted in a timely manner in accordance with WESTON Drug and Alcohol Operating Practice (05-01-010). The accident review is

intended to determine whether the accident was “preventable” as defined by the National Safety Council. The investigation will also include consideration of citations issued, if any, and the specifics of the accident to determine appropriate consequences, if any. Investigation may result in outcomes such as recommendation for driver training programs, changes or modifications to vehicle/equipment, suspension of driving privileges, or employee termination. Typically, auto accident investigations will be coordinated on a divisional level, similar to protocols established by the divisions for other root-cause investigations. The Risk Management Department will provide input and guidance and serve as a liaison with insurance carriers, as needed.

9. MEDICAL SUPPORT

9.1 ON-SITE MEDICAL SUPPORT

In the event specialized/elevated care is necessary, either WESTON or the on-call EMT/ambulance service will transport the injured person to the Hershey Medical Center. The FIG Fire and EMS Department can be notified of emergency situations by using the telephone numbers listed in **Table 9-1**. Other emergency contact numbers are listed in **Tables 9-2** and **9-3**.

A first-aid kit will be provided on-site, and will be in compliance with the criteria contained in American National Standards Institute (ANSI) Z308.1-2009. BBP kits containing PPE barriers and appropriate decontamination solutions will be maintained on-site.

In case of injury, the following procedures apply:

- For minor injuries, routine first-aid procedures will be used.
- For major injuries, an ambulance will be called immediately, and the appropriate first aid will be administered until the ambulance arrives.
- Trained personnel will use approved measures for treatment based on the training they have received.

9.2 OFF-SITE MEDICAL SUPPORT

Table 9-1 Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
Department of Emergency Services (Ambulance, Fire, Police)	911
FIG Police (non-emergency)	(717) 861-2727
FIG Fire Department (non-emergency)	(717) 861-2111
PA State Police	911
Emergency Hospital: Hershey Medical Center 500 University Drive Hershey, PA 17033	(717) 531-8521 (800) 243-1455
Non-Emergency Medical: Good Samaritan Hospital 233 S. 4 th Street Lebanon, PA 17042	(717) 270-7500

Table 9-2 WESTON Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
WESTON PM: John Gerhard	(610) 701- 3793 (office) (610) 513-6897 (cell)
WESTON East Division EHS Officer: Larry Werts	(610) 701-3912 (office) (215) 815-6237 (cell)
WESTON East Division Federal Team Safety Officer Chris Baer	(610) 701-3653 (office) (484) 239-4249 (cell)
WESTON Medical Programs Manager: Bill Irwin	(610) 701-3684 (office) (267) 918-8371 (cell)

Table 9-3 Other Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
Poison Control Center	(800) 962-1253
Spill Response - CHEMTREC	(800) 424-9300
National Response Center	(800) 424-8802
WorkCare WESTON Medical Director: Dr. Peter Greaney WorkCare WESTON Program Administrator Heather Lind	From 06:00 to 16:30 Pacific Time call (800) 455-6155 dial 0 or extension 175, Heather Lind to request the on-call clinician
After-Business Hours Contact (Emergency Only)	16:31 to 05:59 Pacific Time and weekends and Holidays call (800) 455- 6155 and dial 3 to reach the after-hours answering service. Request that the service connect you with the on-call clinician or the on-call clinician will return your call within 30 minutes.
WESTON Emergency (24 hour) (West Chester)	(610) 701-3720

9.3 DIRECTIONS AND MAP TO NEAREST HOSPITAL

The appropriate emergency vehicle will travel to the appropriate medical facility as shown on **Figures 9-1** and **9-2**. **Figure 9-1** shows the route to the emergency hospital (the driving distance is approximately 18 miles and the driving time is approximately 35 minutes). **Figure 9-2** shows the route to the non-emergency hospital (driving distance is approximately 17 miles with a driving time of approximately 32 minutes).

9.4 FIRST AID AND CPR TRAINING

Table 9-4 presents first aid and CPR training for key personnel.

Table 9-4 First Aid and CPR Training for Key Personnel

Name	First Aid (Expiration Date)	CPR (Expiration Date)	BBP (Expiration Date)
Bruce Carnal	4/14/2015	4/14/2015	4/4/2014
Jason McCloskey	4/14/2015	4/14/2015	4/4/2014

9.5 BLOODBORNE PATHOGENS

WESTON personnel will follow the guidance established in the BBP Exposure Control Plan presented in **Attachment F**.

9.6 MEDICAL SURVEILLANCE

Since 1980, WESTON has used a comprehensive Occupational Health Program (OHP) that complies with OSHA and USACE requirements. Site personnel and subcontractors who enter the site during operations must comply with a comparable OHP. Personnel will be required to provide their certifications to the SSHO for review and approval prior to being granted authorization to work. Certifications will be maintained at the project site.

9.6.1 Occupational Health Program

To comply with OSHA requirements, WESTON has designated Dr. Peter Greaney of WorkCare[®] to oversee the site-specific medical surveillance and OHP. Dr. Greaney is a board-

certified physician in internal and occupational medicine. **Dr. Greaney can be reached during regular business hours at (800) 455-6155.**

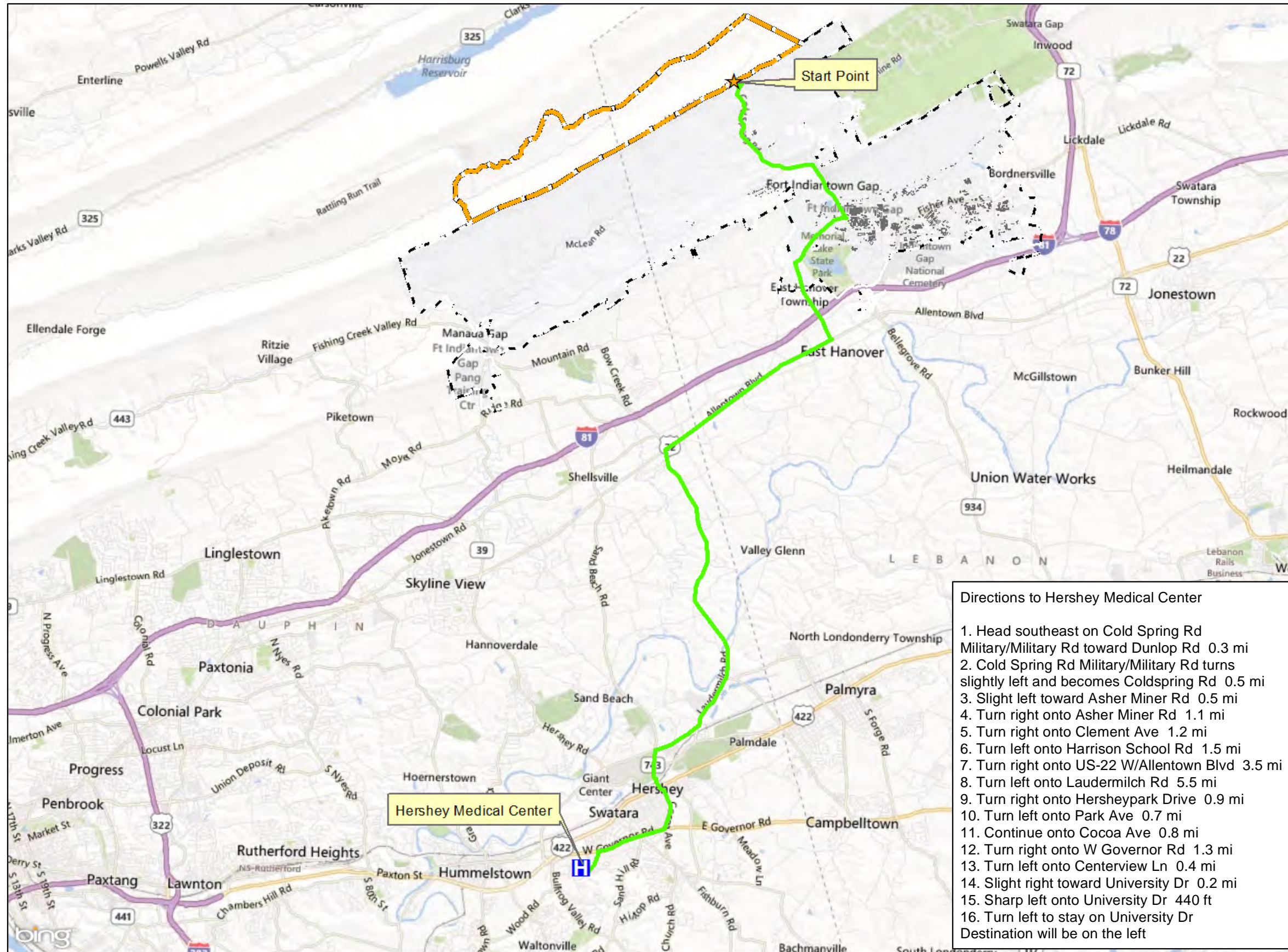
The purpose of the OHP is to ensure suitable job placement of employees, to monitor the health effects of hazards encountered in the workplace, and to maintain and promote good health through preventive measures. Medical examination criteria are established by WorkCare in compliance with 29 CFR 1910.120.

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Legend

- Fort Indiantown Gap Installation Boundary
- Hospital Route
- Ricochet Area MRS



- Directions to Hershey Medical Center**
1. Head southeast on Cold Spring Rd Military/Military Rd toward Dunlop Rd 0.3 mi
 2. Cold Spring Rd Military/Military Rd turns slightly left and becomes Coldspring Rd 0.5 mi
 3. Slight left toward Asher Miner Rd 0.5 mi
 4. Turn right onto Asher Miner Rd 1.1 mi
 5. Turn right onto Clement Ave 1.2 mi
 6. Turn left onto Harrison School Rd 1.5 mi
 7. Turn right onto US-22 W/Allentown Blvd 3.5 mi
 8. Turn left onto Laudermilch Rd 5.5 mi
 9. Turn right onto Hersheypark Drive 0.9 mi
 10. Turn left onto Park Ave 0.7 mi
 11. Continue onto Cocoa Ave 0.8 mi
 12. Turn right onto W Governor Rd 1.3 mi
 13. Turn left onto Centerview Ln 0.4 mi
 14. Slight right toward University Dr 0.2 mi
 15. Sharp left onto University Dr 440 ft
 16. Turn left to stay on University Dr Destination will be on the left

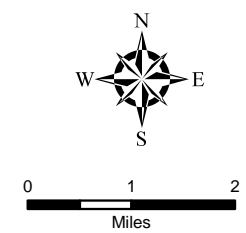
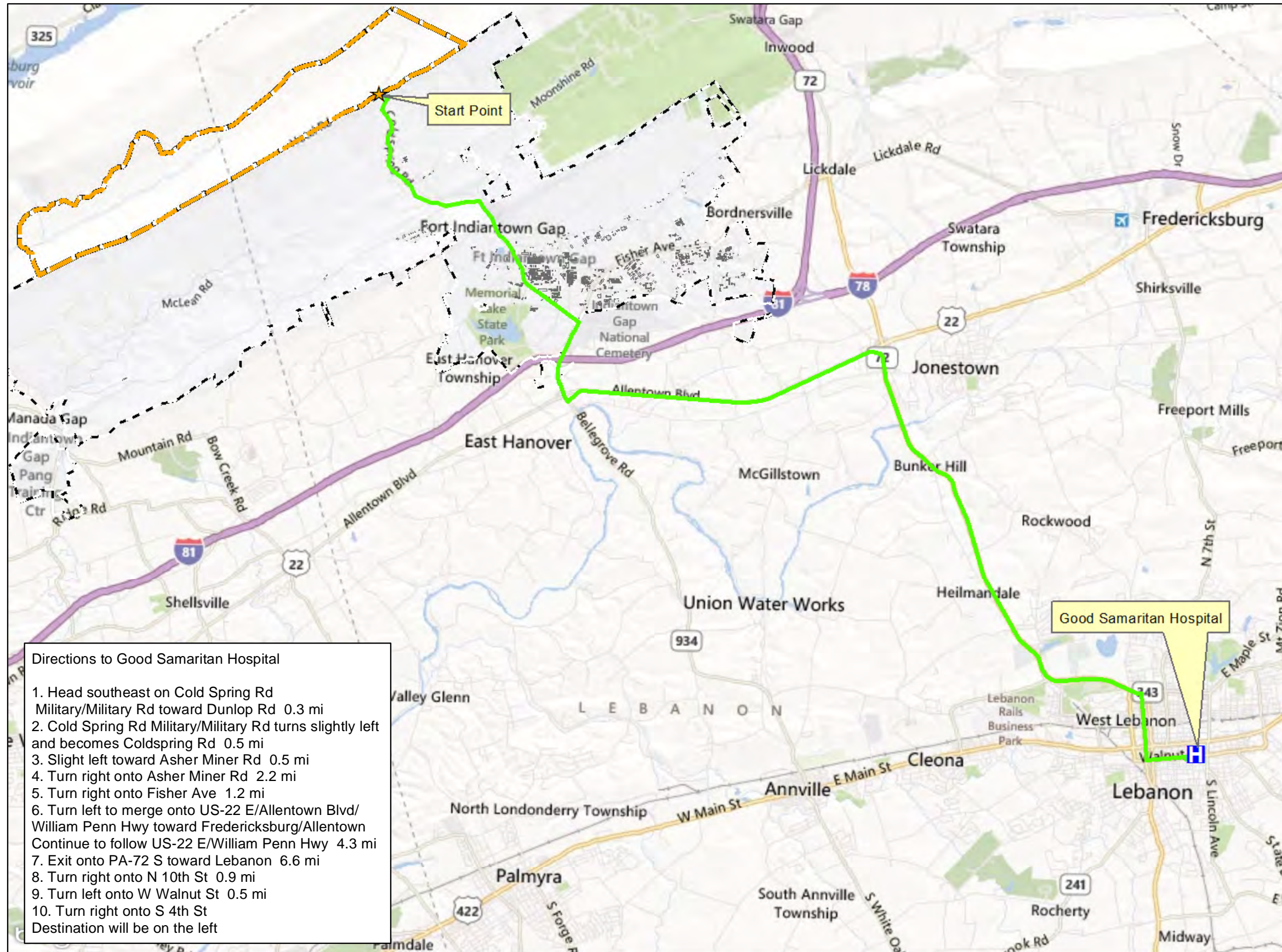


Figure 9-1
Emergency Hospital Route
from Ricochet Area MRS State
Game Lands 211 Adjacent to
Fort Indiantown Gap, Annville, PA



Legend

- Fort Indiantown Gap Installation Boundary
- Hospital Route
- Ricochet Area MRS



Directions to Good Samaritan Hospital

1. Head southeast on Cold Spring Rd Military/Military Rd toward Dunlop Rd 0.3 mi
2. Cold Spring Rd Military/Military Rd turns slightly left and becomes Coldspring Rd 0.5 mi
3. Slight left toward Asher Miner Rd 0.5 mi
4. Turn right onto Asher Miner Rd 2.2 mi
5. Turn right onto Fisher Ave 1.2 mi
6. Turn left to merge onto US-22 E/Allentown Blvd/William Penn Hwy toward Fredericksburg/Allentown Continue to follow US-22 E/William Penn Hwy 4.3 mi
7. Exit onto PA-72 S toward Lebanon 6.6 mi
8. Turn right onto N 10th St 0.9 mi
9. Turn left onto W Walnut St 0.5 mi
10. Turn right onto S 4th St Destination will be on the left

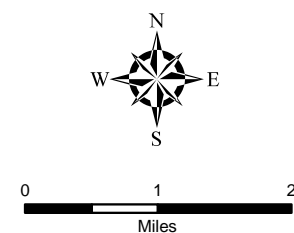


Figure 9-2
Non-Emergency Hospital Route
from Ricochet Area MRS State
Game Lands 211 Adjacent to
Fort Indiantown Gap, Annville, PA

10. PERSONAL PROTECTIVE EQUIPMENT

10.1 HAZARD ASSESSMENTS

For the Ricochet Area MRS project, the EHS Officer and the SSHO are responsible for overseeing the development and implementation of the PPE Program. Once on-site, the SSHO is responsible for ensuring that the level of protection is correct for the activities. If field conditions change, an amendment will be made to the APP and SSHP to reflect the necessary PPE.

10.2 IDENTIFYING WHEN HAZARD ASSESSMENTS WILL BE CONDUCTED

Hazard assessments are conducted during the site walk and document review. During the initial PPE decision-making process, the APP preparer reviewed available site information and established the level of protection to be worn by site personnel for each task. Additional hazard assessments will be conducted periodically and when field activities or site conditions change.

10.3 IDENTIFYING HOW HAZARD ASSESSMENTS WILL BE CONDUCTED

The selection of the most appropriate level of protection depends on the following:

- Hazards, known or potential.
 - Physical hazards.
 - Biological hazards.
 - Chemical hazards.
- Properties such as toxicity, radioactivity, route of exposure, and matrix (i.e., air, soil, water) in which the contaminants are known or suspected.
- Type and measured concentrations of contaminants.
- Potential for exposure based upon task.

Based upon the initial AHAs, the APP preparer, in consultation with the appropriate safety professionals, identified PPE for the specific tasks. The SSHO, in consultation with the appropriate safety professionals, will evaluate the AHAs and the identified PPE to determine its suitability based on the site activities and conditions. New or additional PPE will be selected as

conditions change to ensure that employees are protected from hazards. Care will be taken to recognize the possibility of multiple and simultaneous exposures to a variety of hazards.

The levels of personal protection and the procedures specified in this plan are based on the best information available from reference documents and current site data; therefore, these recommendations represent the minimum safety and health requirements to be observed by personnel engaged in this project. Unforeseeable site conditions or changes may warrant a reassessment of protection levels and controls stated. Adjustments to the APP must have prior approval by the Federal Team Health and Safety Officer and USACE, ARNG, and PAARNG.

10.4 PERSONAL PROTECTIVE EQUIPMENT TRAINING

In accordance with OSHA 29 CFR 1910, Subpart I (Personal Protective Equipment), PPE will be provided, used, and maintained in a sanitary and a reliable condition. The construction, design, and material of PPE will provide employees protection against known or anticipated hazards. PPE will be selected that properly and appropriately fits the employee. Any concerns regarding the use of appropriate PPE will be brought to the attention of the SSHO, who will contact the East Division EHS Officer for assistance in the evaluation of PPE as necessary.

Work at the Ricochet Area MRS will be completed in Level D PPE. If higher levels of protection are required, an addendum to the APP and SSHP will be prepared and approved.

In accordance with OSHA, any worker required to wear PPE shall receive training in the proper use and care of PPE. Periodic retraining shall be offered by the East Division EHS Officer or designees to both the employees and the supervisors. The training shall include, but not necessarily be limited to, the following subjects:

- Proper selection of PPE.
- When PPE is anticipated for use.
- Proper uses and limitations of equipment during temperature extremes, heat/cold stress, and in relation to employee medical conditions.
- Proper donning and doffing, and adjusting.
- Maintenance, cleaning, and storage.
- Inspection procedures.

Training is typically delivered through formal programs such as Hazardous Waste Operations and Emergency Response (HAZWOPER) training, refresher training, or specific hazard training. Additional training is offered through routine site training and site-specific training. After the training, the employees will demonstrate that they understand the components of the PPE Program and how to use PPE properly, or they will be retrained.

10.5 PPE RETRAINING

Retraining is through formal programs such as those discussed in Section 6.

10.6 WRITTEN CERTIFICATION OF EMPLOYEE PPE TRAINING

Project personnel will have appropriate training as determined by the East Division EHS Officer. Required training and certifications are reviewed internally as part of the APP and SSHP development prior to project commencement. WESTON has an on-line system, EHSTrack, to allow rapid access to personnel training records. WESTON can track the current certification status of WESTON personnel assigned to each project. The SSHO will use EHSTrack to update contact information, view EHS personnel training certifications, and view medical clearances. The SSHO will verify each person's training certification and medical clearance status prior to the start of work and will periodically perform reviews for updates. Key site personnel training and certifications are provided in **Table 10-1**.

Table 10-1 Current Key Site Personnel Training/Certifications

Personnel Name	Position	Medical Clearance (expires)	40-Hour HAZWOPER	8-Hour HAZWOPER Refresher (expires)	First Aid (expires)	CPR (expires)	BBP (expires)	30-Hour Construction Safety	Supervisors Health and Safety
Bruce Carnal	SSHO/ UXOSO	3/27/2015	9/21/2009	4/3/2014	4/14/2015	4/14/2015	4/3/2014	3/11/2011	3/24/2011
Jason McCloskey	PA Blaster/ UXOQCS	8/13/2014	8/16/1999	4/3/2014	4/14/2015	4/14/2015	4/3/2014	4/10/2009	2/15/2008

HAZWOPER= Hazardous Waste Operations and Emergency Response.

11. PLANS REQUIRED BY EM 385-1-1

Plans, programs, and procedures required by EM 385-1-1 and their disposition in the APP or SSHP are shown in **Table 11-1**.

Table 11-1 Plans Required by EM 385-1-1

Plan, Program or Procedure	Document Location
a. Layout plans (04.A.01)	See Figure 2-3 for site layout plan. See Section 11.1 for additional information.
b. Emergency Response Plans	
(1) Procedures and tests (01.E.01)	SSHP Section 15.1
(2) Spill plans (01.E.01, 06.A.02)	SSHP Section 15.4
(3) Fire-fighting Plan (01.E.01, 19.A.04)	SSHP Section 15.5
(4) Posting of emergency telephone numbers (01.E.05)	SSHP Sections 15.3.4 and 15.7: Tables 15-1, 15-2, and 15-3
(5) Man overboard/abandon ship (19.A.04)	This plan is not required because no marine activities are anticipated.
(6) Medical support (Section 03.A.02; 03.D)	APP Section 9
c. Plan for prevention of alcohol and drug abuse (01.C.02)	SSHP Section 10.6
d. Site Sanitation Plan (Section 02)	SSHP Section 10.11
e. Access and Haul Road Plan (4.B)	This plan is not required because no haul road activities are anticipated.
f. Respiratory Protection Plan (05.G)	This plan is not required because no activities requiring respiratory protection are anticipated.
g. Health Hazard Control Program (06.A)	Health Hazard Control is addressed in the AHAs in Section 12 of APP and Section 3 of SSHP.
h. Hazard Communication Program (01.B.01) Provide the location of the Material Safety Data Sheet (MSDS), records of contractor employee training, and inventory of hazardous materials (including approximate quantities and a site map) that will be brought onto government project by the contractor and subcontractor.	Will be maintained at the site by the SSO. Attachment 1 of the SSHP.
i. Process Safety Management Plan (06.B.04)	This plan is not required because no highly hazardous chemicals are associated with the work plan.
j. Lead Abatement Plan (06.B.05 and specifications)	This plan is not required because no lead abatement activities are anticipated.
k. Asbestos Abatement Plan (06.B.05 and specifications)	This plan is not required because no asbestos abatement activities are anticipated.

Table 11-1 Plans Required by EM 385-1-1 (Continued)

Plan, Program or Procedure	Document Location
l. Radiation Safety Program (06.E.03)	Encountering ionizing radiation above background or use of radiation producing devices is not anticipated. A Radiation Safety Program is not required. Non-ionizing radiation is addressed in SSHP Section 2.3.4.1.
m. Abrasive blasting (06.H.01)	This plan is not required because no abrasive-blasting activities are anticipated.
n. Heat/Cold Stress Monitoring Plan (06.I.02)	SSHP Section 9
o. Crystalline Silica Monitoring Plan (Assessment) (06.M)	This plan is not required because no work is anticipated to result in exposure to silica.
p. Night Operations Lighting Plan (07.A.08)	This plan is not required because no night operations will occur.
q. Fire Prevention Plan (09.A)	SSHP Section 15.5
r. Wild Land Fire Management Plan (09.K.01)	SSHP Section 15.6
s. Hazardous Energy Control Plan (12.A.01)	This plan is not required because no stored hazardous energy activities are anticipated.
t. Critical lift procedures (16.H)	This plan is not required because no critical lift is required.
u. Contingency plan for severe weather (19.A.03)	SSHP Section 9.3
v. Float Plan (19.F.04)	This plan is not required because no water work will be required.
w. Fall Protection Plan (Section 21.C)	This plan is not required because no work at elevation requiring a fall protection plan is anticipated.
x. Demolition Plan (engineering surveys) (23.A.01)	This plan is required not because building demolition activities will not occur.
y. Excavation/Trenching Plan (25.A.01)	This plan is not required because excavations will be less than 5 feet.
z. Emergency rescue (tunneling) (26.A)	This plan is not required because no tunneling activities are anticipated.
aa. Underground Construction Fire Prevention and Protection Plan (26.D.01)	This plan is not required because no underground construction work will be done.
bb. Compressed Air Plan (26.I.01)	This plan is not required because no work under compressed air is anticipated.
cc. Formwork and Shoring Erection and Removal Plans (27.C)	This plan is not required because no shoring activities are anticipated.
dd. Pre-Cast Concrete Plan (27.D)	This plan is not required because no pre-cast concrete work is anticipated.

Table 11-1 Plans Required by EM 385-1-1 (Continued)

Plan, Program or Procedure	Document Location
ee. Lift Slab Plans (27.E)	This plan is not required because no lift slab activities are anticipated.
ff. Steel Erection Plan (27.F.01)	This plan is not required because no steel erection activities are anticipated.
gg. SSHP	Attachment A of the APP.
hh. Blasting Plan (29.A.01)	This plan is not required because no blasting activities as covered by Section 29 EM385-1-1 will be conducted. Demolition of UXO is addressed in Work Plan and the ESS.
ii. Diving Plan (30.A.13)	This plan is not required because no diving activities are anticipated.
jj. Confined space (34.A)	This plan is not required because no confined space work will be conducted.

11.1 SITE LAYOUT PLAN

As defined in EM 385-1-1 04.A.01, no temporary construction buildings, facilities, fencing, and access routes for temporary structures will be required for this project. However, a temporary trailer used as a field office will be placed at the site. A mobile trailer vendor will be used for delivery and installation of the trailer. Two sets of OSHA-approved aluminum steps will be installed for trailer access. The trailer will be anchored with steel straps to ground anchors and will meet applicable state or local standards. Sections 04.A and 11 (temporary power distribution) of EM 385.1-1 will also be applicable, and a qualified electrician will be used to hook up the electricity.

The layout plan showing the field office trailer for the Ricochet Area RA project is provided in **Figure 2-3**.

12. RISK MANAGEMENT PROCESSES

The AHAs presented in this section define the activities to be performed at the Ricochet Area MRS and identify the sequence of work, the specific hazards anticipated, the site-specific conditions, the equipment and materials, and the control measures to be implemented to eliminate or to reduce each hazard to an acceptable level of risk. Reviews of the project-associated hazards will occur periodically and when field activities change.

- Activity 1: Mobilization/Demobilization
- Activity 2: Grid Survey Activities
- Activity 3: Brush Clearing
- Activity 4: Focused Surface and Subsurface Removal of MEC
- Activity 5: Digital Geophysical Mapping
- Activity 6: Utility Terrain Vehicle (UTV) Usage

Table 12-1 Activity Hazard Analysis

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

Activity 1: **Mobilization/Demobilization**

*Overall Risk Assessment Code (RAC): **M**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Mobilization of manpower and equipment	Chemical Hazards: Exposure to petroleum fuels and lubricants	Vehicles will not be over filled. Caution will be used when refueling. Refueling will not be conducted within 100 feet of an open flame or ignition source.	L
	Biological Hazards: Possibility of stinging and biting insects. Encountering local wildlife, reptiles, and plants.	Appropriate insect repellents containing DEET will be used. Guidance on how to recognize poisonous plants and to avoid contact will be provided. A poster indicating the various types of hazardous plants and reptiles to avoid will be made available. Safety discussions will be conducted on the avoidance of biological hazards. In areas where poisonous snakes are known to congregate, the use of snake chaps and heavy leather gloves will be required. Discussions on snake habits, aggressiveness, and avoidance will be held during safety briefings. In areas where poisonous plants exist, preventative ointments and washing capabilities will be used.	L
	Radiation Hazards: Sun	Use sunblock as appropriate. Avoid extended periods of direct exposure to sun.	L
	Physical Hazards: Driving/Traffic	All drivers will be licensed. All traffic rules, regulations, and control signs will be obeyed. Work areas will be clearly barricaded, and appropriate signs will be displayed. Workers must have special consideration for the danger related to the large military vehicles and support vehicles that are routinely on roadways at FIG. The vehicles and personnel for the investigation activities will give priority to FIG vehicles on the roadways. Persons working near roadways or directing traffic will remain aware of their position in relation to traffic and will wear high visibility vests.	L

Activity 1: Mobilization/Demobilization (Continued)

Task	Hazard	Hazard Control	RAC*
	Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel will conduct an initial walkthrough, and the “buddy system” will be implemented.	M
	Inclement weather	Personnel will be dressed according to weather conditions. Local weather will be monitored on a daily basis or more frequently if storms threaten. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities. The SSHO will monitor for tornado, lightning, and high wind conditions. In the event of severe weather conditions, the SSHO will advise on appropriate shelter locations.	L
	Heat and cold stress	Workers will be briefed and be cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored.	L
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Do not lift a load greater than 25 pounds without mechanical assistance. Verify the path of travel is clear prior to the lift.	M

Activity 1: Mobilization/Demobilization (Continued)

	Hands or fingers caught between objects; abrasions and lacerations	Personnel will be made aware of the hazard and will carefully coordinate the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact with rough or sharp edges. Personnel will wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual and power	Tools will be inspected prior to use. Damaged tools will be tagged out of service until they can be repaired. Tools will be used properly and for their intended purpose. Power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). Personnel will be trained on the proper use of power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, the area will be vacated. Any small fire may be extinguished using a properly rated extinguisher. Storage, handling, and use of flammables and combustible liquids will be in accordance with National Fire Protection Association (NFPA) 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L

Equipment	PPE	Inspection	Training
Hand tools Vehicles	Safety boots High-visibility safety vest Gloves Safety glasses Cold-weather clothing	Equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and First Aid kits will be inspected monthly by the SSHO.	First Aid/CPR and Vehicle Training.

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

Activity 2: **Grid Survey Activities**

***Overall Risk Assessment Code (RAC): M**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Grid Survey Activities (survey and install grid and boundary points)	Biological Hazards: Possibility of stinging and biting insects. Encountering local wildlife, reptiles, and plants.	Appropriate insect repellents containing DEET will be used. Guidance on how to recognize poisonous plants and to avoid contact will be provided. A poster indicating the various types of hazardous plants and reptiles to avoid will be made available. Safety discussions will be conducted on the avoidance of biological hazards. In areas where poisonous snakes are known to congregate, the use of snake chaps and heavy leather gloves will be required. Discussions on snake habits, aggressiveness, and avoidance will be held during safety briefings. In areas where poisonous plants exist, preventative ointments and washing capabilities will be used.	L
	Radiation Hazards: Sun	Use sunblock as appropriate. Avoid extended periods of direct exposure to sun.	L
	Physical Hazards: Driving/Traffic	All drivers will be licensed. All traffic rules, regulations, and control signs will be obeyed. Work areas will be clearly barricaded and appropriate signs will be displayed. Workers must have special consideration for the danger related to the large military vehicles and support vehicles that are routinely on roadways at FIG. The vehicles and personnel for the investigation activities will give priority to FIG vehicles on the roadways. Persons working near roadways or directing traffic will remain aware of their position in relation to traffic and will wear high visibility vests.	L

Activity 2: Grid Survey Activities (Continued)

	Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared to reduce slip hazards. Work will be completed in adequate natural light, or sufficient artificial illumination will be maintained. Site personnel will conduct an initial walkthrough, and the “buddy system” will be implemented.	M
	Inclement weather	Personnel will be dressed according to weather conditions. Local weather will be monitored on a daily basis or more frequently if storms threaten. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities. The SSHO will monitor for tornado, lightning, and high wind conditions. In the event of severe weather conditions, the SSHO will advise on appropriate shelter locations.	L
	Heat and cold stress	Workers will be briefed and be cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according ACGIH and NIOSH guidelines. Personnel will be monitored.	L
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Do not lift a load greater than 25 pounds without mechanical assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel will be made aware of the hazard and asked to carefully coordinate the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact with rough or sharp edges. Personnel will wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual and power	Tools will be inspected prior to use. Damaged tools will be tagged out of service until they can be repaired. Tools will be used properly and for their intended purpose. Power circuits used for hand tools will be protected by a GFCI. Personnel will be trained on the proper use of power tools.	L

Activity 2: Grid Survey Activities (Continued)

	Fire	Fire prevention will be a priority through awareness. In the event of a fire, the area will be vacated. Any small fire may be extinguished using a properly rated extinguisher. Storage, handling, and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Noise	Hearing protection will be required when noise-levels exceed 80 decibels (dB). Noise-level monitoring will be performed as necessary.	L

Equipment	PPE	Inspection	Training
Hand tools Vehicles	Safety boots High-visibility safety vest Gloves Safety glasses Hearing protection Snake chaps	Equipment and meters will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and First Aid kits will be inspected monthly by the SSHO.	First Aid/CPR and Vehicle Training. 30-Hr Construction Safety (SSHO)

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

Activity 3: **Brush Clearing**

***Overall Risk Assessment Code (RAC): M**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Brush clearing with lopping shears and chain saw use for trees already on ground but needing to be moved	UXO Avoidance:	Any ordnance items will be positively identified. Global Positioning System (GPS) coordinates will be taken of the item, and it will be left in place. Surface MEC/UXO sweeps generally clear only to 2 feet below ground surface (bgs) so any surface clearing activities will require clearance in 2-foot increments. A UXO Technician II or higher will escort the clearing crew and conduct a magnetometer-assisted visual survey to screen for metal debris.	M
	Biological Hazards: Possibility of stinging and biting insects. Encountering local wildlife, reptiles, and plants.	Appropriate insect repellents containing DEET will be used. Guidance on how to recognize poisonous plants and to avoid contact will be provided. A poster indicating the various types of hazardous plants and reptiles to avoid will be made available. Safety discussions will be conducted on the avoidance of biological hazards. In areas where poisonous snakes are known to congregate, the use of snake chaps and heavy leather gloves will be required. Discussions on snake habits, aggressiveness, and avoidance will be held during safety briefings. In areas where poisonous plants exist, preventative ointments and washing capabilities will be used.	L
	Radiation Hazards: Sun	Use sunblock as appropriate. Avoid extended periods of direct exposure to sun.	L

Activity 3: Brush Clearing (Continued)

Task	Hazards	Hazard Control	RAC*
	Physical Hazards: Driving/Traffic	All drivers will be licensed. All traffic rules, regulations, and control signs will be obeyed. Work areas will be clearly barricaded and appropriate signs displayed. Workers must have special consideration for the danger related to the large military vehicles and support vehicles that are routinely on roadways at FIG. The vehicles and personnel for the investigation activities will give priority to FIG vehicles on the roadways. Persons working near roadways or directing traffic will remain aware of their position in relation to traffic and wear high visibility vests.	L
	Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel will conduct an initial walkthrough, and the “buddy system” will be implemented.	M
	Inclement weather	Personnel will be dressed according to weather conditions. Local weather will be monitored on a daily basis or more frequently if storms threaten. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities. The SSHO will monitor for tornado, lightning, and high wind conditions. In the event of severe weather conditions, the SSHO will advise on appropriate shelter locations.	L
	Heat and cold stress	Workers will be briefed and be cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to ACGIH and NIOSH guidelines. Personnel will be monitored.	L
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Do not lift a load greater than 25 pounds without mechanical assistance. Verify the path of travel is clear prior to the lift.	M

Activity 3: Brush Clearing (Continued)

Task	Hazards	Hazard Control	RAC*
	Chain saws	Chain saws will be used to cut natural debris (i.e., fallen trees) that will interfere with activities. Chain saws will be operated by qualified persons. Chain saw operators will wear chaps. Chain saw operators will be appropriately trained and experienced. Natural debris to be cut will be checked by experienced persons prior to cutting to identify increased hazard situations.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel will be made aware of the hazard and will carefully coordinate the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges and appropriate precautions will be taken to avoid contact with rough or sharp edges. Personnel will wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual and power	Tools will be inspected prior to use. Damaged tools will be tagged out of service until they can be repaired. Tools will be used properly and for their intended purpose. Power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). Personnel will be trained on the proper use of power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, the area will be vacated. Any small fire may be extinguished using a properly rated extinguisher. Storage, handling, and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L

Activity 3: Brush Clearing (Continued)

Equipment	PPE	Inspection	Training
Hand tools Vehicles	Safety boots High-visibility vests Leather gloves Safety glasses Cold-weather clothing Face shield (Brush removal) Hardhat (Brush removal) Protective chainsaw chaps (brush removal) Snake chaps	Equipment and meters will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and First Aid kits will be inspected monthly by the SSHO.	First Aid/CPR and UTV Safety Training. Chainsaw Training (Game of Logging 01) 30-Hr Construction Safety (SSHO) 40-Hr HAZWOPER and Current 8-Hr Refresher

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

Activity 4: **Focused Surface and Subsurface Removal of MEC**

***Overall Risk Assessment Code (RAC): H**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Focused surface and subsurface removal	<p>Explosives Hazards: Unintentional detonation of 75mm high explosive (HE) and armor piercing, 155mm HE or shrapnel projectiles, and MK-2A4 primers</p>	<p>Establish exclusion zones around intrusive work for nonessential personnel based on minimum separation distances identified in the approved Explosive Safety Submission (ESS). Maintain exclusion zones during all intrusive activities.</p> <p>Munitions will be positively identified prior to movement. Positively identify any fuzing associated with the munitions. If found fuzed, do not handle. If unfuzed, the item may be moved to a central location with approval of UXOSO and concurrence from the USACE Ordnance and Explosives Safety Specialist (OESS). UXO operations will be conducted during daylight hours only. If unknown munitions or suspected chemical warfare materiel (CWM) is found that cannot be positively identified, the USACE OESS will be notified, the detonation will be reassessed, and the course of action verified before proceeding.</p> <p>EM 385-1-97 will be adhered to at all times.</p> <p>The munition with the greatest fragmentation distance (MGFD) is the 155mm M107 HE.</p>	H
	<p>Biological Hazards:</p> <p>Possibility of stinging and biting insects. Encountering local wildlife, reptiles, and plants.</p>	<p>Appropriate insect repellents containing DEET will be used. Guidance on how to recognize poisonous plants and to avoid contact will be provided. A poster indicating the various types of hazardous plants and reptiles to avoid will be made available. Safety discussions will be conducted on the avoidance of biological hazards. In areas where poisonous snakes are known to congregate, the use of snake chaps and heavy leather gloves will be required. Discussions on snake habits, aggressiveness, and avoidance will be held during safety briefings. In areas where poisonous plants exist, preventative ointments and washing capabilities will be used.</p>	L

Activity 4: Focused Surface and Subsurface Removal of MEC (Continued)

Task	Hazards	Hazard Control	RAC*
	Radiation Hazards: Sun	Use sunblock as appropriate. Avoid extended periods of direct exposure to sun.	L
	Physical Hazards: Driving/Traffic	All drivers will be licensed. All traffic rules, regulations, and control signs will be obeyed. Work areas will be clearly barricaded and appropriate signs displayed. Workers must have special consideration for the danger related to the large military vehicles and support vehicles that are routinely on roadways at FIG. The vehicles and personnel for the investigation activities will give priority to FIG vehicles on the roadways. Persons working near roadways or directing traffic will remain aware of their position in relation to traffic and wear high visibility vests.	L
	Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel will conduct an initial walkthrough, and the “buddy system” will be implemented.	M
	Inclement weather	Personnel will be dressed according to weather conditions. Local weather will be monitored on a daily basis or more frequently if storms threaten. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities. The SSHO will monitor for tornado, lightning, and high wind conditions. In the event of severe weather conditions, the SSHO will advise on appropriate shelter locations.	L
	Heat and cold stress	Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to ACGIH and NIOSH guidelines. Personnel will be monitored.	L

Activity 4: Focused Surface and Subsurface Removal of MEC (Continued)

Task	Hazards	Hazard Control	RAC*
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Do not lift a load greater than 25 pounds without mechanical assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel will be made aware of the hazard and asked to carefully coordinate the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact with rough or sharp edges. Personnel will wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual	Tools will be inspected prior to use. Damaged tools will be tagged out of service until they can be repaired. Tools will be used properly and for their intended purpose. Personnel will be trained on the proper use of tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, the area will be vacated. Any small fire may be extinguished using a properly rated extinguisher. Storage, handling, and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Noise	Hearing protection will be required when noise levels exceed 80 decibels (dB). Noise-level monitoring will be performed as necessary.	L

Equipment	PPE	Inspection	Training
Hand tools Vehicles	Safety boots Gloves Safety glasses Hearing protection Snake chaps	Equipment and meters will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and First Aid kits will be inspected monthly by the SSHO. Utility vehicles will be inspected prior to use.	First Aid/CPR and UTV Safety Training 30-Hr Construction Safety (SSHO) 40-Hr HAZWOPER and Current 8-Hr Refresher

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

Activity 5: **Digital Geophysical Mapping**

***Overall Risk Assessment Code (RAC): M**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Geophysical surveys using digital and analog equipment will be performed in designated areas. An instrument verification strip will be constructed.	Chemical Hazards:	No chemical hazards are associated with this activity.	L
	Explosive Hazards: Unintentional detonation of MEC.	A UXO Technician II or higher will escort the survey crew(s) and perform surface MEC avoidance by conducting a magnetometer-assisted visual survey for metallic anomalies. Any surface munitions items found will be positively identified. GPS coordinates will be taken of the item and it will be left in place.	M
	Biological Hazards: Possibility of stinging and biting insects. Encountering large animals, reptiles and rabid animals.	Appropriate insect repellents containing DEET will be used. Guidance on how to recognize poisonous plants and to avoid contact will be provided. A poster indicating the various types of hazardous plants and reptiles to avoid will be made available. Safety discussions will be conducted on the avoidance of biological hazards. In areas where poisonous snakes are known to congregate, the use of snake chaps and heavy leather gloves will be required. Discussions on snake habits, aggressiveness, and avoidance will be held during safety briefings. In areas where poisonous plants exist, preventative ointments and washing capabilities will be used.	L

Activity 5: Digital Geophysical Mapping (Continued)

Task	Hazards	Hazard Control	RAC*
	Radiation Hazards: Sun	Use sunblock as appropriate. Avoid extended periods of direct exposure to sun.	L
	Physical Hazards: Slips, trips, falls, tools, terrain, or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility.	Slip, trip, and fall hazards will be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel will conduct an initial walkthrough, and the “buddy system” will be implemented.	M
	Inclement weather	Personnel will be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities. The SSHO will monitor for tornado, lightning, and high wind conditions. In the event of severe weather conditions, the SSHO will advise on appropriate shelter locations.	L
	Heat and cold stress	Workers will be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to ACGIH and NIOSH guidelines. Personnel will be monitored.	L
	Hunting	Use high-visibility vests, avoid areas where hunting is being conducted, and stop work if hunting is conducted within the work area.	M
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Do not lift a load greater than 25 pounds without mechanical assistance. Verify the path of travel is clear prior to the lift.	M

Activity 5: Digital Geophysical Mapping (Continued)

Task	Hazards	Hazard Control	RAC*
	Hands or fingers caught between objects; abrasions and lacerations	Personnel will be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions will be taken to avoid contact with rough or sharp edges. Personnel will wear work gloves and avoid placing hands between objects.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where MEC is known to exist will be vacated. Any small fire (non-MEC) may be extinguished using a properly rated extinguisher. Storage, handling, and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Hand tools, manual.	Tools will be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. Personnel will be trained on the proper use of tools.	L

Equipment	PPE	Inspection	Training
Hand tools Four-wheel-drive vehicles Schonsted	Safety boots High-visibility vests Gloves Safety glasses Cold-weather clothing Snake chaps	Equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to the manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers, first-aid kits, inspected monthly by the SSHO. Utility vehicles will be inspected prior to use.	First Aid/CPR (at least two personnel); Chainsaw Training; and UTV Safety Training. A minimum of a UXO Technician II or higher will provide anomaly avoidance during survey operations and MEC awareness training to surveyors.

Date Prepared: September 2013

Prepared By: L. Kritzberger, CHST

Reviewed By: C. Baer, CSP

*Overall Risk Assessment Code (RAC): **M**

RAC Matrix		Accident Probability				
Hazard Severity		A	B	C	D	E
I		E	E	H	H	M
II		E	H	H	M	L
III		H	M	M	L	L
IV		M	L	L	L	L

Activity 6: Utility Terrain Vehicle (UTV) Usage

Task	Hazards	Hazard Control	RAC*
Utilize UTV for getting to locations and hauling	Physical Hazards: Driving	All drivers will be trained and familiar with the use of controls. A copy of the operator's manual will be kept with the vehicle at all times. Operators must review all training materials provided by the manufacturer for that specific vehicle. Training will be in accordance with the manufacturer's recommendations. Passenger carry is limited to the number of seatbelts. The UTV must have an operational audible warning device (horn) and brake lights. UTVs must be equipped with windshields and roll-over protection systems. No passengers will be permitted to ride in the cargo area. All passengers must wear seatbelts. All loads must be securely strapped down and the weight evenly distributed. Reduced speed and extreme caution will be used on slopes or rough terrain. Do not stop or start suddenly when going up or down a hill. Use caution when changing direction on a slope.	L

Equipment	PPE	Inspection	Training
Utility vehicles	Safety boots High-visibility vests	Equipment and meters will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and First Aid kits will be inspected monthly by the SSHO. Utility vehicles will be inspected prior to use.	First Aid/CPR/BBP 30-Hr Construction Safety (SSHO) 40-Hr HAZWOPER and Current 8-Hr Refresher UTV Safety Training

ATTACHMENT A

SITE SAFETY AND HEALTH PLAN (SSHP)

ATTACHMENT A
SITE SAFETY AND HEALTH PLAN

**MUNITIONS AND EXPLOSIVES OF CONCERN REMEDIAL ACTION
FOR RICOCHET AREA MUNITIONS RESPONSE SITE
IN STATE GAME LANDS 211, PENNSYLVANIA**

Contract No.: W912DR-09-D-0006
Delivery Order No.: 0009

Prepared by:



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380-1492

October 2013

SIGNATURE PAGE

The following Weston Solutions, Inc. (WESTON®) personnel have reviewed and have agreed to implement and comply with the requirements of the Site Safety and Health Plan (SSHP) for the duration of site activities.

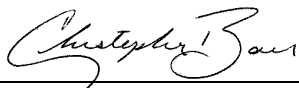
Plan Prepared by:



Louise Kritzberger, CHST
Federal Team Safety Officer
(610) 701-3618

10/11/2013
Date

Plan Approved by:



Chris Baer, CSP
Federal Team Health and Safety Officer
(610) 701-3653

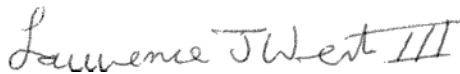
10/11/2013
Date

Plan Review and Concurrence by:



John Gerhard
Project Manager
(610) 701-3793

10/11/2013
Date



Larry Werts
Division Environmental Health and Safety Officer
(610) 701-3912

10/11/2013
Date

SITE SAFETY AND HEALTH PLAN CONCURRENCE/SIGNOFF

Site Name: Munitions and Explosives of Concern (MEC) Remedial Action for Ricochet Area Munitions Response Site in State Game Lands 211, Pennsylvania
Work Location Address: Ricochet Area Munitions Response Site in State Game Lands 211 Adjacent to Fort Indiantown Gap, Pennsylvania

WORKER’S STATEMENT

I have read, understood, and agree to abide by the information set forth in the Accident Prevention Plan (APP), Site Safety and Health Plan (SSHP), and any discussions presented in the personnel health and safety briefing. I have received adequate training to perform the procedures addressed in these plans. If I identify a hazard not addressed in the APP or SSHP, or encounter an operation I cannot perform in accordance with the APP or SSHP, I will stop the process and notify my immediate supervisor.

<u>Name</u>	<u>Signature</u>	<u>Date</u>
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
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_____ Name	_____ Signature	_____ Date

TABLE OF CONTENTS

Section	Page
1. INTRODUCTION.....	1-1
2. SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION.....	2-1
2.1 SITE DESCRIPTION	2-1
2.2 PROJECT DESCRIPTION.....	2-1
2.3 CONTAMINATION AND EXPOSURE POTENTIAL	2-1
2.3.1 Chemical Hazards	2-1
2.3.2 Physical Hazards.....	2-2
2.3.3 Biological Hazards.....	2-2
2.3.4 Radiation.....	2-2
3. ACTIVITY HAZARD ANALYSIS.....	3-1
4. STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES.....	4-1
4.1 COMPETENT PERSON	4-3
4.2 QUALIFIED PERSON.....	4-4
4.3 WESTON SUBCONTRACTORS.....	4-5
4.4 PERSONNEL ASSIGNED TO THE PROJECT.....	4-5
5. TRAINING	5-1
5.1 OSHA 30-HOUR CONSTRUCTION TRAINING.....	5-1
6. PERSONAL PROTECTIVE EQUIPMENT.....	6-1
6.1 LEVEL D PERSONAL PROTECTIVE EQUIPMENT.....	6-2
7. MEDICAL SURVEILLANCE	7-1
7.1 MEDICAL SUPPORT FUNCTIONS	7-1
7.2 OCCUPATIONAL HEALTH PROGRAM.....	7-1
8. EXPOSURE MONITORING/AIR SAMPLING PROGRAM.....	8-1
9. HEAT AND COLD STRESS/WEATHER.....	9-1
9.1 HEAT STRESS.....	9-1
9.1.1 Heat Stress Symptoms and Treatment	9-1
9.1.2 Heat Stress Prevention.....	9-3
9.1.3 Heat Stress Monitoring and Work Cycle Management	9-4
9.2 COLD STRESS	9-5
9.2.1 Cold Stress Symptoms and Treatment.....	9-6
9.2.2 Prevention and Protection	9-7
9.2.3 Work/Warming Regimen.....	9-9
9.3 WEATHER HAZARDS	9-10

TABLE OF CONTENTS (CONTINUED)

Section	Page
10. STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES	10-1
10.1 SITE RULES/PROHIBITIONS.....	10-1
10.1.1 Buddy System	10-1
10.1.2 Designated Eating/Break Areas	10-1
10.1.3 Designated Smoking Areas.....	10-1
10.2 WORK PERMITS	10-1
10.3 MATERIAL HANDLING PROCEDURES.....	10-1
10.4 SPILLS.....	10-2
10.5 DRUM/CONTAINER TANK HANDLING	10-2
10.6 DRUG AWARENESS AND DRUG-FREE WORKPLACE.....	10-2
10.7 EMPLOYEE DUTY SCHEDULE/BASIC FATIGUE MANAGEMENT PLAN	10-3
10.7.1 Employee Duty Schedule.....	10-3
10.7.2 Fatigue Symptoms	10-3
10.7.3 Fatigue Management.....	10-3
10.8 SECURITY PLAN.....	10-4
10.8.1 Site Access	10-4
10.8.2 Site Control	10-4
10.8.3 Theft.....	10-4
10.8.4 Confrontation	10-4
10.9 MOTOR VEHICLE SAFETY	10-4
10.10 TRAFFIC	10-5
10.10.1 Employee Requirements/Responsibilities	10-5
10.10.2 Compliance Issues/Driving Practices	10-5
10.10.3 Other Issues.....	10-6
10.11 SANITATION	10-6
10.11.1 Drinking Water	10-7
10.11.2 Toilets	10-7
10.11.3 Procedures for Vermin Control.....	10-7
10.11.4 Waste Disposal.....	10-7
11. SITE CONTROL	11-1
11.1 ON-SITE COMMUNICATIONS.....	11-1
12. PERSONAL HYGIENE AND DECONTAMINATION.....	12-1
12.1 CONTAMINATION PREVENTION	12-1
12.2 PERSONAL HYGIENE.....	12-1
13. EQUIPMENT DECONTAMINATION	13-1
13.1 DISPOSITION OF DECONTAMINATION WASTE.....	13-1

TABLE OF CONTENTS (CONTINUED)

Section	Page
14. EMERGENCY EQUIPMENT AND FIRST AID EQUIPMENT	14-1
14.1 EMERGENCY EQUIPMENT	14-1
14.2 FIRST RESPONDER KIT	14-1
15. EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES	15-1
15.1 EMERGENCY PROCEDURES.....	15-1
15.2 PERSONNEL AND LINES OF AUTHORITY FOR EMERGENCY SITUATIONS	15-1
15.3 CRITERIA AND PROCEDURES FOR EMERGENCY RECOGNITION AND SITE EVACUATION	15-1
15.3.1 Medical Emergency and Personal Injury.....	15-1
15.3.2 Non-Life-Threatening Incident.....	15-2
15.3.3 Worker Injury or Illness.....	15-2
15.3.4 Emergency Response.....	15-3
15.4 SPILL PLAN	15-9
15.5 FIREFIGHTING PLAN.....	15-9
15.5.1 Fire Extinguishing Equipment	15-10
15.6 WILD FIRES	15-11
15.6.1 Prevention	15-11
15.6.2 Awareness and Response.....	15-12
15.7 MEDICAL SUPPORT.....	15-12
15.7.1 On-Site Medical Support	15-12
15.7.2 Off-Site Medical Support.....	15-13
15.7.3 Directions and Map to Nearest Hospital.....	15-13
15.7.4 First Aid Treatment.....	15-13
16. LOGS, REPORTS, AUDITS, INSPECTIONS, AND RECORDKEEPING	16-1
16.1 SAFETY LOG	16-1
16.2 TRAINING LOG.....	16-1
16.3 SITE CONTROL LOG.....	16-1
16.4 INSPECTION FORMS.....	16-1

ATTACHMENT 1 SITE-SPECIFIC HAZARD COMMUNICATION PLAN/CHECKLIST

ATTACHMENT 2 MATERIAL SAFETY DATA SHEETS

LIST OF TABLES

Title	Page
Table 4-1 Project Safety Team.....	4-1
Table 4-2 Position Descriptions	4-2
Table 4-3 Competent Person Requirements.....	4-4
Table 4-4 Qualified Person Requirement.....	4-5
Table 5-1 Personnel Training and Certifications	5-2
Table 6-1 Minimum Level of Protection Requirements	6-1
Table 9-1 Percent Sunshine Factors—Heat Stress Prevention and Monitoring.....	9-5
Table 9-2 Physiological Monitoring Schedule—Heat Stress Prevention and Monitoring	9-5
Table 9-3 Wind Chill Chart.....	9-10
Table 9-4 Cold Work/Warm-up Schedule for 4-Hour Shifts	9-10
Table 14-1 Emergency Equipment.....	14-1
Table 14-2 Contents for First Responder Kit	14-2
Table 15-1 Emergency Contact Numbers.....	15-5
Table 15-2 WESTON Emergency Contact Numbers	15-5
Table 15-3 Other Emergency Contact Numbers.....	15-6
Table 15-4 Emergency Hand Signals.....	15-7
Table 15-5 General Hand Signals	15-7
Table 15-6 First Aid and CPR Training	15-13

LIST OF FIGURES

Title

Figure 2-1 Ricochet Area and Fort Indiantown Gap

Figure 2-2 Ricochet Area MRS

Figure 4-1 WESTON Health and Safety Organization Chart and Lines of Authority

Figure 15-1 Emergency Hospital Route from Ricochet Area MRS

Figure 15-2 Non-Emergency Hospital Route from Ricochet Area MRS

Figure 15-3 First Aid Treatments Not Otherwise Reportable

LIST OF ACRONYMS

AHA	activity hazard analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ARNG	Army National Guard
BBP	bloodborne pathogens
CDC	Centers for Disease Control
CDL	Commercial Driver's License
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CHST	Construction Health and Safety Technician
CSP	Certified Safety Professional
DDESB	Department of Defense Explosives Safety Board
EC	Emergency Coordinator
EHS	Environmental Health and Safety
EM	Engineering Manual
EMS	Emergency Medical Services
FAR	Federal Acquisition Regulation
FIG	Fort Indiantown Gap
FM	Factory Mutual Research Corp.
HAZWOPER	Hazardous Waste Operations and Emergency Response
MCL	maximum contaminant level
MEC	munitions and explosives of concern
MRS	Munitions Response Site
NOI	Notice of Incident
OHP	Occupational Health Program
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAARNG	Pennsylvania Army National Guard
PGC	Pennsylvania Game Commission
PM	Project Manager
PPE	personal protective equipment
QC	quality control

LIST OF ACRONYMS (Continued)

SGL	State Game Lands
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SUXOS	Senior UXO Supervisor
TP	Technical Paper
UL	Underwriters Laboratories, Inc.
USACE	U.S. Army Corps of Engineers
UTV	utility terrain vehicle
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
WESTON®	Weston Solutions, Inc.

1. INTRODUCTION

This Site Safety and Health Plan (SSHP) provides detailed project-specific health and safety information for conducting the Munitions and Explosives of Concern (MEC) Remedial Action for the Fort Indiantown Gap (FIG) Ricochet Area Munitions Response Site (MRS) (FTIG-003-R-01). The SSHP is written in accordance with applicable U.S. Army Corps of Engineers (USACE), federal, state, and local health and safety requirements and presents the minimum requirements for safety and health that must be met by site personnel engaged in site operations. The SSHP does not in any way relieve Weston Solutions, Inc. (WESTON[®]) site personnel from responsibility for the safety and health of their personnel. Visitors to the site will receive a safety briefing by the Site Safety and Health Officer (SSHO) prior to gaining entry to the work area. The SSHO will provide visitors with appropriate personal protective equipment (PPE) and an escort while on-site and maintain an on-site visitor log.

Changes and modifications to the SSHP are permitted and will be made in writing with the knowledge and concurrence of the Corporate Environmental Health and Safety (EHS) Manager and accepted by USACE, the Army National Guard (ARNG), and the Pennsylvania Army National Guard (PAARNG).

2. SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION

2.1 SITE DESCRIPTION

FIG is located in Dauphin and Lebanon Counties in south-central Pennsylvania (see **Figure 2-1**, Site Location). The Ricochet Area MRS is located in State Game Lands (SGL) 211 (see **Figure 2-2**).

2.2 PROJECT DESCRIPTION

The project description is summarized in Section 2.3 of the Accident Prevention Plan (APP).

Work activities include:

- Activity 1: Mobilization/Demobilization
- Activity 2: Grid Survey Activities
- Activity 3: Brush Clearing
- Activity 4: Focused Surface and Subsurface Removal of MEC
- Activity 5: Digital Geophysical Mapping
- Activity 6: Utility Terrain Vehicle (UTV) Usage

Under each phase of work, inherently hazardous activities have been analyzed to identify controls that will protect the safety and health of personnel working at and entering the project site (see Section 12 of the APP).

2.3 CONTAMINATION AND EXPOSURE POTENTIAL

WESTON will ensure compliance with the requirements of EM 385-1-1, OSHA (29 CFR 1910 and 1926), and WESTON policy requirements through formal and site-specific training programs, as well as routine inspections with follow-up compliance. Specific information pertaining to suspected physical, chemical, biological, and radiological hazards associated with the work areas, tasks, and operations is presented in the following subsections. As new data become available, this APP may need to be modified.

2.3.1 Chemical Hazards

Prior sampling indicates that levels of chemical contamination would not pose a health risk. Chemicals are not anticipated to be brought onto the project site, but in the event that tasks

change, the SSHP will be updated as needed. A site-specific Hazard Communication Plan is presented in **Attachment 1**.

2.3.2 Physical Hazards

Exposure to physical hazards may include manual lifting; slips, trips, falls; heat/cold stress; hand tools (manual and power); terrain or vegetation; uneven walking surfaces; and weather hazards. Additional common physical hazards include hands or fingers caught between objects; electric hazards; being caught in between/against or struck by an object; and traffic.

Based on historical information, remedial investigation (RI) results, and WESTON's site experience, the munitions anticipated at the Ricochet Area MRS include the following: 75 millimeter (mm) high explosive (HE) projectile, 75mm armor piercing HE, 155mm HE projectile, and MK-2A4 primers.

2.3.3 Biological Hazards

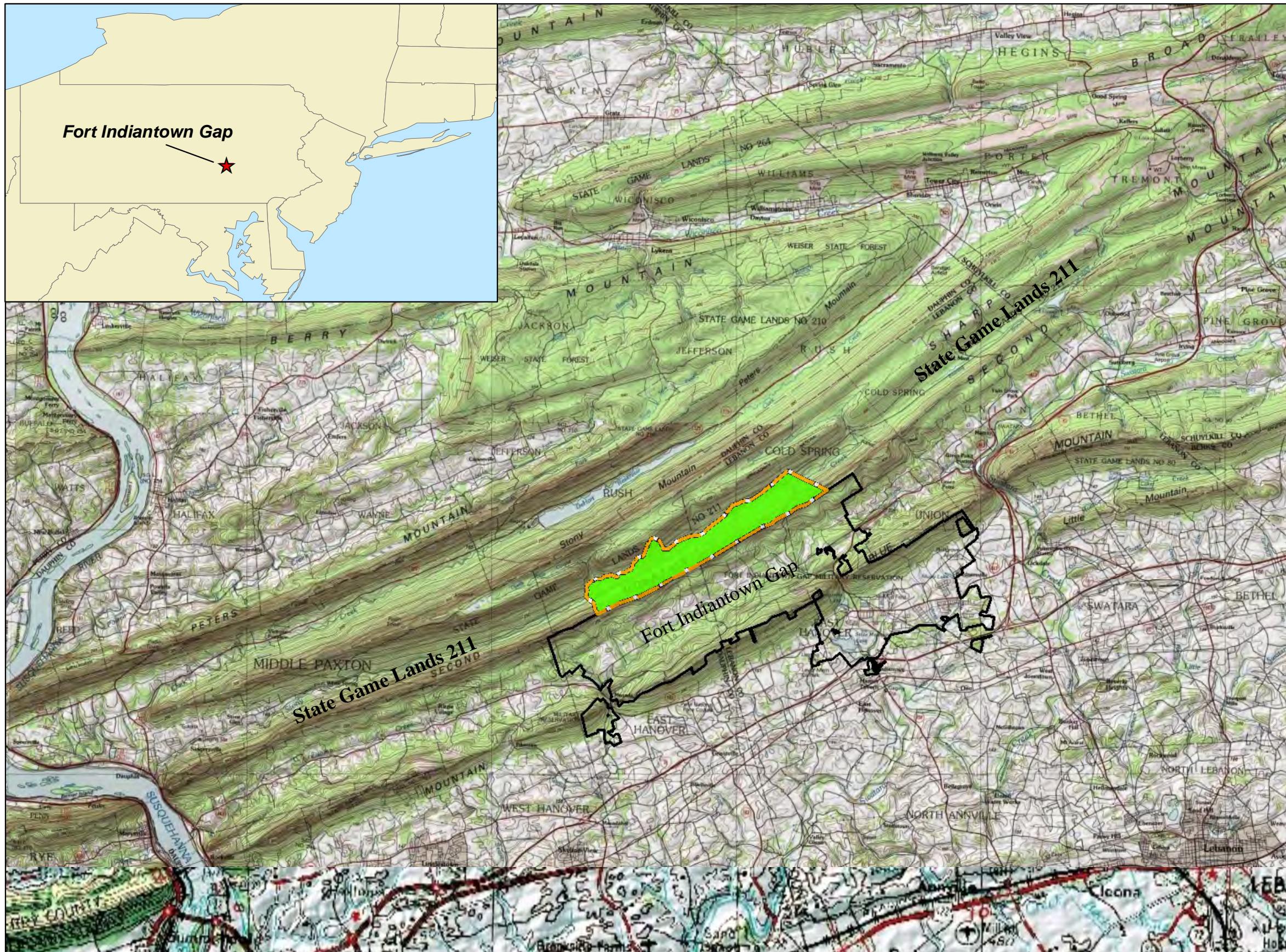
Biological hazards include wild animals (bear, raccoons, foxes, snakes, rats, and mice); insect bites and stings (ticks, bees, mosquitoes); and poisonous plants. A poster indicating the various types of hazardous plants and reptiles to avoid will be displayed at the site trailer. Instruction in the recognition of the animals and insects and their common nesting habits, aggressiveness, and other characteristics will be provided to site workers prior to field activities. Site personnel will be instructed to be alert for and to avoid wild animals, to wear long pants and shirts and snake chaps while working in brush, and to use insect repellent as well as poison-ivy block and cleanser. Any site worker who is knowingly allergic to insect bites will be required to inform the SSHO, and to carry an allergy response kit. First-aid providers will also be trained in the proper first aid procedures for bites. Areas known to have poisonous snakes will be discussed during daily safety briefings when appropriate.

2.3.4 Radiation

Based on the review of existing information, exposure to sources of contamination or ionizing radiation is not expected.

2.3.4.1 *Nonionizing Radiation*

The most likely exposure to nonionizing radiation is the sun. Personnel will receive instruction in using appropriate PPE and/or procedures to follow in the event that nonionizing radiation creates a concern and requires the use of sunscreen and hats.



Legend

- FIG Installation Boundary
- █ Ricochet Area MRS Boundary

Source: PA USGS 7.5 minute Topographic Maps, 1996

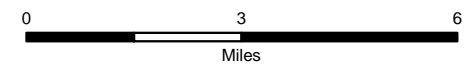
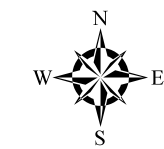
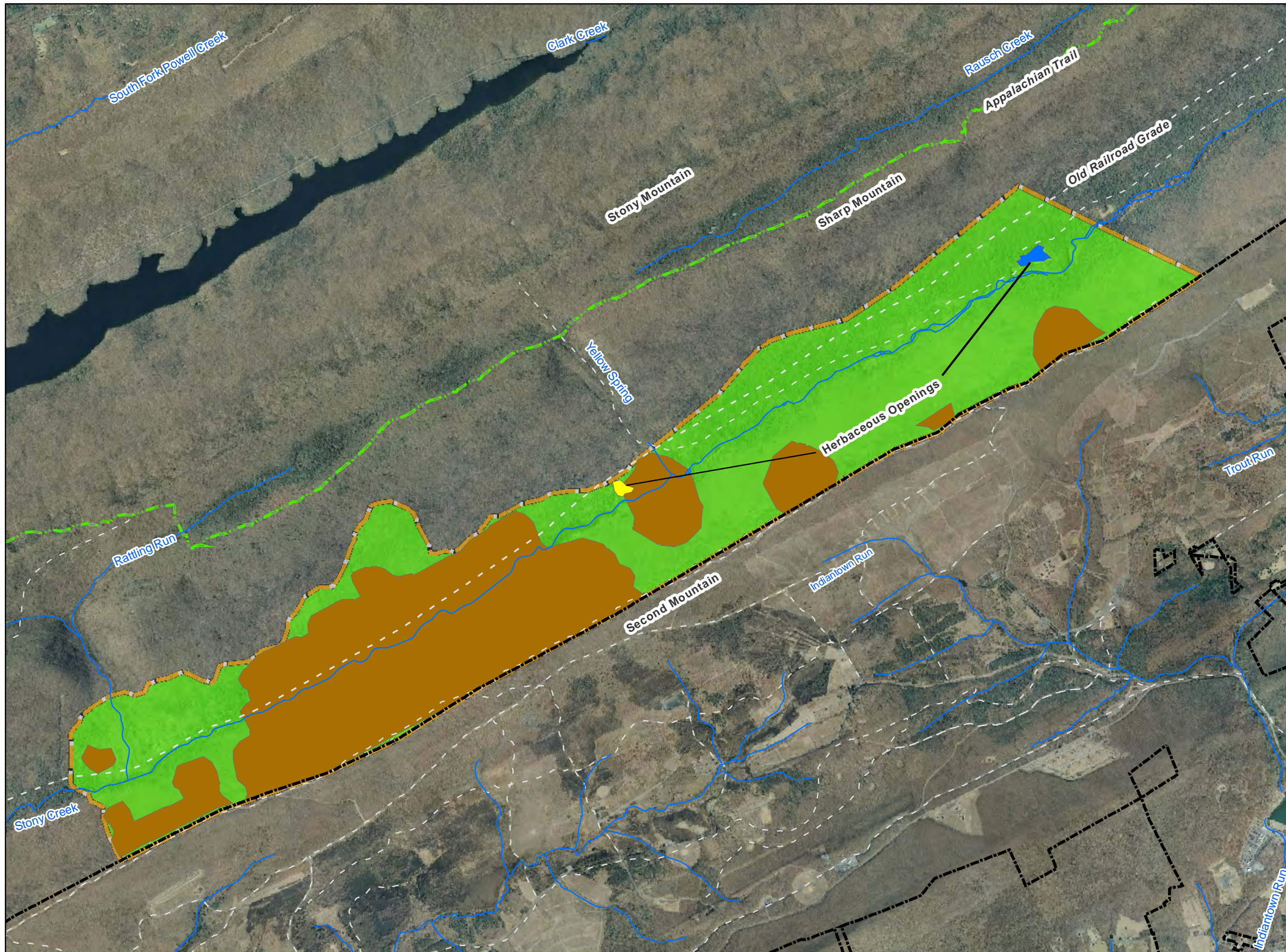


Figure 2-1
Ricochet Area and
Fort Indiantown Gap, Annville, PA



Legend

- FIG Installation Boundary
 - Water
 - - - Appalachian Trail
 - - - Trails
 - ▭ Ricochet Area MRS (3,262 Acres)
 - ▭ Surface Removal Action
 - ▭ Area Boundaries
- Herbaceous Openings**
- ▭ Cold Spring
 - ▭ Yellow Spring

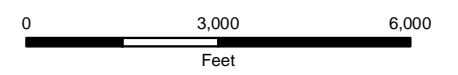


Figure 2-2
Ricochet Area MRS
State Game Lands 211, PA

3. ACTIVITY HAZARD ANALYSIS

Activity hazard analysis (AHA) tables provide a task-specific evaluation of the known or potential hazards associated with performing project activities. Each analysis also includes task-specific information related to hazard control and mitigation, such as the use of specific engineering control measures, specific standard operating procedures to be implemented, and PPE to be used as required. AHA tables are presented in Section 12 of the APP for each project activity. Health and safety equipment such as PPE is described in Section 6 of this plan.

If site conditions or tasks change, the SSHO will evaluate the new conditions or task and will contact the Division EHS Officer for assistance in developing amendments to the SSHP. Amendments made to the SSHP will be submitted to USACE, ARNG, and PAARNG for concurrence, and all field personnel will be made aware of any changes.

4. STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

WESTON is ultimately responsible for the implementation of the health and safety program, APP, and SSHP. Personnel having the potential for exposure to site hazards are subject to the requirements of this SSHP. Work will not be performed in a manner that conflicts with the health, safety, or environmental precautions outlined in the APP or this SSHP. Personnel violating safety procedures are subject to dismissal from the project site.

Table 4-1 presents the key project personnel responsible for the EHS Program implementation. Roles and responsibilities for key project safety personnel are presented in **Table 4-2**.

Table 4-1 Project Safety Team

Name	Title	Phone No. *
John Gerhard	Project Manager (PM)	(610) 701-3793 - office (610) 513-6897 - cell
Larry Werts	East Division EHS Manager	(610) 701-3912 - office (215) 815-6237 - cell
Chris Baer, CSP	East Division Federal Team Safety Officer	(610) 701-3653 - office (484) 239-4249 - cell
Bruce Carnal	Site Safety and Health Officer (SSHO)/ UXO Safety Officer (UXOSO)	(502) 664-7926 – cell

Notes:

CSP = Certified Safety Professional

*Phone numbers will be confirmed/revised prior to field mobilization and revised during the project, as necessary.

Table 4-2 Position Descriptions

Position	Description of Key Responsibilities
Project Manager John Gerhard	<ul style="list-style-type: none"> ▪ Overall responsibility for the management and completion of the project. ▪ Responsible and accountable for project safety. ▪ Overall responsibility for ensuring that project personnel (including subcontractor personnel) comply with EHS regulations, program requirements, and procedures. ▪ Ensure development and implementation of project SSHPs and indicate concurrence with final plans after required EHS reviews. ▪ Ensure project personnel meet applicable safety certification requirements. ▪ Ensure project support is acquired from appropriately qualified safety personnel such as the Division EHS Officer and SSHO. ▪ Ensure project personnel comply with applicable EHS requirements and corporate or client procedures. ▪ Halt any project work activities that represent an imminent hazard. ▪ Ensure appropriate safety equipment and materials are provided to the project. ▪ Ensure timely and accurate reporting and investigation of incidents, accidents, or injuries involving project personnel, with support from the risk management department. Ensure corrective actions are implemented completely. ▪ Ensure proper response and internal notification regarding inspections by regulatory agencies. ▪ Ensure all project personnel have met the site-specific experience and training requirements.
East Division EHS Officer Larry Werts	<ul style="list-style-type: none"> ▪ Oversee and maintain the WESTON Corporate EHS Program, the APP, and SSHP. ▪ Conduct site visits, as necessary, to audit the effectiveness of the APP and SSHP. ▪ Evaluate and authorize changes to the APP and SSHP based on field and occupational exposure, as necessary. ▪ Function as a quality control (QC) staff member.
East Division Federal Team Safety Officer Chris Baer, Certified Safety Professional (CSP)	<ul style="list-style-type: none"> ▪ Develop the APP and SSHP. ▪ Develop modifications to the APP and SSHP as necessary.

Table 4-2 Position Descriptions (Continued)

Position	Description of Key Responsibilities
SSHO/UXOSO Bruce Carnal	<ul style="list-style-type: none"> ▪ Ensure that all project personnel follow the requirements of the APP and SSHP. ▪ Be present during operations. ▪ Directly communicate with the Project Manager and EHS Officer. ▪ Conduct daily safety meetings for site personnel to discuss the day’s activities, associated hazards. ▪ Review site personnel training and experience documentation to ensure compliance with the APP and SSHP. ▪ Coordinate changes/modifications to the APP with the appropriate site personnel. ▪ Conduct or coordinate project-specific training. ▪ Report any incidents that occur on-site to the Project Manager and the Division EHS Officer. ▪ Implement safety corrective actions through training and reinforced awareness. ▪ Maintain exposure data. ▪ Has stop-work authority for all safety issues.

Accountability for health and safety at all levels at WESTON flows from the WESTON Chief Executive Officer (CEO) through a matrix system, as indicated on the organizational chart (**Figure 4-1**), which is presented at the end of this section.

4.1 COMPETENT PERSON

Occupational Safety and Health Administration (OSHA) Regulation 29 Code of Federal Regulations (CFR) 1926.32 defines a Competent Person. Specific OSHA and USACE regulations identify the need for involvement of competent persons. **Table 4-3** presents the competent person requirement and regulatory reference. Mr. Carnal, the UXOSO/SSHO, meets the competent person requirement applicable to this scope of work and has been approved by WESTON’s Division EHS Management. **No work will be performed without a Competent Person on-site.**

Table 4-3 Competent Person Requirements

Competent Person Requirement	Regulatory Reference	Person Designated
SSHO Identification	EM 385-1-1 Sec. 01.A.17	Bruce Carnal
Hearing Protection	29 CFR 1926.101	Bruce Carnal
Mechanized Equipment	29 CFR 1926.600	Bruce Carnal

Note: Engineering Manual (EM) 385-1-1 is the USACE Health and Safety Requirements Manual.

As required by EM 385-1-1, Mr. Carnal has at least 5 years of applicable safety experience and has successfully completed the OSHA 30-hour construction safety course (or equivalent course). Mr. Carnal has performed work on a site(s) of similar hazard, risk, and complexity to the task assignment, and is certified in first aid and cardiopulmonary resuscitation (CPR). Mr. Carnal also has 5 years of experience implementing safety and occupational health procedures and experience conducting exposure monitoring to select and to adjust personal protective equipment (PPE); however, it is unlikely that such adjustments will be needed. The qualifications of all site-specific personnel will be maintained by the SSHO at the site. The certifications and overall qualifications of WESTON personnel are maintained in a database supported by WESTON.

4.2 QUALIFIED PERSON

Site personnel will also include a Qualified Person. WESTON will permit only those employees qualified by training or experience to conduct unexploded ordnance (UXO) operations, or operate equipment and machinery in compliance with OSHA 29 CFR 1926.20(b)(4). According to OSHA 29 CFR 1926.32, “qualified” means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project. **Table 4-4** presents the qualified person’s requirement list.

The Senior UXO Supervisor (SUXOS), UXOSO, UXO Quality Control Specialist (UXOQCS), and UXO Technicians III, II, and I will meet the requirements of the Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18 for the positions assigned.

Table 4-4 Qualified Person Requirement

Qualified Person Requirement	Designated Person(s)
Brief Visitors on Site Hazards and PPE	Bruce Carnal
Licensed Blaster for the State of PA	Jason McCloskey

The qualifications of all site-specific personnel will be maintained on-site. The certifications and overall qualifications of WESTON personnel are maintained in a database supported by WESTON. Documentation will be reviewed and maintained by the SSHO/UXOSO.

4.3 WESTON SUBCONTRACTORS

Subcontractors and suppliers to WESTON will be selected only after their safety and health program is thoroughly evaluated; they must complete an EHS questionnaire and must meet specific safety and occupational health selection criteria. Subcontractors will be under the ultimate direction of the senior on-site WESTON representative and will adhere to all aspects of the SSHP.

4.4 PERSONNEL ASSIGNED TO THE PROJECT

All WESTON personnel who will be involved in on-site activities are responsible for the following:

- Taking all reasonable precautions to prevent injury to themselves and to their fellow employees and being alert to potentially harmful situations.
- Performing only those tasks that they believe they can do safely and have been trained to do.
- Notifying the SSHO of any special medical conditions (i.e., allergies, contact lenses, diabetes).
- Notifying the SSHO of any prescription and/or nonprescription medication that the worker may be taking that might cause drowsiness, anxiety, or other unfavorable side effects.
- Preventing spillage and splashing of materials to the greatest extent possible.
- Practicing good housekeeping by keeping the work area neat, clean, and orderly.

- Reporting immediately all injuries to the SSHO.
- Complying with the SSHP, all safety and health recommendations and precautions, and properly using PPE as determined by the SSHP and/or the SSHO.

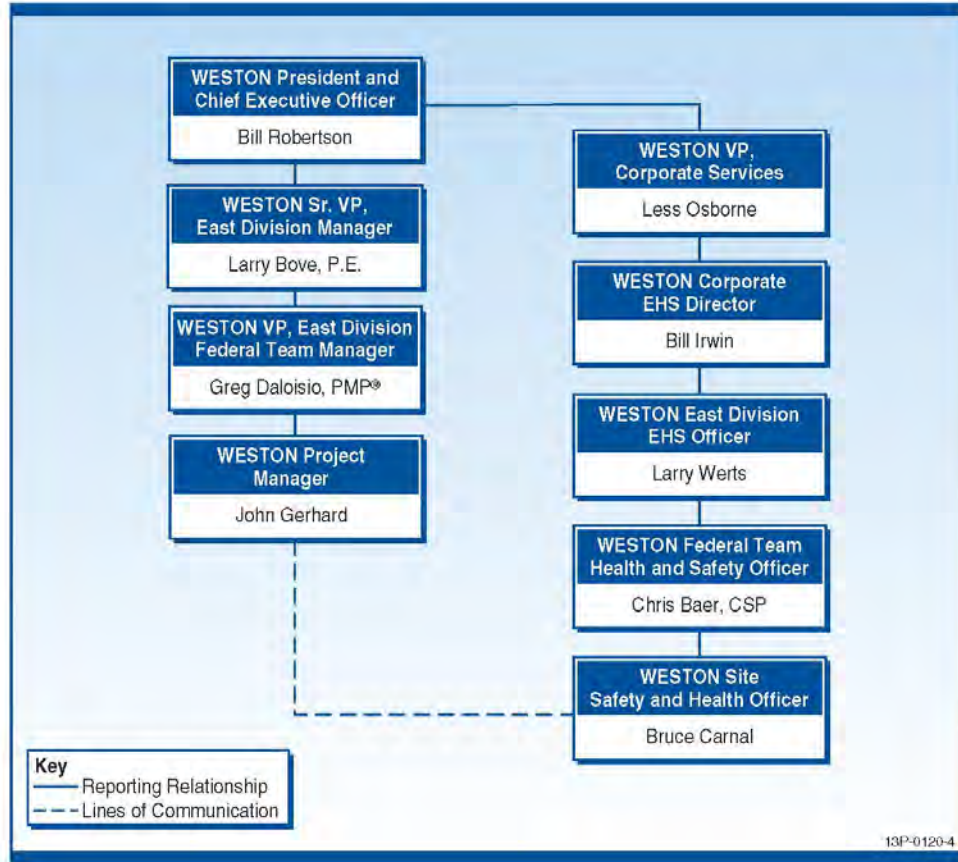


Figure 4-1 WESTON Health and Safety Organization Chart and Lines of Authority

5. TRAINING

WESTON will staff the project with individuals who have the following training and certifications:

- OSHA 30-hour Construction Safety Training – At a minimum, the SSHO.
- OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training and/or 8-hour Refresher – All site personnel.
- First-Aid/CPR/Bloodborne Pathogens (BBP) – A minimum of two persons.

A copy of applicable training records for project personnel will be available on-site and maintained by the SSHO. **Table 5-1** presents personnel training and certifications. Copies of the certifications are provided in **Attachment B** of the APP.

5.1 OSHA 30-HOUR CONSTRUCTION TRAINING

In compliance with USACE Health and Safety Requirements Manual (EM 385-1-1), 15 September 2008, all SSHOs, at a minimum, will have completed the 30-hour OSHA construction safety class or equivalent training, and will complete a minimum of 24 hours of formal safety coursework every 4 years. Training for the OSHA 30-Hour Construction Safety course or equivalent course includes the areas listed below:

- Occupational Safety and Health (OSH) Act/General Duties Clauses.
- 29 CFR 1904, Recordkeeping.
- Subpart C: General Safety and Health Provisions, Competent Person.
- Subpart D: Occupational Health and Environmental Controls.
- Subpart E: PPE, types and requirements for use.
- Subpart F: Understanding fire protection in the workplace.
- Subpart K: Electrical.
- Subpart M: Fall Protection.
- Rigging, welding and cutting, scaffolding, excavations, concrete and masonry, demolition, health hazards in construction, materials handling, storage and disposal,

hand and power tools, motor vehicles, mechanized equipment, marine operations, steel erection, stairways and ladders, confined spaces, or any other safety procedures that are applicable to the work being performed.

Table 5-1 Personnel Training and Certifications

Personnel Name	Position	Medical Clearance (expires)	40-Hour HAZWOPER	8-Hour HAZWOPER Refresher (expires)	First Aid (expires)	CPR (expires)	BBP (expires)	30-Hour Construction Safety	Supervisors Health and Safety
Bruce Carnal	SSHO/ UXOSO	3/27/2015	9/21/2009	4/3/2014	4/14/2015	4/14/2015	4/3/2014	3/11/2011	3/24/2011
Jason McCloskey	PA Blaster/ UXOQCS	8/13/2014	8/16/1999	4/3/2014	4/14/2015	4/14/2015	4/3/2014	4/10/2009	2/15/2008

HAZWOPER= Hazardous Waste Operations and Emergency Response.

6. PERSONAL PROTECTIVE EQUIPMENT

PPE to be used for this work is described below. Personnel performing operations on-site will be required to use the appropriate level of protection. The minimum level of protection required to begin each activity of this project is shown in **Table 6-1**.

Table 6-1 Minimum Level of Protection Requirements

Activity	Level of Protection
Mobilization/Demobilization	Level D
Grid Survey Activities	Level D
Brush Clearing	Level D
Focused Surface and Subsurface Removal of MEC	Level D
Digital Geophysical Mapping	Level D
Utility Terrain Vehicle (UTV) Usage	Level D

The effectiveness of the PPE program will be evaluated by the SSHO. If additional hazards are identified requiring a higher level of protection and changes to the program are necessary, the SSHO will inform the Division EHS Officer and amend the PPE requirements.

In accordance with OSHA 29 CFR 1910, Subpart I - Personal Protective Equipment, PPE will be provided, used, and maintained in a sanitary and reliable condition. PPE will be of the construction, design, and material to provide employees with protection against known or anticipated hazards. PPE will be selected to properly and appropriately fit the employee. WESTON employees have received OSHA-compliant training. Any concerns regarding the use of appropriate PPE will be brought to the attention of the SSHO, who will contact the Division EHS Officer for assistance in evaluation of PPE, as necessary.

Work at the Ricochet Area MRS will be completed in Level D PPE. If higher levels of protection are required, an addendum to the APP and SSHP will be prepared and approved. The SSHO will review the following criteria with employees:

- Proper selection.
- When PPE is anticipated for use.

- Proper uses and limitations of equipment during temperature extremes, heat/cold stress, and in relation to employee medical conditions.
- Proper donning and doffing, and adjusting.
- Maintenance, cleaning, and storage.
- Inspection procedures.

6.1 LEVEL D PERSONAL PROTECTIVE EQUIPMENT

Level D PPE consists of the following:

- Work clothes such as coveralls, long pants, and shirts with sleeves.
- American National Standards Institute (ANSI)-compliant safety boots.
- Safety vests.
- Snake chaps in applicable areas.

7. MEDICAL SURVEILLANCE

7.1 MEDICAL SUPPORT FUNCTIONS

Since 1980, WESTON has used a comprehensive Occupational Health Program (OHP) that complies with OSHA and USACE requirements. All personnel who enter the site when operations are being conducted must comply with a comparable OHP. All medical records are maintained in accordance with 29 CFR 1910.1020. If an unforeseen hazard becomes evident during the performance of work, the SSHO will bring such hazard information to the attention of the WESTON Division EHS Officer and the USACE Contracting Officer's Representative (COR), both verbally and in writing for resolution as soon as possible. In the interim, the necessary action will be taken to reestablish and maintain safe working conditions. Medical certifications for site personnel are summarized in **Table 5-1**. Additional personnel certifications will be available on-site for review.

7.2 OCCUPATIONAL HEALTH PROGRAM

To comply with OSHA requirements, WESTON has designated Dr. Peter Greaney of WorkCare[®] to oversee the site-specific medical surveillance and OHP. Dr. Greaney is a board-certified physician in internal and occupational medicine. **Dr. Greaney can be reached during regular business hours at (800) 455-6155.**

The purpose of the OHP is to ensure suitable job placement of employees, to monitor the health effects of hazards encountered in the workplace, and to maintain and to promote good health through preventive measures. Medical examination criteria are established by WorkCare in compliance with 29 CFR 1910.120.

8. EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Based on the hazard/risk assessment of the site, the nature of the work, and previous experience performing UXO operations at the Ricochet Area MRS, it is not expected that any airborne contaminants or nuisance dust level exposure limits will be exceeded. As a result, no air monitoring or air sampling will be performed. If conditions change, the AHAs and SSHP will be amended. Subsequently, WESTON would perform required monitoring to evaluate the effectiveness of prescribed PPE and to evaluate potential work exposure. Any amendment to the plan will be reviewed and approved by the Division EHS Officer and accepted by USACE, ARNG, and PAARNG.

9. HEAT AND COLD STRESS/WEATHER

Personnel will be provided information about heat and cold stress symptoms. Weather conditions will be discussed during morning safety briefings.

9.1 HEAT STRESS

One of the most common types of stress that can affect field personnel is heat stress. Heat stress can be a serious hazard to workers at project sites because of the PPE required. The SSHA is responsible for evaluating the conditions, work tasks, and requirements for PPE, and for implementing the emergency response procedures. The following subsections describe the signs and symptoms, monitoring requirements, prevention and treatment procedures for heat rash, heat cramps, heat exhaustion, and heat stroke. These requirements and procedures will be followed at all times.

During hot conditions, cool drinking water will be provided for employees. Employees will be encouraged to drink at least one cup every 20 minutes and take breaks in a cooler, shady location. Personnel not acclimated to the climate or taking medications that might make them sensitive to heat should be allowed additional breaks. When possible, work should be scheduled during cooler periods of the day. Personnel working outside should use sun screen with a high SPF.

9.1.1 Heat Stress Symptoms and Treatment

9.1.1.1 Heat Rash

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation, and skin is aggravated by chafing clothes. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance.

- **Symptoms**—Mild red rash, especially on areas of the body that come into contact with protective gear.
- **Treatment**—Decrease amount of time spent working in protective gear and provide body powder to help absorb moisture and decrease chafing. Heat rash can be prevented by showering, resting in a cool place, and allowing the skin to dry.

9.1.1.2 Heat Cramps

Heat cramps are caused by inadequate electrolyte intake. The individual may be receiving adequate water; however, if not combined with an adequate supply of electrolytes, the blood can thin to the point where it seeps into the active muscle tissue, causing cramping.

- **Symptoms**—Acute painful spasms of voluntary muscles, most notably of the abdomen and extremities.
- **Treatment**—Move the victim to a cool area and loosen clothing. Have the victim drink 1 to 2 cups of cool potable water or diluted commercial electrolyte solution (e.g., Gatorade[®], Quench[®]) immediately, and then every 20 minutes thereafter until symptoms subside. Electrolyte supplements can enhance recovery; however, it is best to double the amount of water required by the dry mix package directions or to add supplemental water to the liquid form.

9.1.1.3 Heat Exhaustion

Heat exhaustion is a state of weakness or exhaustion caused by the loss of fluids from the body. Heat exhaustion is not as dangerous as heat stroke, but if not properly managed in the field, it may lead to heat stroke.

- **Symptoms**—Pale, clammy, and moist skin, profuse perspiring, and extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. The person may have a headache, may vomit, may feel dizzy, and may be irritable or confused.
- **Treatment**—Move the victim to a cool, air-conditioned or temperature-controlled area, loosen clothing, place in a position with the head lower than the feet (shock prevention), and allow the victim to rest. Consult a physician. Ensure that the victim is not nauseated or vomiting. If not nauseated or vomiting, give the victim small sips of cool water or diluted electrolyte replenishment solution (1 to 1 dilution with water, or if mixing from powder, double the water added). If this is tolerated, have the victim drink 1 to 2 cups of fluid immediately, and every 20 minutes thereafter until symptoms subside. Seek medical attention at the advice of the consulting physician.

9.1.1.4 Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the body's heat regulating mechanisms, i.e., the individual's temperature control system (sweating) stops working correctly. Body temperature rises so high that brain damage and death may result if the person is not cooled quickly.

- **Symptoms**—Red, hot, dry skin (although the person may have been sweating earlier); nausea, dizziness, confusion, extremely high body temperature (i.e., 104 degrees Fahrenheit [$^{\circ}$ F] or greater as measured with a tympanic thermometer), rapid respiratory and pulse rate, seizures or convulsions, unconsciousness or coma.
- **Treatment**—Immediately call for emergency medical assistance. Remove the victim from the source of heat and cool the victim quickly. If the body temperature is not brought down quickly, permanent brain damage or death may result. Remove all PPE and as much personal clothing as decency permits. Fan the person while sponging or spraying with cool or tepid water. Apply ice packs (if available) to the back of the neck, armpits, groin area, or behind the knees. Place the victim flat on his or her back or with head and shoulders slightly elevated. If conscious, and not nauseated or vomiting, the victim may be provided sips of cool water. Do not give the victim coffee, tea, or alcoholic beverages. Emergency medical personnel will take over treatment upon arrival.

9.1.2 Heat Stress Prevention

The following measures should be followed to prevent heat stress:

- The most important measure is to prevent heat-related illness through adequate fluid intake.
- Ensure workers drink 1/2 to 1 quart of liquid per hour in high heat conditions. Most of this liquid should be water.
- Provide a shaded area for rest breaks.
- Ensure that adequate shelter is available to protect personnel against heat and direct sunlight. When possible, shade the work area.
- Discourage the intake of caffeinated drinks during working hours.
- Monitor for signs of heat stress.
- Encourage workers to maintain a good diet during these periods. In most cases, a balanced diet and lightly salted foods should help maintain the body's electrolyte balance. Bananas are especially good for maintaining the body's potassium level.
- If using commercial electrolyte mixes, double the amount of water called for in the package directions. Indications are that “full-strength” preparations taken under high heat stress conditions may actually decrease the body's electrolytes.
- Acclimate workers to site work conditions by slowly increasing workloads (i.e., do not begin work activities with extremely demanding tasks).
- Encourage workers to wear lightweight, light-colored, loose-fitting clothing.

- In extremely hot weather, conduct field activities in the early morning and evening.
- Maintain good hygienic standards through frequent showering and changes of clothing.
- Allow clothing to dry during rest periods.

9.1.3 Heat Stress Monitoring and Work Cycle Management

When strenuous field activities are part of ongoing site work conducted in hot weather, the following guidelines should be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures should be instituted when the temperature exceeds 70 °F and the tasks and risk analysis indicate an increased risk of heat stress problems. Consult the safety professional (e.g., Division EHS Officer or SSHO) if questions arise as to the need for specific heat stress monitoring. In all cases, the site personnel must be aware of the signs and symptoms of heat stress and be provided adequate rest breaks and proper aid as necessary. The SSHO will conduct heat stress monitoring. The SSHO will use a tympanic thermometer for body temperature and a standard thermometer for ambient temperature.

NOTE: For purposes of this operating practice, a break is defined as a 15-minute period.

A physiological monitoring schedule is determined by following the steps below:

- Measure the air temperature with a standard thermometer.
- Estimate the fraction of sunshine by judging the percentage of time the sun is out (refer to **Table 9-1**).
- Calculate the adjusted temperature based on the following formula:

$$\text{Adjusted Temperature} = \text{Actual Temperature} + 13 X \text{ (where } X = \text{sunshine fraction from Table 9-1)}$$

- Using **Table 9-2**, determine the physiological monitoring schedule for fit and acclimated workers for the calculated adjusted temperature.

The length of the work period is governed by the frequency of physiological monitoring (**Table 9-2**). The length of the work period is governed by physiological parameters (heart rate and body temperature). As noted above, the rest period will be set at 15 minutes in duration. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If

the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period. Body temperature can be checked with a tympanic thermometer after work but before the employee drinks water. If the body temperature taken exceeds 99.7 °F, shorten the next work cycle by one third. These adjustments of the work period based on heart rate and body temperature were recommended in OSHA Technical Manual TED 01-00-015, January 1999, Section III: Chapter 4, Heat Stress.

Table 9-1 Percent Sunshine Factors—Heat Stress Prevention and Monitoring

Percent Sunshine (%)	Cloud Cover	Sunshine Fraction
100	No cloud cover	1.0
50	50% cloud cover	0.5
0	Full cloud cover	0.0

Table 9-2 Physiological Monitoring Schedule—Heat Stress Prevention and Monitoring

Adjusted Temperature	Level D (Permeable clothing)
90 °F (32.2 °C) or above	After each 45 minutes of work
87.5 °F (30.8° - 32.2 °C)	After each 60 minutes of work
82.5 °F - 87.5 °F (28.1 °C - 32.2 °C)	After each 90 minutes of work
77.5 °F - 82.5°F (25.3 °C - 28.1 °C)	After each 120 minutes of work
72.5 °F - 77.5 °F (22.5 °C - 25.3 °C)	After each 150 minutes of work

9.2 COLD STRESS

In the planning stages of a project, the potential for cold-related hazards are considered during risk assessment. The SSHO must make decisions on the proper safety procedures. The SSHO will be responsible for implementing the program as well as attaining data on cold stress monitoring using a kestrel or other similar device, which measures wind speed, humidity, and ambient temperature. Each worker must evaluate the risk associated with his or her work and be

actively alert to these hazards. Any site worker may stop work if safety procedures are not followed or if the risk is too great.

Personnel working outdoors are subject to cold stress at temperatures below 40 °F. Exposure to extreme cold can cause skin injury or death if the core body temperature is unchecked and permitted to drop. Chemical-protective clothing does not provide protection against cold stress and may increase susceptibility. The following subsections describe the signs and symptoms, monitoring requirements, prevention, and treatment procedures for cold stress. These requirements and procedures will be followed at all times.

During cold conditions, employees will be encouraged to take rewarming breaks. Any employee whose clothes become wet will immediately be wrapped in a blanket and will change into dry clothes as soon as possible. Thermally protective gloves should be worn and extremities will be covered by appropriate clothing. Clothing should allow sufficient ventilation or wick moisture away from the skin. Metal hand-held equipment should have a barrier between the equipment and skin.

9.2.1 Cold Stress Symptoms and Treatment

9.2.1.1 Frostbite

Frostbite is the freezing of tissue and most commonly affects the toes, ears, fingers, and face. Frostbite occurs when an extremity loses heat faster than it can be replaced by the circulating blood. Frostbite may result from direct exposure to extreme cold or to cool, high wind. Damp socks or shoes may contribute to frostbite of the toes.

- **Symptoms**—Cold, tingling, aching, or stinging feeling followed by numbness; skin color is red, purple, white, or very pale and is cold to the touch; blisters may be present (in severe cases).
- **Treatment**—Call for emergency medical assistance. Move the victim indoors and/or away from additional exposure to cold, wet, and wind. Wrap the affected area in a soft, clean cloth (sterile, if available). Give a warm drink (water or juices, not coffee, tea or alcohol). Do not allow the victim to smoke. Do not rub the frostbitten part (this may cause gangrene). Do not use ice, snow, gasoline, or anything cold on the frostbitten area. Do not use heat lamps or hot water bottles to rewarm the frostbitten area. Do not place the frostbitten area near a hot stove. Do not break blisters. After rewarming, elevate the area and protect it from further injury.

9.2.1.2 Hypothermia

Hypothermia means “low heat” and is a potentially serious condition. Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 98.6 °F. Although some hypothermia cases are caused by extremely cold temperatures, most cases develop in air temperatures between 30 °F and 50 °F, especially when compounded with water immersion and/or windy conditions. The victim of hypothermia may not know, or may refuse to admit, that he or she is experiencing hypothermia. All personnel must be observant for these signs for themselves and for other team members.

- **Symptoms**—Cool bluish skin; uncontrollable shivering; vague, slow, slurred speech; irritable, irrational, or confused behavior; memory lapses; clumsy movements, fumbling hands; fatigue or drowsiness. Below the critical body core temperature of 95 °F, the body cannot produce enough heat by itself to recover. At this point, emergency measures must be taken to reverse the drop in core temperature. The victim may slip into unconsciousness and can die in less than 2 hours after the first signs of hypothermia are detected. Treatment and medical assistance are critical.
- **Treatment**—Call for emergency medical assistance. Do not leave the victim alone. Prevent further heat loss by moving the person to a warmer location out of wind, wet, and cold. Remove cold, wet clothing, and replace with warm, dry clothing or wrap the victim in blankets. If the victim is conscious, provide warm liquids, candy, or sweetened foods. Carbohydrates are the food most quickly transformed into heat and energy. Do not give the victim alcohol or caffeine. Have the person move his or her arms and legs to create muscle heat. If he or she is unable to move, place warm bottles or hot packs on the arm pits, groin, neck, and head. Do not rub the arms and legs or place the person in warm water.

9.2.2 Prevention and Protection

The following general guidelines are recommended for preventing or minimizing cold stress:

- Wear loose, layered clothing, masks, woolen scarves, and hats. Wear liners under hard hats.
- Protect hands with gloves or mittens.
- Never touch cold metal with bare hands.
- Wear waterproof, slip-resistant, insulated boots.
- Use chemical foot and hand warmers (commercially available) inside boots and gloves.

- In extreme cold, cover the mouth and nose with wool or fur to “pre-warm” the air you breathe.
- If wearing a face protector, remove it periodically to check for frostbite.
- Ensure that clothing remains secure around the body, especially at the neck and waist.
- If required to wear chemical protective clothing, remember that it generally does not afford protection against cold stress. In many instances, chemical protective clothing increases susceptibility. Dress carefully if both chemical protection and thermal insulation are required.
- Remove outer layers to avoid overheating, and remove clothing soaked with perspiration; replace layers to avoid becoming chilled.
- Keep clothes dry by wearing water-resistant and wind-resistant clothing and outerwear.
- Wear clothing that will “breathe” or allow water vapor to escape.
- Eat well-balanced meals, ensure adequate intake of liquids and avoid alcoholic beverages. Drink warm, sweet beverages and soups. Limit the intake of caffeinated drinks due to the diuretic and circulatory effects.
- Use available warm shelters and implement work-rest schedules.
- If warm shelters are not available, use cars/vehicles as shelters from the cold. (Ensure that tailpipes are not covered by heavy snowfall).
- Use radiant heaters to provide warmth (if using propane heaters ensure adequate ventilation to avoid carbon monoxide poisoning).
- Monitor yourself and others for changes in physical and mental condition.
- Use the buddy system or supervision to ensure constant protective observation.
- If heavy work must be done, resulting in sweating/wet clothing, take rest periods in heated shelters and change into dry clothing as necessary.
- New employees should not work full-time in the cold during the first days of employment until they become accustomed to the working conditions and the use of required protective clothing.
- Include the weight and bulkiness of clothing in estimating the required work performance and weights to be lifted by the worker.
- Arrange the work in such a way that sitting or standing still for long periods is minimized.

- Perform work protected from drafts to the greatest extent possible. If possible, shield the work area from wind.

Table 9-3 and **Table 9-4** should be consulted to adjust working schedules for wind chill conditions based on equivalent chill temperature (ECT). These tables are guidelines only; ambient temperatures and wind conditions should be monitored frequently, and work schedules adjusted as required. If workers show signs or symptoms of cold stress, the work schedule must be adjusted, as required.

9.2.3 Work/Warming Regimen

Work should be performed during the warmest part of the day. If work is performed continuously in cold or winter conditions or where rain or cool winds are expected, provide heated warming shelters, tents, cabins, or break rooms nearby. Encourage workers to use the shelter at regular intervals, depending on the severity of the cold exposure. **Table 9-4**, Cold Work/Warm-up Schedule for 4-Hour Shifts, provides guidance for working in severe cold weather. The onset of heavy shivering and/or the feeling of excessive fatigue, drowsiness, irritability, or euphoria indicate the need to immediately return to the shelter. Pain, numbness, or tingling in the extremities is indication of the need to immediately return to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation, or the worker should change into dry clothing. Never return to work in wet clothing.

Table 9-3 Wind Chill Chart

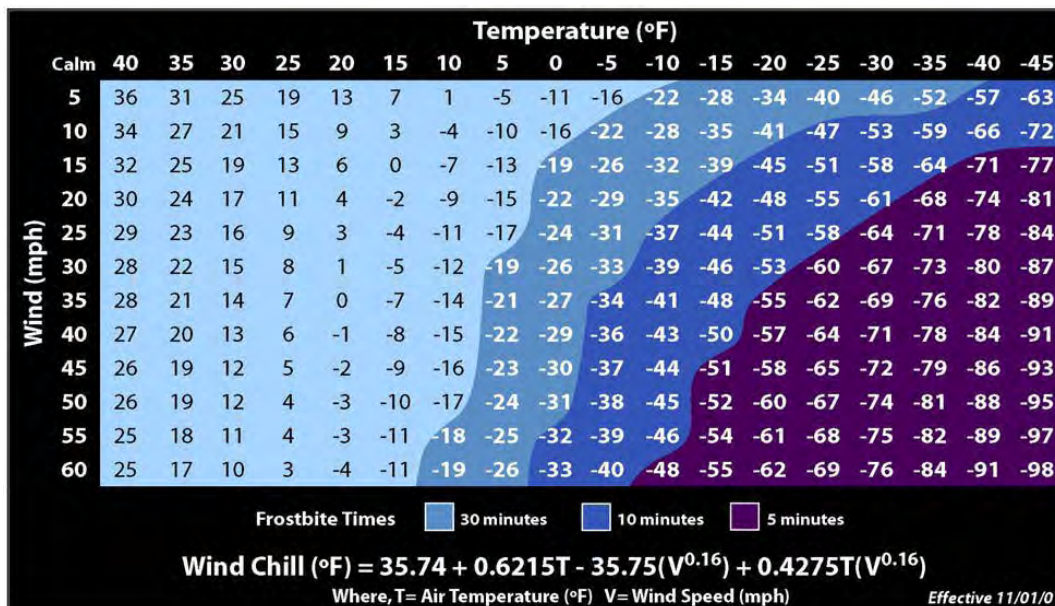


Table 9-4 Cold Work/Warm-up Schedule for 4-Hour Shifts

Equivalent Chill Temperature	Maximum Work Period	Number of Breaks
≥ -24 °F	Normal	1
-25 °F to -29 °F	75 minutes	2
-30 °F to -34 °F	55 minutes	3
-35 °F to -39 °F	40 minutes	4
-40 °F to -44 °F	30 minutes	5
≤ -45 °F	Stop work	Stop work

9.3 WEATHER HAZARDS

It is possible that severe weather will occur during this project. In the event that a storm threatens the area through observation of a storm system (lightning observation and thunder), all field work will be halted and weather service bulletins and civil defense messages will be monitored on local radio or through cell phone applications. The SSHO will determine through visual observations and weather updates (gathered through the radio or cell phone) when it is necessary to halt work and when to re-start field activities, which include observing the “30-30” rule that states:

- If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter.
- If you hear thunder, but did not see the lightning, assume that lightning is within 6 miles and seek shelter.
- Remain in the shelter for 30 minutes following the last lightning strike.

When a tornado warning goes into effect, the following actions will be taken:

- If in your vehicle: Leave your vehicle and seek shelter in a sturdy building. As a last resort, seek shelter in a ditch or culvert.
- In buildings: Take shelter in an interior hallway on a lower floor. A closet, bathroom, or other small room with short, stout walls will give some protection from collapse and flying debris. Otherwise, get under heavy furniture and stay away from the windows.
- Out in open country: Seek inside shelter immediately. If a tornado approaches, lie flat in the nearest depression, such as a ditch or culvert, and cover your head with your arms.

Additionally, when wind speed exceeds 40 mph, the following actions will be taken:

- Follow manufacturer instructions in assessing the limitations associated with field equipment.
- Shut down outdoor activities involving work at elevation.
- Move mobile items stored outside to indoor locations.
- Secure any items that cannot be moved inside.
- Be careful opening exterior doors.
- Stay away from power lines.
- Be cautious about downed power lines, tree limbs, and debris on roads.

If weather remains unstable for more than 1 hour, the SSHO will monitor weather bulletins to further assess changing conditions.

10. STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

Using common sense, operating under the “buddy system” (or two-person rule), and following safe practices can reduce the hazards of normal project activities.

The general site safety procedures contained in the WESTON Corporate EHS Program field operating procedures guide (which will be on-site) will be followed, and no running or horseplay will be allowed at the site.

10.1 SITE RULES/PROHIBITIONS

10.1.1 Buddy System

All work at the Ricochet Area MRS will be performed using the buddy system. Team members will keep in contact with each other at all times. Team members will be made aware of any slip, trip, and lifting hazards along with any potential exposure to chemical substances, heat or cold stress, and general hazards within their work area.

10.1.2 Designated Eating/Break Areas

Eating and break areas will be located away from the active work area. No food or beverages will be allowed in any work environments.

10.1.3 Designated Smoking Areas

All regulations governing approved areas for smoking and spark generation will be strictly followed. Smoking is prohibited except in designated smoking areas. The SSHO will identify designated smoking areas. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines.

10.2 WORK PERMITS

No facility work permits are associated with this project.

10.3 MATERIAL HANDLING PROCEDURES

No hazardous material handling will occur as part of these activities.

10.4 SPILLS

No spills are anticipated for this project. No hazardous substances will be taken on-site.

10.5 DRUM/CONTAINER TANK HANDLING

No drums or container handling will be part of this project.

10.6 DRUG AWARENESS AND DRUG-FREE WORKPLACE

WESTON fully supports all aspects of the Drug-Free Workplace Act of 1988. As such, WESTON has implemented Operating Practice 05-01-010, Drug-Free Workplace. This practice is in accordance with Federal Acquisition Regulation (FAR) subpart 252.223-7004. Strict disciplinary actions are enforced for any violation of WESTON's Drug-Free Workplace policy. All WESTON employees, as a condition of employment, have documented understanding and receipt of this policy.

While on duty, employees will not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances. Employees found to be under the influence of or consuming such substances will be immediately removed from the job site. Contractors will also adhere to WESTON's drug-free workplace requirements.

Any employee under a physician's treatment and taking prescribed narcotics or any medication, including over-the-counter medication, that may prevent a person from being ready, willing, and able to safely perform his/her duties will provide a medical clearance statement to his/her supervisor from the attending physician.

WESTON's Operating Practice emphasizes supervisor training, a provision for self-referral to treatment, and maximum respect for individual confidentiality as well as a provision for identifying and dealing with illegal drug users, including testing. WESTON's practice also provides for education, counseling, rehabilitation, and coordination with available community resources.

10.7 EMPLOYEE DUTY SCHEDULE/BASIC FATIGUE MANAGEMENT PLAN

10.7.1 Employee Duty Schedule

Personnel will follow WESTON's Employee Schedule. If extended periods of working long hours are required, the SSHO will monitor employees for outward signs of fatigue. Employee rotations may need to be adjusted to allow for individual differences in how fatigue-related stress is handled and for employee-specific roles on the project.

While working extended hours, employee travel time to and from work will be minimized to allow for sufficient rest and should be taken into account in determining limits on hours per day and per week. Group transportation to and from the work location and lodging will be used to address this situation. Consideration should be given to "awake" time and not just the hours logged on a time sheet.

10.7.2 Fatigue Symptoms

Intrinsic Symptoms

- **Physical**—Frequent, unexplainable headaches, muscle aches and pains, breathing difficulties, blurred/double vision, and/or burning urination.
- **Mental**—Difficulty focusing attention, distracted easily, depression, impaired judgment, and/or poor visual perception.

Extrinsic Symptoms

- **Physical**—Degraded motor skills, tenseness and tremors, intolerant/irritable, increased reaction time, and/or social withdrawal.
- **Mental**—Absentmindedness, poor short-term memory, lack of interest and drive, confusion and fearfulness, slow startle response, worry, and/or anxiety.

10.7.3 Fatigue Management

WESTON employees and subcontractors should not work in excess of 84 hours per week (12 hours/day – 7 days/week) unless approved by the Project Manager. The Division and Corporate EHS communities, as well as the local Operations/Resource Manager, are available to support the Project Manager's decision process.

10.8 SECURITY PLAN

10.8.1 Site Access

Visitors to the project are required to sign in with the SSHO, and the SSHO will document the presence of visitors in the logbook. Visitors will be escorted by site personnel.

10.8.2 Site Control

The Ricochet Area MRS is located in SGL 211, to which the public has unrestricted access. A daily sign-in will be required for all project staff. Coordination with Pennsylvania Game Commission (PGC) will be required to restrict public access to active work areas.

10.8.3 Theft

On-site theft of equipment is not expected. No equipment or valuable items will be kept inside vehicles. If it is necessary that equipment remain inside a vehicle, it will be kept out of obvious sight, and the vehicle will be locked and all windows closed. Personnel will secure vehicles, even if parking for only brief periods, and will carry vehicle keys with them at all times. Vehicles will be parked in well-lit areas.

In the event a theft does occur, local authorities will be promptly notified and appropriate WESTON personnel will be notified. Notice of Incident (NOI) Track information will be completed within 24 hours.

10.8.4 Confrontation

Personnel will be observant of their surroundings. They should ensure their own safety, the safety of their co-workers, and the safety of the public by not confronting or challenging aggressive perpetrators. Authorities should be contacted if site personnel observe any unusual circumstances.

10.9 MOTOR VEHICLE SAFETY

Safety is of utmost importance at WESTON. Employees must act responsibly every day to ensure the safety of themselves and others. This safety commitment also applies when driving vehicles. All employee drivers are required to operate vehicles safely, obeying federal, state, and local laws, and company policies. Driving is a privilege, not a right.

10.10 TRAFFIC

The site is located within SGL 211 adjacent to FIG. Posted speed limits will be obeyed at all times, and seat belts will be worn when driving. All drivers will be licensed.

10.10.1 Employee Requirements/Responsibilities

Compliance with all federal, state, and local laws is expected.

Drivers of WESTON vehicles must possess a current, valid driver's license of the appropriate class required for their driving needs, e.g., Class C, Commercial Driver's License (CDL).

All driving duties and functions are to be performed in a safe, legal, and professional manner.

Employee drivers are to attend periodic defensive driving training and other driver safety meetings as scheduled through their local Safety Officers.

Driving requires a high level of skill and alertness. When fatigue, illness, or medication impact alertness, reflexes, and decision-making capabilities, an employee driver should cease driving until the situation improves or is corrected and contact his/her manager to discuss the situation.

Unsafe vehicles and related equipment will be reported and repaired. Unsafe vehicles are not to be driven for WESTON business.

NOITrack will be used to report any vehicle accident while on the job or any accident occurring at any time if a company-owned or insured "allowance" vehicle is involved.

A driver orientation program and/or driving evaluation tests may be required of drivers to assess overall driving skills.

10.10.2 Compliance Issues/Driving Practices

10.10.2.1 Speed Limits

Drivers are required to obey posted speed limits and other traffic laws. Fines for any traffic violations are the employee's responsibility.

10.10.2.2 Seat Belts

WESTON drivers and their passengers are required to wear seat belts at all times while the vehicle is in operation.

10.10.2.3 Distracted Driving

It is recognized that distracted driving can contribute to accidents; accordingly, WESTON employees are to exercise caution and good judgment when driving. Reading maps, eating, placing or receiving a call on a cell phone, and other activities may contribute to an accident. Cell phone use while driving, including the use of hands-free devices, creates a distraction and driver inattention. The following basic guidelines should always be observed:

- Make outgoing calls after you have pulled over to a safe area.
- Let incoming calls go to voice mail, or if answering the phone is necessary, make sure the caller knows you are driving and keep the call short. Be aware of local or state laws governing the use of cell phones while driving.
- Operate vehicles in a safe, legal, and professional manner at all times.

10.10.2.4 Transporting Weapons

Transporting weapons (such as firearms, large knives) or dangerous property (significant or placardable quantities of regulated hazardous materials or substances) is prohibited unless specifically authorized.

10.10.3 Other Issues

Additional safety procedures may be established at a particular job site or within a Division. WESTON employees are responsible for compliance with any additional safety procedures and safety solutions that apply or that may be identified.

10.11 SANITATION

Employers will establish and maintain hygienic sanitation provisions for all employees in all places of employment. General housekeeping activities will occur daily.

10.11.1 Drinking Water

An adequate supply of potable water will be provided in all places of employment, for both drinking and personal cleansing. Cool drinking water (bottled water) will be provided.

10.11.2 Toilets

Toilets are required in all places of employment. Toilet facilities are available at the site trailer and staging area and throughout FIG. Hand soap or similar cleansing agents are available. There are no toilet facilities in SGL 211.

10.11.3 Procedures for Vermin Control

The work areas will be kept clean and organized. Organics such as foods will be wrapped and then properly discarded to avoid attracting pests.

10.11.4 Waste Disposal

A dumpster for garbage will be made available.

11. SITE CONTROL

The SSHO coordinates access control and security on-site. Because of the nature of the activities, only authorized personnel are allowed in the work zone. Authorized personnel are those who have completed the required training and who meet medical requirements. Unauthorized personnel will not be allowed in the work zone. The potential of cross-contamination is not applicable to this project based on the project characterization.

During on-site operations, the SSHO will order operations to cease if nonauthorized personnel are observed within the operating area. To ensure safety, site controls include the following:

- Eating, drinking, and smoking are prohibited except in designated areas.
- Operations will cease if nonauthorized personnel are present.
- The SSHO or his designee will escort authorized site visitors.
- All personnel entering the site, including visitors, will wear the proper PPE and sign in and out on the Site Visitors Log.
- The SSHO will maintain the Site Control Log to ensure accurate accountability of personnel on-site.
- The SSHO will provide an SSHP safety briefing to all personnel entering the site to inform them of potential site hazards. Personnel must acknowledge this briefing by signing the SSHP Review Form.
- In case of an emergency, personnel will exit the site and move to a designated safe area. The SSHO will determine the designated safe area that is located upwind of the site. The SSHO will notify the Project Manager and the Division EHS Officer if an emergency warrants site evacuation.

11.1 ON-SITE COMMUNICATIONS

In an emergency, important messages will be conveyed quickly and accurately. Verbal communication will be the primary form of communication at the site. The anticipated distance between the site workers will be no more than 250 feet. Verbal communication at the site can be impeded by on-site background noise and the use of PPE. A vehicle horn or air horn will be available with each team for emergency alerting purposes.

Outside support sources will be reached, assistance obtained, and measures for public notification ensured, if necessary. Separate internal emergency signals will be developed and rehearsed daily at safety meetings. External communications will be obtained through cellular phones or radios located at the site and procedures will be posted in a location accessible to site workers.

The emergency telephone numbers, which are listed in **Tables 15-1** through **15-3**, will be prominently posted in WESTON's field vehicles. The emergency telephone numbers, along with the APP and SSHP, OSHA 300 Log, safety and health promotional posters, date of last work day injury, and OSHA Safety and Health poster, will be kept unobstructed and readily available to the workers.

12. PERSONAL HYGIENE AND DECONTAMINATION

12.1 CONTAMINATION PREVENTION

Based on field tasks, no contact with contamination is expected.

12.2 PERSONAL HYGIENE

Employees will practice sound hygiene practices, including washing hands, face, and arms at the hygiene station after operations have concluded. Appropriate hand-washing facilities with soap will be available at the site trailer and staging area. In addition, hand sanitizer will be available. Following Centers for Disease Control (CDC) guidelines, personnel should wet their hands with clean running water and apply soap. Use warm water if it is available. Rub hands together to form lather and scrub all surfaces. Continue rubbing hands for 20 seconds. Rinse hands well under running water, then dry hands using paper towels. If possible, use that same paper towel to turn off the faucet. Good personal hygiene should be in effect at all times.

13. EQUIPMENT DECONTAMINATION

All equipment and tools will be cleaned prior to site entry to remove grease, oil, dirt, or any other off-site materials. The SSHO will inspect the equipment prior to approving the items for use on-site. The SSHO is responsible for inspecting equipment for adequate decontamination prior to removal off-site.

13.1 DISPOSITION OF DECONTAMINATION WASTE

Based on site tasks, no decontamination waste will be generated.

14. EMERGENCY EQUIPMENT AND FIRST AID EQUIPMENT

14.1 EMERGENCY EQUIPMENT

The emergency equipment listed in **Table 14-1** will be maintained in proper working order and frequently inspected for completeness during site operations.

Table 14-1 Emergency Equipment

Equipment	Location	Operation
First-aid kit	Support vehicle(s)	All operations
BBP kit	Support vehicle(s)	All operations
Eye wash	Support vehicle(s)	All operations
10-lb ABC fire extinguisher	Support vehicle(s)	All operations
Allergy response kit	Support vehicle(s)	All operations

14.2 FIRST RESPONDER KIT

Medical supplies required to be on-site are listed in **Table 14-2**. The minimum requirements of ANSI Z308.1-2009 and EM 385-1-1, November 2008, Section 03.B will be met. Documented monthly inspections of first-aid kits will be performed by the SSHO.

Two appropriately trained WESTON or subcontractor personnel will provide on-site first aid/CPR support. In the event that specialized/elevated care is necessary, either WESTON or the on-call ambulance service will transport the injured person to the appropriate medical facility.

Personnel needing basic first-aid treatment will also be documented as discussed in Section 15.7.4. An updated copy will be sent to the Division EHS Officer monthly to watch for trends in minor incidents.

Table 14-2 Contents for First Responder Kit

Description	Qty	Description	Qty
Absorbent compress, 32 sq. inches	1	Adhesive Tape, 3/8"x 5 yds	1
Adhesive Bandages, 1"x 3"	16	Analgesic/ pain reliever	16
Antibiotic Treatment, 1/32 Oz.	6	Antiseptic Wipes	6
Bandage Compress, 2" x 36"	4	Bandage Compress, 3" x 36"	2
Bandage Compress, 4" x 36"	1	Breathing Barrier	1
Burn Dressing, 4" x 4"	1	Burn Treatment, 1/32 Oz.	6
CleanseAway Poison Oak & Ivy Cleanser	1	Cold Pack, 4"x 5"	1
Eye Covering, 2.9 sq. inches per eye	2	Eye Wash, 4 Oz.	1
Medical Exam Gloves	2 pair	Roller Bandage, 2" x 6 yds	2
Roller Bandage, 4" x 6 yds	1	Sterile Pad, 3" x 3"	4
Triangular Bandage, 40 x 40 x 56 inches	1		
Contents for BBP Kit			
Breathing Barrier	1	Bodily Fluid Disposal Kit	1
Medical Exam Gloves	1 pair	PDI SaniCloth wipes	2

15. EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

15.1 EMERGENCY PROCEDURES

Site evacuation route and predetermined meeting location map will be developed and posted prior to mobilization. The evacuation route and predetermined meeting location map will be reviewed with all employees prior to the start of work and prior to the start of each new task.

Within a few days of the startup of work, a drill will be run for the emergency response plan. WESTON has evaluated the emergency medical services. The SSHO will have a roster of individuals on-site so that they can be accounted for in the event of an emergency.

15.2 PERSONNEL AND LINES OF AUTHORITY FOR EMERGENCY SITUATIONS

Fire and Emergency Medical Services (EMS) will provide support as necessary. The SSHO will be appointed as an Emergency Coordinator (EC), and a system will be implemented to provide a common framework within which people can work together effectively.

15.3 CRITERIA AND PROCEDURES FOR EMERGENCY RECOGNITION AND SITE EVACUATION

15.3.1 Medical Emergency and Personal Injury

The first worker who notices that a medical emergency or personal injury has occurred will immediately make a subjective decision whether the emergency is life-threatening and/or otherwise serious and will then proceed as described in the following subsections. Because no contaminants of concern exist on-site, emergency decontamination of personnel will not be required.

15.3.1.1 Life-Threatening and/or Otherwise Serious Incident

If a life-threatening incident occurs, emergency medical assistance will be immediately requested. If an apparent life-threatening and/or otherwise serious incident has occurred, the first person who identifies the situation will summon the SSHO or Site Manager. The SSHO or Site Manager, whoever arrives first, will assume the role of EC. The EC will be apprised of the situation and told where the injured person(s) is/are located. As the EC proceeds to the accident

scene, communications channels will be opened and kept on standby until the EC has surveyed the scene and performed a primary survey of the injured person. The EC will determine whether emergency assistance should be summoned and what information must be relayed, and will provide emergency action principles that are consistent with the injury. The EC will appoint a staff person or persons who will meet the emergency responders and take them quickly to the injured person. If necessary, decontamination of the individual will be performed at the direction of the EC.

15.3.2 Non-Life-Threatening Incident

If it is determined that no threat to life is present, the worker will assist the injured person to a safe location and contact the SSHO. The injured person will then be treated and monitored in accordance with standard first-aid procedures and this SSHP.

15.3.3 Worker Injury or Illness

The SSHO will be responsible for monitoring the general health of site workers. Site illnesses, conditions, or injuries that can be expected given the working conditions include hypothermia, frostbite, construction-related injuries, insect bites, and injuries caused by slips, trips, and falls.

These conditions will be prevented by properly training site workers in the appropriate use of health and safety equipment, dressing appropriately, monitoring the breathing zone atmosphere when necessary, and maintaining good housekeeping procedures.

The specific response to an injury or illness will depend on its type and severity, but in general, first aid will be administered in the field by the SSHO, who will be certified in first aid and CPR. The worker may then be transported to the hospital designated in this SSHP (see **Table 15-1** and **Figures 15-1** and **15-2** for hospital information and directions). General guidelines for first aid are as follows:

- For minor injuries, routine first-aid procedures will be used and documented.
- For major injuries, an ambulance will be called immediately and the appropriate first aid administered while awaiting arrival of the ambulance.
- Trained personnel will use approved measures to administer treatment.

15.3.4 Emergency Response

During an emergency, the following actions will be taken, with some actions conducted concurrently. No one will attempt emergency response/rescue until the situation has been assessed and the appropriate response outlined. Emergency response may involve the following circumstances or activities:

- Fire or explosion and prevention.
- Spills and spill prevention.
- Inclement weather.
- Evacuation planning.

The minimum actions taken will be as follows:

- All work will cease.
- All affected employees and subcontractors will be warned/notified of the emergency.
- The area will be isolated.
- Appropriate notifications will be made.

Rescue/response may include the following:

- Assess: Assess existing and potential hazards to site personnel and the off-site population.
- Determine:
 - Whether and how to respond.
 - The need for evacuation of site personnel and off-site population.
 - The resources needed for evacuation and response.
- Survey Casualties:
 - Locate all injured persons and assess their condition.
 - Determine resources needed for stabilization and transport.
- Request Aid: Contact the required off-site/on-site personnel or facilities, such as the ambulance, fire department, and/or police.

- **Allocate Resources:** Allocate on-site personnel and equipment to rescue and initiate incident response operations.
- **Extricate:** Remove or assist injured persons from the area, using appropriate PPE equipment and procedures.
- **Control:** As trained, and as determined safe, assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency.
- **Decontaminate:** Remove any protective clothing.
- **Stabilize:** Administer any medical procedures that are necessary before the injured person(s) can be moved. Stabilize or permanently fix the hazardous condition. Attend to what caused the emergency and anything damaged or endangered by the emergency.
- **Transport:** Transport personnel following any necessary decontamination for unforeseen or unexpected potential exposure or measures necessary to avoid contaminating others.
- **Log Casualties:** Record name of individual, time, destination, and condition upon transport.
- **Evacuate:**
 - Move site personnel to a safe distance upwind of the incident.
 - Monitor the incident for significant changes. The hazards may diminish, permitting personnel to re-enter the site, or hazards may increase and require public evacuation.
- **Casualty Tracking:** Record disposition, condition, and location.
- **Notification:** Notify appropriate individuals/entities.

15.3.4.1 Evacuation Routes and Procedures

Personnel will exit the site by the nearest means of egress during accidents requiring evacuation. Once personnel are off-site, the personnel will assemble at a location designated by the SSHO for accountability. Any missing personnel will be brought to the attention of the emergency responders.

15.3.4.2 Emergency Alarm Systems

Portable telephones and/or 2-way radios will be available for site and emergency communications (WESTON project office, Project Manager, Site Manager, SSHO, and field

staff). In addition, equipment spotters will be provided with emergency air horns to alert all personnel to stop work immediately. Emergency communications and signals are described in the tables below. All field personnel will be trained regarding site emergency signals.

Emergency service personnel (police/fire/ambulance) will be summoned by requesting support from the Department of Emergency Services personnel. Emergency contact numbers are provided in **Tables 15-1** through **15-3**, and the hospital location and directions from the Ricochet Area MRS are provided in **Figure 15-1** and **Figure 15-2**.

Table 15-1 Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
Department of Emergency Services (Ambulance, Fire, Police)	911
FIG Police (non-emergency)	(717) 861-2727
FIG Fire Department (non-emergency)	(717) 861-2111
PA State Police	911
Emergency Hospital: Hershey Medical Center 500 University Drive Hershey, PA 17033	(717) 531-8521 (800) 243-1455
Non-Emergency Hospital: Good Samaritan Hospital 233 S. 4 th Street Lebanon, PA 17042	(717) 270-7500

Table 15-2 WESTON Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
WESTON PM: John Gerhard	(610) 701- 3793 (office) (610) 513-6897 (cell)
WESTON East Division EHS Officer: Larry Werts	(610) 701-3912 (office) (215) 815-6237 (cell)
WESTON East Division Federal Team Safety Officer: Chris Baer	(610) 701-3653 (office) (484) 239-4249 (cell)
WESTON Medical Programs Manager: Bill Irwin	(610) 701-3684 (office) (267) 918-8371 (cell)

Table 15-3 Other Emergency Contact Numbers

Organization/Point of Contact	Telephone Number
Poison Control Center	(800) 962-1253
Spill Response – CHEMTREC	(800) 424-9300
National Response Center	(800) 424-8802
WorkCare WESTON Medical Director: Dr. Peter Greaney WorkCare WESTON Program Administrator Heather Lind	From 06:00 to 16:30 Pacific Time call (800) 455-6155, then dial 0 or extension 175; Heather Lind to request the on-call clinician
After-Business Hours Contact (Emergency Only)	16:31 to 05:59 Pacific Time and weekends and Holidays call (800) 455- 6155 and dial 3 to reach the after-hours answering service. Request that the service connect you with the on-call clinician or the on-call clinician will return your call within 30 minutes.
WESTON Emergency (24 hour) (West Chester)	(610) 701-3720

15.3.4.3 Hand and Emergency Signals Communications

It is essential that workers have a means of communicating rapidly and effectively during heavy equipment operations, construction, hazardous waste operations, and other types of activities. Communication while wearing PPE can be extremely difficult. The following information provides guidance for uniform communication protocols to be used, as needed, in field operations. **Tables 15-4** and **15-5** present emergency and general hand signals for uniform communication use.

15.3.4.4 Emergency Signals

Emergency signals are critical for alerting workers of danger and to maintain site control during an emergency. Bullhorns, radios, air horns, and similar devices will be used as described below for emergency communications. Emergency hand signals should be used as a secondary means of communication.

Table 15-4 Emergency Hand Signals

Signal	Meaning
One long sound/blast of the emergency alarm signal, air horn, siren, whistle	Emergency situation: face safety watch and watch or listen for directions
Pause; followed by a number of short sounds, 1, 2, 3, or 4	Evacuate to the predesignated emergency meeting place indicated by the number of sounds
Two long blasts of the emergency alarm signal, air horn, siren, whistle	All clear
Point one arm in direction of evacuation, make a large circling motion with the other arm in direction of evacuation	Evacuate the area
Hand clutching throat	Cannot breathe; out of air
Grip partner's wrist or place both hands around partner's arm	Leave area immediately

Table 15-5 General Hand Signals

Signal	Meaning
Point index finger toward self	I; me
Point index finger toward object	It; them
Point index finger toward person	You; them
Circle index finger at group	We; us; all of us
Pointed finger on extended arm	Look in that direction
Beckon with index finger	Come here
Point with thumb in a particular direction	Move this way; go this way
Hold index finger up near head	Wait
Slowly ease palm face down	Relax; slow down
Put palm over brow	Scout it out; check it out
Move hand far away from body	Stay away
Hands on top of head	Need assistance
Grip partner's wrist or place both hands around partner's arm	Leave area immediately
Thumbs up	OK; I'm all right
Thumbs down	No; negative; bad; not OK
Hand gripping throat	Cannot breathe; out of air
Wave hands over head from side-to-side	Attention; stand-by for the next signal

Table 15-5 General Hand Signals (Continued)

Signal	Meaning
Swing hand from direction of person receiving signal to directly overhead and through in circle	Come here
Clenched fist of extended arm	Stop motion/hold position
Draw index finger across front of throat	Shut off engine; cut off power; quit
Place palm face down and rotate from side to side	Unsure; can't decide
Form a circle with thumb and index finger	OK; I understand; agree
Military salute	I understand and will comply

15.3.4.5 Radio Communications

When radio communication is used, personnel will be instructed in the use of the radio, in which channel should be used, and in the following radio guidelines. Personnel will use the radio only for necessary work-related communication and will use the following procedures:

- Speak clearly.
- Call the name or call sign of the individual or unit you are trying to reach, and identify yourself (e.g., “Unit 1; this is Safety”).
- Wait for acknowledgement (e.g., “Safety, this is Unit 1”) before you continue transmission.
- Proceed with your transmission. When finished, say “Over” when you expect a response. When transmission is complete and no response is expected, say “Out.”
- When receiving a radio call, acknowledge the call immediately unless doing so would interfere with safety.
- If a transmission is incomplete or not understood, request clarification.
- Emergency calls should begin with the words “Emergency, Emergency, Emergency.” Give absolute priority to emergency communication. Unless answering or aiding the emergency call, do not use the radio until certain it will not interfere with further emergency communication.
- Ensure that radios are charged and tested prior to each work shift and as necessary thereafter.
- Malfunctioning radios must not be used and must be replaced immediately.

- Do not transmit false information or unidentified communication.
- Profanity and indecent language are prohibited. Transmittal of sensitive information over the radio is prohibited.

15.3.4.6 Decontamination and Medical Treatment of Injured Personnel

Because there is no known contamination on-site, decontamination of site personnel will not be required.

15.3.4.7 Emergency Medical Facilities and Phone Numbers for Responders

The emergency telephone numbers listed in **Tables 15-1** through **15-3** will be prominently posted in WESTON's vehicles. The emergency telephone numbers, along with the APP and SSHP, OSHA 300 Log, deficiency tracking system documents, safety and health promotional posters, date of last work day injury, and OSHA Safety and Health poster, will be kept unobstructed and readily available to the workers.

15.3.4.8 Criteria for Alerting Local Community Responders

In the event of an emergency requiring outside emergency services, WESTON personnel will immediately dial 911 to contact the appropriate organization. Following the phone call, WESTON personnel will contact on-site personnel to inform them that emergency service personnel and equipment will be entering the work area. Subsequent to these notifications, appropriate WESTON personnel will be contacted and informed regarding the situation.

Information provided by the servicing agencies is provided at the end of this section.

15.4 SPILL PLAN

A spill plan is not necessary because fuel will not be stored on-site.

15.5 FIREFIGHTING PLAN

Potential sources of fuel include grass and leaves. Types of fire suppression systems include multipurpose ABC portable fire extinguishers. In case of fire, evacuate the area immediately. Activate 911 or the established Fire Emergency Number from a safe location. Indicate what is happening, the location of the fire, and whether there are injuries. Comply with requests from the 911 operator for information. Do not hang up until told to do so by the operator, or allow the

operator to hang up first. Upon completion of the emergency phase, comply with incident notification procedures.

If the fire is small and manageable with fire-extinguishing equipment at hand, and you are trained in the use of this equipment, you may make the decision to use this equipment while waiting for advanced assistance. Never place yourself in danger, always have a plan for escape, and never attempt to fight a fire if there are any doubts about the type of fire or your ability to successfully fight the fire. Never allow the fire to get between you and your escape route.

15.5.1 Fire Extinguishing Equipment

Fire extinguishing equipment that meets 29 CFR Part 1926, Subpart F, will be on hand and ready for use to control fires. The following procedures will be followed:

1. Flammable and Combustible Materials (liquids, gases):
 - Flammable materials must be properly labeled, stored, handled, and used.
 - No smoking or use of open flame-producing devices within 50 feet of flammable and combustible materials.
 - Obtain MSDSs for all flammable materials in use and ensure all personnel are aware of hazards.
 - Label all containers with contents, the word “Flammable”, and in accordance with hazard communication requirements.
 - Store materials in well-ventilated areas that are free of ignition sources and flame or sparks.
 - Ensure that incompatible materials are stored in remote locations from each other (e.g., keep flammables from oxidizers).
 - Limit quantities to minimum required.
 - Store cylinders in upright and secure positions.
 - Bond and ground containers as (and where) necessary.
 - Use proper storage cabinets for flammable and combustible materials. Contact EHS Staff for assistance.
 - Use only approved containers.
 - Use and dispense only in well-ventilated areas.
2. Combustible Materials (solids):
 - Solid combustible materials include wood, paper, and cloth. Proper housekeeping reduces concerns for combustion of these materials. Use proper receptacles for disposal, and dispose of solid combustible materials routinely.

3. Oxidizers:

- An oxidizer is a substance that increases the flammability of materials, allowing them to burn more easily. Examples include pure oxygen, chlorine, and ammonium nitrate. Store oxidizers in a remote location from flammable and combustible materials.

4. Electric Appliances:

- Do not use electric appliances near flammable or combustible materials. Never place an appliance on an unstable surface. Use only Underwriters Laboratories, Inc. (UL) - or Factory Mutual Research Corp. (FM)-approved appliances. Follow the manufacturer's recommendations or requirements for use and maintenance.

5. Smoking:

- Smoking is prohibited indoors. Smoking is allowed only in outdoor, designated areas. Smokers are to maintain smoking areas in a clean and safe condition. Ensure that receptacles for disposal of cigarettes and other smoking materials are appropriately constructed, free of combustible debris, and, when necessary, are cool before emptying into waste receptacles.

6. Housekeeping:

- Personnel are responsible for keeping work areas free of combustible materials and debris.
- Weeds and grass must be properly maintained to limit potential fire hazard.
- The SSSH will document and inspect all project fire extinguishers on a monthly basis.

15.6 WILD FIRES

15.6.1 Prevention

Site personnel should practice smart fire safety habits and watch out for hazardous conditions. If conditions are dry, wild fires can pose a threat—not only because there is plenty of fuel to burn, but also because rural areas and remote locations often do not have easy access for firefighters. There also is a chance that embers from a fire a mile or more away may fall onto nearby vegetation and cause them to catch fire. The following preventive measures will be observed:

- Smoke only in designated areas.
- Avoid driving through high grass or areas where vehicle exhaust or hot engine surfaces could cause fires.
- Keep a fire extinguisher handy.
- Be extra cautious during the dry season and observe warnings and prohibitions established by the Forestry Service or other agencies.
- Be aware of wild fires in neighboring areas.

15.6.2 Awareness and Response

Wild fires can spread quickly and without warning. A subtle shift in the wind could send the flames in your direction even though authorities may have deemed your area safe. Make sure you have a plan in place:

- Be aware of wild fires in neighboring areas.
- Do not attempt to fight forest fires. If fire or smoke is observed, notify all site personnel, initiate evacuation, and report the fire to the designated emergency agencies.
- Designate a place to meet if there is a fire.
- Identify multiple places you could evacuate to, such as a motel outside the danger zone.

If you are driving:

- Roll up your windows and close your air vents.
- Drive slowly and turn on your headlights.
- Do not drive through heavy smoke.

15.7 MEDICAL SUPPORT

It is very easy to panic, but if you remain calm and prepare for emergency situations, you will increase your chances of evacuating safely.

15.7.1 On-Site Medical Support

In the event specialized/elevated care is necessary, either WESTON or the local on-call ambulance service will transport the injured person to the hospital. The local Fire and EMS Department can be notified of emergency situations by using the telephone numbers listed in **Table 15-1**. There will be fewer than 100 people on-site; therefore, WESTON will not be providing on-site medical support.

A first aid kit complying with the criteria contained in ANSI Z308.1-2009 will be provided on-site.

- For minor injuries, routine first aid procedures will be used and documented.
- For major injuries, an ambulance will be called immediately, and the appropriate first aid administered while awaiting the arrival of the ambulance.

- Trained personnel will use approved measures for treatment based on the training they have received.

15.7.2 Off-Site Medical Support

WESTON has contacted the local emergency resources to verify their availability and ability to respond to any emergencies encountered.

15.7.3 Directions and Map to Nearest Hospital

The appropriate emergency vehicle will travel to the closest emergency hospital to the site, which is the Hershey Medical Center, located at 500 University Drive, Hershey, PA (see **Figure 15-1**). **Figure 15-1** shows the route to the hospital from the Ricochet Area MRS (the driving distance is approximately 18 miles and the driving time is approximately 35 minutes). **Figure 15-2** shows the route to the non-emergency hospital (Good Samaritan Hospital) from Ricochet Area MRS (driving distance is approximately 17 miles with a driving time of approximately 32 minutes). The maps showing the route to the hospital will be posted near the site telephone and in each site vehicle, and a written description of the route is included on the maps. The hospital route will be verified prior to work initiation in case of unforeseen construction or other changes in the route.

15.7.4 First Aid Treatment

Personnel needing basic first-aid treatment will also be documented using the form presented as **Figure 15-3**. An updated copy will be sent to the WESTON Division EHS Officer monthly to watch for trends in minor incidents.

Copies of certifications for the individuals presented in **Table 15-6** are presented in **Attachment B** of the APP.

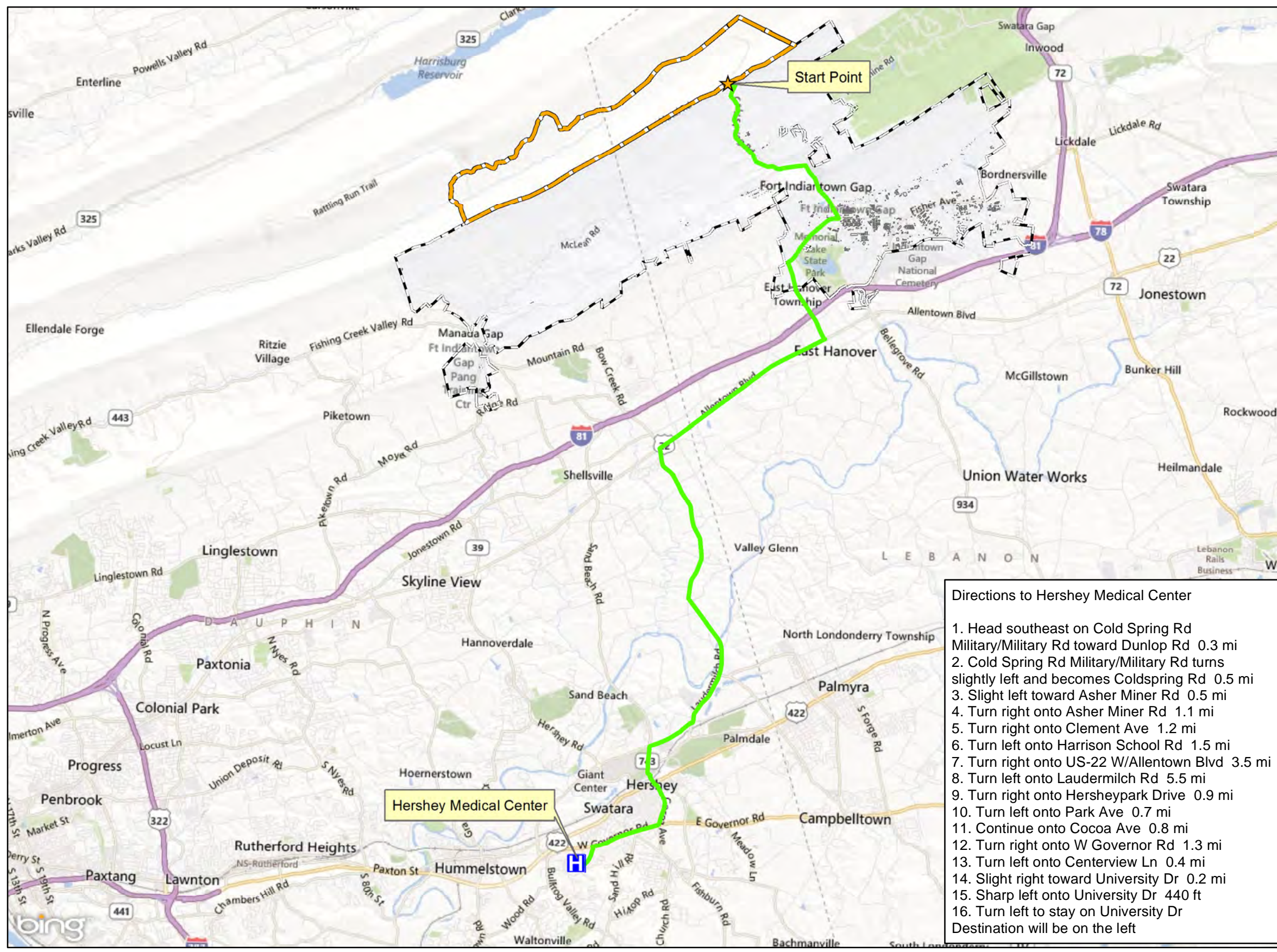
Table 15-6 First Aid and CPR Training

Name	First Aid (Expiration Date)	CPR (Expiration Date)	BBP (Expiration Date)
Bruce Carnal	4/14/2015	4/14/2015	4/4/2014
Jason McCloskey	4/14/2015	4/14/2015	4/4/2014



Legend

- Fort Indiantown Gap
- Installation Boundary
- Hospital Route
- Ricochet Area MRS



- Directions to Hershey Medical Center**
1. Head southeast on Cold Spring Rd Military/Military Rd toward Dunlop Rd 0.3 mi
 2. Cold Spring Rd Military/Military Rd turns slightly left and becomes Coldspring Rd 0.5 mi
 3. Slight left toward Asher Miner Rd 0.5 mi
 4. Turn right onto Asher Miner Rd 1.1 mi
 5. Turn right onto Clement Ave 1.2 mi
 6. Turn left onto Harrison School Rd 1.5 mi
 7. Turn right onto US-22 W/Allentown Blvd 3.5 mi
 8. Turn left onto Laudermilch Rd 5.5 mi
 9. Turn right onto Hersheypark Drive 0.9 mi
 10. Turn left onto Park Ave 0.7 mi
 11. Continue onto Cocoa Ave 0.8 mi
 12. Turn right onto W Governor Rd 1.3 mi
 13. Turn left onto Centerview Ln 0.4 mi
 14. Slight right toward University Dr 0.2 mi
 15. Sharp left onto University Dr 440 ft
 16. Turn left to stay on University Dr Destination will be on the left

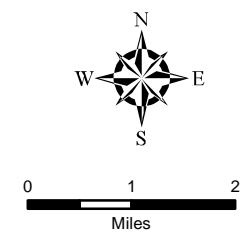
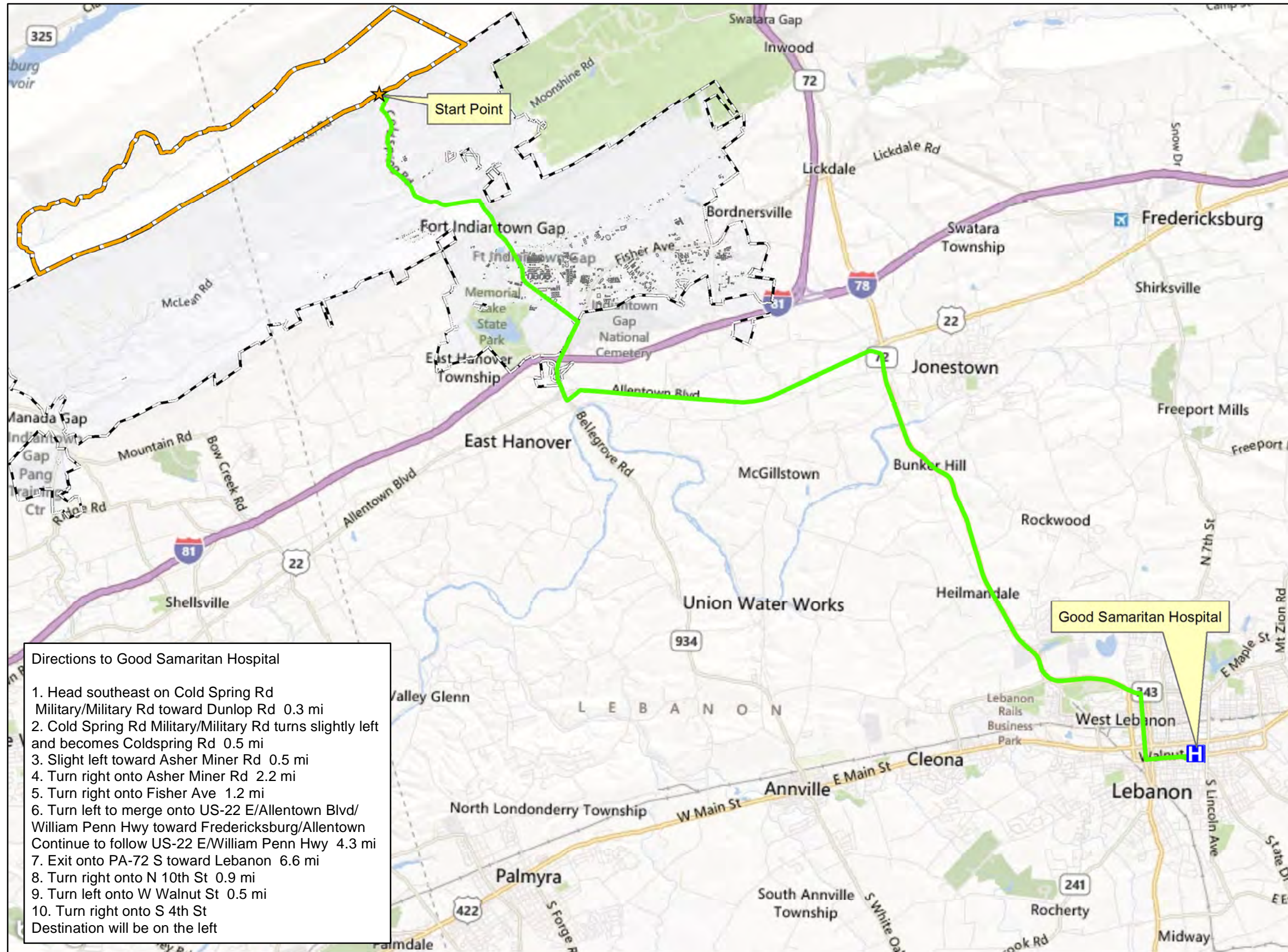


Figure 15-1
Emergency Hospital Route
from Ricochet Area MRS State
Game Lands 211 Adjacent to
Fort Indiantown Gap, Annville, PA



Legend

- Fort Indiantown Gap
- Installation Boundary
- Hospital Route
- Ricochet Area MRS



- Directions to Good Samaritan Hospital
1. Head southeast on Cold Spring Rd Military/Military Rd toward Dunlop Rd 0.3 mi
 2. Cold Spring Rd Military/Military Rd turns slightly left and becomes Coldspring Rd 0.5 mi
 3. Slight left toward Asher Miner Rd 0.5 mi
 4. Turn right onto Asher Miner Rd 2.2 mi
 5. Turn right onto Fisher Ave 1.2 mi
 6. Turn left to merge onto US-22 E/Allentown Blvd/William Penn Hwy toward Fredericksburg/Allentown Continue to follow US-22 E/William Penn Hwy 4.3 mi
 7. Exit onto PA-72 S toward Lebanon 6.6 mi
 8. Turn right onto N 10th St 0.9 mi
 9. Turn left onto W Walnut St 0.5 mi
 10. Turn right onto S 4th St Destination will be on the left

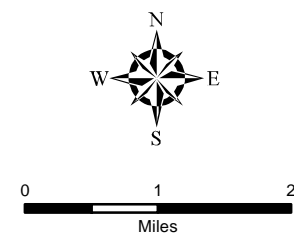


Figure 15-2
Non-Emergency Hospital Route
from Ricochet Area MRS State
Game Lands 211 Adjacent to
Fort Indiantown Gap, Annville, PA

Figure 15-3 First Aid Treatments Not Otherwise Reportable

First Aid Tracking Form
Treatments not otherwise Reportable

Date	Person	Injury	Treatment

16. LOGS, REPORTS, AUDITS, INSPECTIONS, AND RECORDKEEPING

16.1 SAFETY LOG

The SSHO will maintain a safety log of all safety-related activities. The SSHO is responsible for ensuring that health and safety activities for the day, as well as safety meeting minutes, are documented in the safety log or filed appropriately. In addition, the SSHO will maintain a site OSHA 300 log.

16.2 TRAINING LOG

The SSHO is responsible for ensuring that all training conducted relative to job site activities is documented appropriately.

16.3 SITE CONTROL LOG

A log of all personnel visiting, entering, or working on the site will be maintained. The log will include the following: date, name, agency or company, and the time entering and exiting the site. This information, including dates, will be recorded in the site control log.

16.4 INSPECTION FORMS

Daily safety and health inspections will be conducted by the SSHO with the results recorded in the safety log. The SSHO will conduct periodic safety and health audits to ensure site personnel are performing the tasks in accordance with the work plan and this SSHP.

The SSHO will also complete the Site-Specific Hazard Communications Checklist (see **Attachment 1**) and ensure that it is kept up to date.

ATTACHMENT 1

SITE-SPECIFIC HAZARD COMMUNICATION PLAN/CHECKLIST

**Hazardous Chemicals
Potentially Brought to Site**

The hazardous materials that may be used on-site are presented in the following list, and Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials are presented in **Attachment 2**. All subcontractors and other parties working nearby will be informed of the presence of these chemicals and the location of the MSDSs.

Chemical Name	Quantity
Diesel Fuel	One gallon
Gasoline	One gallon
Chainsaw bar oil	One quart

SITE-SPECIFIC HAZARD COMMUNICATION PLAN/CHECKLIST

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will use this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

Although responsibilities for activities within this document are the primary responsibility of the WESTON Site Safety and Health Officer (SSHO), it is the responsibility of all WESTON and subcontractor personnel to ensure compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON is known by all affected employees, the following hazard communication program has been established. All affected personnel will participate in the hazard communication program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH), or any affected employer/employee on a multi-employer site.

- Site or other location name/address: Ricochet Area MRS in State Game Lands 211, Adjacent to Fort Indiantown Gap
- Project Manager: John Gerhard
- Site/Location Safety Officer: Bruce Carnal
- List of chemicals compiled, format: HASP: Other: _____
- Location of MSDS Files: SSHO vehicle
- Training Conducted by: Name: _____ Date: _____
- Indicate format of training documentation: Field Log: _____ Other: Follow-up meetings
- Client briefing conducted regarding hazard communication: Entry
- If multi-employer site (client, subcontractor, agency, etc.), indicate name of affected companies: Subcontractor
- Other employer(s) notified of chemicals, labeling, and MSDS information: All subs and vendors:
- Has WESTON been notified of other employer's or client's hazard communication program(s) as necessary?

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and available in a centrally identified location with the Material Safety Data Sheets (MSDSs). Further information on each chemical may be obtained by reviewing the appropriate MSDSs. The list will be arranged to enable cross-reference with the MSDS file and the label on the

container. Current chemicals that will be used by WESTON include diesel fuel gasoline, chainsaw bar oil, propane, and oils and greases.

Container Labeling

The SSHO will verify that all containers received from the chemical manufacturer, importer, or distributor for uses on-site are clearly labeled.

The SSHO is responsible for ensuring that labels are placed where required and for comparing MSDS and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs)

MSDSs will be obtained for all hazardous materials to be used in performance of this contract in accordance with Federal Acquisition Regulation (FAR) 52.223-3. These MSDSs and an inventory of hazardous material will be compiled prior to bringing the material on-site. MSDSs will be maintained at the job site and available to all employees and inspectors. The subcontractor must have an active Hazardous Communication Program in place for all employees as required by Code of Federal Regulations (CFR) 29 CFR 1910.1200. To assist this effort, the SSHO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SSHO will ensure procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will inform affected employees of any new information. If an MSDS is not received at the time of initial shipment, the SSHO will contact the manufacturer and request delivery of an MSDS for that product, in accordance with the requirements of WESTON's Written Hazard Communication Program.

The SSHO will maintain an MSDS file that contains a log of, and copies of, MSDSs for all hazardous chemicals in use at the site, and inform all site workers of the file's location. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SSHO or designated alternate. When a revised MSDS is received, the SSHO will immediately replace the old MSDS.

Employee Training and Information

The SSHO is responsible for the WESTON site-specific personnel training program. The SSHO will ensure that the following program information is supplied to all affected employees.

At the time of initial assignment for employees to the work site or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below:

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- Signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and written hazard communication program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, and personal protective equipment (PPE).
- Hazardous, nonroutine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks, the SSHO will provide affected employee(s) with information about the hazardous chemicals he or she may be using during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Multi-Employer Worksites

The SSHO is responsible for providing other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. The SSHO and the Site Manager are responsible for obtaining information about hazardous chemicals used by other employers and that WESTON employees

may be exposed to. WESTON's chemical list will be made available to other employers upon request. MSDSs will be provided as necessary.

The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

ATTACHMENT 2

MATERIAL SAFETY DATA SHEETS



123455-22 DIESEL #2, ON-ROAD (LOW SULFUR)
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: DIESEL #2, ON-ROAD (LOW SULFUR)
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:

Lubricants and Specialties: 800-662-4525 800-443-9966

Fuels Products: 800-947-9147

MSDS Fax on Demand: 713-613-3661

MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: HYDROCARBONS AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
DIESEL FUEL (68334-30-5)	100

COMPONENT(S) OF PRODUCT INGREDIENTS INCLUDE:

NAPHTHALENE (91-20-3)	0.5
-----------------------	-----

ETHYL BENZENE (100-41-4)	0.5
--------------------------	-----

NOTE: Composition may contain up to 0.5% performance additive.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

This product is considered hazardous according to regulatory guidelines (See Section 15).

EMERGENCY OVERVIEW: Clear (May Be Dyed) Liquid. Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion. DOT ERG No. : 128

POTENTIAL HEALTH EFFECTS: Respiratory irritation, headache, dizziness, nausea, loss of consciousness, and in cases of extreme exposure, possibly death. Diesel exhaust may cause lung cancer. Prolonged, repeated skin contact may result in skin irritation or more serious skin disorders. Low viscosity material-if swallowed may enter the lungs and cause lung damage. Note: This product contains polycyclic aromatic hydrocarbons, some of which have been reported to cause skin cancer in test animals and in humans under conditions of poor personal hygiene and prolonged repeated contact.

POTENTIAL ENVIRONMENTAL EFFECTS: Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Remove contaminated clothing. Dry wipe exposed skin and cleanse yourself with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. (See Section 16 - Injection Injury)

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIANS: Material if aspirated into the lungs may cause chemical pneumonitis. PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective, but water should be used to keep fire-exposed containers cool. Prevent runoff from fire control or dilution from entering streams,

sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Material is combustible. Liquid can release vapors that readily form flammable mixtures at or above the flash point. Product can accumulate a static charge which may cause a fire or explosion.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 55(131) (ASTM D-93).
Flammable Limits (approx.% vol.in air) - LEL: 0.6%, UEL: 7.0%
NFPA HAZARD ID: Health: 1, Flammability: 2, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Eliminate sources of ignition. Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Eliminate sources of ignition and warn other ships in the vicinity to stay clear. Notify port and other relevant authorities. Confine with booms if skimming equipment is available to recover the spill. Otherwise disperse in unconfined waters, if permitted by local authorities and environmental agencies. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: Keep product away from high energy ignition sources, heat, sparks, pilot lights, static electricity, and open flame. Harmful in contact with or if absorbed through the skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Store in a cool area. Avoid sparking conditions. Ground and bond all transfer equipment.

SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or

ground product transfer system. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

ExxonMobil recommends an 8-hour time-weighted average (TWA) exposure of 500 mg/m³ total vapor (approx. 100 ppm) or 5 mg/m³ stable aerosols.

Substance Name (CAS-No.)	Source	---TWA---		----STEL----		NOTE
		ppm	mg/m ³	ppm	mg/m ³	
NAPHTHALENE (91-20-3)	OSHA	10	50	15	75	
	ACGIH	10	52	15	79	
ETHYL BENZENE (100-41-4)	OSHA	100	435	125	545	
	ACGIH	100	434	125	543	

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Use in well ventilated area with local exhaust ventilation. Ventilation equipment must be explosion proof. Use away from all ignition sources.

RESPIRATORY PROTECTION: Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-contained breathing apparatus may be required for use in confined or enclosed spaces.

EYE PROTECTION: If splash with liquid is possible, chemical type goggles should be worn.

SKIN PROTECTION: Impervious gloves must be worn. If contact is likely

oil impervious clothing must be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Clear (May Be Dyed)
ODOR: Hydrocarbon
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 149(300)
MELTING POINT C(F): NA
FLASH POINT C(F): > 55(131) (ASTM D-93)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: 0.5
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.82-0.87
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: > 1.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): < -7(20)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): NA

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, strong acids, alkalies, and oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the

components.

INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

Repeated dermal application of middle distillates, heating oils and diesel oils to rabbits for 2-4 weeks at up to 1 gm/kg resulted in strong to severe skin irritation with some weight loss at the higher dose. Toxic effects ranging from weight loss to mortality was observed in rabbits treated repeatedly with very high doses (6 gm/kg) of these oils. Repeated inhalation exposure of middle distillate and diesel vapor and aerosol to rats for 2-4 weeks at up to 6 mg/l resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and some reduction in lung function.

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

Diesel fuel vapors were tested in an inhalation teratology (developmental toxicity) study in rats and when only minimal maternal toxicity was observed, no fetotoxic or developmental effects were observed. A developmental toxicity study of dermally applied middle distillates did indicate fetotoxicity (reduced litter size, litter weight, increased resorptions) at doses that also caused significant maternal toxicity.

---CHRONIC TOXICOLOGY (SUMMARY)---

Diesel fuel, heating oil and middle distillates have been shown to be carcinogenic in lifetime mouse skin painting bioassays. While in some cases, the tumor incidence is low in the test populations and possibly associated with skin irritation, concurrent evidence from short-term predicative tests (Modified Ames) does indicate some level of mutagenic activity associated with levels of polycyclic aromatic compounds in certain test samples.

---SENSITIZATION (SUMMARY)---

Middle distillate oils were not skin sensitizers when tested in a Modified Buehler Guinea Pig Sensitization Assay.

---OTHER TOXICOLOGY DATA---

Overexposure to diesel exhaust fumes may result in eye irritation, headaches, nausea, and respiratory irritation. Animal studies involving lifetime exposure to high levels of diesel exhaust have produced variable results, with some studies indicating a potential for lung cancer. Limited evidence from epidemiological studies suggest an association between long-term occupational exposure to diesel engine emissions and lung cancer. Diesel engine exhaust typically consists of gases and particulates, including carbon dioxide, carbon monoxide, nitrogen compounds, oxides of sulfur, and hydrocarbons. Diesel exhaust composition will vary with fuel, engine type, load cycle, engine maintenance,

tuning and exhaust gas treatment. Use of adequate ventilation and/or respiratory protection in the presence of diesel exhaust is recommended to minimize exposures. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative substances.

ECOTOXICITY: Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/ IrL50 =1-10 mg/L). This substance has also been shown to be toxic to specific fish species (LL50 = 1-10 mg/L for rainbow trout, Atlantic silverside).

MOBILITY: Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.

PERSISTENCE AND DEGRADABILITY: The majority of the components in this product are expected to be inherently biodegradable. The constituents of diesel fuels/heating oil which are volatilized will photodegrade in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation.

BIOACCUMULATIVE POTENTIAL: Not established.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning for fuel value in compliance with applicable laws and regulations.

RCRA INFORMATION: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).

FLASH: > 55(131) C(F)

14. TRANSPORT INFORMATION

NOTE:The flash point of this material is > 131F. Regulatory classifications vary as follows:

DOT: Flammable Liquid OR Combustible Liquid - (49CFR 173.120(b)(2))
OSHA: Combustible Liquid
IATA/IMO: Flammable Liquid

USA DOT:

SHIPPING NAME: Diesel Fuel
HAZARD CLASS & DIV: COMBUSTIBLE LIQUID
ID NUMBER: NA1993
ERG NUMBER: 128
PACKING GROUP: PG III
STCC: NE
DANGEROUS WHEN WET: No
POISON: No
LABEL(s): NA
PLACARD(s): Combustible
PRODUCT RQ: NA
MARPOL III STATUS: NA

RID/ADR:

HAZARD CLASS: 3
PACKING GROUP: III
LABEL: 3
DANGER NUMBER: 30
UN NUMBER: 1202
SHIPPING NAME: Gas Oil
REMARKS: NA

IMO:

HAZARD CLASS & DIV: 3
UN NUMBER: 1202
PACKING GROUP: PG III
SHIPPING NAME: Gas Oil
LABEL(s): Flammable Liquid
MARPOL III STATUS: NA

ICAO/IATA:

HAZARD CLASS & DIV: 3
ID/UN Number: 1202
PACKING GROUP: PG III
SHIPPING NAME: Gas Oil
SUBSIDIARY RISK: NA
LABEL(s): Flammable Liquid

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Xn N Harmful, Dangerous for the environment.

Risk Phrase(s): R40-65-66-51/53.

Limited evidence of a carcinogenic effect. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S24-2-36/37-62.

Avoid contact with skin. Keep out of the reach of children. Wear suitable protective clothing and gloves. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Contains: Gas oil - unspecified.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES:
FIRE CHRONIC ACUTE

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ETHYL BENZENE (COMPONENT ANALYSIS)	100-41-4	0.5%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
NAPHTHALENE (COMPONENT ANALYSIS) (0.50%)	91-20-3	16, 22
ETHYL BENZENE (COMPONENT ANALYSIS)	100-41-4	1, 8, 24
DIESEL OIL..C9-20	68334-30-5	21, 26

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: DIESEL FUEL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS DIESEL OIL.. C9-20

WARNING!

COMBUSTIBLE LIQUID AND VAPOR. RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

MAY CAUSE SKIN CANCER ON PROLONGED, REPEATED SKIN CONTACT. ANIMAL SKIN ABSORPTION STUDIES RESULTED IN INCREASED MORTALITY, EFFECTS ON BODY WEIGHT, THE IMMUNE SYSTEM AND THE UNBORN CHILD. PROLONGED, REPEATED SKIN CONTACT MAY CAUSE IRRITATION. DIESEL EXHAUST MAY CAUSE LUNG CANCER.

Keep away from heat and flame. Avoid prolonged or repeated overexposure by skin contact or inhalation. Use with adequate ventilation. Keep container closed. Keep out of reach of children.

FIRST AID: If inhaled, remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. In case of contact, remove contaminated clothing. Dry wipe the exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself and others. Wear impervious gloves. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: C, TRN: 123455-22,
CMCS97: EMGF22, REQ: PS+C, SAFE USE: C
EHS Approval Date: 03APR2003

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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

EXXON -- EXXON GASOLINE, 030000 - 00380 -- 9130-00F005173

===== Product Identification =====

Product ID:EXXON GASOLINE, 030000 - 00380

MSDS Date:01/01/1987

FSC:9130

NIIN:00F005173

MSDS Number: BBRXG

=== Responsible Party ===

Company Name:EXXON/HOUSTON, TX 77001

Emergency Phone Num:(713) 656-3424

CAGE:FO023

=== Contractor Identification ===

Company Name:EXXON COMPANY U.S.A.

Box:2180

City:HOUSTON

State:TX

ZIP:77252-2180

Country:US

Phone:713-656-5949 / 713-656-3424

CAGE:29700

Company Name:EXXON/HOUSTON, TX 77001

CAGE:FO023

===== Composition/Information on Ingredients =====

Ingred Name:BENZENE (SARA III)

CAS:71-43-2

RTECS #:CY1400000

Fraction by Wt: 4.9%

OSHA PEL:1PPM/5STEL;1910.1028

ACGIH TLV:10 PPM; A2; 9192

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

Ingred Name:HEXANE (N-HEXANE)

CAS:110-54-3

RTECS #:MN9275000

Fraction by Wt: 1-3%

OSHA PEL:500 PPM

ACGIH TLV:50 PPM; 9293

EPA Rpt Qty:1 LB

DOT Rpt Qty:1 LB

Ingred Name:TOLUENE (SARA III)

CAS:108-88-3

RTECS #:XS5250000

Fraction by Wt: 50%

OSHA PEL:200 PPM/150 STEL

ACGIH TLV:50 PPM; 9293

EPA Rpt Qty:1000 LBS

DOT Rpt Qty:1000 LBS

Ingred Name:XYLENES (O-,M-,P- ISOMERS) (SARA III)

CAS:1330-20-7

RTECS #:ZE2100000

Fraction by Wt: 50%

OSHA PEL:100 PPM/150 STEL

ACGIH TLV:100 PPM/150STEL;9192
 EPA Rpt Qty:1000 LBS
 DOT Rpt Qty:1000 LBS

Ingred Name:TETRAETHYL LEAD (SARA III)
 CAS:78-00-2
 RTECS #:TP4550000
 OSHA PEL:S, 0.075MG/M3(PB)
 ACGIH TLV:S, 0.1 MG/M3(PB)9192
 EPA Rpt Qty:10 LBS
 DOT Rpt Qty:10 LBS

=====
 Hazards Identification
 =====

Effects of Overexposure:SKIN & EYE IRRIT, RESP TRACT, HEADACHES,
 DIZZINESS, ANESTHETIC, UNCONSCIOUSNESS, CNS EFFECT.

=====
 First Aid Measures
 =====

First Aid:IF SPLASHED, FLUSH EYES W/WATER FOR 15 MINS. CALL A PHYS. IN
 CASE OF SKIN CONTACT, REMOVE ANY CONTAMINATED CLOTHING/WASH W/SOAP
 & WATER. INHALATION: IF OVERCOME BY VAPOR, REMOVE FROM
 EXPOSURE/CALL A P HYS. IF INGESTED, DON'T INDUCE VOMITING.

=====
 Fire Fighting Measures
 =====

Flash Point:(-36F)
 Lower Limits:1.4%
 Upper Limits:7.6%
 Extinguishing Media:USE DRY CHEMICAL, FOAM OR CO2
 Fire Fighting Procedures:WATER MAY BE INEFFECTIVE. WATER COOL
 CONTAINERS.
 Unusual Fire/Explosion Hazard:IF A LEAK OR SPILL HAS IGNITED/USE WATER
 TO DISPERSE THE VAPORS/PROTECT MEN ATTEMPTING TO STOP LEAK.

=====
 Accidental Release Measures
 =====

Spill Release Procedures:SHUT OFF/ELIMINATE ALL IGNITION SOURCES. KEEP
 PEOPLE AWAY. RECOVER FREE PRODUCT. ADDAND, EARTH OR OTHER SUITABLE
 ABSORBENT TO SPILL AREA. MINIMIZE BREATHINGAPORS. MINIMIZE SKIN
 CONTACT. VENTILATE CONF INED SPACES. OPEN ALL WINDOWDOORS.

=====
 Handling and Storage
 =====

Handling and Storage Precautions:KEEP CONTAINERS CLOSED WHEN NOT IN
 USE. DON'T HANDLE OR STORE NEAR HEAT, SPARKS, FLAME OR STRO
 OXIDANTS. ADEQUATE VENTILATION REQUIRED.
 Other Precautions:FOR USE AS A MOTOR FUEL ONLY. DON'T USE AS A CLEANING
 SOLVENT/THINNER/OTHER NON-MOTOR FUEL USES. DON'T SIPHON BY MOUTH.
 MIN TS OF LIQ GASOLINE ASPIRATED INTO LUNGS CAUSE CHEM PNEUMONITIS

=====
 Exposure Controls/Personal Protection
 =====

Respiratory Protection:USE AIR-SUPPLIED RESP PROTECTION IN CONFINED OR
 ENCLOSED SPACES.
 Ventilation:PROVIDE >60 FEET PER MINUTE HOOD FACE VELOCITY.
 Protective Gloves:CHEM-RESISTANT
 Eye Protection:SPLASH GOGGLES/FACESHIELD
 Other Protective Equipment:USE CHEMICAL-RESISTANT APRON OR OTHER
 IMPERVIOUS CLOTHING.

Supplemental Safety and Health
MSDS DATE: 07/01/85

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:70F
Vapor Density:5
Spec Gravity:0.74
Solubility in Water:NEGLIGIBLE
Appearance and Odor:CLEAR COLORED LIQ (ORANGE) GASOLINE HYDROCARBON
Percent Volatiles by Volume:100%

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDANTS/LIQUID CHLORINE/OXYGEN/CALCIUM HYPOCHLORITE.
Stability Condition to Avoid:WILL NOT REACT VIOLENTLY WITH WATER.
Hazardous Decomposition Products:FUMES, SMOKE, CO, ALDEHYDES & OTHER
DECOMPOSITION PRODUCTS.

===== Disposal Considerations =====

Waste Disposal Methods:KEEP PRODUCT OUT OF SEWERS & WATERCOURSES BY
DIKING OR IMPOUNDING. ASSURE CONFORMITY WITH APPLICABLE
GOVERNMENTAL REGULATIONS. CONTINUE TO OBSERVE PRECAUTIONS FOR
VOLATILE, FLAMMABLE VAPORS FROM ABSOR BED MATERIAL.

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particular situation.



Chainsaw Oil

Product Description

Chainsaw Oil is specifically developed for the lubrication of chain and guide bars of modern chain saws. Selected mineral base oils are combined with special additives to provide good protection against wear, rust and corrosion. Chainsaw Oil has good low temperature flow properties which makes it suitable for outside applications even during the winter season.

Features and Benefits

Features	Advantages and Potential Benefits
Good adherence to metal surfaces	Stays well in place on saw chains and guide bars and ensures optimum component lifetime
Excellent protection against wear, rust and corrosion	Contribution toward increased chain and guide bar life and reduced maintenance costs as wear related failures are reduced
Low pour point	Ensures flow ability even at low operating temperatures for higher efficiency

Applications

Chainsaw Oil can be used in hand-held or machine operated chain saws as specified by the manufacturer. It is suitable for lubrication of chains, slideways and guides in industrial applications, where a lubricant with good adherence, protection against wear, rust and corrosion and a low pour point is required.

Typical Properties

Chainsaw Oil	
Viscosity, ASTM D 445	
cSt@40°C	87
cSt@100°C	11
Pour Point, °C, ASTM D 97	-24
Flash Point, °C, ASTM D 92, min.	220
Specific Gravity @ 15.6°C, kg/l, ASTM D4052	0.877

Health and Safety

Based on available information, this product is not expected to produce adverse effects on health when used for the intended application and the recommendations provided in the Material Safety Data Sheet (MSDS) are followed. MSDS's are available upon request through your sales contact office, or via the Internet. This product should not be used for purposes other than its intended use. If disposing of used product, take care to protect the environment.

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Typical Properties are typical of those obtained with normal production tolerance and do not constitute a specification. Variations that do not affect product performance are to be expected during normal manufacture and at different blending locations. The information contained herein is subject to change without notice. All products may not be available locally. For more information, contact your local ExxonMobil contact or visit www.exxonmobil.com

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ATTACHMENT B

**RESUMES AND CERTIFICATIONS FOR IDENTIFIED SAFETY
PERSONNEL**

LAWRENCE J. WERTS, III

Qualifications Summary

- Twenty-two years of professional experience.
- Eleven years of experience as a sampling/process technician. Duties include sampling soils, groundwater, surface water, and building surfaces; and pilot studies involving activated carbon, ion exchange, and activated aluminum technologies.
- Three years of experience coordinating reviews of aboveground storage tank (AST) compliance with federal regulations.
- One year of experience sampling asbestos for use in risk analyses and real estate assessments.
- Four years of experience coordinating training activities for an Army Reserve Unit.
- Three years of experience as an operator of a radioactive waste processing unit. Duties include personnel monitoring.
- Two years of experience providing training and inspections in hazardous waste management requirements.

Credentials

8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2012)
30-Hour Construction Safety and Health Training Course, OSHA 29 CFR 1926 Subparts C, E, M, P, & X, WESTON (2007)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), WESTON (1988)
Bloodborne Pathogens Training, OSHA 29 CFR 1910.1030, (2007)
Bloodborne Pathogens Refresher Training, OSHA 29 CFR 1910.1030, WESTON (2013)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), (1989)
DOT/IATA Hazardous Materials Training, 49 CFR 172 Subpart H, Bureau of Dangerous Goods, LTD (2006)
DOT/IATA Hazardous Materials Training – Refresher, 49 CFR 172 Subpart H, Lion Technology, Inc. (2011)
Confined Space Training – Entrant, Attendant, Non-Entry Rescue, OSHA 29 CFR 1910.146, WESTON (2000)
Trenching/Excavation Competent Person Training Course, OSHA 29 CFR 1026 Subpart P, WESTON (2007)
Fall Protection Competent Person Training Course – Initial, OSHA 29 CFR 1926 Subpart M, WESTON (2007)
Fall Protection Competent Person Training Course – Refresher, OSHA 29 CFR 1926 Subpart M
Dangerous Goods Shipping Procedures, 49 CFR 172 Subpart H, FedEx (2000)
Dangerous Goods Shipping Waste, 49 CFR 172 Subpart H, PADEP (2002)
CPR/First Aid Training, American Red Cross (2011)
The Emergency Program Manager, Federal Emergency Management Agency (FEMA) (1990)
Emergency Management U.S.A., FEMA (1991)
Hazardous Materials: A Citizens Orientation, FEMA (1991)
Radiological Emergency Management, FEMA (1991)
Preparedness Planning In Nuclear Crisis, FEMA (1991)
Fundamentals Course for Radiological Monitors (1992)

Employment History

1988-Present WESTON
1990-Present U.S. Army Reserve

Employment History (Continued)

1997-Pres	U.S. Army Intelligence Operation Detachment, Washington, DC
1995-1996	U.S. Army Corps of Engineers (Philadelphia District)
1990-1995	FEMA
1987-1988	Alternative Ways, Inc.
1983-1987	New Jersey Department of Defense
1980-1983	Hydro Nuclear Services
1977-1980	Philadelphia Inquirer

Key Projects

Technical Operations and Maintenance, Pennsylvania, Confidential Client, Technician.

Oversee the operation of six groundwater remediation systems. Responsibilities include minor electrical repairs and the rehabilitation of groundwater pumps and managing the overall sampling of the six remediation systems.

Technical Operations and Maintenance, Gibbsboro, NJ, Confidential Client, Technician.

Oversee the operation of a Thermal Oxidizer and Product Recovery System, and perform minor adjustments on both.

Hazardous Waste Management Training and Inspections, Philadelphia, PA, Philadelphia International Airport, Division of Aviation, Technician. Co-authored a training manual and presented training on hazardous waste management, and provide airport facilities personnel with technical advice on management of hazardous and nonhazardous waste by way of monthly inspections.

Air Monitoring for Abandoned Pipeline Removal, Philadelphia, PA, Philadelphia International Airport, Division of Aviation, Technician. Provided emergency air monitoring immediately after a 10-foot, 18-inch-diameter pipe was encountered during construction activities at the airport. This was followed by additional air monitoring and construction oversight during the safe removal of the pipe.

Hazardous Waste Removal, Philadelphia, PA, Philadelphia International Airport, Division of Aviation, Technician. Provided sampling and oversight for the removal of numerous waste drums from airport property. Also made arrangements with a subcontractor for the safe disposal of the drums.

Soil Sampling, Philadelphia, PA, Philadelphia International Airport, Division of Aviation, Technician. Collected more than 150 soil samples to determine levels of total petroleum hydrocarbons. Using a field screening kit, determined areas needing further characterization.

Absorption Pilot System Installation and Operations Project, Various Locations, U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), Senior Crew Chief. Installed and operated a granular-activated carbon (GAC) alumina and ion exchange resin adsorption pilot system for the removal of explosives, arsenic, and volatile organic compounds (VOCs) from groundwater. Sampling, plumbing of columns, pumps, air stripper, tanks, and laboratory data management.

Key Projects (Continued)

Soils Characterization, Various Locations, Confidential Client, Senior Technician.

Characterized petroleum- and polychlorinated biphenyl (PCB)-contaminated soils from natural gas compressor stations. Project included the mapping and collection of soil, water, destructive, wipe, and groundwater samples.

Water Characterization, Industrial Manufacturing Facility, AVTEX Fibers, Senior Technician. Characterized water contaminated with zinc from unknown sources at a large industrial manufacturing facility. The project included remote sampler setup, lithium chloride testing, and stormwater system mapping.

Groundwater Characterization, Tooele Army Depot, Tooele, UT, Senior Technician. The project included installation and operation of a small-scale air stripper collecting samples of trichloroethylene (TCE) to evaluate the effectiveness of removing TCE from groundwater.

Groundwater Sampling, Chattanooga, TN, USATHAMA, Senior Crew Chief. Conducted groundwater monitor well sampling, both on-site and domestic.

Weir Construction, Iron Mountain, CA, ICI, Senior Crew Chief. Assisted in the construction of weirs in remote locations. In addition, assisted in the installation of measurement devices.

Planning and Coordination, Pennsylvania, Chester County, Federal Emergency Management Agency (FEMA), Plans/Operations NCO. Duties include the review and production of plans, and the implementation of procedures relating to attack preparedness, radiological defense, and shelter. Review of nuclear power plant emergency procedures and emergency plans. Review of Nuclear Material License in Chester County. In addition, participates in the review of Part B applications regarding public safety and radiological exercises at nuclear power plants.

Sludge Dewatering Study, Delaware, Star Refinery, Senior Technician. Monitored sludge dewatering unit operations and conducted sludge sampling for process control/monitoring purposes.

Drum Removal, Lanchester Landfill, Chester County, Senior Technician. Oversaw the removal and overpacking of buried drums in Level B protection.

Remedial Investigation/Feasibility Study (RI/FS), Massachusetts, U.S. Army, Senior Technician. Sampling and data evaluation for a U.S. Army site whose mission involved the production and handling of depleted uranium, beryllium, heavy metals, organics, and radionuclides associated with the operation of a nuclear reactor on-site. Assisted the field team leader in scheduling and overseeing field operations, attended public meetings, and assisted in data interpretation. In addition, involved in the radiological surveys of buildings, including reactor building survey, and sanitary and stormwater pipes. Team leader providing health physics support for a mixed waste study, including drum sampling, equipment, contractor, and environmental sampling.

Key Projects (Continued)

Decontamination Support and Health Physics Support, Various Locations, Public Service Electric and Gas Company (PSE&G), Salem Nuclear Generating Station, Indiana and Michigan Electric Company, Donald C. Cook Nuclear Power Plant, Decontamination Technician, Respirator Fit Test Technician, Whole Body Count Technician, Health Physics Technician, and Radwaste Technician. Operator of a mobile counting laboratory and a radioactive waste processing unit involved in all types of decontamination motion work (floors, tools, walls, tanks, pumps, steam generators, reactor cavities, reactor parts, sump, and all other equipment associated with a nuclear power plant). Involved in health physics support (including radiation surveys, air monitoring, as low as reasonably achievable [ALARA] planning in high-radiation areas, to routine surveys of all types of equipment).

Lead-Based Paint Sampling, Fort Drum, NY, U.S. Army Corps of Engineers (USACE), Senior Technician. Involved in the development of a sampling procedure to obtain representative samples of building debris on a weight basis. Acts as a Team Leader in the sampling of 253 buildings slated for demolition.

CHRISTOPHER BAER, CSP

Qualifications Summary

- More than 9 years of professional environmental, health, and safety experience.
- Developed various project Health and Safety Plans. Demonstrated history of working safely, overseeing and/or modifying job processes to meet zero accident objectives.
- Nine years of environmental and operation experience involving field sampling of various matrices, including soil and water.
- Has led response teams during emergency responses in EPA Regions 2, 3, 4, and 6.
- Nine years of technical report preparation.
- Fifteen years as a member of a volunteer fire department.

Registration

Certified Safety Professional, Board of Certified Safety Professionals (No. 21895; 2010)
Licensed Asbestos Building Inspector in Commonwealth of Pennsylvania (No. 041810; 2010)

Education

B.S., Environmental Science—Kutztown University of Pennsylvania (2002)

Credentials

CEHS Summit 2011 Day 1, WESTON (2011)
CEHS Summit 2011 Day 2, WESTON (2011)
CEHS Summit 2011 Day 3, WESTON (2011)
EPA Forms II Lite, Dyn Corp. (2010)
Boating Safety, Pennsylvania Fish and Boat Commission (2011)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), All American Environmental Services, Inc. (2002)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2013)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), (2004)
30-Hour Construction Safety and Health Training Course, OSHA 29 CFR 1926, WESTON (2010)
Trenching/Excavation Competent Person Training Course, OSHA 29 CFR 1026 Subpart P, WESTON (2010)
Fall Protection Competent Person Training Course – Initial, OSHA 29 CFR 1926 Subpart M, WESTON (2010)
Homeland Security Exercise and Evaluation Program, FEMA EMI (2012)
Response Readiness Training/Level A Weapons of Mass Destruction, U.S. Environmental Protection Agency (2004)
Project Management Training – Level 2, Tetra Tech (2007)
Level B PPE Training, WESTON (2002)
Confined Space Training – Entrant, Attendant, Non-Entry Rescue – Initial, OSHA 29 CFR 1910.146, WESTON (2002); Refresher, GeoTrans (2010)
Advanced Radiation Training, EPA (2003)
ICS-100 Introduction to Incident Command System, FEMA (2010)
ICS-200 Basic Incident Command System, FEMA (2010)

Credentials (Continued)

IS-300/IS-400, Advanced Incident Management Training, Incident Management Training Consortium (2003)
IS-700 National Incident Management System (NIMS), FEMA (2005)
IS-800 National Response Plan (NRP), an Introduction, FEMA (2005)
EPA AHERA Inspector Training – Refresher, Criterion Laboratories, Inc. (2012)
Rapid Assessment Tools, EPA Region 5 (2005)
Shipping and Transporting Dangerous Goods – Administrative/Field Personnel – Initial, Weston Solutions, Inc., Manual of Procedures for Shipping and Transporting Dangerous Goods Training Course, 49 CFR 172 Subpart H, WESTON (2003)
Hazardous Waste Management and Shipping for Environmental Professionals, 40 CFR 265.16, Eduwhere (2002)
First Aid/CPR/AED Training, American Heart Association (2012)
Bloodborne Pathogens Training –Initial, OSHA 29 CFR 1910.1030, (2003); Refresher, WESTON (2013)
Boating Safety Certificate, State of New Jersey (1999)
Fire-Fighter Essentials, Northampton County Community College (1996)
Hazardous Materials Awareness Training, NFPA 472, Bucks County Community College (2011)
Respiratory Protection 1, Bucks County Community College (1999)
Principles of Chemical Emergency Preparedness Course, EPA Region 3 (2010)
Emergency Vehicle Driver Training (EVOC), Bucks County Community College (2010)
Radiation/Nuclear Awareness, Counter-Terrorism Operations Support Program for FEMA, National Preparedness Directorate (2010)
Technical Emergency Response Training for CBRNE Incidents, Center for Domestic Preparedness (DHS), FEMA (2011)

Employment History

2010-Present WESTON [7-10 to Present; West Chester, PA; Associate Geoscientist]
2006-2010 GeoTrans, Inc. [Senior Environmental Scientist]
2005-2006 Environmental Waste Minimization, Inc. [Field Technician]
2002-2005 WESTON [Project Scientist]

Key Projects

BioWatch Program, U.S. Environmental Protection Agency (EPA) Region 3, Superfund Technical Assessment and Response Team (START) -4, Task Leader. Serving as Task Leader for the START BioWatch program in EPA Region 3, including two separate BioWatch jurisdictions. Responsibilities include developing and maintaining BioWatch Phase I and Phase II sampling plans, maintaining and updating BioWatch Phase I sampling kits, attending BioWatch Action Committee and Core Work Group meetings, and developing and participating in Homeland Security Exercise and Evaluation Program (HSEEP) compliant exercises. (2010 to Present; WESTON]

Principles of Chemical Emergency Planning, EPA Region 3, START-4. Assisted with development of the Principles of Chemical Emergency Planning course. Developed mock

Key Projects (Continued)

Facility and Community Chemical Emergency Response Plan; designed an HSEEP-compliant tabletop exercise for class participants to test the mock Corporate Emergency Response Plans (CERPs) Delivered an abridged version of the course (1 day) at the 2011 Emergency Planning and HazMat Response conference in Pittsburgh, PA. [2010 to 2012; WESTON]

Removal/Assessment Activities, Powhatan Mining Company Site, EPA Region 3, START-4, Project Leader. Project Leader for removal and assessment actions at the former Powhatan Mining Company site. Site was the location of a former amphibole asbestos processing facility. Developed multimedia sampling plans for on-site and nearby residential properties. Collected perimeter, personal, and interior air samples to be analyzed for asbestos. Procured laboratory for various asbestos analyses. Conducted activity bases sampling on-site and at nearby residences. [2010 to 2012; WESTON]

Hazard Analysis, AGMET, Delano, PA, EPA Region 3, START-4. Led entry teams to conduct hazard category analysis of 500+ containers at an abandoned precious metals recycler. Level B and C entries were made to conduct a hazardous materials inventory and container sampling. Level B and C entries were conducted over a 3-week period with approximately 4 to 8 hours per day spent in personal protective equipment (PPE). Conducted hazard categorization utilizing the HAZCAT chemical identification system, HAZMAT ID Ranger, and Ahura 1st Defender for 800+ samples. Utilized EPA Emergency Response Team's (ERT) DrumTracker software to manage hazard categorization data and results. [2011; WESTON]

Teris El Dorado Explosion, El Dorado, AR, EPA Region 6, START-2. Conducted emergency response activities for an explosion and fire involving a warehouse at a hazardous waste incineration facility storing acids/bases, oxidizers, flammables, and flammable metals. Led the air monitoring team including four START personnel responsible for conducting air monitoring and air sampling to determine the impact to the surrounding area and plume delineation. Coordinated laboratory analysis of air samples collected during the response for analysis of pesticides, herbicides, metals, semivolatile organic compounds (SVOCs), acid gases, and volatile organic compounds (VOCs). Conducted oversight of fire suppression, decontamination, and remediation activities. [2005]

Hazard Analysis, RTF Pyrotechnics and Electroplating, Marshall, TX, EPA Region 6, START-2, Field Team Leader. Was responsible for four START personnel. Led hazard category analysis activities and conducted Level B and C sampling for 1,000 plus containers utilizing HAZCAT chemical analysis. Level B and C sampling required approximately 2 weeks of entries with daily entries totaling approximately 4 to 6 hours in the exclusion zone (EZ). Sampling included using electrostatic dispersal devices for shock-sensitive materials. Utilized Inficon HAPSITE gas chromatograph/mass spectrometer (GC/MS) to identify contents of drums. Inventoried containers and managed associated data utilizing EPA ERT's DrumTracker software. Assisted the U.S. Bureau of Alcohol, Tobacco, and Firearms (ATF) in stabilization of potentially shock-sensitive chemicals and removal of destabilized diethyl ether peroxide. Assisted in conducting informal hazardous materials response training to the local fire department, including a Class D burn session. [2004; WESTON]

Key Projects (Continued)

Mustard Tank Investigation, Aberdeen, MD, U.S. Army Garrison, Aberdeen Proving Ground (APG), Directorate of Safety, Health, and Environment (DSHE), Entry Team Member. Conducted an investigation for the presence of a mustard gas tank and/or mustard gas contamination in an underground concrete storage vault requiring Level B PPE. Level B PPE investigation occurred over a 3-week period with approximately 4 to 8 hours per day spent in Level B PPE. [2002; WESTON]

Waste/Production Material Sampling, S&K Industries, Tulsa, OK, EPA Region 3, START-2, Entry Team Leader. Served as Entry Team Leader during Level B and Level C entries to collect samples of waste and production materials at a former chrome-plating facility. Conducted HAZCAT analysis of unknown samples collected during Level B and C entries. Level B and C PPE work was conducted over a 1-week period with approximately 4 to 6 hours per day spent in PPE. [2004; WESTON]

BP Pipeline Oil Spill, Edmond, OK, EPA Region 6, START-2. Conducted oversight activities at an emergency response for a 10,000-barrel crude oil spill in a local park. Coordinated with local, state, and federal officials to ensure proper cleanup of the impacted areas and conducted real-time air-monitoring for benzene, H₂S, lower explosive limit (LEL), and hydrocarbons. Provided data analysis of the air-monitoring results. [2003; WESTON]

Columbia Shuttle Recovery, Palestine, TX, EPA Region 6, START-2, Assistant Field Team Leader. Managed up to 75 START personnel at the Palestine Base Camp for the Columbia shuttle recovery project. Daily duties of the project were to document the recovery of shuttle debris through the use of personal global positioning system (GPS), Personal Digital Assistant (PDA) database, photographic documentation, and provide near-real-time data to the Disaster Field Office. Provided health and safety oversight for over 100 field personnel. [2003; WESTON]

Fire, Hazardous Materials, Vehicle, Water Emergencies, Northampton and Harleysville, PA, Volunteer First Responder. Active member of a volunteer fire department since 1996. Responded to various emergencies including commercial/noncommercial structure fires, brush fires, odor investigations, carbon monoxide alarms, vehicle accidents, and water rescues. Currently certified in structural fire fighter, hazmat awareness, water rescue, and dive rescue. Typical PPE include Level B fire-fighting ensemble for fire fighting, chemical-resistant dry suit, and self-contained breathing apparatus (SCUBA) with full-face respirator ensemble for dive rescue. [1996 to Present]

Liberty Radiation Exercises, Philadelphia, PA, EPA Region 3, START-3 CERT. Participated in a national Tier 2 full-scale exercise based on a simulated terrorist attack involving a radiological dispersal device (RDD) as part of the Technology, Mitigation, and Assessment Team (TMAT) under the Environmental Unit in the Planning Section of the Incident Command System (ICS). TMAT was tasked with developing the cleanup plan for areas impacted by the RDD release. The cleanup plan included cleanup technology selection and preliminary assessment, then based on two representative sample areas (residential and business), analyzed and summarized the following: land-use characteristics, radioactive deposition and dose rates, prioritization and estimated time lines, cleanup tactics and technologies, required resources, waste management, and estimated costs. [2010]

Key Projects (Continued)

Operation Black Leg, Dallas/Fort Worth Metroplex, TX, EPA Region 6, START-2.

Managed a team of 8 START personnel under National Incident Management System (NIMS) as Operations Section Chief for emergency response activities at a mock biological weapons production facility working in conjunction with the FBI. Response activities included development of a Quality Assurance Sampling Plan to delineate contamination outside the facility; Level A, B, and C entries for initial reconnaissance; evidence preservation and sample collection; establish evacuation zones utilizing the On-Scene Coordinator Area Response System extension of ArcView 3.2; performed geographic information system (GIS) analysis to identify sensitive receptors near the facility, and coordinated laboratory analysis of potential biological agent samples. [2004; WESTON]

Mass Decontamination Drill, Arlington, VA, EPA Region 3, START-3 CERT, Team Member.

Member of the decontamination team during a mass decontamination drill designed by the Pentagon Force Protection Agency to determine the effectiveness of two different self-decontamination techniques. Drill used *Bacillus thuringiensis* to mock an anthrax release outside the Pentagon that would be detectable using sampling and laboratory techniques used to identify anthrax in a real world incident. Tasks included sampling personnel who were potentially exposed to *Bacillus thuringiensis* to determine the effectiveness of the two self-decontamination techniques being evaluated. [2009; GeoTrans, Inc.]

Super Bowl 2004, Houston, TX, EPA Region 6, START-2. Led three START roving monitoring teams, which included two personnel each. Responsibilities included air monitoring, data collection in Response Manager in key locations around Reliant Stadium. Produced maps using ArcGIS 8.0 to show locations of sensitive receptors and key facilities around Reliant Stadium. [2004; WESTON]

Operation River City, Louisville, KY, EPA Region 4, START-2, Entry Team Leader.

Served as Entry Team Leader during Level A and B entries into a mock chemical and biological weapons laboratory with FBI, EPA Criminal Investigation Division (CID), and U.S. Coast Guard (USCG) Gulf Strike Team. Entries were made to conduct reconnaissance of the laboratory to identify agents and hazardous substances and to collect samples for laboratory analysis, and preserve evidence. Exercise was 3 days and included 24-hour operations. Approximately 6 to 8 hours per shift were spent in Level A or B PPE. [2003; WESTON]

Emergency Response Equipment Maintenance, TX, EPA Region 6, START-2. Maintained EPA-owned emergency response equipment including weekly inspections, calibrations, and service. Advised EPA on new technology and emergency response equipment. Equipment included air monitoring and sampling, water quality, chemical identification/hazard analysis, Level A suits, SCBA units, communications, and emergency response vehicles. [2003 to 2005; WESTON]

Environmental, Health, and Safety (EHS) Course, EPA Region 3, START-3 CERT.

Assisted with preparation and co-instructed several EHS courses for first responders. Courses included HAZMAT Technician, HAZMAT Operations, HAZMAT Chemistry, Air Monitoring, Weapons of Mass Destruction (WMD) Awareness, Oil Spill Response, and Radiation Response courses. [2006 to 2010; GeoTrans, Inc.]

Key Projects (Continued)

EPA On-Scene Coordinator (OSC) Readiness Exercise, EPA Region 6, START-2. Assisted with the preparation and co-instructed 2-day classroom and practical sessions focusing on environmental emergency response skills including: Level A, B, and C PPE; air monitoring; hazard analysis; WMD awareness; sampling; and decontamination. [2003 to 2004; WESTON]

Annual Resource Conservation and Recovery Act (RCRA) Refresher Training, Baltimore, MD, Maryland Aviation Administration (MAA). Developed and conducted annual RCRA refresher training for all MAA employees that work with hazardous waste. Training included proper sample handling, labeling, and storage. [2002 to 2003; WESTON]

Operations and Maintenance (O&M) for Groundwater/Leachate Recirculation System, Superfund Site, Mt. Holly, NJ, Confidential Client. Conducted O&M activities for an innovative groundwater and leachate recirculation system to contain a groundwater plume and degrade source material within a landfill cell using water and air injection/extraction. Design was approved by New Jersey Department of Environmental Protection (NJDEP) and EPA and construction was completed in February 2007. Performed work integral to revising a previous risk assessment (RA) and feasibility study (FS) for the Superfund site in central New Jersey. Tasks included operation of treatment systems including entering, monitoring, and assessing confined spaces; weekly inspections; groundwater sampling; and oversight of well installation and construction subcontractors. Coordinated laboratory analysis for groundwater and air samples collected at the site. Wrote the Quality Assurance Sampling Plan to determine the effectiveness of the air injection/extraction system. [2006 to 2010; GeoTrans, Inc.]

Wetlands Remediation/Restoration, Rowe, MA, Yankee Atomic Energy Company. Conducted activities to remediate and restore a stream and wetland impacted by low-level radioactive contamination. Remediation and restoration activities included rerouting the flow of the impacted stream through the use of polyvinyl chloride (PVC) piping and submersible pumps, removal of contaminated material, survey of the extent and depth of excavation, and restoration of the stream and associated wetland to Massachusetts Department of Environmental Protection (MassDEP) requirements. [2005]

Superfund Emergency Removal Assessment, Hampton, VA, EPA Region 3, START-3 CERT. Led investigation activities at a former dry cleaners site. Investigation activities included: hazard category analysis activities for containers; subsurface investigation utilizing a Geoprobe® with membrane interface probe (MIP) technology; collecting surface and subsurface soil samples; screening soil samples utilizing a photoionization detector (PID); collecting groundwater samples from temporary groundwater wells; and recording sample location information utilizing a Trimble GPS. Coordinated Contract Laboratory Program (CLP) laboratory analysis for soil and groundwater samples collected as part of the investigation. Samples were analyzed for VOCs and SVOCs. Interpreted MIP data. [2009; GeoTrans, Inc.]

Multimedia Sampling, Aberdeen, MD, U.S. Army Garrison at APG, DSHE, Field Team Member. Conducted surface-water, groundwater, soil, sediment, and vegetation sampling for alpha radiation contamination. Arranged for laboratory analysis and screening for chemical warfare agents (CWAs). Packaged and shipped environmental samples to appropriate laboratories. [2002 to 2003; WESTON]

Key Projects (Continued)

Polychlorinated Biphenyl (PCB) and Lead-Contaminated Soil Investigation and Remediation, Multiple Sites in New Jersey, Ford Motor Company, Land Division. As part of an NJDEP-ordered emergency removal assessment/action to clean up the site, led field activities during investigation and remediation of PCB- and lead-contaminated soils and crushed concrete. Investigative activities included surface and subsurface soil sampling, and soil classification and VOC monitoring of soil borings. Remediation activities included oversight of remediation contractors, air monitoring, air sampling, hazardous and nonhazardous waste manifesting management, soil disposal classification sampling, and post-excavation sampling. [2006]

BOARD OF CERTIFIED SAFETY PROFESSIONALS

affirms that

Christopher M Baer

Has applied for, met qualifications, and passed required examination(s) and is hereby authorized to use the designation

Certified Safety Professional®
in Comprehensive Practice

So long as this certificate is not suspended or revoked and the certificant renews this authorization annually and meets Continuance of Certification requirements.

Board of Examiners in witness whereof we have here unto
set our hands and affixed the Seal of the Board this
15th Day of October, 2010



Samuel J. Guadalupe

President

Thomas H. D.

Secretary

21895

CSP No.





This Certifies That

CHRISTOPHER BAER

Has Completed the

30-Hour Construction Safety and Health Training Course

In accordance with OSHA Outreach Training Program (Includes Competent Person Instruction as indicated in 29 CFR 1926 Subparts C, E, M, P, & X) completed on 10/01/2010 in West Chester, PA

A handwritten signature in black ink, appearing to read "Owen B. Douglass, Jr.", with "PhD, CIH" written below it.

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink, appearing to read "Theodore L. Blackburn", with "CSP, CET" written below it.

INSTRUCTOR

Theodore L. Blackburn CSP, CET

82_1947_10012010

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This Certifies That

CHRISTOPHER BAER

Has Completed the

8-Hour Site Manager And Supervisor Training Course

In Accordance With 29 CFR 1910.120(e)(4) completed on 07/30/2004 in Dallas, TX

A handwritten signature in black ink, appearing to read "Owen B. Douglass, Jr.", with "PhD, CIH" written below it.

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink, appearing to read "James E. Davis II", with "PG, CSP" written below it.

INSTRUCTOR

James E. Davis II PG, CSP

Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380

Heartsaver® First Aid CPR AED



Training Center Name ZEE MEDICAL, INC. TC ID # CA 20194

TC Info IRVINE, CA 92606 ^{PH} (877)275-4933

Course Location READING, PA

Instructor Name JAMES SHUMAN Inst ID # 05101861923

Holder's Signature

© 2011 American Heart Association Tampering with this card will alter its appearance. 90-1815

CHRIS BAER

This card certifies that the above individual has successfully completed the objectives and skills evaluations in accordance with the curriculum of the AHA Heartsaver First Aid CPR AED Program. Optional completed modules are those **NOT** marked out:
Child CPR AED ~~Completed~~ Written Test ~~Completed~~

9/20/2012

Issue Date

09-2014

Recommended Renewal Date

→
PEEL
HERE
→

Strike through the modules **NOT** completed.

This card contains unique security features to protect against forgery.

TRAINING CERTIFICATION

In Compliance With OSHA 1910.120

Christopher M. Baer

has successfully completed a training course entitled:

40-hr Hazardous Waste Site Worker

Certificate Expires:

07/03



School Director



This Certifies That

CHRISTOPHER BAER

Has Completed the

8-Hour HAZWOPER Refresher Training Course

In accordance with 29 CFR 1910.120(e)(8) completed on 01/30/2013 in West Chester, PA

A handwritten signature in black ink, reading "Owen B. Douglass, Jr., PhD, CIH".

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink, reading "Owen B. Douglass Jr., PhD, CIH".

INSTRUCTOR

Owen B. Douglass Jr., PhD, CIH

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This Certifies That

CHRISTOPHER BAER

Has Completed the

Bloodborne Pathogens Training Course Refresher

In accordance with 29 CFR 1910.1030 completed on 01/30/2013 in West Chester, PA

A handwritten signature in black ink that reads "Owen B. Douglass, Jr., PhD, CIH".

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink that reads "Owen B. Douglass Jr., PhD, CIH".

INSTRUCTOR

Owen B. Douglass Jr., PhD, CIH

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BRUCE A. CARNAL

Qualifications Summary

- More than 28 years of EOD expertise garnered through active military duty and UXO private industry clearance operations.
- Ensured safe storage of hazardous materials and proper disposal.
- Selected and ensured proper PPE was available based on hazardous material stored on-site.
- Scheduled and provided health and safety training to personnel including chemical and incident response, and selection and proper use of PPE.

Registration

Blaster's License in State of New Jersey, New Jersey
Department of Labor
Blaster's License in Commonwealth of Kentucky and State of
West Virginia, West Virginia State Fire Marshal
Blaster's License, USACE (No. 1932)
Permit to Use Explosives (Class A Unlimited) in State of West
Virginia
License to Purchase Explosives, Bureau of Alcohol, Tobacco,
and Firearms (ATF)
UXO Certification, USACE Huntsville Center (No. 1932)
Blaster Certificate of Competence, New York Department of
Labor (No. 10-4954)
Certified Welder in State of North Carolina

Education

Basic EOD School, U.S. Navy (1983); Refresher (1996)

Credentials

DOT Hazardous Materials Transportation, 49 CFR 172 Subpart
H, Eduwhere (2011)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29
CFR 1910.120(e)(4), WESTON (2011)
Trenching/Excavation Competent Person Training Course,
OSHA 29 CFR 1026 Subpart P, WESTON (2011)
Fall Protection Competent Person Training Course – Initial,
OSHA 29 CFR 1926 Subpart M, WESTON (2011)
Bloodborne Pathogens Refresher Training, OSHA 29 CFR
1910.1030, WESTON (2013)
First Aid/CPR/AED Training, American Safety and Health
Institute (2013)
Commercial Drivers License with HAZMAT Endorsement, DOT
(2008)
40-Hour Licensed Blaster Course, Kentucky Department of
Mines and Minerals (2001)
40-Hour Health and Safety Training, OSHA 29 CFR
1910.120(e)(3), OHM (1989)
40-Hour Hazardous Waste Site Worker Training, OSHA 29 CFR
1910.120(e)(3), KCTCS (2009)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR
1910.120(e)(8), WESTON (2013)

Credentials (Continued)

30-Hour Construction Safety and Health Training Course, OSHA 29 CFR 1926, WESTON (2011)

Basic Explosive Ordnance Disposal, Naval School Explosive Ordnance Disposal (1983)

Employment History

2009-Present WESTON

2010-2011 Tetra Tech NUS

2007-2009 Chimera Enterprises

2000-2007 Impact Drilling and Blasting

1980-2000 U.S. Marine Corps, Active Duty

Key Projects

Remedial Action (RA) at Tobyhanna Artillery Range (TOAR), Formerly Used Defense Site (FUDS), Tobyhanna State Park, PA, U.S. Army Corps of Engineers (USACE) Military Munitions Response Program (MMRP), Unexploded Ordnance Safety Officer (UXOSO).

Responsible for the safety program for the three to four UXO teams involved in the remediation process while ensuring the safety of the public and their continued use of the State Park.

Responsible for setup and safe demolition of UXO items found. Ensured team and public safety in accordance with Army Regulations (ARs), EM 385-1-97, EM 385-1-1, and other USACE publications. [11-09 to Present]

Remedial Investigation (RI) at 11 Munitions Response Sites (MRSs), U.S. Military Academy, West Point, NY, MMRP, UXOSO/UXO Quality Control (UXOQC).

Took part in identifying and evaluating unknown historical UXO items and their potential risk to the base inhabitants and obviated their hazard by either proper identification or disposal. Ensured team and public safety in accordance with pertinent ARs, EM 385-1-97, EM 385-1-1, and other USACE publications. Passed inspection from WESTON Corporation Safety and Health personnel with high marks. Maintained a good working relationship with on-site USACE Ordnance and Explosive Safety Specialist (OESS) and provided the U.S. Military Academy (USMA) Museum with rare ordnance pieces deemed munitions debris (MD) but of historical significance. Responsible for the safe, quality execution of performance-based task order (TO) on this highly complex stakeholder-rich facility. Duties include daily safety coordination with Directorate of Public Works (DPW) Environmental Management Division staff, Directorate of Emergency Services (DES), residents, and tenants of other facilities on-post. Supervised safety of over 12 on-site multidisciplinary staff including UXO personnel, munitions constituent (MC) samplers, geophysicists, surveyors, and community outreach staff. Conducted daily safety briefings; was responsible for ensuring field personnel were working in accordance with the site Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP); and ensured personnel were wearing appropriate personal protective equipment (PPE). Responsible for monitoring staff and exclusion zone from safety perspective and for quality control (QC) purposes.

RI of Ricochet Area MRSs in State Game Lands 211, Fort Indiantown Gap, PA, Pennsylvania National Guard, MMRP, UXO Team Leader. Responsible for supervision of UXO team and MC sampling personnel. Traversed more than 100 miles over very treacherous

Key Projects (Continued)

rocky sloped terrain. Numerous physical hazards and biological hazards were present. Safely supported the demolition, collection, and disposal of all recovered munitions and MD. [11-09 to Present]

UXO Avoidance Support, Stone Mountain, GA, U.S. Navy, UXO Technician III/UXOSO and UXOQC. Served as UXO Construction Site Supervisor while conducting UXO avoidance support and visual survey for Comprehensive Long-Term Environmental Actions Navy (CLEAN), Indian Head, MD, and Pensacola, FL. The following are highlights of health and safety activities completed:

- Conducted daily safety briefings.
- Ensured personnel were adhering to site Health and Safety Plan (HASP).
- Ensured personnel were wearing proper PPE and selected PPE based on tasks and season.
- Ensured the staff adhered to project QC requirements.

UXO Range Operations, Fort Lewis, WA, UXO Technician II/III Team Leader. Served as UXO Construction Site Supervisor conducting UXO range operations at Fort Lewis, WA. The following highlight the health and safety activities:

- Responsible for ensuring field personnel were working in accordance with site APP/SSHP.
- Ensured personnel were wearing appropriate PPE.
- Ensured the project QC was adhered to as outlined in project plans.

G-Street Salvage Yard Remedial Action, Aberdeen Proving Ground (APG), MD, Directorate of Safety, Health, and Environment (DSHE), UXO Team Leader. Was UXO Team Leader responsible for complying with the Sampling and Analysis Plan (SAP), Contractor Quality Control Plan (CQCP), and Site-Specific Safety and Health Plan for remediation of the G-Street Salvage Yard at APG. Served as UXO Team Leader during remediation of the Burn Residue Disposal Area portion of the site, which was conducted in Level A PPE due to the potential for encountering chemical warfare materiel (CWM). Management of the team included monitoring, sampling, and removal. [12-07 to 1-09]

UXO Clearance/Construction Support, APG, Edgewood, MD, UXO Technician II/III Team Leader. Served as UXO Construction Site Supervisor while conducting UXO clearance and construction support, subbing to Tech Escort and WESTON on APG. Supervised heavy equipment operations.

UXO Construction Site Supervision, Various Locations, Blasting Superintendent. Ensured blasting safety was adhered to on numerous job sites. Heavy equipment was used in operations. All operations were conducted safely with no safety violations. The following highlight the health and safety activities:

- Conducted daily safety briefing to ensure blasting/site work was conducted in a safe manner.
- Established safe blasting zone and ensured established zones were adhered to.

Key Projects (Continued)

- Ensured proper storage of explosives and detonators in accordance with Kentucky Department of Mines and Minerals, MSAH, and Bureau of Alcohol, Tobacco, and Firearms (ATF) regulations.
- Conducted housekeeping inspections to ensure magazines and job sites were maintained in a safe condition.
- Established magazines and safety zones based on safe storage capacities to ensure storage quantities did not exceed the safe storage capacities.
- Selected PPE and ensured personnel were wearing proper PPE for each task.

Development of Explosive Wash-Out System (EWOS), 2D EOD PLT, 2D FSSG, Camp Lejeune, NC, Explosive Ordnance Disposal (EOD) Supply Chief. Performed stated Supply Chief duties. Helped develop a U.S. Environmental Protection Agency (EPA)-compliant EWOS, enabling unit to conduct large-scale inerting of ordnance items for NAVSEASYS COM and other external commands in a safe and environmentally friendly manner. Ensured that the unit was in compliance with installation, state, and federal EPA standards. [10-98 to 6-00]

Range Use Scheduling EOD Support, Camp Fuji EOD, Maine Corps Base (MCB) Camp Fuji, Japan EOD Noncommissioned Officer-in-Charge (NCOIC). Scheduled range usage and provided EOD support for tenant units aboard Camp Fuji. Served as UXO Construction Site Supervisor weekly or as needed during range sanitization in conjunction with Japanese EOD/Fuji Schools personnel. Provided supervision as Range Safety Officer (UXO Construction Site Supervisor) and Range NCOIC. Ensured U.S. Marine Corps (USMC) and Japanese safety regulations were adhered to at all permanent and tenant units. [10-97 to 10-98]

EOD Teams, 2D EOD PLT, 2D FSSG, Camp Lejeune, NC, EOD Supply and Hazardous Materials (HAZMAT) Chief. Maintained five EOD team sets and requisite vehicles for the Platoon and deploying detachments. Coordinated external transport and logistics while serving as Range Safety Officer (UXO Construction Site Supervisor) for Platoon field operations, UXO disposal operations, and UXO inerting operations. [6-94 to 12-95]

Range Clearance, 3D EOD PLT EOD Detachment, 3D FSSG, Camp Hansen, Okinawa, Assigned to EOD Team, MCB Camp Fuji, Japan, EOD Team Leader. Coordinated with NCOIC, Camp Fuji EOD, and Japanese EOD units to assist with range clearance and disposal. Was Range Safety Officer (UXO Construction Site Supervisor) during range clearance and disposal operations. Provided EOD support to tenant units while training aboard Camp Fuji. [6-93 to 6-94]

Range Clearance/Disposal, MALS-26 EOD, 2D MAW, MCAS New River, NC, EOD NCOIC. Ensured team training, safety, and proficiency. Scheduled and assigned as Range Safety Officer (UXO Construction Site Supervisor) during range clearance, disposal, and inerting operations, coordinating with other co-located EOD units. Provided EOD support for Combined Arms Exercise (CAX) at 29 Palms, CA. [6-92 to 7-93]

Range Clearance Schedule, Inerting Operations, MALS 29 EOD, 2D MAW, MCAS New River, NC, EOD Technician. Continued range clearance schedule as well as inerting operations while assigned as Range Safety Officer (UXO Construction Site Supervisor). Deployed to

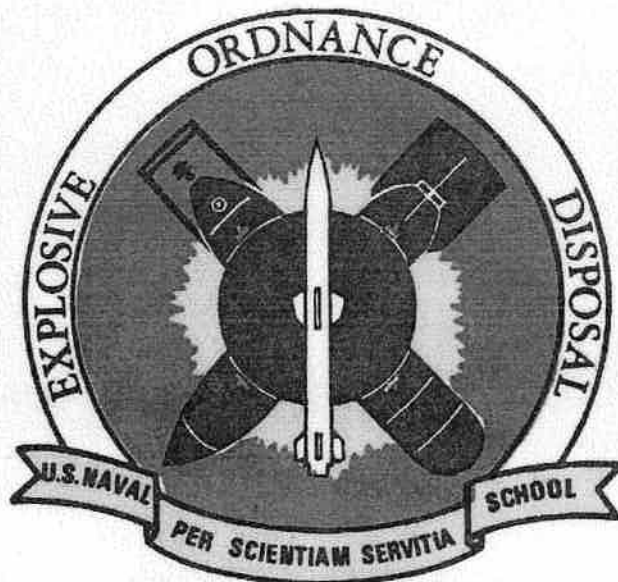
Key Projects (Continued)

Norway in support of squadron aviation assets. Trained personnel on UXO safety. Deployed to Saudi Arabia/Kuwait during Operation Desert Shield/Desert Storm in January-May 1992 in support of combat operations including supporting Saudi Arabian National Guard (SANG) units immediately after the Battle of Kahafji. Served as Range Safety Officer (UXO Construction Site Supervisor) while conducting UXO clearance, UXO disposal, and inerting operations. [6-88 to 6--92]

Range Clearance, 2D EOD PLT, 2D FSSG, Camp Lejeune, NC, EOD Technician.

Conducted monthly/bi-monthly range clearances. Took part in numerous ordnance inerting and disposal operations. Assigned to two separate Med Floats and conducted range clearance/disposal/range support operations in Norway, England, Germany, Spain, Italy, Morocco, and Puerto Rico. [12-83 to 6-88]

Naval School Explosive Ordnance Disposal



This certifies that

Corporal
Bruce A. Carnal, 524-82-0734, USMC

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL

is awarded this
Certificate

this 16th day of December A.D. 1983

J. Sedlak, Jr.
J. SEDLAK, JR., CDR, USN
COMMANDING OFFICER



This is to certify that

Bruce A. Carnal

has successfully completed the following course

40-Hr Hazardous Waste Site Worker

Per 29 CFR 1910.120

As conducted by the Kentucky State Fire Commission and the Midwest Consortium for Hazardous Waste Worker Training

September 21, 2009

Date

KCTCS09210940H01

Certification Number

Director, Hazardous Materials Training Center

Three days of site-specific training

Per 29 CFR 1910.120 was conducted

on _____

Signature

Date



This Certifies That

BRUCE CARNAL

Has Completed the

30-Hour Construction Safety and Health Training Course

In accordance with OSHA Outreach Training Program (Includes Competent Person Instruction as indicated in 29 CFR 1926 Subparts C, E, M, P, & X) completed on 03/11/2011 in West Chester, PA

A handwritten signature in black ink, appearing to read "Owen B. Douglass, Jr.", with a stylized flourish at the end.

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink, appearing to read "Theodore L. Blackburn", with a stylized flourish at the end.

INSTRUCTOR

Theodore L. Blackburn

82_16433_03112011 *Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380*



This Certifies That

BRUCE CARNAL

Has Completed the

8-Hour Site Manager and Supervisor Training Course

In accordance with 29 CFR 1910.120(e)(4) completed on 03/24/2011 in Belcamp, MD

A handwritten signature in black ink, appearing to read "Owen B. Douglass, Jr., PhD, CIH".

TRAINING MANAGER

Owen B. Douglass, Jr., PhD, CIH

A handwritten signature in black ink, appearing to read "George M. Crawford Jr, CIH".

INSTRUCTOR

George M. Crawford Jr CIH

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This Certifies That

BRUCE CARNAL

Has Completed the

8-Hour HAZWOPER Refresher Training Course

In accordance with 29 CFR 1910.120(e)(8) completed on 04/04/2013 in Tobyhanna , PA

A handwritten signature in black ink that reads "Ted Blackburn CSP, CET".

TRAINING MANAGER
Ted Blackburn, CSP, CET

A handwritten signature in black ink that reads "Christopher M. Baer CSP".

INSTRUCTOR
Christopher M. Baer CSP

1_16433_04042013

Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380

2010
CPR and AED
 Certification Card

BRUCE CARNAL

has successfully completed and competently performed the required knowledge and skill objectives for this program.

Adult
 Child and Infant
 Adult, Child, and Infant

Card is void if more than one box is checked.

AMERICAN SAFETY & HEALTH INSTITUTE

ASHI-Approved Certification Card
JOHN LYON
 Authorized Instructor (Print Name)

107336
 Registry No.

04/14/2013 **04/14/2015**
 Class Completion Date Expiration Date

570-840-1796 **JEFF 13**
 Training Center Phone No. Training Center I.D.

This card certifies the holder has demonstrated the required knowledge and skill objectives to a currently authorized ASHI Instructor. Certification does not guarantee future performance, or imply licensure or credentialing. Course content conforms to the 2010 AHA Guidelines for CPR and ECC, and other evidence-based treatment recommendations. Certification period may not exceed 24 months from class completion date. More frequent reinforcement of skills is recommended.

2010
Basic First Aid
 Certification Card

BRUCE CARNAL

has successfully completed and competently performed the required knowledge and skill objectives for this program.

AMERICAN SAFETY & HEALTH INSTITUTE

ASHI-Approved Certification Card
JOHN LYON
 Authorized Instructor (Print Name)

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This Certifies That

BRUCE CARNAL

Has Completed the

Bloodborne Pathogens Training Course Refresher

In accordance with 29 CFR 1910.1030 completed on 04/04/2013 in Tobyhanna, PA

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TRAINING MANAGER
Ted Blackburn, CSP, CET

A handwritten signature in black ink that reads "Christopher M. Baer CSP".

INSTRUCTOR
Christopher M. Baer CSP

2_16433_04042013

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Qualifications Summary

- More than 10 years of professional experience as EOD/UXO Specialist and Supervisor.
- Supervision of personnel conducting UXO/EOD removal and disposal operations.
- Recovery of UXO and firing range residue, including detection, excavation, transport, storage, and disposition.
- Responsible for quality control (QC) and safety of UXO operations; compliance with site safety and health plans; and conducting daily site safety briefings.
- Responsible for sampling, packaging, and shipping of possibly contaminated soils.
- Compliance with federal, state, and local regulations.
- Heavy equipment operator.

JASON McCLOSKEY

Registration

UXO Certification, USACE Huntsville Center (No. 971; 1997)
Pennsylvania Blaster's License (No. BL 7384; 2010)
Delaware Blaster's License (2008)

Education

Graduate of Naval Joint Service Explosive Ordnance Disposal (EOD) School, Eglin AFB, FL/Indian Head, MD (1997)
B.A., International Politics, Criminal Justice—Penn State University (in progress)

Credentials

Behavior-Based Safety, Phase I Training, WESTON (2009)
Bloodborne Pathogens Refresher Training, OSHA 29 CFR 1910.1030, WESTON (2013)
Trenching/Excavation Competent Person Training Course, OSHA 29 CFR 1026 Subpart P, WESTON (2009)
Fall Protection Competent Person Training Course – Initial, OSHA 29 CFR 1926 Subpart M, WESTON (2009)
Underground Utilities Competent Person Training, WESTON (2008)
40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), Comprehensive Safety Services Training Academy (1999)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2013)
30-Hour Construction Safety and Health Training Course, OSHA 29 CFR 1926, WESTON (2009)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), WESTON (2008)
Hazardous Materials Shipping, Manifesting, and Response Training and Certification, HM-181/126F
First Aid/CPR/AED Training, American Safety and Health Institute (2013)
Certified Radiation Worker II, Nevada Test Site, WESTON (2007)
Certified De-miner/Landmine Clearance Operations, Iraq, USACE (2003)
International Association of Bomb Technicians and Investigators, Member

Employment History

2004-Present WESTON
2001-2004 USA Environmental
1999-2000 UXB International, Inc
1996-1999 U.S. Air Force, Active Duty

Key Projects

Ordnance Removal Action, Tobyhanna Army Depot/State Park, U.S. Army Corps of Engineers (USACE), Baltimore District Oversight, Demolitions Supervisor/Quality Control (QC) Specialist/Site Safety Officer. Team Leader for all explosives and blasting operations. Oversees and conducts entire explosives program for site, including: storage, inventory, receipt, transportation, and use. Supports Project Manager/field staff in planning/enforcing USACE QC methods. Develops Quality Control Plans (QCPs), reviews and oversees work to ensure compliance. Trains staff and ensures compliance with the munitions and explosives of concern (MEC)-specific sections of the QCP and site-specific Health and Safety Plan (HASP). Conducts daily safety briefings, responsible for overall site safety. Conduct checks on explosives magazines, all equipment, and vehicles. Has direct oversight on all explosives operations. [9-07 to Present]

Ordnance Removal Action, Surf City, NJ, USACE, Baltimore District, Unexploded Ordnance (UXO) Team Leader. Provided supervision and direction to 4 UXO technicians and a construction personnel team conducting mechanical sieving operations for MEC items, using over 10 pieces of heavy equipment and 2 sifting plants. Recovered over 2,000 munitions items, and completed project 1 month early.

Ordnance Removal Action, Fort Miles, DE, USACE, Baltimore District, UXO Supervisor. Supervises personnel conducting MEC detection, investigation, excavation, and removal. Conducts surface and subsurface detection, investigations, excavation, and removal. Performs demilitarization operations of discarded military munitions (DMM) items. Operates heavy equipment to excavate ordnance items. [9-07 to Present]

Ordnance Removal Action, Fort Belvoir, VA, USACE Baltimore District, UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. Operated heavy equipment to excavate ordnance items. [11-06 to 9-07]

Ordnance Removal Action, Former Fort Devens, MA, Mass Development, Inc., UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. [10-05 to 12-05]

Ordnance Removal Action, Tonopah Test Range/Nevada Test Site, Nellis, AFB, NV, U.S. Department of Energy (DOE), UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. Operated heavy equipment to excavate ordnance items. Removed radioactive contamination. [9-05 to 10-05; 1-05 to 5-05]

Iraq Survey Group, Operation Iraqi Freedom, Baghdad, Iraq, U.S. Defense Intelligence Agency (DIA), Contract Explosive Ordnance Disposal (EOD) Specialist. Conducted wartime EOD support for DIA/Iraq Survey Group (ISG). Provided subject matter expertise and armed security escort for weapons of mass destruction (WMD) searches and intelligence collection activities in hostile environment. Identified and neutralized ordnance, booby traps, and other hazards encountered. [12-03 to 4-04]

Ordnance Removal Action, Operation Iraqi Freedom, Basra, Iraq/Kuwait, USACE Centcom Area of Responsibility, UXO Specialist. Conducted ordnance, booby trap, and improvised explosive device (IED) surface and subsurface detection, investigation, excavation, transport, and disposal operations in wartime environment. Provided ordnance avoidance for non-UXO personnel. Planned and performed clearance of landmine fields and sanctioned render-safe procedures for live ordnance. Instructed and provided subject matter expertise to military, contract, and DOD civilian personnel on issues regarding UXO and force protection. Performed QC duties. [3-03 to 11-03]

Ordnance Removal Action, Camp Good News, Massachusetts Military Reserve/Former Erie Army Depot, Camp Perry, OH/National Training Center Live Ordnance Ranges, Fort Irwin, CA/Amchitka Island, Aleutian Islands, AK, Multiple Clients, UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. Operated heavy equipment to excavate ordnance items. [5-02 to 12-02; 7-01 to 12-01]

Engineering Evaluation/Cost Analysis (EE/CA), Storm King Mountain, West Point, NY, USACE, UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. Mountain-climbed and implemented other unorthodox methods to conduct initial investigation and ordnance characterization of Storm King Mountain, along with other remote, inaccessible areas of West Point Military Academy, NY.

Ordnance Removal Action, Kaho'olawe Military Range Complex, HI, U.S. Navy, UXO Specialist. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations. Provided ordnance avoidance for non-UXO personnel. Operated heavy equipment to excavate ordnance items. [10-99 to 7-00]

EOD Unit, Nellis Air Force Base (AFB), NV, U.S. Air Force, USAF EOD Technician. Conducted ordnance surface and subsurface detection, investigation, excavation, transport, and disposal operations on live military ranges. Provided EOD support to Nellis AFB and its extensive ranges, U.S. Secret Service, and local and state law enforcement agencies. Conducted and/or participated in various exercises/research and development programs resulting in implementation of many innovative techniques to locate and dispose of ordnance and IEDs. Responsible for developing, maintaining, coordinating, and performing day-to-day operations of unit's \$3 million Lazer Neutralization Program. Provided explosive ordnance awareness and antiterrorism/force protection (AT/FP) classes to U.S. military and local community. [7-97 to 8-99]



Naval School

Explosive Ordnance Disposal

Certificate of Completion

Presented to

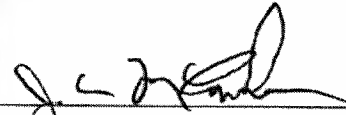
A1C Jason J. McCloskey, USAF

for having successfully completed the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL

Phase I & II - Surface (CINs A-431-0069/A-431-0012)

on this, 11th day of July, 1997



CDR J. C. McLAWHORN, USN
Commanding Officer



This Certifies That

JASON MCCLOSKEY

Has Completed the

30-Hour Construction Safety and Health Training Course

In accordance with OSHA Outreach Training Program (Includes Competent Person Instruction as indicated in 29 CFR 1926 Subparts C, E, M, P, & X) completed on 04/10/2009 in Vernon Hills, IL

A handwritten signature in black ink that reads "Conrad W. Lehr, CET, CIT".

TRAINING MANAGER

Conrad W. Lehr, CET, CIT

A handwritten signature in black ink that reads "Theodore L. Blackburn, CSP, CET".

INSTRUCTOR

Theodore L. Blackburn CSP, CET

82_3086_04102009

Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380

Comprehensive Safety Services Training Academy

Certification

This Certificate Acknowledges That
JASON J. McCLOSKEY

HAS BEEN TRAINED IN THE FOLLOWING:

1910.120
HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE
40 HOUR TRAINING

Dated this 16TH Day of AUGUST 1999

Carl R. Patfield

Instructor

Carl R. Patfield

Certified by Nevada State Fire Marshal



This Certifies That

JASON MCCLOSKEY

Has Completed the

8-Hour HAZWOPER Refresher Training Course

In accordance with 29 CFR 1910.120(e)(8) completed on 04/04/2013 in Tobyhanna , PA

A handwritten signature in black ink that reads "Ted Blackburn CSP, CET".

TRAINING MANAGER
Ted Blackburn, CSP, CET

A handwritten signature in black ink that reads "Christopher M. Baer CSP".

INSTRUCTOR
Christopher M. Baer CSP

1_3086_04042013

Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380



This Certifies That

JASON MCCLOSKEY

Has Completed the

8-Hour Site Manager and Supervisor Training Course

In accordance with 29 CFR 1910.120(e)(4) completed on 02/15/2008 in West Chester, PA

A handwritten signature in black ink that reads "Conrad W. Lehr, CET, CIT".

TRAINING MANAGER

Conrad W. Lehr, CET, CIT

A handwritten signature in black ink that reads "Conrad W. Lehr, CET".

INSTRUCTOR

Conrad W. Lehr CET

195_3086_02152008

Weston Solutions, Inc • 1400 Weston Way • West Chester, PA • 19380

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION



BLASTER'S LICENSE

BL - 7384

EXPIRES: 08/31/2016

26 BELMONT SQ
DOYLESTOWN PA 18901

JASON J MCCLOSKEY

IS AUTHORIZED FOR THE FOLLOWING:

DEMOLITION

2010
CPR and AED
 Certification Card

JAKE MCCLOSKEY

has successfully completed and competently performed
 the required knowledge and skill objectives for this program.

Adult
 Child and Infant
 Adult, Child, and Infant

Card is void if more than one box is checked.

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JOHN LYON
 Authorized Instructor (Print Name)

107336
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04/14/2013 **04/14/2015**
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(570)840-1796 **JEFF 13**
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2010
Basic First Aid
 Certification Card

JAKE MCCLOSKEY

has successfully completed and competently performed
 the required knowledge and skill objectives for this program.

**AMERICAN
 SAFETY &
 HEALTH
 INSTITUTE**

ASHI-Approved Certification Card
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Bloodborne Pathogens Training Course Refresher

In accordance with 29 CFR 1910.1030 completed on 04/04/2013 in Tobyhanna, PA

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TRAINING MANAGER
Ted Blackburn, CSP, CET

A handwritten signature in black ink that reads "Christopher M. Baer CSP".

INSTRUCTOR
Christopher M. Baer CSP

2_3086_04042013

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ATTACHMENT C

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

Project Name: _____

Inspector: _____

Submit to: _____

Date: _____

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

THE WESTON SITE APPEARANCE

YES	NO		COMMENT
		Is the site secured to prevent inadvertent, unnecessary, or unauthorized access? Are gates closed and locked at any time that the access point is not occupied or visible to site workers?	
		Are access points posted with signs to indicate client and end-user client name, WESTON's name and logo, names of other contractors and sub-contractors, project name and location, and appropriate safety messages?	
		Are required postings in place (e.g., Labor Poster, Emergency Phone Numbers, Site Map, etc.)?	
		Are site trailers tied down per local code and provided with stairs that have a landing platform with guard and stair railings?	
		Is a Site Safety file system established in the office to maintain records required by applicable safety regulations	
		Is the Health and Safety Plan (HASP) or Accident Prevention Plan (APP) amended as scope of work changes, hazards are discovered or eliminated or if risk change?	
		Is the Site Safety Plan and the Safety Officers Field Manual on site?	
		Is new employee indoctrination provided?	
		Have site Rules been provided, discussed and signed off on by all employees	
		Incident Reporting procedure explained to all?	
		Is site management trained in the WESTON (and client as applicable) Incident Reporting system?	
		Are NOI and Supplemental Report forms and OSHA 300 Log available on site?	
		Is Site Management aware of the Case Management and Incident Investigation Procedures?	
		Is there a list of preferred provider medical facilities available?	
		Has the "Inspection By A Regulatory Agency" procedure been reviewed by all site management?	
		Will Competent Persons be required because of activities to be performed, equipment to be used or hazards to be encountered?	

POLICIES

YES	NO		COMMENT
		Each individual employee is aware that he or she responsible for complying with applicable safety requirements, wearing prescribed safety equipment and preventing avoidable accidents.	
		Do employees understand that they will wear clothing suitable for existing weather and work conditions and the minimum work uniform will include long pants, sleeved work shirts, protective footwear, hard hat, and safety glasses unless otherwise specified via the HASP.	
		Are employees provided safety and health training to enable them to perform their work safely? Is all training documented to indicate the date of the session, topics covered, and names of participants?	
		Safety meetings are conducted daily. The purpose of the meetings are to review past activities, review pertinent tailgate safety topics and establish safe working procedures for anticipated hazards encountered during the day.	
		Training has been provided to all personnel regarding handling of emergency situations that may arise from the activity or use of equipment on the project.	
		Employees/contractors are informed and understand that they may not be under the influence of alcohol, narcotics, intoxicants or similar mind-altering substances at any time. Employees found under the influence of or consuming such substances will be immediately removed from the job site.	
		Site workers and operators of any equipment or vehicles are able to read and understand the signs, signals and operating instructions of their use.	
		Have contractors performing work provided copies of relevant documentation (such as medical fit-for-duty, training certificates, fit-tests, etc.) prior to initiation of the project?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

SANITATION

29 CFR 1926 Subparts C, D. EM 385-1-1, Section 2

YES	NO		COMMENT
		Is an adequate supply of drinking water provided. Is potable/drinking water labeled as such? Are there sufficient drinking cups provided?	
		Is there a sufficient number of toilets?	
		Are washing facilities readily available and appropriate for the cleaning needs?	
		Are washing facilities kept sanitary with adequate cleansing and drying materials?	
		Waste is secured so as not to attract rodents, insects or other vermin?	
		Is an effective housekeeping program established and implemented?	

ACCIDENT PREVENTION SIGNS, TAGS, LABELS, SIGNALS, AND PIPING SYSTEM IDENTIFICATION

29 CFR 1926 Subpart G. EM 385-1-1, Section 8

YES	NO		COMMENT
		Are signs, tags, and labels provided to give adequate warning and caution of hazards and instruction/directions to workers and the public?	
		Are all employees informed as to the meaning of the various signs, tags and labels used in the workplace and what special precautions are required?.	
		Are construction areas posted with legible traffic signs at points of hazard?	
		Are signs required to be seen at night lighted or reflectorized?	
		Tags contain a signal word ("danger" or "caution") and a major message to indicate the specific hazardous condition or the instruction to be communicated to the employee. Tags follow requirements as outlined in 29 CFR 1926.200.	

MEDICAL SERVICES AND FIRST AID

29 CFR 1926 Subparts C, D. EM 385-1-1, Section 3

YES	NO		COMMENT
		Is a local medical emergency facility (LMEF) identified in the HASP or APP?	
		Has the LMEF been visited to verify the directions and establish contacts?	
		Has site management reviewed WESTON's incident management procedures?	
		Have clinics and specialists that will help WESTON manage injuries and illnesses been identified?	
		Is there at least two (2) people certified in First Aid and CPR?	
		Are first aid kits available at the command post and appropriate remote locations?	
		Are first Aid Kits and Eyewash/Safety Showers inspected weekly?	
		Are 15 minute eyewash/safety showers in place if required.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

**FIRE PREVENTION AND PROTECTION
29 CFR 1926 Subpart F. EM 385-1-1, Section 9**

YES	NO		COMMENT
		Is an Emergency Response and Contingency Plan in place?	
		Are emergency phone numbers posted?	
		Are fire extinguishers selected and provided based on the types of materials and potential fire classes in each area.	
		Are fire extinguishers provided in each administrative and storage trailer, within 50 ft but no closer than 25 ft of any fuel or flammable liquids storage, on welding and cutting equipment, on mechanical equipment?	
		Are fire extinguishers checked daily and inspected monthly?	
		Do site personnel know the location of fire extinguishers and how to use them?	
		Are flammable and combustible liquids stored in approved containers?	
		Safety cans are used for dispensing flammable or combustible liquids in 5 gallon or less volumes.	
		Are flammable and combustible liquids stored in flammable storage cabinets or appropriate storage areas?	
		Are flammable materials separated from oxidizers by at least 20 feet (or 5 foot tall, ½ -hour rated fire wall) when in storage?	
		Are fuel storage tanks double walled or placed in a lined berm?	
		Spills are cleaned up immediately and wastes are disposed of properly.	
		Combustible scrap, debris and waste material (oily rags) are stored in closed metal containers and disposed of promptly.	
		Vehicle fueling tanks are grounded and bonding between the tank and vehicle being fueled is provided?	
		LPG is stored, handled and used according to OSHA regulations 29 CFR 1926.	
		LPG cylinders are not stored indoors.	
		Is a hot work permit program in place? See WESTON FLD-36	
		Is smoking limited to specific areas, prohibited in flammable storage areas and are signs posted to this effect?	

**HAZARDOUS SUBSTANCES, AGENTS AND ENVIRONMENTS
29 CFR 1926 Subparts D, Z. EM 385-1-1, Sections 6, 28**

YES	NO		COMMENT
		Are operations, materials and equipment evaluated to determine the presence of hazardous contaminants or if hazardous agents could be released in the work environment?	
		Are MSDS for substances made available at the work-site when any hazardous substance is procured, used, or stored?.	
		Are all containers and piping containing hazardous substances labeled appropriately?	
		Is there an inventory of hazardous substances?	
		Is there a site Specific Hazard Communication Program?	
		Spill kits appropriate for the hazardous materials present are on site and their location is known to spill responders.	
		Is disposal of excess hazardous chemicals performed according to WESTON's guidelines and RCRA regulations.	
		Before initiation of activities where there is an identified asbestos or lead hazard, is there a written plan detailing compliance with OSHA and EPA asbestos or lead abatement requirements? Does the plan comply with state and local authority, and USACE requirements, as applicable?	
		Are personnel trained and provided with protection against hazards from animals, poisonous plants and insects?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

PERSONAL PROTECTIVE AND SAFETY EQUIPMENT, RESPIRATORY AND FALL PROTECTION
29 CFR 1926 Subparts D, E, M. EM 385-1-1, Section 5

YES	NO		COMMENT
		Do employees understand that the minimum PPE is hard hat, safety glasses with side shields and safety shoes or boots and that long pants and a sleeved shirt are required?	
		Has the SSHC reviewed the PPE requirements in the HASP against actual site conditions and certified that the PPE is appropriate? (see Field Manual, PPE Program)	
		PPE is inspected, tested and maintained in serviceable and sanitary condition as recommended by the manufacturer. Is defective or damaged equipment taken out of service and repaired or replaced?	
		Are workers trained in the use of the PPE required?	
		Are personnel exposed to vehicular or equipment traffic, including signal persons, spotters or inspectors required to vests or apparel marked with a reflective or high visibility material?	
		Is there a noise hazard? If yes, hearing protection will be required.	
		Is there a splash or splatter hazard? Face shields or goggles will be required.	
		Will personnel be working in or over water? Personnel Floatation devices will be required.	
		Is there a welding hazard? Welding helmet and leathers will be required. Is there a cutting torch hazard? Goggles and protective clothing will be required.	
		Is each person on a walking/working surface with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level protected from falling by the use of guardrail systems, safety net systems or personal fall arrest systems? See WESTON FLD 25 (Note General Industry standard is four feet).	
		Guardrail systems are used as primary protection whenever feasible. Guardrail construction meets criteria in 29 CFR 1926.502(b).	
		Personal fall arrest systems (PFAS) are inspected and appropriate for use.	
		Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses are from synthetic fibers.	
		Safety nets and safety net installations are constructed, tested and used according to 29 CFR 1926.502.c	
		Is respirator use required? See WESTON Respiratory Protection Program	
		Persons using respiratory protection have been successfully medically cleared, trained and fit tested.	
		Respirators are used according to the manufacturer's instructions, regulatory requirements, selection criteria and health and safety plan provisions.	
		For Level C operations with organic vapor contamination, is the cartridge change-out schedule documented?	
		Is breathing certified as Grade D, or better, and certification available on-site?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

MACHINERY AND MECHANIZED EQUIPMENT
29 CFR 1926 Subparts N, O. EM 385-1-1, Sections 16, 17, 18

YES	NO		COMMENT
		Are inspections of machinery by a competent person established?	
		Is equipment inspected daily before its next use?	
		Equipment inspection reports are reviewed, followed-up on negative findings and records of inspections are maintained?	
		Machinery or equipment found to be unsafe is taken out of service until the unsafe condition has been corrected.	
		Is there a preventive maintenance program established?	
		Are operators of equipment qualified and authorized to operate?	
		Is all self-propelled construction and industrial equipment equipped with a reverse signal alarm?	
		Are seats or equal protection provided for each person required to ride on equipment. Are seatbelts installed and worn on motor vehicles, as appropriate.	
		All equipment with windshields is equipped with powered wipers. If fogging or frosting is possible, operable defogging or defrosting devices are required.	
		Internal combustion engines are not operated in enclosed areas unless adequate ventilation are made. Air monitoring is conducted to assure safe working conditions.	
		Is each bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, or similar equipment equipped with at least one dry chemical or carbon dioxide fire extinguisher with a minimum rating of 5-B:C?	
		Will cranes or other lifting devices be used? If so, are the following documents available on site: 1) a copy of the operating manual, 2) load rating chart, 3) log book, 4) a copy of the last annual inspection and 5) the initial on-site inspection?	
		Do operators have certificates of training to operate the type of crane(s) to be used?	
		Is a signal person provided when the point of operation is not in full view of the vehicle, machine or equipment operator? When manual (hand) signals are used, is only one person designated to give signals to the operator?	
		Signal persons back one vehicle at a time. While under the control of a signal person, drivers do not back or maneuver until directed. Drivers stop if contact with the signal person is lost.	
		Is a critical lift plan prepared by a competent person whenever: a lift is not routine, or a lift exceeds 75% of a crane's capacity, a lift results in the load being out of the operator's line of sight, or a lift involves more than one crane, a man basket is used, or the operator believes there is a need for a critical lift plan.	
		Fork Lifts (Powered Industrial Trucks) - Will forklifts be used on site?	
		All fork lifts meet the requirements of design, construction, stability, inspection, testing, maintenance and operation as indicated in ANSI/ASME B56.1 Safety Standards for Low Lift and High Lift Trucks.	
		Do forklift operators have certificates of training?	
		Are pile driving operations conducted according to EM 385-1-1, Section 16.L?	
		Is drilling equipment operated, inspected, and maintained as specified in the manufacturer's operating manual? Is a copy of the manual available at the work-site? See also the Drilling Safety Guide in the Safety Officers Field Manual.	
		Are flag persons provided when operations or equipment on or near a highway expose workers to traffic hazards? Do flag persons and persons working in proximity to a road wear high visibility vests? Are persons exposed to highway vehicle traffic protected by signs in all directions warning of the presence of the flag persons and the work? Do signs and distances from the work zone conform to federal and local regulations?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

MOTOR VEHICLES
29 CFR 1926 Subpart O. EM 385-1-1, Section 18

YES	NO		COMMENT
		Motor vehicle operators have a valid permit, license, or certification of ability for the equipment being operated.	
		Inspection, maintenance and repair is according to manufacturer's requirements by qualified persons.	
		Vehicles are inspected on a scheduled maintenance program.	
		Vehicles not in safe operating condition are removed from service until defects are corrected.	
		Glass in windshields, windows, and doors is safety glass. Any cracked or broken glass is replaced.	
		Seatbelts are installed and worn.	
		The number of passengers in passenger-type vehicles does not exceed the number which can be seated.	
		Trucks used to transport personnel have securely anchored seating, a rear endgate, and a guardrail.	
		No person is permitted to ride with arms or legs outside of a vehicle body; in a standing position on the body; on running boards; seated on side fenders, cabs, cab shields, rear of the truck or on the load.	
		ATV operators possess valid state drivers license, have completed an ATV training course prior to operation of the vehicle, and wear appropriate protective equipment such as helmets, boots, and gloves.	

EXCAVATING AND TRENCHING
29 CFR 1926 Subpart P. EM 385-1-1, Section 25

YES	NO		COMMENT
		Has the known or estimated location of utility installations such as sewer, telephone, fuel, electric, water lines, or any other underground installations that may be expected to be encountered during excavation been determined before excavation? Have utility locations been verified by designated state services according to state regulations? Has the client provided clearance where state jurisdiction doesn't apply?	
		Have overhead utilities in excavation areas been identified and either de-energized, shielded or barricaded so excavating equipment will not come within 10 feet?	
		Are inspections of the excavation, the adjacent areas, and protective systems made daily and as necessary by a competent person?	
		Are Protective systems in place as prescribed by the competent person?	
		Is material removed from excavations managed so it will not overwhelm the protective systems?	
		Are barriers provided between excavations and walkways?	
		Are excavations by roadways barricaded to warn vehicles of presence or to prevent them from falling in?	
		Is there a means of exit from the excavation every 25 feet?	
		Is air monitoring required? If yes, Is it performed?	

CONFINED SPACES
29 CFR 1910 Subpart J. EM 385-1-1, Section 6

YES	NO		COMMENT
		Is there a Confined Space Entry Program in place?	
		Are the confined Spaces identified and labeled?	
		Will the Confined Spaces be entered?	
		Is appropriate entry documentation used and on-file?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ELECTRICAL
29 CFR 1926 Subpart K. EM 385-1-1, Section 11

YES	NO		COMMENT
		Are electrical installations made according to the National Electrical Code and applicable local codes?	
		Qualified electricians make all connections and perform all work within 10 feet of live electric equipment.	
		Location of underground, overhead, under floor, behind wall electrical lines is known and communicated. Lines are documented by qualified person as de-energized where necessary.	
		Workers understand they must not work near live parts of electric circuits, unless they are qualified as required by OSHA or are protected by de-energizing and grounding the parts, guarding the parts by insulation, or other effective means?	
		Employees who regularly work on or around energized electrical equipment or lines are instructed in the cardiopulmonary resuscitation (CPR) methods.	
		Workers are prohibited from working alone on energized lines or equipment over 600 volts.	
		Are Ground-fault circuit interrupters (GFCI's) or is ground fault circuit protection provided to protect employees from ground-fault hazards for all 115 – 120 Volt, 15 and 20 amp receptacle outlets which are not a part of the permanent wiring of a building or structure at construction sites?	
		Circuit breakers are labeled.	
		Circuit breaker and all cabinets with exposed electric conductors are kept tightly closed.	
		Unused openings (including conduit knockouts) in electrical enclosures and fittings are closed with appropriate covers, plugs or plates.	
		Sufficient access and working space is provided and maintained about all electrical equipment to permit ready and safe operations and maintenance.	
		Motors are located within sight of their controllers or controller disconnecting means are capable of being locked in the pen position or is a separate disconnecting means installed in the circuit within sight of the motor.	
		Are visual inspections of extension cords and cord-and plug-connected equipment conducted daily? Is equipment found damaged or defective tagged and removed from service, and not used until repaired?	
		Wet Areas - Is portable lighting used in wet or conductive locations, such as tanks or boilers operated at no more than 12 volts and protected by GFCIs.	
		Are electrical installations in hazardous areas to NEC?	
		Metal ladders and tools including tape measures or fabric with metal thread are prohibited where contact with energized electrically parts is possible.	
		All extension cords are the three-wire type, designed and rated for hard or extra hard usage?	
		Worn or frayed electrical cords or cables are taken out of service. Fastening with staples, hanging from nails or suspending extension cords by wire is prohibited.	
		Electric wire/flexible cord passing through work areas is protected from damage such as foot traffic, vehicles, sharp corners, projections and pinching? Flexible cords and cables passing through holes are protected by bushings or fittings?	
		Before an employee or contractor performs any service or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system is to be isolated. Only authorized persons may apply and remove lockouts and tags.	
		Contractors planning to use hazardous energy control procedures submit their hazardous energy control plan to the WESTON site safety officer or designee before implementing lockout/tagout procedures.	
		There is a site specific hazardous energy control plan that clearly and specifically outlines the scope, purpose, authorization, rules and techniques to be used for the control of hazardous energy.	
		Workers possess the knowledge and skills required for the safe application, usage and removal of energy controls.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

WELDING AND CUTTING
29 CFR 1926 Subpart J. EM 385-1-1, Section 10

YES	NO		COMMENT
		Prior to performing welding, cutting or any other heat or spark producing activity, an assessment of the area is made by a competent person to identify combustible materials and potential sources of flammable atmospheres.	
		Welders, cutters and their supervisors are trained in the safe operation of their equipment, safe welding and cutting practices, hot work permit requirements, and fire protection.	
		Welding and cutting equipment is inspected daily before use. Unsafe equipment is taken out of use, replaced or repaired.	
		Workers and the public is shielded from welding rays, flashes, sparks, molten metal and slag.	
		Employees performing welding, cutting or heating are protected by PPE appropriate for the hazards (e.g., respiratory, vision and skin protection).	
		Compatible fire extinguishing equipment is provided in the immediate vicinity of welding or cutting operations.	
		Drums, tanks, or other containers and equipment which have contained hazardous materials shall be thoroughly cleaned before welding or cutting. Cleaning shall be performed in accordance with NFPA 327, <u>Cleaning or Safeguarding Small Tanks and Containers</u> , ANSI/AWS F4.1, <u>Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances</u> , and applicable health and safety plan requirements.	

HAND AND POWER TOOL SAFETY
29 CFR 1926 Subpart I. EM 385-1-1, Section 13

YES	NO		COMMENT
		Power tools are from a manufacturer listed by a nationally recognized testing laboratory for the specific application for which they are to be used.	
		Hand & power tools are inspected, maintained, tested and determined to be in safe operating condition before use.	
		Tools found to be unsafe are not used, tagged and repaired or destroyed.	
		Users of tools are trained in safe use.	
		Electrical tools have cords and plug connections in good repair.	
		Electrical tools are effectively grounded or approved double insulated.	
		Reciprocating, rotating, and moving parts of equipment are guarded if they may be accessed by employees or they otherwise create a hazard.	
		Safety clips/retainers are installed and maintained on pneumatic impact tool connections.	
		Chain saws have an automatic chain brake or anti-kickback device.	
		Pneumatic and hydraulic hoses and fittings are inspected regularly.	
		Employees who operate powder actuated tools are trained and carry valid operators cards.	
		Powder activated tools are stored in individual locked containers, when not in use and are not loaded until ready to use.	
		Powder actuated tools are inspected for obstructions or defects daily before use.	
		Powder actuated tool operators have appropriate PPE.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

RIGGING

29 CFR 1926 Subpart H. EM 385-1-1, Section 15

YES	NO		COMMENT
		Rigging equipment is inspected as specified by the manufacturer, by a qualified person, before use on each shift and as necessary to assure that it is safe.	
		Defective equipment is removed from service.	
		Rigging not in use is removed from the work area, properly stored, and maintained in good condition.	
		Wire rope removed from service for defects is cut up or plainly marked as unfit for use as rigging.	
		The number of saddle clips used to form eyes in wire rope conforms with Table H-20, are spaced evenly and the saddles are on the live side.	
		Chain rigging has a tag clearly indicating load limits, is inspected before initial use, then weekly, and is of alloyed metal.	
		Fiber rope rigging is not used if it is frozen or has been subject to acids or excessive heat.	
		Slings and their fittings and fastenings are inspected before use on each shift and as needed during use.	
		Drums, sheaves, and pulleys on rigging hardware are smooth and free of surface defects that can damage rigging.	

MATERIAL HANDLING, STORAGE, AND DISPOSAL

29 CFR 1926 Subpart H. EM 385-1-1, Section 14

YES	NO		COMMENT
		Employees are trained in and use safe lifting techniques.	
		Materials are not moved or suspended over workers unless positive precautions have been taken to protect workers.	
		Conveyors are constructed, inspected, & maintained by qualified persons according to manufacturer's recommendations.	
		All conveyors are to be equipped with emergency stopping devices.	
		Hazardous exposed moving machine parts are guarded mechanically, electrically or by location.	
		Controls are clearly marked and/or labeled to indicate the function controlled.	
		Taglines are used for suspended loads where the movement may be hazardous to persons.	
		Material in storage is protected from falling or collapse by effective stacking, blocking, cribbing, etc.	
		Walkways and aisles are to be kept clear.	
		Materials are not stored on scaffolds or runways in excess of normal placement or in excess of safe load limits.	
		Work areas and means of access are maintained safe and orderly.	
		Tools, materials, extension cords, hoses or debris do not cause tripping or other hazards.	
		Storage and construction sites are kept free from the accumulation of combustible materials.	
		Waste materials and rubbish are placed in containers or, if appropriate, in piles. Waste materials are disposed of in accord with applicable local, state, or federal requirements.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

**FLOATING PLANT AND MARINE ACTIVITIES
29 CFR 1926 Subpart O. EM 385-1-1 Section 19**

YES	NO		COMMENT
		Floating plants that are regulated by the USCG have current inspections and certificates.	
		Before any floating plant is brought to the job site and placed in service it is inspected and determined to be in safe operating condition	
		Periodic inspections are made such that safe operating conditions are maintained. Strict compliance with EM 385-1-1, Section 19 is expected.	
		Plans are in place for removing or securing the plant and evacuation of personnel endangered by severe weather and other marine emergencies such as; fire, flooding, man overboard, hazardous materials incidents, etc..	
		Means of access are properly secured, guarded, and maintained free of slipping and tripping hazards.	
		Dredging operations follow guidelines as established in EM 385-1-1, Section 19.D.	

**PRESSURIZED EQUIPMENT AND SYSTEMS
29 CFR 1926 Subparts I, F. EM 385-1-1, Section 20**

YES	NO		COMMENT
		Pressurized equipment and systems are inspected before being placed into service.	
		Pressurized equipment or systems found to be unsafe are tagged "Out of Service-Do Not Use".	
		Systems and equipment are operated, inspected and maintained by qualified, designated personnel.	
		Safe clearance, lockout/tagout procedures are followed as appropriate during maintenance or repair.	
		Air hose, pipes, fittings are pressure-rated for the activity. Defective hoses are removed from service.	
		Hoses aren't laid over ladders, steps, scaffolds, or walkways in a manner that creates a tripping hazard.	
		The use of compressed air for personal cleaning is prohibited. The use of compressed air for other cleaning is restricted to less than 30 psig.	
		Compressed gas cylinders are stored in well-ventilated locations.	
		Cylinders in storage are separated from flammable or combustible liquids and from easily ignitable materials by at least 40 feet or by a minimum five feet tall, ½ -hour fire resistive partition.	
		Stored cylinders containing oxidizing gases are separated from fuel gas cylinders by at least 20 feet or by a minimum five feet tall, ½ -hour fire resistive partition.	
		Cylinder valve caps are in place when cylinders are in storage, in transit, or a regulator is not in place.	
		Compressed gas cylinders in service are secured in substantial fixed or portable racks or hand trucks.	
		Oxygen cylinders and fittings are kept away from, and free from oil and grease.	
		Cylinder Storage areas are posted with the names of the gases in storage and with signs indicating "No Smoking or Open Flame".	
		Cylinders are to be stored such that mechanical and corrosion damage is avoided. Cylinders are not to be stored in areas required as an egress path.	
		Cylinders may be stored in the open outdoors, however, they must be protected from the ground to prevent corrosion and must be protected from temperatures that may exceed 125 degrees F.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

WORK PLATFORMS/SCAFFOLDS
29 CFR 1926 Subparts L, M, N. EM 385-1-1 Sections 21, 22

YES	NO	COMMENT
		Work platforms are erected, used, inspected, tested, maintained and repaired according to manufacturer's requirements.
		Construction, inspection, and disassembly of scaffolds is under the direction of a competent person.
		Workers on scaffolding have been trained by a qualified person.
		Scaffolds are erected on a firm and level surface and are square and plumb.
		Scaffolds are not loaded in excess of rated capacity.
		Working levels of work platforms are fully planked or decked.
		Planks are in good condition and free from obvious defects.
		Fabricated frame scaffolding four times higher than the base width is secured to building/structure according to manufacturer's instruction and/or OSHA requirements.
		Working platforms of scaffolding over ten feet in height have guard rails meeting OSHA specifications. Fall protection is suggested at four feet or greater.
		Scaffolding/work platforms are accessed by means of a properly secured ladder or equivalent. Built on ladders conform to scaffold ladder requirements. Climbing of braces is not allowed.
		Crane supported work platforms are designed and used in accordance with OSHA standards.
		Elevating work platforms are operated, inspected and maintained according to the equipment operations manual.
		Employees working in aerial lifts remain firmly on the floor of the basket. Employees use fall protection while in an aerial lift basket.

WALKING AND WORKING SURFACES AND STAIRS
29 CFR 1926 Subparts L, M, X. EM 385-1-1, Sections 21, 22, 24

YES	NO	COMMENT
		Work areas are clean, sanitary, and orderly
		Work surfaces are kept dry or appropriate means are taken to assure the surfaces are slip-resistant
		Accumulations of combustible dust are routinely removed.
		Aisles and passageways are kept clear and marked as appropriate.
		There is safe clearance for walking in aisles where motorized or mechanical handling equipment is operating.
		Materials or equipment is stored in such a way that sharp projections will not interfere with the walkway.
		Changes of direction or elevation are readily identifiable.
		Aisles or walkways that pass near moving or operating machinery, welding operations or similar operations are arranged so employees will not be subjected to potential hazards.
		Standard guardrails are provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground and bridges provided where workers must cross over conveyors and similar hazards.
		There are standard stair rails or handrails on all stairways having four or more risers or with an elevation of 30 or more inches.
		Stairways are at least 22 inches wide. (General Industry Standard)
		Stairs angle no more than 50 and no less than 30 degrees, risers are uniform from top to bottom (plus or minus 1/4 inch) and are provided with a surface that renders them slip resistant.
		Stairway handrails are not less than 36 inches above the leading edge of stair treads and have at least 3 inches of clearance between the handrails and the wall or surface they are mounted on.
		Where doors or gates open directly on a stairway, there is a platform provided so the swing of the door does not reduce the width of the platform to less than 20 inches.
		Where stairs or stairways exit directly into any area where vehicles may be operated, there are adequate barriers and warnings provided to prevent employees stepping into the path of traffic.
		Signs are posted showing the load capacity of elevated storage areas.
		An appropriate means of access and egress is provided for surfaces with 19 or more inches of elevation change.
		Material on elevated surfaces is minimized, with that necessary for immediate work requirements piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading.

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

FLOOR AND WALL HOLES AND OPENINGS
29 CFR 1926 Subpart M. EM 385-1-1, Section 24

YES	NO		COMMENT
		Floor and roof openings that persons can walk into or fall through are guarded by a physical barrier or covered.	
		Holes (defined as equal to or greater than 2 inches in least dimension) where person could trip must be covered/protected.	
		Unprotected sides and edges on a walking/working surface six feet or more (note four feet in General Industry) are protected by guardrail system, safety net or Personal Fall Arrest System (PFAS).	
		Unused portions of service pits and pits not actually in use are either covered or protected by guardrails or equivalent.	
		Coverings for holes or other openings must be constructed of sufficient strength to support any anticipated load, must be secured in place to prevent accidental removal or displacement and must be marked indicating purpose (e.g., stenciled "Hole" or painted contrasting color to surroundings).	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

LADDERS

29 CFR 1926 Subpart X. EM 385-1-1, Section 21

YES	NO		COMMENT
		Portable ladders are used for their designed purpose only.	
		Portable ladders are examined for defects prior to, and after use.	
		Ladders found to be defective are clearly tagged to indicate "DO NOT USE" if repairable, or destroyed immediately if no repair is possible.	
		Workers are trained in hazards associated with ladder use and how to inspect ladders.	
		Ladders have secure footing provided by a combination of safety feet, top of ladder tie-offs and mud cills or a person holding the ladder to prevent slipping.	
		The handrails of a straight ladder used to get from one level to another extend at least 36 inches above the landing.	
		Ladders conform to construction criteria of ANSI Standards A-14.1 and A-14.2.	
		Wooden ladders are not painted with an opaque covering such that signs of flaws, cracks or drying are obscured.	
		Fixed ladders are constructed and used according to OSHA Standards, 29 CFR 1910.27 and ANSI A-14.3.	
		Rungs, cleats or steps, and side rails that may be used for handholds when climbing, offer adequate gripping surface and are free of splinters, splinters or burrs, and substances that could cause slipping.	
		Fixed ladders of greater than 24 feet have cages or other approved fall protection devices. (note General Industry is 20 feet).	
		Where fall protection is provided by ladder safety systems (body belts or harnesses, lanyards and braking devices with safety lines or rails), systems meet the requirements of and are used in accordance with WESTON Fall Protection Standard Practices and are compatible with construction of the ladder system.	

DEMOLITION

29 CFR 1926 Subpart T. EM 385-1-1, Section 23

YES	NO		COMMENT
		Prior to initiating demolition activities an engineering survey (by a competent person) and a demolition plan (by a competent person) is completed.	
		All employees engaged in demolition activities are instructed in the demolition plan.	
		It has been determined through the engineering survey and outlined in the plan, if any hazardous materials, or conditions (e.g., asbestos, lead, utility connections, etc.) exist. Such hazards are controlled or eliminated before demolition is started.	
		Continued inspections, by a competent person, are conducted to ensure safe employee working conditions.	

TREE MAINTENANCE AND REMOVAL

29 CFR 1910 Subpart R. EM 385-1-1, Section 31

YES	NO		COMMENT
		Tree maintenance or removal is done is under the direction of a qualified person.	
		Tree work, in the vicinity of charged electric lines, is by trained persons qualified to work with electricity and tree work. Appropriate distances are maintained for all workers who are not qualified.	
		Equipment is inspected, maintained, repaired and used in accordance with the manufacture's directions.	
		Prior to felling actions are planned to include clearing of the area to permit safe working conditions and escape.	
		Employees must be trained in the safe operation of all equipment.	
		All equipment and machinery is inspected and determined safe prior to use.	
		Work is performed under requirements of FLD 43.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

BLASTING

29 CFR 1926 Subpart U. EM 385-1-1, Section 29

YES	NO		COMMENT
		A blasting safety plan is developed prior to bringing explosives on-site.	
		The transportation, handling, storage, and use of explosives, blasting agents, and blasting equipment must be directed and supervised by a person with proven experience and ability in blasting operations. Licensing of person is verified.	
		Blasting operations in or adjacent to cofferdams, piers, underwater structures, buildings, structures, or other facilities must be carefully planned with full consideration to potential vibration and damage.	

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE AND UNDERGROUND STORAGE TANK (UST) ACTIVITIES

29 CFR 1926 Subpart D. EM 385-1-1, Section 28

YES	NO		COMMENT
		All construction activities performed with known or potential exposure to hazardous waste are conducted in accordance with Hazardous Waste Operations and Emergency Response requirements.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

CONCRETE and MASONRY CONSTRUCTION
29 CFR 1926 Subpart Q. EM 385-1-1, Section 27

YES	NO		COMMENT
		Construction loads are not placed on a concrete or masonry structure or portion of a concrete or masonry structure unless the employer determines, based on information from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.	
		Employees are not permitted to work above or in positions exposed to protruding reinforcing steel or other impalement hazards unless provisions have been made to control the hazard.	
		Sections of concrete conveyances and airlines under pressure are secured with wire rope (or equivalent material) in addition to the regular couplings or connections.	
		Structural and reinforcing steel for walls, piers, columns, and similar vertical structures is supported and/or guyed to prevent overturning or collapse	
		All form-work, shoring, and bracing is designed, fabricated, erected, supported, braced, and maintained so it will safely support all vertical and lateral loads that may be applied until the loads can be supported by the structure.	
		Shoring equipment is inspected prior to erection to determine that it is specified in the shoring design. Any equipment found to be damaged is not used.	
		Erected shoring equipment is inspected immediately prior to, during, and immediately after the placement of concrete. Any shoring equipment that is found to be damaged, displaced, or weakened is immediately reinforced or re-shored.	
		Shoring, vertical slip forms and jacks conform with requirements of Section 27.B.08-13 of USACE EM 385-1-1.	
		Forms and shores (except those on slab or grade and slip forms) are not removed until the individual responsible for forming and/or shoring determines that the concrete has gained sufficient strength to support its weight and all superimposed loads.	
		Precast concrete members are adequately supported to prevent overturning or collapse until permanent connections are complete	
		No one is permitted under pre-cast concrete members being lifted or tilted into position except employees required for the erection of those members.	
		Lift slab operations are planned and designed by a registered engineer or architect.	
		Hydraulic jacks used in lift slab construction have a safety device that causes the jacks to support the load in any position if the jack malfunctions	
		No one is permitted under the slab during jacking operations.	
		A limited access zone is established whenever a masonry wall is being constructed.	
		Fall protection is provided to masonry workers exposed to falls of 6 feet or more.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

STEEL ERECTION
29 CFR 1926 Subpart R. EM 385-1-1, Section 27

YES	NO		COMMENT
		Impact wrenches have a locking device for retaining the socket. Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.	
		Structural and reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent collapse	
		No loading is placed upon steel joists until all bridging is completely and permanently installed.	
		Workers are provided fall protection whenever they are exposed to falls of 1.8 m (6 ft) or more (EM 385-1-1).	
		Temporary flooring in skeleton steel erection conforms with Section 27.F of USACE 385-1-1	

ROOFING
29 CFR 1926 Subpart M. EM 385-1-1, Sections 21, 22, 24, 27

Yes	No		Comments
		In the construction, maintenance, repair, and demolition, of roofs, fall protection systems is provided that will prevent personnel from slipping and falling from the roof and prevent personnel on lower levels from being struck by falling objects	
		On all roofs greater than 4.8 m (16 ft) in height, a hoisting device, stairways, or progressive platforms are furnished for supplying materials and equipment.	
		Roofing materials and accessories that could be moved by the wind, including metal roofing panels, that are on the roof and unattached are secured when wind speeds are greater than, or are anticipated to exceed, 10 mph.	
		Level, guarded platforms are provided at the landing area on the roof.	
		When their use is permitted, warning line systems comply with USACE Section 27.07 of EM 385-1-1.	
		Workers involved in roof-edge materials handling or working in a storage area located on a roof with a slope \neq to four vertical to twelve horizontal and with edges 6 ft or more above lower levels are protected by the use of a guardrail, safety net, or personal fall arrest system along all unprotected roof sides and edges of the area.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ENVIRONMENTAL COMPLIANCE

Yes	No		Comments
		Environmental Compliance and Waste Management Plan on file.	
		Waste Determination Made.	
		Manifest and/or Shipping Papers prepared and filed.	
		Manifest Exception Reports Prepared, as necessary. Procedures to track manifests in place.	
		State Annual and EPA Biennial Reporting Information Available.	
		RCRA Personnel Training Records on file.	
		CAA Permits on file.	
		CWA Permits on file.	
		RCRA Permits on file.	
		State and/or Local Permits on file.	
		RCRA Inspections conducted and Documentation on file.	
		Transporter and TSD compliance information on file.	
		Waste Accumulation Areas Managed Properly.	
		Wetlands Areas Identified and Protected.	
		Endangered, Threatened or Special Concern Species or Areas Identified and Protective Methods Determined.	
		Runon and Runoff Concerns Identified and Managed.	
		Adjacent Land Areas Protected as Necessary.	
		Non-Hazardous Solid Wastes Managed Properly.	

MISCELLANEOUS REGULATORY and POLICY COMPLIANCE

Yes	No		Comments
		Personnel Training Records for DOT Materials Handling on file.	
		Noise Control Issues Addressed and Managed.	
		Site Security Issues Identified and Managed.	
		Known Historical, Archeological and Cultural Resources Identified and Managed.	
		WESTON EHS Analysis Checklist In Use.	
		Safety Observation and Recognition Program in place.	
		Weekly EHS Report Card System in place.	
		Federal, State and Local Required Postings in place.	
		Site specific Lockout/Tagout Program is in place.	
		Site-specific Confined Space Program is in place.	
		Site Safety Officer filing system is in place and up to date.	

ATTACHMENT D

DEFICIENCY TRACKING FORM

SAMPLE DEFICIENCY TRACKING FORM
Site Information and Date

No.	Description	Risk Rating	Date Identified	Status/Date	Reference	Comments	Corrective Action/ Date to be Completed	Responsible Party
EX	PPE	IV	1/2010		EM385-1-1.05.B	Several individuals not using glasses - forgotten, left on hardhat, or dangling from neck strap	Develop program to ensure PPE items specified are worn. Have supervisors lead by example.	
1								
2								
3								
4								
5								
6								
7								
8								

Notes:

Risk Ratings:
 I – Catastrophic
 II – Serious
 III – Severe
 IV – Moderate
 V – Minor

BMP – Best Management Practice

Requirement of EM 385-1-1, Section 01.A.06 (e)

ATTACHMENT E

**PRELIMINARY ACCIDENT NOTIFICATION (PAN) FORM AND USACE
ENG FORM 3394 ACCIDENT INVESTIGATION REPORT**

WORK SHEET FOR PRELIMINARY ACCIDENT NOTIFICATION

This work sheet is a field tool to assist the collection of information about an accident and facilitate the completion of a Preliminary Accident Notification. For Member of the Public Recreation Visitor accidents use the Initial Notification of Public Recreation Accident Work Sheet

Project Name: _____ Project Office Symbol: _____ Date Worksheet Completed: _____
Date of Accident: _____ Time of Accident: _____ Person Completing Worksheet: _____ Phone #: _____

Location and Incident Information

Exact Location of Accident: _____

Number of Persons Involved: _____ Number of Properties Involved: _____

Personnel Classification

Government: Civilian Military Government Direct Contractor Foreign National Volunteer

Contractor Member of the Public

Type of Accident (Mark all that are applicable)

Injury/Illness Fatality Motor Vehicle Property Damage Fire Diving

Personal Data (If more than 2 persons involved provide their personal data on a separate sheet)

Person 1 - Name: Last _____ First _____ Middle Initial ____ Age: ____ Gender: Male Female

Date of Birth: _____ Address: _____

Job Series/Title: _____ Grade: ____ Duty Status: On Duty Off Duty TDY Time Began Work _____

Unit and Station Assignment: _____ Office Symbol: _____ Date Hired: _____

Nature of Injury: _____ Body Part(s) Affected Primary _____ Secondary _____

Type of Injury _____ Source of Injury _____

Severity of Injury: (See definitions on reverse side) Fatality: **Yes/No** Permanent Total Disability: **Yes/No**

Permanent Partial Disability: **Yes/No** Other Serious Injury: **Yes/No**

Estimated Days away from Work: _____ Estimated Days Restricted Duty/Job Transfer: _____

Primary Language Spoken: _____ English Literate: **Yes/No**

Does this person wish to remain anonymous **Yes/No**

What was employee worker doing before the accident occurred? _____

Name of Physician/Health Care Professional: _____

Medical Treatment Facility: _____

Address: _____ Phone # _____

Person 2 - Name: Last _____ First _____ Middle Initial ____ Age: ____ Gender: Male Female

Date of Birth: _____ Address: _____

Job Series/Title: _____ Grade: ____ Duty Status: On Duty Off Duty TDY Time Began Work _____

Unit and Station Assignment: _____ Office Symbol: _____ Date Hired: _____

Nature of Injury: _____ Body Part(s) Affected Primary _____ Secondary _____

Type of Injury _____ Source of Injury _____

Severity of Injury: (See definitions on reverse side) Fatality: **Yes/No** Permanent Total Disability: **Yes/No**

Permanent Partial Disability: **Yes/No** Other Serious Injury: **Yes/No**

Estimated Days away from Work: _____ Estimated Days Restricted Duty/Job Transfer: _____

Primary Language Spoken: _____ English Literate: **Yes/No**

Does this person wish to remain anonymous **Yes/No**

What was employee worker doing before the accident occurred? _____

Name of Physician/Health Care Professional: _____

Medical Treatment Facility: _____

Address: _____ Phone # _____

Summary of Accident:(Use additional sheet if needed)

Remarks:

Describe Any Information Released to the Public:

Nature of Injury

Amputation
Abrasion
Back Strain
Burn
Contusion/Bruise
Concussion
Dislocation of joint

Drowning
Fracture
Hearing Loss
Hernia
Laceration/Cut
Puncture
Strain

Stroke
Traumatic Food Poisoning
Traumatic Heart Condition
Traumatic Mental Disorder
Traumatic Respiratory
(Carbon Monoxide)
Traumatic Skin Disease

Tuberculosis
Traumatic Virological/Infective
Parasitic Disease
Traumatic Injury Other(list)

Type of Injury

Struck by/against
Fell/slipped/tripped
Caught on/in/between

Punctured/lacerated
Stung/bit by
Contact with/by

Exerted
Exposed
Inhaled

Ingested
Absorbed
Traveling In

Severity of Injury

Injury

Illness

Fatality

Permanent Disability

Source of Injury

Environmental Condition
Building or other Area
Walking surface
Electricity
Temperature Extreme
Weather
Fire
Water

Mechanical Equipment
Guard/Shield
Video Display Terminal
Heating
Motor Vehicle/Cycle
Boat
Bicycle/Other non-
motorized vehicle

Noise
Radiation
Light
Ventilation
Smoke
Stress
Confined Space
Carbon Monoxide

Inanimate Object
Animal Insect
Human (Violence)
Diving Equipment
Parachute

Body Parts

Arm or Wrist
Breast
Testicle
Abdomen
Chest
Lower Back
Penis
Side
Upper Back
Waist
Trunk Other
Ear
Eye

Brain
Cranial Bones
Teeth
Jaw
Throat/Larynx
Mouth
Nose
Tongue
Head Other External
Elbow
Finger
Thumb
Toe

Face
Scalp
Knee
Leg
Hip
Ankle
Buttock
Hand
Feet
Collar Bone
Shoulder Blade
Rib
Sternum

Vertebrae
Trunk Bones other
Shoulder
Lung
Kidney
Heart
Liver
Reproductive Organs
Stomach
Intestines
Trunk/internal

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT <input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CONTRACTOR	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> PUBLIC	<input type="checkbox"/> FATAL <input type="checkbox"/> OTHER	XXXXXXXXXXXXXXXXXXXX	<input type="checkbox"/>	XXXXXXXXXXXX

2. PERSONAL DATA

a. NAME <i>(Last, First MI.)</i>	b. AGE	c. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE
f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ON DUTY <input type="checkbox"/> TDY <input type="checkbox"/> OFF DUTY		h. EMPLOYMENT STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ARMY ACTIVE <input type="checkbox"/> ARMY RESERVE <input type="checkbox"/> VOLUNTEER <input type="checkbox"/> PERMANENT <input type="checkbox"/> FOREIGN NATIONAL <input type="checkbox"/> SEASONAL <input type="checkbox"/> TEMPORARY <input type="checkbox"/> STUDENT <input type="checkbox"/> OTHER <i>(Specify)</i> _____	

3. GENERAL INFORMATION

a. DATE OF ACCIDENT <i>(YYYYMMDD)</i>	b. TIME OF ACCIDENT <i>(Military Time)</i> hrs.	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME (2) SUBCONTRACTOR
e. CONTRACT NUMBER <input type="checkbox"/> CIVIL WORKS <input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER <i>(Specify)</i> _____		f. TYPE OF CONTRACT <input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> SERVICE <input type="checkbox"/> A/E <input type="checkbox"/> DREDGE <input type="checkbox"/> OTHER <i>(Specify)</i> _____	g. HAZARDOUS/TOXIC WASTE ACTIVITY <input type="checkbox"/> SUPERFUND <input type="checkbox"/> DERP <input type="checkbox"/> IRP <input type="checkbox"/> OTHER <i>(Specify)</i> _____

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see help menu)*

a. CONSTRUCTION ACTIVITY # <input style="width:50px;" type="text"/>	b. TYPE OF CONSTRUCTION EQUIPMENT # <input style="width:50px;" type="text"/>
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5. INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see help menu)*

a. SEVERITY OF ILLNESS/INJURY # <input style="width:50px;" type="text"/>	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY
e. BODY PART AFFECTED PRIMARY _____ # <input style="width:50px;" type="text"/> SECONDARY _____ # <input style="width:50px;" type="text"/>	g. TYPE AND SOURCE OF INJURY/ILLNESS TYPE _____ # <input style="width:50px;" type="text"/> SOURCE _____ # <input style="width:50px;" type="text"/>		
f. NATURE OF ILLNESS / INJURY # <input style="width:50px;" type="text"/>			

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see help menu)*

a. ACTIVITY AT TIME OF ACCIDENT # <input style="width:50px;" type="text"/>	b. PERSONAL FLOTATION DEVICE USED? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
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7. MOTOR VEHICLE ACCIDENT						
a. TYPE OF VEHICLE		b. TYPE OF COLLISION		c. SEAT BELTS		
<input type="checkbox"/> PICKUP/VAN <input type="checkbox"/> AUTOMOBILE <input type="checkbox"/> TRUCK <input type="checkbox"/> OTHER (Specify) _____		<input type="checkbox"/> SIDE SWIPE <input type="checkbox"/> HEAD ON <input type="checkbox"/> REAR END <input type="checkbox"/> BROADSIDE <input type="checkbox"/> ROLL OVER <input type="checkbox"/> BACKING <input type="checkbox"/> OTHER (Specify) _____		USED	NOT USED	NOT APPLICABLE
				(1) FRONT SEAT	<input type="checkbox"/>	<input type="checkbox"/>
				(2) REAR SEAT	<input type="checkbox"/>	<input type="checkbox"/>
8. PROPERTY MATERIAL INVOLVED						
a. NAME OF ITEM			b. OWNERSHIP		c. AMOUNT OF DAMAGE	
(1)						
(2)						
(3)						
9. VESSEL/FLOATING PLANT ACCIDENT (Fill in line and correspondence code number in box from list - see help menu)						
a. ACTIVITY AT TIME OF ACCIDENT			(CODE)	a. ACTIVITY AT TIME OF ACCIDENT		
_____			# <input type="text"/>	_____		
10. ACCIDENT DESCRIPTION (Use additional paper, if necessary, see attached page 4.)						
11. CAUSAL FACTOR(s) (Read instructions before completing)						
a. (Explain YES answers in item 13)						
DESIGN: Was design of facility, workplace or equipment a factor?					YES	NO
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?					<input type="checkbox"/>	<input type="checkbox"/>
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?					<input type="checkbox"/>	<input type="checkbox"/>
OPERATING PROCEDURES: Were operating procedures a factor?					<input type="checkbox"/>	<input type="checkbox"/>
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?					<input type="checkbox"/>	<input type="checkbox"/>
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?					<input type="checkbox"/>	<input type="checkbox"/>
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?					<input type="checkbox"/>	<input type="checkbox"/>
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?					<input type="checkbox"/>	<input type="checkbox"/>
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?					<input type="checkbox"/>	<input type="checkbox"/>
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?					<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?					<input type="checkbox"/>	<input type="checkbox"/>
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident?					<input type="checkbox"/>	<input type="checkbox"/>
b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT? (If yes, attach a copy.)					<input type="checkbox"/>	<input type="checkbox"/>
12. TRAINING						
a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?			b. TYPE OF TRAINING		c. DATE OF MOST RECENT FORMAL TRAINING (YYYYMMDD)	
<input type="checkbox"/> YES <input type="checkbox"/> NO			<input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB			
13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)						
a. DIRECT CAUSE(s) (Attach additional sheets as needed, See page 4)						
b. INDIRECT CAUSE(s) (Attach additional sheets as needed, See page 5)						

14. ACTION(s) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(s)

DESCRIBE FULLY (Attach additional sheets as necessary, See page 5)

15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

a. BEGINNING (YYYYMMDD) b. ANTICIPATED COMPLETION (YYYYMMDD)

c. DATE SIGNED (YYYYMMDD) d. TITLE OF SUPERVISOR COMPLETING REPORT e. CORPS SIGNATURE, SUPERVISOR COMPLETING REPORT

c. DATE SIGNED (YYYYMMDD) d. TITLE OF SUPERVISOR COMPLETING REPORT e. CONTRACTOR SIGNATURE, SUPERVISOR COMPLETING REPORT

f. ORGANIZATION IDENTIFIER (Division, Branch, Section, etc.,) g. OFFICE SYMBOL

16. MANAGEMENT REVIEW (1st)

a. CONCUR b. NONCONCUR c. COMMENTS

DATE (YYYYMMDD) TITLE SIGNATURE

17. MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.,)

a. CONCUR b. NONCONCUR c. COMMENTS

DATE (YYYYMMDD) TITLE SIGNATURE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. CONCUR b. NONCONCUR c. ADDITIONAL ACTIONS/COMMENTS

DATE (YYYYMMDD) TITLE SIGNATURE

19. COMMAND APPROVAL

COMMENTS

DATE (YYYYMMDD) COMMANDER SIGNATURE

10.

ACCIDENT DESCRIPTION *(Continuation)*

13a.

DIRECT CAUSE(s) *(Continuation)*

13b.

INDIRECT CAUSE(s) *(Continuation)*

14.

ACTION(s) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(s) *(Continuation)*

GENERAL. Complete a separate report for each person who was injured, caused, or contributed to the accident (*excluding uninjured personnel and witnesses*). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16 and 17.

INSTRUCTIONS FOR SECTION 1 - ACCIDENT CLASSIFICATION

(Mark All Boxes That Are Applicable)

a. GOVERNMENT Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.

(1) INJURY/ILLNESS/FATALITY - Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (*injury*), CA-2 (*illness*) or CA-6 (*fatality*) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.

(2) PROPERTY DAMAGE - Mark the appropriate box if accident resulted in any damage of \$1000 or more to government property (*including motor vehicles*).

(3) VEHICLE INVOLVED - Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY - Mark if the accident involved an in-house USACE diving activity.

b. CONTRACTOR

(1) INJURY/ILLNESS/FATALITY - Mark if accident resulted in any contractor lost-time injury/illness or fatality.

(2) PROPERTY DAMAGE - Mark the appropriate box if accident resulted in any damage of \$1000 or more to contractor property (*including motor vehicles*).

(3) VEHICLE INVOLVED - Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY - Mark if the accident involved a USACE Contractor diving activity.

c. PUBLIC.

(1) INJURY/ILLNESS/FATALITY - Mark if accident resulted in public fatality or permanent total disability. (*The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander.*)

(2) VOID SPACE - Make no entry.

(3) VEHICLE INVOLVED - Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" is marked.

(4) VOID SPACE - Make no entry.

INSTRUCTIONS FOR SECTION 2 - PERSONAL DATA

a. NAME - (*MANDATORY FOR GOVERNMENT ACCIDENTS, OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS*) Enter last name, first name, middle initial of person involved.

b. AGE - Enter age.

c. SEX - Mark appropriate box.

d. SOCIAL SECURITY NUMBER - (*FOR GOVERNMENT PERSONNEL ONLY*) Enter the social security number (*or other personal identification number if no social security number issued*).

e. GRADE - (*FOR GOVERNMENT PERSONNEL ONLY*) Enter pay grade. Example: 0-6; E-7; WG-8; WS-12; GS-11; etc.

f. JOB SERIES/TITLE - For government civilian employees enter the pay plan, full series number, and job title, e.g., GS-O810/Civil Engineer. For military personnel enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11G50. For contractor employees enter the job title assigned to the injured person, e.g., carpenter, laborer, surveyor, etc.

g. DUTY STATUS - Mark the appropriate box.

(1) ON DUTY - Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.

(2) TDY - Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.

(3) OFF DUTY - Person was not on official business at time of accident.

h. EMPLOYMENT STATUS - (*FOR GOVERNMENT PERSONNEL ONLY*) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTION FOR SECTION 3 - GENERAL INFORMATION

- a. DATE OF ACCIDENT - Enter the month, day, and year of accident.
- b. TIME OF ACCIDENT - Enter the local time of accident in military time. Example: 1430 hrs (*not* 2.30 p.m.).
- c. EXACT LOCATION OF ACCIDENT - Enter facts needed to locate the accident scene, (*installation/project name, building number, street, direction and distance from closest landmark, etc.*).
- d. CONTRACTOR NAME
- (1) PRIME - Enter the exact name (*title of firm*) of the prime contractor.
- (2) SUBCONTRACTOR - Enter the name of any subcontractor involved in the accident.
- e. CONTRACT NUMBER - Mark the appropriate box to identify if contract is civil works, military, or other: if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.
- f. TYPE OF CONTRACT - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
- g. HAZARDOUS/TOXIC WASTE ACTIVITY (*HTW*) - Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (*IRP*) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (*FUDS*) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 - CONSTRUCTION ACTIVITIES

- a. CONSTRUCTION ACTIVITY - Select the most appropriate construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

1. MOBILIZATION	13. CARPENTRY
2. SITE PREPARATION	14. ELECTRICAL
3. EXCAVATION/TRENCHING	15. SCAFFOLDING/ACCESS
4. GRADING (EARTHWORK)	16. MECHANICAL
5. PIPING/UTILITIES	17. PAINTING
6. FOUNDATION	18. EQUIPMENT/MAINTENANCE
7. FORMING	19. TUNNELING
8. CONCRETE PLACEMENT	20. WAREHOUSING/STORAGE
9. STEEL ERECTION	21. PAVING
10. ROOFING	22. FENCING
11. FRAMING	23. SIGNING
12. MASONRY	24. LANDSCAPING/IRRIGATION
	25. INSULATION
	26. DEMOLITION

- b. TYPE OF CONSTRUCTION EQUIPMENT - Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER", and write in specific type of equipment.

CONSTRUCTION EQUIPMENT

1. GRADER	12. DUMP TRUCK (<i>HIGHWAY</i>)
2. DRAGLINE	13. DUMP TRUCK (<i>OFF HIGHWAY</i>)
3. CRANE (<i>ON VESSEL/BARGE</i>)	14. TRUCK (<i>OTHER</i>)
4. CRANE (<i>TRACKED</i>)	15. FORKLIFT
5. CRANE (<i>RUBBER TIRE</i>)	16. BACKHOE
6. CRANE (<i>VEHICLE MOUNTED</i>)	17. FRONT-END LOADER
7. CRANE (<i>TOWER</i>)	18. PILE DRIVER
8. SHOVEL	19. TRACTOR (<i>UTILITY</i>)
9. SCRAPER	20. MANLIFT
10. PUMP TRUCK (<i>CONCRETE</i>)	21. DOZER
11. TRUCK (<i>CONCRETE/TRANSIT MIXER</i>)	22. DRILL RIG
	23. COMPACTOR/VIBRATORY ROLLER
	24. OTHER

INSTRUCTIONS FOR SECTION 5 - INJURY/ILLNESS INFORMATION

- a. SEVERITY OF INJURY/ILLNESS - Reference paragraph 2-10 of USAGE Supplement 1 to AR 385-40 and enter code and description from list below.

NOI	NO INJURY
FAT	FATALITY
PTL	PERMANENT TOTAL DISABILITY
PPR	PERMANENT PARTIAL DISABILITY
LWD	LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK
NLW	RECORDABLE CASE WITHOUT LOST WORKDAYS
RFA	RECORDABLE FIRST AID CASE
NRI	NON-RECORDABLE INJURY

- b. ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work;

c. ESTIMATED DAYS HOSPITALIZED - Enter the estimated number of workdays the person will be hospitalized.

d. ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.

e. BODY PART AFFECTED - Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME	HEAD, EXTERNAL	H1	EYE EXTERNAL
ARM/WRIST	AB	ARM AND WRIST		H2	BOTH EYES EXTERNAL
	AS	ARM OR WRIST		H3	EAR EXTERNAL
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST		H4	BOTH EARS EXTERNAL
	B2	BOTH BREASTS		HC	CHIN
	B3	SINGLE TESTICLE		HF	FACE
	B4	BOTH TESTICLES		HK	NECK/THROAT
	BA	ABDOMEN		HM	MOUTH/LIPS
	BC	CHEST		HN	NOSE
	BL	LOWER BACK	KNEE	HS	SCALP
	BP	PENIS		KB	BOTH KNEES
	BS	SIDE	LEG, HIP, ANKLE, BUTTOCKS	KS	KNEE
	BU	UPPER BACK		LB	BOTH LEGS/HIPS/ ANKLES/
	BW	WAIST	BUTTOCK	LS	SINGLE LEG/HIP/ ANKLE/BUTTOCK
BZ	TRUNK OTHER				
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL	HAND	MB	BOTH HANDS
	C2	BOTH EARS INTERNAL		MS	SINGLE HAND
	C3	SINGLE EYE INTERNAL	FOOT	PB	BOTH FEET
	C4	BOTH EYES INTERNAL		PS	SINGLE FOOT
	CB	BRAIN			
	CC	CRANIAL BONES	TRUNK BONES	R1	SINGLE COLLAR BONE
	CD	TEETH		R2	BOTH COLLAR BONES
	CJ	JAW		R3	SHOULDER BLADE
	CL	THROAT, LARYNX		R4	BOTH SHOULDER BLADES
	CM	MOUTH		RB	RIB
CN	NOSE		RS	STERNUM (BREAST BONE)	
CR	THROAT, OTHER		RV	VERTEBRAE (SPINE; DISC)	
CT	TONGUE		RZ	TRUNK BONES OTHER	
CZ	HEAD OTHER INTERNAL				
ELBOW	EB	BOTH ELBOWS	SHOULDER	SB	BOTH SHOULDERS
	ES	SINGLE ELBOW		SS	SINGLE SHOULDER
FINGER	F1	FIRST FINGER	THUMB	TB	BOTH THUMBS
	F2	BOTH FIRST FINGERS		TS	SINGLE THUMB
	F3	SECOND FINGER			
	F4	BOTH SECOND FINGERS	TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	F5	THIRD FINGER		V2	LUNGS, BOTH
F6	BOTH THIRD FINGERS		V3	KIDNEY, SINGLE	
F7	FOURTH FINGER		V4	KIDNEYS, BOTH	
F8	BOTH FOURTH FINGERS		VH	HEART	
TOE	G1	GREAT TOE		VL	LIVER
	G2	BOTH GREAT TOES		VR	REPRODUCTIVE ORGANS
	G3	TOE OTHER		VS	STOMACH
	G4	TOES OTHER		VV	INTESTINES
			VZ	TRUNK, INTERNAL OTHER	

f. NATURE OF INJURY/ILLNESS - Select the most appropriate nature of injury/illness from the list below. This nature of injury/illness shall correspond to the primary body part selected in 5e, above. Enter the nature of injury/illness name on the line and place the corresponding CODE letters in the box provided.

* The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME	TU	BURN, SCALD, SUNBURN
*TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TB	BACK STRAIN	TR	TRAUMATIC RESPIRATORY DISEASE
	TC	CONTUSION, BRUISE, ABRASION	TQ	TRAUMATIC FOOD POISONING
	TD	DISLOCATION	TW	TRAUMATIC TUBERCULOSIS
	TF	FRACTURE	TX	TRAUMATIC VIROLOGICAL/INFECTIVE/
	TH	HERNIA		
			PARASITIC DISEASE	T1
GENERAL NATURE CATEGORY				
	TK	CONCUSSION	T2	TRAUMATIC HEARING LOSS
	TL	LACERATION, CUT	T3	TRAUMATIC HEART CONDITION
	TP	PUNCTURE	T4	TRAUMATIC MENTAL DISORDER, STRESS; NERVOUS CONDITION
	TS	STRAIN, MULTIPLE	T8	TRAUMATIC INJURY - OTHER (EXCEPT DISEASE, ILLNESS)

** A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which does not meet the definition of traumatic injury or disability as described above.

**GENERAL NATURE
CATEGORY**

****NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY**

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME		
RESPIRATORY DISEASE	RA	ASBESTOSIS		DD ENDEMIC DISEASE (OTHER THAN CODE TYPES R&S)
	RB	BRONCHITIS		DE EFFECT OF ENVIRONMENTAL
	RE	EMPHYSEMA		
	RP	PNEUMOCONIOSIS	CONDITION	
	RS	SILICOSIS		DH HEARING LOSS
	R9	RESPIRATORY DISEASE, OTHER		DK HEART CONDITION
				DM MENTAL DISORDER, EMOTIONAL STRESS, NERVOUS CONDITION
				DR RADIATION
				DS STRAIN, MULTIPLE
VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS		DJ ULCER
	VC	COCCIDIOMYCOSIS		DV OTHER VASCULAR CONDITIONS
	VF	FOOD POISONING		D9 DISABILITY, OTHER
	VH	HEPATITIS		
	VM	MALARIA		
	VS	STAPHYLOCOCCUS		
	VT	TUBERCULOSIS	SKIN DISEASE OR	
	V9	VIROLOGICAL/INFECTIVE/ PARASITIC - OTHER	CONDITION	
				SB BIOLOGICAL
				SC CHEMICAL
DISABILITY, OCCUPATIONAL	DA	ARTHRITIS, BURSITIS		S9 DERMATITIS, UNCLASSIFIED
	DB	BACK STRAIN, BACK SPRAIN		
	DC	CEREBRAL VASCULAR CONDITION, STROKE		

g TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and Source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples

(1) An employee tripped on carpet and struck his head on a desk. TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/oak.

TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliver while grinding a turbine blade.

TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.

TYPE: 800 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 800, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE Identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME		
			EXERTED
		0810	LIFTED, STRAINED BY (SINGLE ACTION)
	STRUCK	0620	STRESSED BY (REPEATED ACTION)
0110	STRUCK BY		EXPOSED
0111	STRUCK BY FALLING OBJECT	0710	INHALED
0120	STRUCK AGAINST	0720	INGESTED
	FELL, SLIPPED, TRIPPED	0730	ABSORBED
0210	FELL ON SAME LEVEL	0740	EXPOSED TO
0220	FELL ON DIFFERENT LEVEL	0800	TRAVELING IN
0230	SLIPPED, TRIPPED (NO FALL)		
	CAUGHT		
0310	CAUGHT ON		
0320	CAUGHT IN	0100	BUILDING OR WORKING AREA
0330	CAUGHT BETWEEN	0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC.)
	PUNCTURED, LACERATED		STAIRS, STEPS
0410	PUNCTURED BY	0120	LADDER
0420	CUT BY	0130	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0430	STUNG BY	0140	BOILER, PRESSURE VESSEL
0440	BITTEN BY	0150	EQUIPMENT LAYOUT (ERGONOMIC)
	CONTACTED	0160	WINDOWS, DOORS
0510	CONTACTED WITH (INJURED PERSON MOVING)	0170	ELECTRICITY
0520	CONTACTED BY (OBJECT WAS MOVING)	0180	

0200	ENVIRONMENTAL CONDITION	0631	CARBON MONOXIDE
0210	TEMPERATURE EXTREME (INDOOR)	0640	MIST, STEAM, VAPOR, FUME
0220	WEATHER (ICE, RAIN, HEAT, ETC.)	0641	WELDING FUMES
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)	0650	PARTICLES (UNIDENTIFIED)
0240	NOISE	0700	CHEMICAL, PLASTIC, ETC.
0250	RADIATION	0711	DRY CHEMICAL - CORROSIVE
0260	LIGHT	0712	DRY CHEMICAL - TOXIC
0270	VENTILATION	0713	DRY CHEMICAL - EXPLOSIVE
0271	TOBACCO SMOKE	0714	DRY CHEMICAL FLAMMABLE
0280	STRESS (EMOTIONAL)	0721	LIQUID CHEMICAL - CORROSIVE
0290	CONFINED SPACE	0722	LIQUID CHEMICAL - TOXIC
0300	MACHINE OR TOOL	0723	LIQUID CHEMICAL - EXPLOSIVE
0310	HAND TOOL (POWERED, SAW, GRINDER, ETC.)	0724	LIQUID CHEMICAL - FLAMMABLE
0320	HAND TOOL (NONPOWERED)	0730	PLASTIC
0330	MECHANICAL POWER TRANSMISSION APPARATUS	0740	WATER
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)	0750	MEDICINE
0350	VIDEO DISPLAY TERMINAL	0800	INAMINATE OBJECT
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL	0810	BOX, BARREL, ETC.
0370	HEATING EQUIPMENT	0820	PAPER
0380	WELDING EQUIPMENT	0830	METAL ITEM, MINERAL
0400	VEHICLE	0831	NEEDLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE	0840	GLASS
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE	0850	SCRAP, TRASH
0421	DRIVER OF GOVERNMENT VEHICLE	0860	WOOD
0422	PASSENGER OF GOVERNMENT VEHICLE	0870	FOOD
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)	0880	CLOTHING, APPAREL, SHOES
0440	AIRCRAFT (NOT COMMERCIAL)	0900	ANIMATE OBJECT
0450	BOAT, SHIP, BARGE	0911	DOG
0500	MATERIAL HANDLING EQUIPMENT	0912	OTHER ANIMAL
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)	0920	PLANT
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)	0930	INSECT
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST	0940	HUMAN (VIOLENCE)
0540	HOIST, SLING CHAIN, JACK	0950	HUMAN (COMMUNICABLE DISEASE)
0550	CRANE	0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)
0551	FORKLIFT	1000	PERSONAL PROTECTIVE EQUIPMENT
0560	HANDTRUCK, DOLLY	1010	PROTECTIVE CLOTHING, SHOES, GLASSES,
0600	DUST, VAPOR, ETC.		GOGGLES
0610	DUST (SILICA, COAL, ETC.)	1020	RESPIRATOR, MASK
0620	FIBERS	1021	DIVING EQUIPMENT
0621	ASBESTOS	1030	SAFETY BELT, HARNESS
0630	GASES	1040	PARACHUTE

INSTRUCTIONS FOR SECTION 6 - PUBLIC FATALITY

a. **ACTIVITY AT TIME OF ACCIDENT** - Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the most appropriate primary activity area (water related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

1. Sailing
2. Boating-powered
3. Boating-unpowered
4. Water skiing
5. Fishing from boat
6. Fishing from bank dock or pier
7. Fishing while wading
8. Swimming/supervised area
9. Swimming/designated area
10. Swimming/other area
11. Underwater activities (skin diving, scuba, etc.)
12. Wading
13. Attempted rescue
14. Hunting from boat
15. Other

NON-WATER RELATED RECREATION

16. Hiking and walking
17. Climbing (general)
18. Camping/picnicking authorized area

19. Camping/picnicking unauthorized area
20. Guided tours
21. Hunting
22. Playground equipment
23. Sports/summer (baseball, football, etc.)
24. Sports/winter (skiing, sledding, snowmobiling etc.)
25. Cycling (bicycle, motorcycle, scooter)
26. Gliding
27. Parachuting
28. Other non-water related

OTHER ACTIVITIES

29. Unlawful acts (fights, riots, vandalism, etc.)
30. Food preparation/serving
31. Food consumption
32. Housekeeping
33. Sleeping
34. Pedestrian struck by vehicle
35. Pedestrian other acts
36. Suicide
37. "Other" activities

b. **PERSONAL FLOTATION DEVICE USED** - If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7 - MOTOR VEHICLE ACCIDENT

a. **TYPE OF VEHICLE** - Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.

b. **TYPE OF COLLISION** - Mark appropriate box.

c. **SEAT BELT** - Mark appropriate box.

INSTRUCTIONS FOR SECTION 8 - PROPERTY/MATERIAL INVOLVED

a. **NAME OF ITEM** - Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.

b. **OWNERSHIP** - Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE*)

c. **\$ AMOUNT OF DAMAGE** - Enter the total estimated dollar amount of damage (*parts and labor*), if any.

INSTRUCTIONS FOR SECTION 9 - VESSEL/FLOATING PLANT ACCIDENT

a. **TYPE OF VESSEL/FLOATING PLANT** - Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/floating plant.

VESSEL/FLOATING PLANTS

1. ROW BOAT
2. SAIL BOAT
3. MOTOR BOAT
4. BARGE
5. DREDGE/HOPPER
6. DREDGE/SIDE CASTING
7. DREDGE/DIPPER
8. DREDGE/CLAMSHELL BUCKET
9. DREDGE/PIPE LINE
10. DREDGE/DUST PAN
11. TUG BOAT
12. OTHER

b. **COLLISION/MISHAP** - Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

1. COLLISION W/OTHER VESSEL
2. UPPER GUIDE WALL
3. UPPER LOCK GATES
4. LOCK WALL
5. LOWER LOCK GATES
6. LOWER GUIDE WALL
7. HAULAGE UNIT
8. BREAKING TOW
9. TOW BREAKING UP
10. SWEEP DOWN ON DAM
11. BUOY/DOLPHIN/CELL
12. WHARF OR DOCK
13. OTHER

INSTRUCTIONS FOR SECTION 10 - ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT - Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

INSTRUCTIONS FOR SECTION 11 - CAUSAL FACTORS

a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:

- (1) **DESIGN** - Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) **INSPECTION/MAINTENANCE** - Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) **PERSON'S PHYSICAL CONDITION** - Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?
- (4) **OPERATING PROCEDURES** - Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) **JOB PRACTICES** - Were any of the provisions of the Safety and Health Requirements Manual (*EM 385-1-1*) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (*including EM 385-1-1*) fail to adequately address the task or work process? Would better job practices improve the safety of the task?
- (6) **HUMAN FACTORS** - Was the person under undue stress (*either internal or external to the job*)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
- (7) **ENVIRONMENTAL FACTORS** - Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc. play a part in the accident?

- (8) **CHEMICAL AND PHYSICAL AGENT FACTORS** - Did exposure to chemical agents (*either single shift exposure or long-term exposure*) such as dusts, fibers (*asbestos, etc.*), silica, gases (*carbon monoxide, chlorine, etc.*), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (*UV radiation created during welding, etc.*) contribute to the accident/incident?
- (9) **OFFICE FACTORS** - Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
- (10) **SUPPORT FACTORS** - Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (*in terms of employee skills, number of workers, and adequate supervision*) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc.?
- (11) **PERSONAL PROTECTIVE EQUIPMENT** - Did the person fail to use appropriate personal protective equipment (*gloves, eye protection, hard-toed shoes, respirator, etc.*) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?
- (12) **DRUGS/ALCOHOL** - Is there any reason to believe the person's mental or physical capabilities, judgment, etc. were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".
- b. **WRITTEN JOB/ACTIVITY HAZARD ANALYSIS** - Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. If one was performed, attach a copy of the analysis to the report.

INSTRUCTIONS FOR SECTION 12 - TRAINING

- a. **WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?** - For the purpose of this section "trained" means the person has been provided the necessary information (*either formal and/or on-the-job (OJT) training*) to competently perform the activity/task in a safe and healthful manner.
- b. **TYPE OF TRAINING** - Mark the appropriate box that best indicates the type of training (*classroom or on-the-job*) that the injured person received, before the accident happened.
- c. **DATE OF MOST RECENT TRAINING** - Enter YYYYMMDD of the last formal training completed that covered the activity task being performed at the time of the accident.

INSTRUCTIONS FOR SECTION 13 - CAUSES

- a. **DIRECT CAUSES** - The direct cause is that single factor, which most directly lead to the accident. See examples below.
- b. **INDIRECT CAUSES** - Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

- a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.

Direct cause: failure to provide fall protection at elevation. **Indirect causes:** failure to enforce USACE safety requirements, improper training/motivation of employee (*possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety*); failure to ensure provision of positive fall protection whenever elevated, failure to address fall protection during scaffold dismantling in phase hazard analysis.

- b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (*Note: USACE vehicle was in proper/safe working condition*).

Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.

Indirect cause: failure of employee to pay attention to driving (*defensive driving*).

INSTRUCTIONS FOR SECTION 14 - ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION - Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent recurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15 - DATES FOR ACTION

- a. **BEGIN DATE** - Enter the date YYYYMMDD when the corrective action(s) identified in section 14 will begin.
- b. **COMPLETE DATE** - Enter the date YYYYMMDD when the corrective action(s) identified in section 14 will be completed.
- c. **DATE SIGNED** - Enter YYYYMMDD that the report was signed by the responsible supervisor.
- d.e. **TITLE AND SIGNATURE** - Enter the title and signature of supervisor completing the accident report. For a GOVERNMENT employee accident/illness the immediate supervisor will complete and sign the report. For PUBLIC accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For CONTRACTOR accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE supervisor shall also sign the report. Upon entering the information required in 15c., 15d., 15e., 15f. and 15g. below, the responsible USACE supervisor shall forward the report for management review as indicated in section 16.

f. **ORGANIZATION NAME** - For GOVERNMENT employee accidents enter the USACE organization name (*Division, Branch, Section, etc.*) of the injured employee. For PUBLIC accidents enter the USACE organization name for the person identified in block 15d. For CONTRACTOR accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

g. **OFFICE SYMBOL** - Enter the latest complete USACE Office Symbol for the USACE organization identified in block 15f.

INSTRUCTIONS FOR SECTION 16 - MANAGEMENT REVIEW (1st)

1ST REVIEW - Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15d. shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (*2nd review*) for review and comment.

INSTRUCTIONS FOR SECTION 17 - MANAGEMENT REVIEW (2nd)

2ND REVIEW - The FOA Staff Chief (*i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.*) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18 - SAFETY AND OCCUPATIONAL HEALTH REVIEW

3RD REVIEW - The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

INSTRUCTION FOR SECTION 19 - COMMAND APPROVAL

4TH REVIEW - The FOA Commander shall (*to include the person designated Acting Commander in his absence*) review the completed report, comment if required, sign, date and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.

ATTACHMENT F

**BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN – FIRST
AID PROVIDERS**

BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN – FIRST AID PROVIDERS

SCOPE

WESTON personnel do not provide medical assistance as a primary job duty; however, this Bloodborne Pathogen Exposure Control Plan (ECP) is applicable to designated first aid providers. WESTON workers expected to administer first aid must have a basic understanding of bloodborne pathogens in order to protect themselves effectively from any hazards. At a minimum, this Bloodborne Pathogen ECP for First Aid Providers will be on site

WESTON personnel may deliver First Aid and CPR in a nonclinical setting. First Aid and CPR duties are often performed in uncontrolled environments, which, due to a lack of time and other factors, do not allow for application of a complex decision-making process to the emergency at hand.

This ECP is intended to assist personnel in making decisions concerning the use of personal protective equipment (PPE) and resuscitation equipment, as well as for decontamination, labeling, containerizing and disposal procedures.

Information Program

Identification and assessment of risk from exposure to biological hazards is conducted as part of the development of the APP and SSHP. This ECP deals with forms of infection that are of concern to workers who can come in contact with bodily fluids associated with blood.

WESTON training programs provide information on bloodborne pathogens and the Occupational Exposure to Bloodborne Pathogens Standard to all field personnel with special emphasis on those employees who are certified and called upon to perform First Aid.

Exposure Control

This ECP is designed to eliminate or minimize employee exposure to bloodborne pathogens through information and training, use of PPE, safe handling procedures, decontamination, and proper disposal methods.

Exposure Determination

Employees certified in First Aid and CPR may be at risk from bloodborne pathogens when these services are rendered. Attachment 1 identifies tasks in which occupational exposure may occur, potential contact, and required protective measures for First Aid providers.

METHODS OF COMPLIANCE

Universal Precautions

When treating a victim for an injury, conducting CPR, or handling potentially infectious waste, the use of universal precautions is the recommended approach to infection control. Universal precautions assume all human blood and certain human body fluids are infectious for HIV, HBV and other bloodborne pathogens. Other body substances, including feces, urine, or vomit are not included, unless they contain visible blood. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

Work Practice Controls

Work practice controls reduce the likelihood of exposure by formalizing the manner in which a task is performed.

- All first aid procedures involving blood or other potentially infectious materials shall be performed in a manner that minimizes splashing, spraying, spattering, and generation of droplets of these substances.
- Mouth suctioning of blood or other infectious materials is prohibited.
- When handling sharps such as needles used for bee stings or diabetes, do not recap, purposely bend, break by hand, remove from disposable syringes, or otherwise manipulate by hand.
- As soon as possible after use, contaminated sharps are to be placed in puncture proof/leak proof containers until they can be disposed.
- Broken glassware which may be contaminated shall not be picked up directly with the hands unless gloves are used to protect the hands against cuts. It is best to use mechanical means, such as a brush and dust pan then place contaminated broken glass in a puncture proof/leak proof container.
- When handling red bag waste, hold the top end of the bag rather than the bottom.
- Containers of potentially infectious waste should be labeled with a biohazard label.
- All PPE should be inspected prior to use. PPE should not be worn if the PPE barrier is compromised.
- Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood, other body fluids to which universal precautions apply, or their potentially contaminated articles. Hands should always be washed after gloves are removed even if the gloves appear intact.
- Where hand washing facilities are not readily accessible, an antiseptic hand cleaner along with clean cloth/paper towels or antiseptic towelettes should be used. When antiseptic hand cleaners or towelettes are used hands shall be washed with soap and running water as soon as feasible.

Engineering Controls

Engineering controls isolate or remove the bloodborne pathogen hazard from the workplace.

- Proper containerizing, labeling and disposal of contaminated items are required for all potentially infectious waste.
- Minimizing needle sticks by placing them in a puncture proof container.
- Limiting access or close off areas which contain potentially infectious materials.

Administrative Controls

Administrative controls reduce or eliminate bloodborne pathogen hazards from the workplace by program development (i.e., ECP), auditing to ensure these programs are in place and implemented, and providing information and training.

Personal Protective Equipment (PPE)

PPE is specialized clothing or equipment worn by an employee for protection against a hazard. Attachment 1 provides examples of recommendations for PPE in the nonclinical setting; the list is not intended to be all-inclusive.

First-aid kits will be supplemented with bloodborne pathogen kits or supplies and will be readily accessible at all times.

If the chance of being exposed to blood is high, the caregiver should put on protective attire before beginning CPR or First Aid. Protective barriers should be used in accordance with the level of exposure encountered.

Under rare or extraordinary circumstances, a responding employee may decide, based on his or her judgment, that use of PPE would prevent delivery of care or pose an increased hazard to safety of the employee or co-worker. When this judgment has been made, an investigation of the event will be initiated and documented in order to determine what changes in procedures or protective equipment is needed.

Resuscitation Equipment

No transmission of HBV or HIV infection during mouth to mouth resuscitation has been documented. However, because of the risk of salivary transmission of other infectious diseases and the theoretical risk of HIV and HBV transmission during artificial ventilation of trauma victims, disposable mouth to mouth resuscitation masks (one-way valve type only) should be used. These devices are designed to isolate emergency response personnel from contact with victim's blood and blood-contaminated saliva, respiratory secretions, and vomit. Disposable resuscitation equipment and devices should be disposed of once they have been used.

Decontamination and Disposal

All PPE will be removed prior to leaving a contaminated area and secured properly for decontamination or proper disposal.

Decontamination uses physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal. All spills of blood and blood-contaminated fluids should be promptly cleaned up. The area should be decontaminated with a commercial disinfectant solution or a 1:100 solution of household bleach. Soiled cleaning equipment should be cleaned and decontaminated with the disinfectant solution.

If a victim's clothes become soiled with blood during First Aid or CPR, the soiled material (i.e., clothes, resuscitation equipment or disposable towels) should be placed in a red or orange plastic bag. If possible this bag should accompany the victim to the hospital or ambulance. Where on-site emergency care is given and additional medical treatment is not likely, soiled material should be placed in a red or orange plastic bag and then pick-up should be arranged by a local medical waste disposal company. Containers must be identified prior to transport or pick-up.

Any questions regarding the disposal or management of soiled garments or materials should be directed to Federal Team Health and Safety Officer or Division Environmental Health and Safety Officer.

Containerizing

The potentially contaminated materials and sharps container generated from giving First Aid and CPR will be placed in a red or orange container/bag. When PPE is removed it shall be placed in an appropriate designated area for containerization. If the outside contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling processing storage, transport or shipping and is labeled or color coded.

Sharps such as needles used for bee stings or diabetes should be placed in a puncture proof/leak proof color coded or labeled container. If other contents could puncture the primary container, the primary container shall be placed within a secondary container which is puncture resistant. The liquid generated from the decontamination process should be contained in a leak proof container until a local medical waste disposal company can provide information on proper disposal based on local, state and federal regulations.

Labeling and Hazard Communication

Biohazard warning labels required by the Standard [29 CFR 1910.1030(g)(1)(i)(B)] must be attached to containers of regulated wastes or other containers of potentially infectious materials during storage, transport or shipment. Red or orange bags may be substituted for labeling requirements, otherwise, a biohazard label with lettering or symbols should be affixed to the outside of each bag or container generated. Consequently, any container so labeled or any red or orange bagged waste or materials shall be considered to contain either blood or other infectious material.

Incident Reporting

When an employee gives First Aid or CPR, or is potentially exposed to a bloodborne pathogen, a Notification of Incident (NOI) Report must be completed. The report must indicate "Potential Exposure to Bloodborne Pathogens"

Vaccination and Post-Exposure Evaluation and Follow-up

The pre-work Hepatitis B Vaccination for First Aid providers is not required, it will therefore, be offered post-exposure.

Hepatitis B vaccines are effective in preventing hepatitis B following a documented exposure when given within 1 week after HBV exposure. The vaccine may be more effective when combined with HBIG, a preparation of immune globulin with high levels of antibody to HBV (anti-HBs). The U.S. Public Health Service and Center for Disease Control guidelines should be accessed for current information.

Upon suspicion or verification of exposure to blood or infectious materials, Hepatitis vaccine will be made available to the exposed individual(s) at no cost to the employee. The employee will immediately be referred to WESTON's Occupational Medical Consultant (OMC) for counseling and management.

Upon learning of exposure to a source or source individual found to be positive for HBV or HIV, WESTON's OMC will provide direction on case management. The OMC, after discussion of the exposure situation with the medical clinic or hospital where the victim was evaluated and treated for injury, will determine whether the exposed employee should be tested for HBV or HIV prior to the status of the source being known (or in the case where the source is unknown).

HBV and HIV testing of the source individual should be done at the local offices' medical clinic or at the hospital where the victim was treated for injury. Local laws may apply for testing source individuals in situations where consent cannot be obtained because the source refuses testing or cannot be identified (i.e., an unconscious patient). If the job location does not allow access to the local offices' medical clinic then a new WESTON OMC will be consulted for guidance. The alternate clinic/hospital must offer pretest counseling, post test counseling and referral for treatment.

Consult with WESTON's OMC to determine if the exposed employee should be given the HBV post-exposure vaccination.

Collection and testing of blood for HBV and HIV serological status shall be performed as soon as feasible on the exposed employee's blood (after consent) where the source is found to be positive for HIV or HBV. Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed by the Medical Safety Officer of applicable laws and regulations concerning

disclosure of the identity and infectious status of the source individual. When the source individual is already known to be infected with HBV or HIV testing of the source individual known HBV or HIV status need not be repeated (Center for Disease Control, 1985).

If the source of the exposure is a needle stick or bloodstained material (i.e., blood stained material contacted an open wound on a field team member) the source should be placed in an appropriate container (i.e., sharps container for needles and red bag for blood tainted material). The container should be given to the WESTON medical clinic for analysis. If the source is found to be HBV or HIV positive, the incident report must be updated to change the status from suspected to confirmed exposure. At this point the NOI Report will be placed in a limited control access portion of incident filing system to maintain confidentiality.

Human Immunodeficiency Virus Post Exposure Management

For any exposure to a source or source individual who has AIDS, who is found to be positive for HIV infection or who refuses testing, the worker should be counseled regarding the risk of infection and evaluated clinically and serologically for evidence for the HIV infection as soon as possible after the exposure. WESTON's OMC will provide direction on the case management.

If the source individual was tested and found to be seronegative, follow-up will be determined by WESTON's OMC.

If the source or source individual cannot be identified, decisions regarding appropriate follow-up should be individualized. Serological testing will be made available to all workers who may be concerned they have been infected with HIV through an occupational exposure. WESTON's OMC will provide direction on the case management.

Communication of Hazards to Employees

Training Schedule

WESTON ensures that employees, who are certified to provide First Aid and CPR, are trained in all components of the bloodborne pathogen standard upon assignment and at the annual refresher training. All First Aid providers must be aware of task modifications or procedure changes which might affect occupational exposure.

Training Contents

A training sign-up sheet will be completed to include course title, date, attendees' names, signatures, job classifications, instructor's name, and duration of the class. Training content will include the following information:

- Where an accessible copy of the regulatory text and the WESTON's ECP can be found.
- An explanation of WESTON's ECP and the means by which employees can obtain a copy of the written plan.
- A general explanation of the epidemiology and symptoms of bloodborne diseases.
- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials.
- An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and PPE.
- Information on the types, proper use, location, removal, handling, decontamination and disposal of PPE.

- An explanation of the basis for selection of PPE.
- Information on the Hepatitis B vaccine (or any new vaccines), including information on its efficacy, safety, method of administration, the benefits of being vaccinated.
- An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available.
- Information on the post-exposure evaluation and follow-up that WESTON is required to provide for the employee following an exposure incident.
- An explanation of the signs and labels and/or color coding for disposal of infectious materials.
- An opportunity for interactive questions and answers with the person conducting the training session.

Recordkeeping

When an employee gives First Aid or CPR and in doing so becomes subject to this ECP, he/she will verbally report the incident within 1 hour and complete a WESTON NOI Report within 24 hours. As part of a medical record, the circumstances of exposure will be kept confidential. Relevant information includes the activities in which the worker was engaged at the time of exposure, the extent to which appropriate work practices and PPE were used, and a description of the source of exposure (USHHS and NIOSH, 1989). When the source is tested for HIV or HBV, the incident report is updated and placed in a confidential file.

ATTACHMENT 1
TASK IDENTIFICATION, POTENTIAL CONTACT, AND PROTECTION

CPR AND FIRST AID			
EMERGENCY SITUATION	SERVICE	POTENTIAL CONTACT	PPE SUGGESTED
Victim is lying on the ground	Primary survey of victim and opening victims airway	Skin to skin contact	Gloves
Victims breathing has ceased	Rescue breathing	Skin to skin contact Mouth to mouth contact	Gloves Resuscitation mouthpiece
No pulse	CPR	Skin to skin contact	Gloves Resuscitation mouthpiece
Victim is lying on the ground	Secondary survey of victim	Skin to skin contact	Gloves
Choking without stoppage of breathing	Heimlich maneuver	Skin to skin contact	None required if skin is intact Non-intact skin requires gloves
Heart Attack	Comfort victim	Skin to skin contact	Gloves
Bleeding with spurting blood	External control	Skin to skin contact	Gloves Gown or coveralls Apron (option) Mask or face protection Eyewear
Minimal bleeding	External control	Skin to skin contact	Gloves
Compound fractures	External control	Skin to skin contact	Gloves
Burns	External control	Skin to skin contact	Gloves
Poisoning	If induced vomiting is needed	Skin to skin contact	Gloves Eyewear
Diabetic shock	Giving an injection	Sharps from needle could cause direct injection	Gloves Sharps container
Bites and stings	Giving an injection	Sharps from needle could cause direct injection	Gloves Sharps container
Seizures	External control	Eyes and skin contact	Gloves Eyewear

CPR AND FIRST AID			
EMERGENCY SITUATION	SERVICE	POTENTIAL CONTACT	PPE SUGGESTED
Stroke	Provide comfort	None	Gloves
Heat Stress/Cold Stress	External control	Skin to skin contact	Gloves
Victim has fainted	Raise legs for shock	Skin to skin contact	Gloves
Victim falls down in hazardous atmosphere	Rescue victim from area	Skin to skin contact	Gloves
Soiled clothes handling	Place soiled clothing and materials in red/orange bag	Skin contact with bloodborne pathogens in clothing fabrics	Gloves Gown or apron (as needed)
Decontamination	Scrub with disinfectant	Skin contact with bloodborne pathogens in clothing fabrics	Gloves Gown or apron (as needed)
Containerization	Place contaminated clothing into bags	Potential skin contact with residual bloodborne pathogen on bags	Gloves Gown or apron (as needed)

APPENDIX C

EXPLOSIVES SAFETY SUBMISSION



EXPLOSIVES SAFETY SUBMISSION

MUNITIONS AND EXPLOSIVES OF CONCERN REMOVAL ACTION

**RICOCHET AREA MUNITIONS RESPONSE SITE
STATE GAME LANDS 211, PENNSYLVANIA**

FEBRUARY 2013

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Prepared for:
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TABLE OF CONTENTS

Section	Page
1. BACKGROUND	1
1.1 SITE LOCATION.....	1
1.2 SITE DESCRIPTION	1
1.3 SITE HISTORY	2
1.4 CURRENT AND FUTURE LAND USE.....	3
1.5 PROJECT AREA.....	3
1.6 REASON FOR MEC	4
1.7 TYPES OF MEC.....	4
2. MAPS	5
3. EXPLOSIVES SAFETY QUANTITY-DISTANCE.....	5
3.1 MUNITION WITH THE GREATEST FRAGMENT DISTANCE.....	5
3.2 MEC AREA	6
3.3 DEMOLITION EXPLOSIVES	7
3.4 PLANNED OR ESTABLISHED DEMOLITION AREAS	7
3.5 FOOTPRINT AREAS	7
3.6 MAXIMUM CREDIBLE EVENT	7
4. START DATE.....	8
5. MEC MIGRATION.....	8
6. DETECTION EQUIPMENT AND RESPONSE TECHNIQUES	8
6.1 REMOVAL DEPTH.....	8
6.2 DETECTION EQUIPMENT	8
6.3 SWEEP PROCEDURES	9
6.4 EXCLUSION ZONE CONTROL	9
6.5 INTRUSIVE INVESTIGATION.....	9
6.6 QUALITY CONTROL AND QUALITY ASSURANCE.....	9
7. DISPOSITION TECHNIQUES.....	10
7.1 DEMOLITION OPERATIONS.....	10
7.2 EXPLOSIVE STORAGE, ACCOUNTABILITY, AND TRANSPORTATION.....	10
7.3 ENGINEERING CONTROLS	10
7.4 SCRAP PROCEDURES.....	11
7.5 ALTERNATIVE DISPOSAL TECHNIQUES.....	12



TABLE OF CONTENTS (Continued)

Section	Page
8. ENVIRONMENTAL, ECOLOGICAL, OR CULTURAL CONSIDERATIONS	12
9. TECHNICAL SUPPORT.....	12
9.1 MILITARY SUPPORT	12
9.2 CONTRACTOR	12
10. RESIDUAL RISK MANAGEMENT	13
10.1 LAND USE CONTROLS	13
10.2 LONG-TERM MANAGEMENT	13
11. UXO SAFETY EDUCATION PROGRAM	13
12. STAKEHOLDER INVOLVEMENT	14
13. CONTINGENCIES.....	14
14. REFERENCES.....	14

APPENDIX A—FIGURES

APPENDIX B—MSD CALCULATION SHEETS



LIST OF TABLES

Table		Page
Table 1-1	Munitions Response Site Covered by this ESS	1
Table 1-2	Type and Depth of MEC Recovered.....	5
Table 3-1	Minimum Separation Distances	6

LIST OF APPENDIX A FIGURES

Figure A-1	Regional Location Map
Figure A-2	MRS Location Map
Figure A-3	Quantity Distance (Q-D) Map

LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
ARNG	Army National Guard Directorate
bgs	below ground surface
BEM	Buried Explosion Module
BIP	blow-in-place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CTT	Closed, Transferring and Transferred
CWM	chemical warfare materiel
CWM-DC	Chemical Warfare Design Center
DDESB	Department of Defense Explosives Safety Board
DMM	discarded military munitions
DoD	Department of Defense
DoDI	Department of Defense Instruction
EM-CX	Environmental and Munitions Center of Expertise
EOD	Explosive Ordnance Disposal
ESS	Explosives Safety Submission
EZ	exclusion zone
FIG	Fort Indiantown Gap
FS	Feasibility Study
ft	feet
HE	high explosive
HFD	hazardous fragment distance
HRR	Historical Records Review
LUC	land use control
MD	munitions debris
MDAS	material documented as safe
MEC	munitions and explosives of concern
MFD-H	maximum fragment distance–horizontal
MFR-H	maximum fragment range–horizontal
MGFD	munition with the greatest fragment distance
mm	millimeter
MPPEH	material potentially presenting an explosive hazard
MRS	Munitions Response Site
MSD	minimum separation distance

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

NEW	net explosive weight
NGB	U.S. Army National Guard Bureau
OE	ordnance and explosives
PADEP	Pennsylvania Department of Environmental Protection
PGC	Pennsylvania Game Commission
PM	Project Manager
POC	point of contact
QA	quality assurance
QC	quality control
QCM	Quality Control Manager
Q-D	quantity distance
RCWM	recovered chemical warfare materiel
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SGL	State Game Lands
SI	Site Inspection
SUXOS	Senior UXO Supervisor
TP	Technical Paper
TSD	team separation distance
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USGS	United States Geological Survey
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
WESTON®	Weston Solutions, Inc.

1. BACKGROUND

1.1 SITE LOCATION

The Ricochet Area Munitions Response Site (MRS) is located approximately 20 miles north of Harrisburg, Pennsylvania. The MRS is a 3,262-acre section of Pennsylvania State Game Lands (SGL) 211, which is owned by the Commonwealth of Pennsylvania and managed by the Pennsylvania Game Commission (PGC) (**Figure A-1**). The Ricochet Area MRS lies within East Hanover Township in Dauphin County and Cold Spring Township in Lebanon County and is immediately adjacent to the Fort Indiantown Gap (FIG) Military Reservation (**Figure A-2**).

This removal action is being performed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and is part of the overall remedial action process. Additional removal responses may be dictated in the future during the remainder of the remedial response process, as determined by subsequent action memoranda or other Record of Decision (ROD) documents. If subsequent responses are determined to be necessary in the remedial process, this Explosives Safety Submission (ESS) will be reviewed and amended as necessary. **Table 1-1** lists the MRS within the project location. Not all MRSs are covered by this ESS.

Table 1-1 Munitions Response Site Covered by this ESS

Area	Total Acreage	Munitions Removal Action
Ricochet Area MRS ^a	1,344	Surface removal of munitions and explosives of concern (MEC) over 1,334 acres and subsurface removal of MEC over 11 acres.

Note: ^a The Ricochet Area MRS is 3,262 acres in size. The planned munitions removal action will span 1,334 acres of the MRS.

1.2 SITE DESCRIPTION

1.2.1 Terrain and Vegetation

The topography of the Ricochet Area MRS is that of the Valley and Ridge System. Inspection of the United States Geological Survey (USGS) Topographic Quadrangle (USGS, 1981) shows the

MRS is bounded to the south by Second Mountain, with ridgeline elevations between 1,200 and 1,400 feet (ft) above mean sea level (amsl). Stony Creek is at an elevation of nearly 700 ft and marks the lowest topographic portion of the MRS. The approximate northern boundary of the MRS is north of the old railroad grade. Most of the MRS is heavily wooded with dense brush and rock outcrops. Two herbaceous openings totaling 11 acres are maintained as grassland food plots for wild game. Forested wetland areas are interspersed among many of the seeps and springs located throughout the Ricochet Area MRS and along the Stony Creek stream corridor.

Steep and low lying terrain may hinder munitions and explosives of concern (MEC) removal actions along the north slope of South Mountain. Analysis of digital elevation maps suggests that less than 1% of the MRS has sporadic steep terrain with a greater than 50% slope creating access issues for personnel. Low lying areas may intermittently fill with water during the rainy season, limiting access.

1.2.2 Soil Condition

Four major soil associations are present across the Ricochet Area MRS: Dekalb-Lehew, Calvin-Klinesville, Berks-Weikert-Bedington, and Laidig-Hazelton-Leck Kill. The soil in the area is generally thin and rocky. The soil on the steep slopes of the mountains consists primarily of very stony sandy loams with channery subsoil. The valleys contain alluvial materials from the well-drained stony sandy loams on the foot slope to shaley silt loams found along the streams (USDA, 2009). Rocks with elevated iron content are present within the MRS; however, in general, the overall geology and soil conditions do not interfere with the use of magnetometers in this region.

1.3 SITE HISTORY

FIG was established in 1931 when the Commonwealth of Pennsylvania purchased approximately 18,000 acres adjacent to SGL 211. Training maneuvers started in 1933. Historical records indicate that surface danger zones extended from FIG into the current area known as the Ricochet Area MRS. From 1945 to 1958, the Army also used the Cold Spring portion of the MRS as an artillery firing position and a bivouac area.

The Ricochet Area MRS was not intentionally used as a target area for military activities conducted at FIG's operational range areas. The presence of munitions within the Ricochet Area

MRS is the result of unintentional overshots and/or ricochets from the former FIG operational ranges in use from 1933 to 1998.

1.4 CURRENT AND FUTURE LAND USE

The Ricochet Area MRS is located in SGL 211. Current land use includes a number of recreational activities such as fishing, hunting, hiking, running, bicycle riding, snow shoeing, dog sledding, cross-country skiing, snowmobiling, horseback riding, Fall-Drive-Thru, bird watching, and other outdoor activities. Non-recreational activities within the MRS include trail, game, and forest maintenance performed by PGC employees or its contractors. The majority of the MRS is in an undeveloped state. No major road or railways traverse the site.

The PGC plan for future land use includes continued recreational, road construction and maintenance, special wildlife area management, timber management, and preservation area maintenance.

1.5 PROJECT AREA

1.5.1 General

A description of the MRS covered by this ESS is given in **Subsection 1.1** and in **Table 1-1**. This ESS covers the munitions response actions for the Ricochet Area MRS, which is a total of 3,262 acres. The Remedial Investigation (RI) results identified a 1,334-acre area that has an elevated anomaly density and an increased probability for encountering MEC on the ground surface based on current and future land use. Unexploded ordnance (UXO), including 75 millimeter (mm) and 155mm projectiles, was recovered in this area.

Within the MRS, two herbaceous openings totaling 11 acres are regularly tilled and maintained by PGC personnel, creating an increased probability for encountering MEC on the surface and subsurface based on current and future land use. The area of the northeastern herbaceous opening was used as an artillery firing point. Subsurface discarded military munitions (DMM), including MK-2A4 primers, were recovered from this area.

1.5.2 Historical and Characterization Data Analysis

The Ricochet Area MRS is currently in the Proposed Plan phase of the CERCLA process. Previous phases of work include the following:

- Closed, Transferring and Transferred (CTT) Range Inventory/Phase 3 Range/Site Inventory (Malcolm Pirnie, 2003).
- Historical Records Review (HRR) (URS, 2007).
- Site Inspection (SI) (URS, 2008).
- Remedial Investigation (Weston Solutions, Inc. [WESTON], 2011).
- Feasibility Study (FS) (WESTON, 2012).

1.5.3 Selected Munitions Response Actions

Based on the results of the RI and current and future land use of the MRS, a surface removal will be performed over the 1,334-acre area. An 11-acre subsurface removal action to depth-of-detection will be performed at the herbaceous openings. **Table 1-1** summarizes the munitions response actions for the Ricochet Area MRS. The munitions response actions are also discussed in **Subsection 1.5.1**.

The munitions response actions for the remaining MRS (i.e., Sharp Mountain MRS) will be addressed in a separate ESS or addendums to this ESS.

1.5.3.1 Land Use Controls

The land use controls (LUCs) selected as likely to be effective and feasible for the Ricochet Area MRS are described in **Subsection 10.1** of this ESS.

1.6 REASON FOR MEC

The MRS history presented in **Subsection 1.3** provides the reason for MEC at the Ricochet Area MRS.

1.7 TYPES OF MEC

A total of 162 acres of the Ricochet Area MRS were investigated using a combination of visual, analog, and digital magnetic geophysical surveys to delineate the nature and extent of MEC.

Thirteen MEC (9 UXO and 4 DMM) were identified and disposed of during RI activities, 121 munitions debris (MD) items, and 594 non-munitions related items (manmade/cultural items such as railroad spikes, nails, metal scrap, horseshoes, and wire) were identified and removed from the MRS. **Table 1-2** provides additional detail of the items discovered during the RI. **Subsection 1.5.2** identifies the reports that highlight the past activities and actions conducted at the Ricochet Area MRS.

Table 1-2 Type and Depth of MEC Recovered

Type of Munitions	Maximum Depth of MEC Recovered During Remedial Investigation (inches)	Maximum Geophysical Detection Depth (inches below ground surface [bgs])
75mm High Explosive (HE) Projectile	0.25	32
75mm Armor Piercing HE	0.25	32
155mm HE Projectile	0	67
MK-2A4 Primers	1.0	4

2. MAPS

Maps are provided in **Appendix A**. **Figure A-1** shows the site in relation to the surrounding area, and **Figure A-2** shows the MRS location. **Figure A-3** presents the quantity-distance (Q-D) arcs (hazardous fragment distance [HFD] and maximum fragment distance–horizontal [MFD-H]) that will be used during the MEC removal action.

3. EXPLOSIVES SAFETY QUANTITY-DISTANCE

3.1 MUNITION WITH THE GREATEST FRAGMENT DISTANCE

Based on munitions recovered within the MRS and information from the HRR, SI, and RI, the munition with the greatest fragment distance (MGFD) anticipated is the 155mm high explosive (HE) M107 projectile. **Figure A-3** in **Appendix A** shows the Q-D arc for the HFD (unintentional detonation) and maximum fragment range–horizontal MFR-H (intentional detonation without engineering controls, e.g., sandbags) that will be used during the MEC removal action. **Table 3-1** lists the minimum separation distances (MSDs) for the MRS based on the MGFD.

If MEC with a greater fragmentation distance is encountered, the MSD will be adjusted in accordance with Department of Defense Explosives Safety Board (DDESB) Technical Paper 16 (DDESB, 2009) and technical updates, operations will continue, and an amendment to this ESS will be submitted for approval (a copy of this document will be available on-site). Q-D arcs will be adjusted accordingly.

Table 3-1 Minimum Separation Distances

Munitions Response Site (MRS)	Munition with the Greatest Fragmentation Distance (MGFD)	MSD (ft) ¹			
		Unintentional Detonations		Intentional Detonations	
		Hazardous Fragment Distance (HFD)	Team Separation Distance (K40)	Without Engineering Controls (MFD-H)	Using Engineering Controls
Ricochet Area	Projectile, 155mm, M107, HE ² and ³	450 ²	105 ²	2,894 ³	220 ¹

¹ Sandbag mitigation will be used for M107 Composition B. Buried Explosion Module (BEM) will be used for M107 TNT. BEM results in an MSD of 0 ft but 220 ft will be adhered to during all disposal operations.

² 155mm, M107 (Composition B filled)

³ 155mm, M107 (Trinitrotoluene [TNT] filled)

See **Appendix B** for calculation sheets and documentation of MSD.

3.2 MEC AREA

The MSD restrictions for MEC areas will apply to non-essential personnel during all surface and subsurface MEC removal actions (see **Table 3-1** for applicable MSDs). Preliminary site work activities, such as surveying, laying grid lanes, and anomaly detection, do not require establishing an MSD for Q-D purposes. Project personnel are defined as those on-site contractor and Department of Defense (DoD) personnel required to participate in the MEC removal action, along with those approved and authorized visitors. All other personnel are non-essential personnel. The MSD arcs are depicted on the Q-D map in **Figure A-3**. The team separation distance (TSD) at this site will be the K40 distance of the MGFD for the specific MRS. Positive control of the exclusion zone (EZ), based on the MSD, will be maintained whenever MEC operations are being conducted. Prior to beginning MEC operations, the contractor will ensure

that there are no non-essential personnel within the EZ, and the contractor will ensure that the EZ remains clear of non-essential personnel throughout the MEC operations by establishing road blocks, barricades, or spotters. If non-essential personnel enter the MSD area, operations will be halted until they can be escorted from, or pass through, the area.

3.3 DEMOLITION EXPLOSIVES

3.3.1 Delivery on an As-Needed Basis

Explosives will be provided by a local vendor on an as-needed basis. MEC will be marked and guarded, if necessary, until disposal is accomplished.

3.3.2 Explosive Storage Magazines

An explosives storage magazine will not be used.

3.4 PLANNED OR ESTABLISHED DEMOLITION AREAS

All disposal activities will be conducted within each grid using blow-in-place (BIP) procedures.

3.5 FOOTPRINT AREAS

3.5.1 Blow-in-Place

The MSD for BIP operations is shown in **Table 3-1** under intentional detonations. The MSD for engineering controls (e.g., sandbags) for expected MEC items is presented in **Table 3-1**, and the MSD calculation sheets are provided in **Appendix B**.

3.5.2 Collection Points

It is anticipated that collection points will not be used for this removal action.

3.5.3 In-Grid Consolidated Shots

It is anticipated that consolidating multiple MEC will not be necessary for this project.

3.6 MAXIMUM CREDIBLE EVENT

No explosive contaminated soil is expected for the areas addressed by this submission; therefore, no maximum credible event is calculated.

4. START DATE

The anticipated start date of this removal action is June 1, 2013.

5. MEC MIGRATION

The potential transport mechanisms for MEC include soil/sediment disturbance, frost heave, and erosion/deposition. Based on the United States (U.S.) Department of Commerce weather map, frost lines range from 20 to 25 inches below ground surface (bgs).

6. DETECTION EQUIPMENT AND RESPONSE TECHNIQUES

6.1 REMOVAL DEPTH

The planned removal action is identified in **Table 1-1** and discussed in **Subsection 1.5.1**.

6.2 DETECTION EQUIPMENT

The MEC anticipated at the Ricochet Area MRS are medium- to large-caliber projectiles that are made of ferrous casings that are easily detectable by a variety of geophysical instruments. A combination of one or more of the following geophysical instruments will be used at the site.

6.2.1 Analog Mag and Flag using Flux-Gate Magnetic Gradiometers

Approved detectors for this project include the Schonstedt model GA52Cx and Foerster Mk26. These instruments have been demonstrated during the RI and can be expected to consistently detect the MEC items shown in **Table 1-2** at their expected depths. These detection depths are significantly greater than the depths at which any MEC items were recovered during the RI (see **Table 1-2**). Other similar geophysical instruments may be approved by the Army National Guard Directorate (ARNG).

6.2.2 Digital Geophysical Mapping Using Time-Domain Electromagnetic Induction

Approved detectors for this project include the Geonics EM61-MK2, Geometrics MetalMapper, and TEMTADS systems. These instruments have similar detection characteristics and can be expected to consistently detect the MEC items shown in **Table 1-2** at their expected depths.

These detection depths are significantly greater than the depths at which any MEC items were recovered during the RI (see **Table 1-2**). Other similar geophysical instruments may be approved by the ARNG.

6.3 SWEEP PROCEDURES

Before site investigations begin, the personnel operating detection equipment will demonstrate proficiency with the particular instrument(s) to be used. The site will be divided into grids for administrative purposes. The search lanes used will be suitable for the equipment and terrain.

6.4 EXCLUSION ZONE CONTROL

Prior to initiation of on-site MEC operations, all non-essential personnel will be removed to a location outside the MSD for the operation being conducted. Once MEC operation commences, positive control of the MSD will be maintained and only essential personnel will be allowed inside the MSD. During MEC operations, non-essential personnel will be prevented from entering the MSD by a combination of road closures and the use of spotters, or by the spotters notifying the UXO personnel to stop work when a vehicle or person approaches the MSD boundary.

6.5 INTRUSIVE INVESTIGATION

Excavation and identification of anomalies will be performed using the criteria and procedures outlined below. The efforts addressed in this ESS involve manual unintentional detonation operations and mechanized unintentional detonation operations employing anomaly avoidance. Only UXO-qualified personnel and UXO Technician I under supervision of UXO-qualified personnel will perform excavation and investigation of anomalies. To gain access to a subsurface anomaly, earthmoving machinery such as a backhoe may be used to assist in removing the overburden within 12 inches to the side or top of the anomaly; hand tools will be used to remove the remaining overburden. Additional excavation will be conducted using small hand tools only.

6.6 QUALITY CONTROL AND QUALITY ASSURANCE

Upon conclusion of the removal activities in each area, the UXO Quality Control Specialist (UXOQCS) will conduct a surface and subsurface quality control (QC) inspection. Areas that pass the QC inspection will be submitted for quality assurance (QA) inspection by the United

States Army Corps of Engineers (USACE). Any non-conformance to contractual requirements will be documented and reported in writing to the Senior UXO Supervisor (SUXOS), Quality Control Manager (QCM), and Project Manager (PM). The SUXOS will be responsible for the field remediation of the non-conformance.

7. DISPOSITION TECHNIQUES

7.1 DEMOLITION OPERATIONS

All MEC items requiring detonation will be marked pending BIP disposal. All explosive operations will be supervised by the SUXOS and coordinated with the Government safety specialist. All explosive operations will follow the procedures outlined in TM 60A-1-1-31 and EM 385-1-97, *Explosives Safety and Health Requirements Manual* (USACE, 2008), with Errata Sheet Number 5 dated 21 July 2010. Demolition operations will be performed daily. If demolition operations cannot be performed daily because of inclement weather or other similar reasons, the area will be secured until the MEC items can be destroyed.

7.2 EXPLOSIVE STORAGE, ACCOUNTABILITY, AND TRANSPORTATION

Explosives will be delivered on an as-needed basis. Total control of explosives will be maintained while the explosives are on-site. All vehicles transporting explosives will be properly inspected, equipped, and placarded prior to loading of explosives onto the vehicle, and DD Form 626, Motor Vehicle Inspection, will be completed.

7.3 ENGINEERING CONTROLS

The use of dry sand is authorized as an engineering control for intentional detonation for the MEC identified in **Table 3-1**, in accordance with the Buried Explosion Module (BEM) calculation sheets in Appendix B. Although BEM reflects an MSD of 0 ft, a minimum 220-ft MSD will be maintained during intentional detonations.

Sandbag mitigation may be used for intentional detonations as delineated in the *Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions*, HNC-ED-CS-S 98-7, Amendment 1 (USAESCH, 2011), Environmental and Munitions Center of Expertise (EM-CX) Safety Advisory: Use of Jet Perforator During

Intentional Detonation While Using Sandbag Mitigation for Engineering Controls (USACE, EM-CX, 2011), and the DDESB memorandum, Clarifications Regarding Use of Sandbags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions (DDESB, 2010). This engineering control may be applied to mitigate fragmentation and blast hazards to the MSD identified in **Table 3-1**. A copy of HNC-ED-CS-S-98-7, Amendment 1 and the DDESB memorandum will be available on-site if this engineering control is applied. Only one MEC item will be destroyed at a time using this technique.

Tamping (single or multiple items) may be used in accordance with DDESB Technical Paper (TP) 16 and the BEM version 6.3. These reports will be available on-site for all mitigation methods used.

7.4 SCRAP PROCEDURES

7.4.1 Inspection and Certification

All material potentially presenting an explosive hazard (MPPEH) and other debris will be assessed and its explosives safety status determined and documented prior to transfer within the DoD or released from DoD control. Prior to release to the public, MPPEH will be documented by authorized and technically qualified personnel as MDAS after a 100% inspection and an independent 100% re-inspection to determine that it is safe from an explosives safety perspective. MPPEH procedures will be in accordance with Department of Defense Instruction (DoDI) 4140.62 (DoD, 2008).

7.4.2 DD Form 1348-1A

DD Form 1348-1A or similar form will be completed to reflect that all MDAS has been 100% inspected and re-inspected by qualified individuals in accordance with the requirements outlined in DoDI 4140.62 and EM 1110-1-4009 (USACE, 2007). The SUXOS will sign the certificate as follows: *“This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, is inert and/or free of explosives or related materials.”*

7.5 ALTERNATIVE DISPOSAL TECHNIQUES

No off-site destruction of recovered MEC is anticipated for this MEC removal action. All detonations will occur within the grid. No other disposal techniques are anticipated for this MEC removal action.

8. ENVIRONMENTAL, ECOLOGICAL, OR CULTURAL CONSIDERATIONS

Several special status species of plants exist within the MRS that will require coordination with the landowner and regulatory agencies, including the Minniebush (*Menziesia pilosa*), Netted Chainfern (*Woodwardia areolata*), and American Holly (*Ilex opaca*). However, no environmental, ecological, or cultural considerations will limit the removal action.

9. TECHNICAL SUPPORT

9.1 MILITARY SUPPORT

No chemical warfare materiel (CWM) is suspected at this site. However, if a munition with a unknown filler is found, or if a MEC item cannot be positively identified, the Government Safety Specialist will notify the local point of contact (POC) as designated in the work plan. The local POC is not the local law enforcement agent; he/she will notify the local enforcement agency of the discovery, which will contact Explosive Ordnance Disposal (EOD). If an item is a recovered chemical warfare materiel (RCWM) or has an unknown liquid filler, the on-site USACE project team will notify the Chemical Warfare Design Center (CWM-DC) at USAESCH by calling the 24/7 telephone number at 256-895-1180.

9.2 CONTRACTOR

All on-site Contractor UXO personnel will meet the training and minimum experience required by Technical Paper 18, Minimum Qualifications for UXO Technicians and Personnel (DDESB, 2004).

10. RESIDUAL RISK MANAGEMENT

10.1 LAND USE CONTROLS

The Pennsylvania Department of Environmental Protection (PADEP) and PGC have expressed interest and willingness to assist with LUCs that are proposed for the Ricochet Area MRS. The individuals interviewed during the course of the remedial action anticipate a formal LUC program and ARNG guidance and direction on what role their agencies are expected to undertake in the context of an overall public education strategy. The following LUCs have been proposed as part of the remedial action:

1. Signs.
2. Notification during permitting and contracting.
3. Brochures/fact sheets.
4. Information packages to public officials and emergency management agencies.
5. Awareness video.
6. Classroom education.
7. Internet website.
8. Appalachian Trail Guidebook editorials.
9. Construction support.

10.2 LONG-TERM MANAGEMENT

Recurring reviews will be conducted every 5 years after implementation of the selected munitions response and overall remedial action, including LUCs described in **Subsection 10.1**. This effort will be performed to determine whether the munitions response actions continue to be protective of human health, safety, and the environment. Recurring reviews will also provide an opportunity to assess the applicability of new technology to address previous technical impracticability determinations. The review will evaluate specific factors that may impact the continued effectiveness of the response. These factors may include such considerations as changes in physical conditions at the Ricochet Area MRS or changes in public accessibility. If no changes have occurred, the areas will continue to be monitored at the specified intervals.

11. UXO SAFETY EDUCATION PROGRAM

The ongoing public education program includes an active community involvement group for the local population. Additional educational materials are planned as part of the LUCs described in

Subsection 10.1. The LUCs will provide MEC awareness to PGC personnel, its contractors, and the public

12. STAKEHOLDER INVOLVEMENT

PGC, PADEP, ARNG, and USACE, Baltimore District are the principal stakeholders for the overall remedial action process. Both PGC and PADEP support the ARNG- and USACE-preferred remedial alternative proposed for the Ricochet Area MRS. The public is informed through ongoing community involvement group meetings as well as regularly scheduled notices and mailings discussing past and planned actions at the MRS.

13. CONTINGENCIES

No contingencies have been identified.

14. REFERENCES





- DDESB (Department of Defense Explosives Safety Board). 2004. Technical Paper (TP) 18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel. 20 December 2004.
- DDESB (Department of Defense Explosives Safety Board). 2009. Technical Paper (TP) 16, Methodologies for Calculating Primary Fragment Characteristics, Revision 3.
- DDESB (Department of Defense Explosives Safety Board). 2010. Clarifications Regarding Use of Sandbags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions. 29 November 2010.
- DoD (Department of Defense). 2008. Department of Defense Instruction (DoDI) 4140.62. Material Potentially Presenting an Explosive Hazard. November 25, 2008.
- Malcolm Pirnie. 2003. *Closed, Transferring and Transferred Range/Site Inventory Report; Fort Indiantown Gap, Pennsylvania, U.S. Army National Guard Bureau (NGB). Final CTT Inventory Report.* Prepared for the U.S. Army Environmental Center and Corps of Engineers-Baltimore District. October 2003.
- URS (URS Group, Inc.). 2007. *Final Historical Records Review, Fort Indiantown Gap, Pennsylvania.* Prepared for the U.S. Army Corps of Engineers (USACE), Baltimore District. June 2007.

- URS (URS Group, Inc.). 2008. *Final Site Inspection Report, Fort Indiantown Gap, Pennsylvania*. Prepared for the U.S. Army Corps of Engineers (USACE), Baltimore District. September 2008.
- USACE (U.S. Army Corps of Engineers). 2007. EM 1110-1-4009, Ordnance and Explosives Response. 15 June 2007, with Errata Sheet Number 2, dated 7 November 2007.
- USACE (U.S. Army Corps of Engineers). 2008. *Explosives Safety and Health Requirements Manual*, EM 385-1-97, 15 September 2008, with Errata Sheet Number 5 dated 21 July 2010.
- USACE (U.S. Army Corps of Engineers), Environmental and Munitions Center of Expertise (EM-CX). 2011. Safety Advisory: Use of Jet Perforator During Intentional Detonation While Using Sandbag Mitigation for Engineering Controls. 7 November 2011.
- USAESCH (US Army Engineering and Support Center, Huntsville). 1998 (terminology update 2000). *Procedures for Demolition of Multiple Rounds (Consolidated Shots) on Ordnance and Explosives (OE) Sites*. August 1998 (update March 2000).
- USAESCH (U.S. Army Engineering Support Center, Huntsville). 2011. *Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions*. Amendment 1. HNC-ED-CS-S 98-7. February 2011.
- USDA (United States Department of Agriculture). 2009. *Custom Soil Resource Report for Dauphin County, Pennsylvania, and Lebanon County, Pennsylvania*. December 21, 2009.
- USGS (United States Geological Survey). 1981. Grantville Quadrangle. Compiled by D. M. Hoskins and D.B. MacLachlan. In: Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania.
- WESTON (Weston Solutions, Inc.). 2011. *Final Remedial Investigation Report for the Ricochet Area Munitions Response Site, State Game Lands 211, Pennsylvania*. Prepared for National Guard Bureau and Pennsylvania Army National Guard. July 2011.
- WESTON (Weston Solutions, Inc.). 2012. *Final Feasibility Study Report for the Ricochet Area Munitions Response Site, State Game Lands 211, Pennsylvania*. Prepared for National Guard Bureau and Pennsylvania Army National Guard. January 2012.

APPENDIX A
FIGURES



Legend

-  FIG Installation Boundary
-  Ricochet Area MRS (3,262 Acres)
-  Sharp Mountain MRS (4,740 Acres)
-  State Game Lands 211

Source: PA USGS 7.5 minute Topographic Maps, 1996

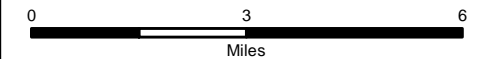
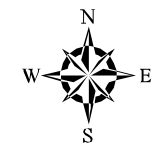
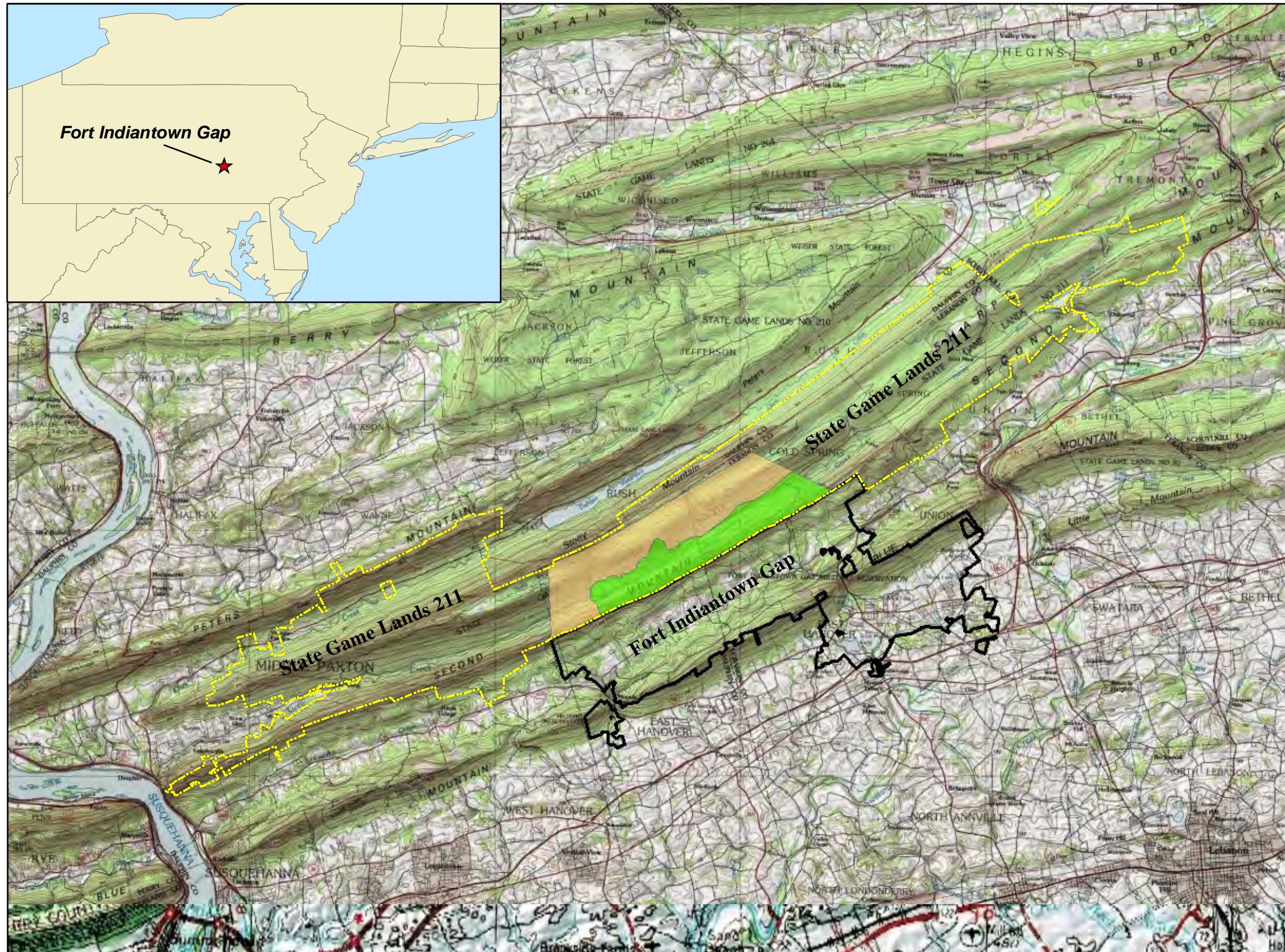
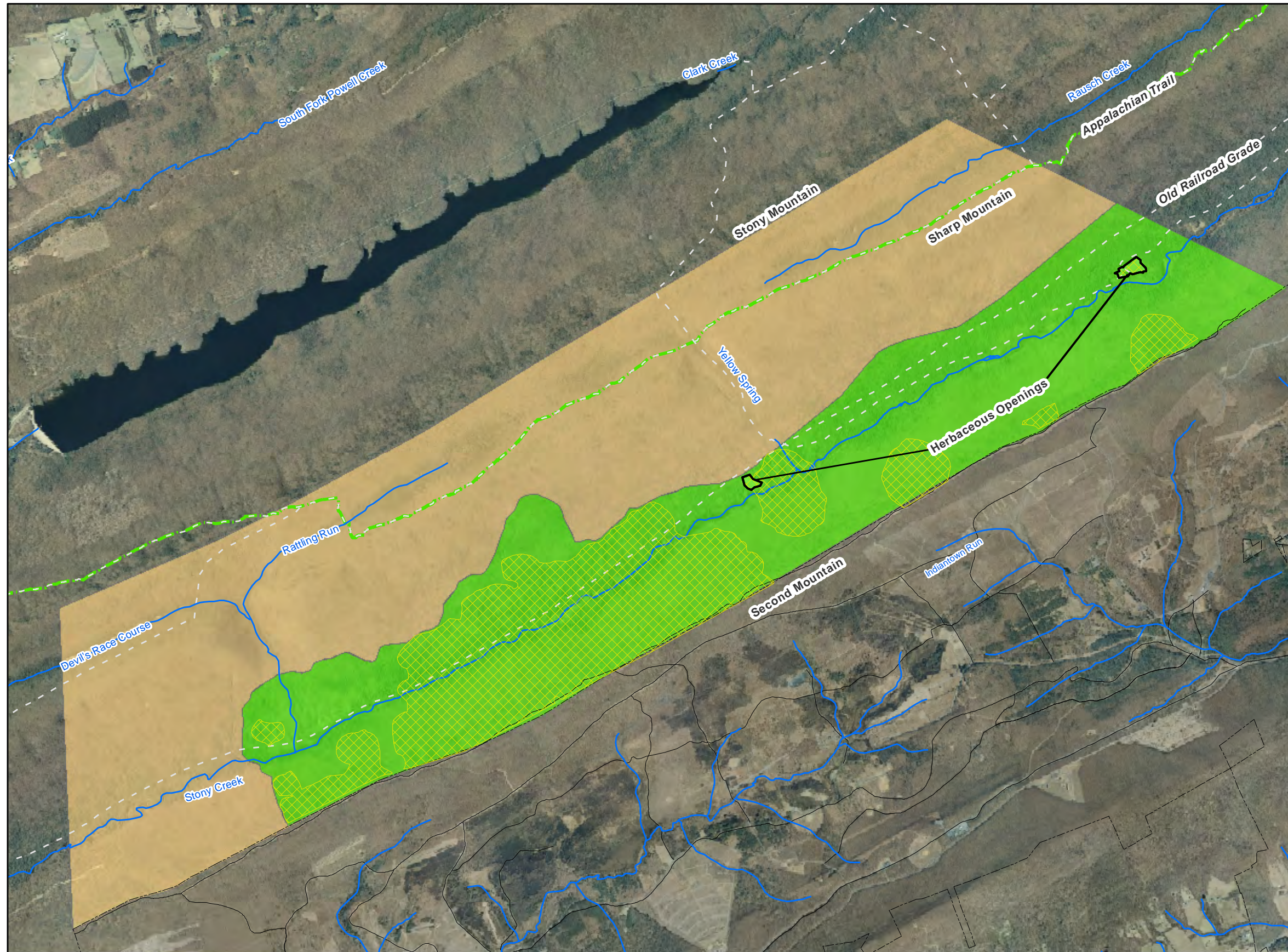


Figure A-1
Regional Location Map
Ricochet Area MRS
State Game Lands 211,
Pennsylvania





Legend

- FIG Installation Boundary
- Ricochet Area MRS (3,262 Acres)
- Sharp Mountain MRS (4,740 Acres)
- ▨ Removal Action Areas (1,334 Acres)

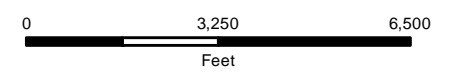
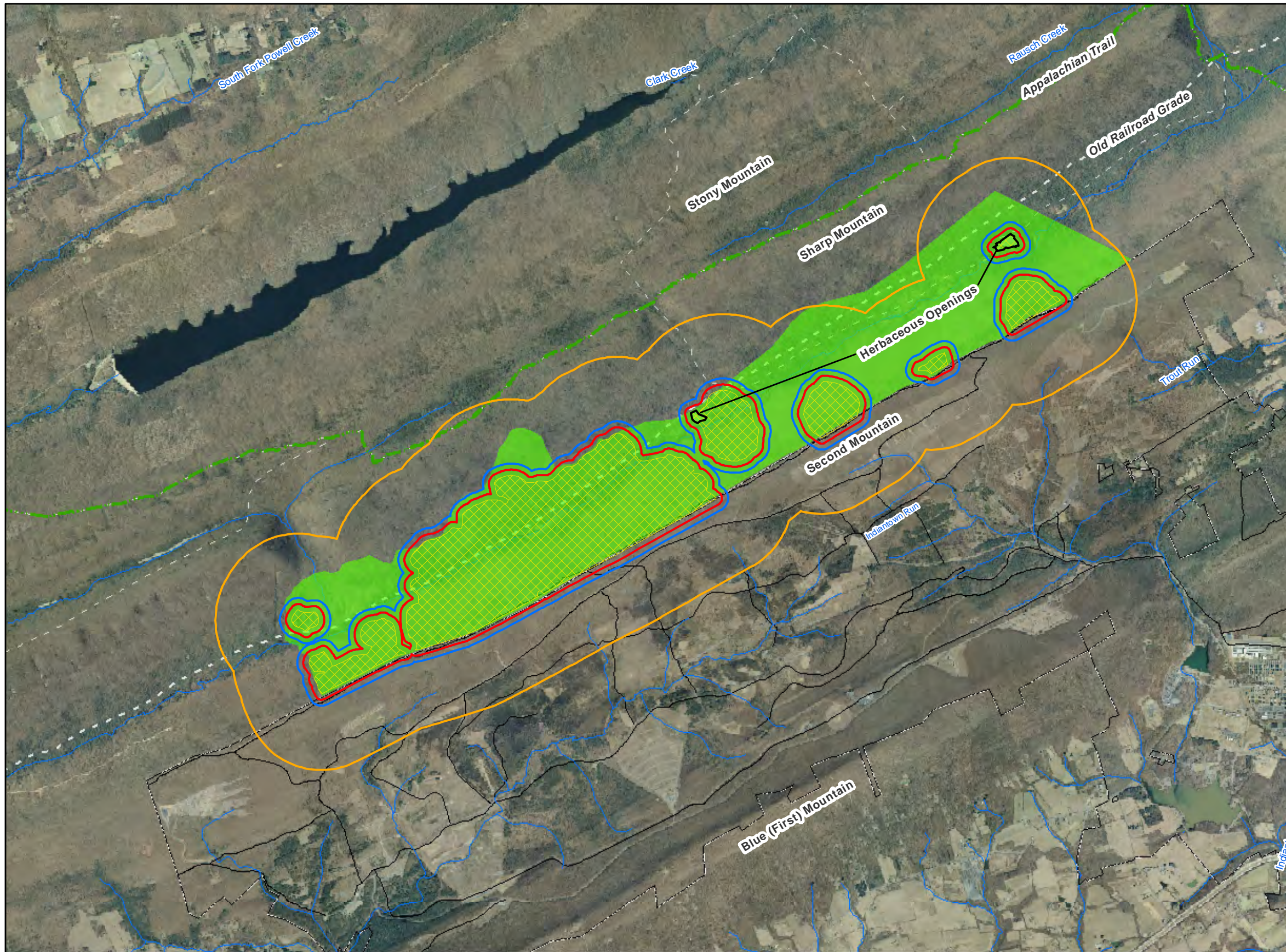


Figure A-2
 MRS Location Map
 Ricochet Area MRS
 State Game Lands 211,
 Pennsylvania



Legend

- FIG Installation Boundary
 - Ricochet Area MRS (3,262 Acres)
 - ▨ Removal Action Areas (1,334 Acres)
- MGFD: Projectile, 155mm, M107, HE**
- Hazardous Fragmentation Distance (HFD) - 450 ft
 - Intentional Detonation with Engineering Controls (HFD) - 220 ft
 - Intentional Detonation without Engineering Controls (MFD-H) - 2,894 ft

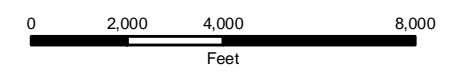
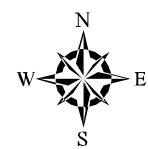


Figure A-3
 Q-D Map
 Ricochet Area MRS
 State Game Lands 211,
 Pennsylvania

APPENDIX B
MSD CALCULATION SHEETS

Fragmentation Data Review Form



Database Revision Date 4/2/2012

Category:

Munition:

Case Material:

Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

Record Created By:

Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Cylindrical Case Weight (lb):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD (Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet) (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Note: Per VS.E3.2.2.1 of DoD 6055.09-M the minimum sited K328 distance may be no smaller than 200 ft.

Sandbag and Water Mitigation Options

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10^6 (lb-ft²/s²):

Single Sandbag Mitigation

Required Wall & Roof Thickness (in):

Expected Max. Throw Distance (ft):

Minimum Separation Distance (ft):

Double Sandbag Mitigation

Required Wall & Roof Thickness (in):

Expected Max. Throw Distance (ft):

Minimum Separation Distance (ft):

Water Mitigation

Minimum Separation Distance (ft):

Water Containment System:

Note: Use Sandbag and Water Mitigation in accordance with all applicable documents and guidance. If a donor charge larger than 32 grams is utilized, the above mitigation options are no longer applicable. Subject matter experts may be contacted to develop site specific mitigation options.

Minimum Thickness to Prevent Perforation

	Intentional	Unintentional
4000 psi Concrete (Prevent Spall):	14.45	6.68
Mild Steel:	2.74	1.29
Hard Steel:	2.25	1.06
Aluminum:	5.30	2.61
LEXAN:	10.69	6.73
Plex-glass:	9.43	5.10
Bullet Resist Glass:	8.58	4.39

Item Notes

Distribution authorized to the Department of Defense and U.S. DoD contractors only for Administrative-Operational Use (17 October 2002). Other requests shall be referred to the Chairman, Department of Defense Explosives Safety Board, Room 856C, Hoffman Building I, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600.

Fragmentation Data Review Form: 155mm, M107 Composition B Filled

Fragmentation Data Review Form



Database Revision Date 4/2/2012

Category:

Munition:

Case Material:

Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

Record Created By:

Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Cylindrical Case Weight (lb):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95% Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD (Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet) (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Note: Per VS.E3.2.2.1 of DoD 6055.09-M the minimum sited K328 distance may be no smaller than 200 ft.

Sandbag and Water Mitigation Options

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Single Sandbag Mitigation

Required Wall & Roof Thickness (in):

Expected Max. Throw Distance (ft):

Minimum Separation Distance (ft):

Double Sandbag Mitigation

Required Wall & Roof Thickness (in):

Expected Max. Throw Distance (ft):

Minimum Separation Distance (ft):

Water Mitigation

Minimum Separation Distance (ft):

Water Containment System:

Note: Use Sandbag and Water Mitigation in accordance with all applicable documents and guidance. If a donor charge larger than 32 grams is utilized, the above mitigation options are no longer applicable. Subject matter experts may be contacted to develop site specific mitigation options.

Minimum Thickness to Prevent Perforation

	Intentional	Unintentional
4000 psi Concrete (Prevent Spall):	14.62	7.33
Mild Steel:	2.82	1.43
Hard Steel:	2.31	1.17
Aluminum:	5.39	2.85
LEXAN:	11.10	7.30
Plex-glass:	9.91	5.69
Bullet Resist Glass:	9.14	4.99

Item Notes

Distribution authorized to the Department of Defense and U.S. DoD contractors only for Administrative-Operational Use (17 October 2002). Other requests shall be referred to the Chairman, Department of Defense Explosives Safety Board, Room 856C, Hoffman Building I, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600.

Fragmentation Data Review Form: 155mm, M107 TNT Filled

BURIED EXPLOSION MODULE

(Version 6.2)

*Based on DDESB Technical Paper 16 Revision 3, EARTHES software,
and NSW CDD/TR-92/196
(ENGLISH UNITS)*

SELECT BURIAL MEDIUM Soil ▼ SELECT SOIL TYPE Dry Sand ▼ <small>(See TP 16, Revision 3 for soil details)</small>	SELECT ITEM DESCRIPTION 155mm M107 (TNT filled) OTHER (User Defined) ▼
USER DEFINED FRAGMENT CHARACTERISTICS	
FRAGMENT WEIGHT (lbs)	1.055
ENTER FRAGMENT VELOCITY (ft/s)	4,035.00
SINGLE ITEM TNT EQUIVALENT WEIGHT (lbs)	14.60
ENTER TOTAL NUMBER OF ITEMS	1
ENTER TOTAL WEIGHT OF ALL DONOR CHARGES (lbs)	1.00
SINGLE ITEM NEW (lbs)	14.60
SINGLE ITEM MAXIMUM FRAGMENT WEIGHT (lbs)	1.0550
FRAGMENT WEIGHT USED IN CALCULATIONS (lbs)	1.0550
SINGLE ITEM MAXIMUM FRAGMENT VELOCITY (ft/s)	4,035
FRAGMENT VELOCITY USED IN CALCULATIONS (ft/s)	4,035
TOTAL TNT WEIGHT USED (lbs)	15.90
ENTER DEPTH OF BURIAL (ft)	6.25
ENTER HORIZONTAL RANGE (for pressure calculation) (ft)	600
<div style="border: 1px solid black; display: inline-block; padding: 5px;"> CRATER OR CAMOUFLET? CAMOUFLET </div> CAMOUFLET CAVITY RADIUS (ft) 2.84	
FRAGMENT EXIT VELOCITY (ft/s) 0.0	FRAGMENT LAUNCH ANGLE (°) 0.0
MAXIMUM FRAGMENT DISTANCE (ft) 0.0	
Distance at which pressure is 0.060 psi=	Blast Withdrawal Distance (buried/under) (ft) N/A*
Open Air Withdrawal Distance, K328 (ft) 824.8	Fragment Hazard Distance (ft) ** 0.0
	Pressure at Fragment Hazard Distance (psi) N/A*
	(dB) N/A*
	Pressure at Range Entered (psi) N/A*
	(dB) N/A*
*Airblast methodology not applicable (N/A) for Camouflet conditions:	
**Depth too great—no fragments expected	

5/17/2012

1

Buried Explosion Module 155mm, M107 TNT Filled

APPENDIX D

CONTRACTOR FORMS

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	1. TOTAL PRICE		2. SHIP FROM	3. SHIP TO																																																																																																																																																																		
COD I Z M D														RI FROM														M O S														U N I O S														QUANTITY														S U P P L E M E N T A R Y A D D R E S S														S I G N A T U R E														D I S T R I B U T I O N														P R O J E C T														P R I O R I T Y														R E L E A S E D A T E														A D V I S I O N														R I O P O S I T I O N														M A R K I N G														UNIT PRICE		DOLLARS		CTS		4. MARK FOR													
24. DOCUMENT NUMBER & SUFFIX (30-44)														25. NATIONAL STOCK NO. & ADD (8-22)														26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-66) UP (74-80)														27. ADDITIONAL DATA														5. DOC DATE														6. NMFC														7. FRT RATE														8. TYPE CARGO														9. PS																																																																																																							
10. QTY. REC'D														11. UP														12. UNIT WEIGHT														13. UNIT CUBE														14. UFC														15. SL																																																																																																																																																	
16. FREIGHT CLASSIFICATION NOMENCLATURE																																																																																																																																																																																																																							
17. ITEM NOMENCLATURE																																																																																																																																																																																																																							
18. TY CONT														19. NO CONT														20. TOTAL WEIGHT														21. TOTAL CUBE																																																																																																																																																																													
22. RECEIVED BY														23. DATE RECEIVED																																																																																																																																																																																																									

PREVIOUS EDITION MAY BE USED



DAILY QC REPORT

Project:

Site Location:

Date:

Describe daily QC activities:

Grid QC:

Transect QC:

Definable Feature of Work (identify control phase: preparatory, initial, follow-up, final)	Inspection Performed	Result/Recommendation (document deficiency, nonconformance, lesson learned)

Attach additional pages as necessary.

Approved By:

Approval Date:



CORRECTIVE ACTION REQUEST (CAR)

PART 1: TO BE COMPLETED BY THE PERSON IDENTIFYING THE NONCONFORMANCE:

Originator:

Date:

Customer Name/External Source:

Contact/ID#:

Issue:

PART 2: TO BE COMPLETED BY THE UXOQCS:

CAR #:

Related to CAR #:

Priority (High, Med., or Low):

ASSIGNED TO:

Response Due Date:

PART 3: TO BE COMPLETED BY THE PERSON RESPONSIBLE FOR ACTION:

Impact:

(The Impact of the nonconformance)

Root Cause:

Document the result of the investigation regarding what caused the nonconformance.

Note: not required for Preventative action only issues.

Corrective Action:

Document what was done to correct the problem/nonconformance. Note: not required for Preventative Action only issues.

Preventative Action:

Document how the action will prevent recurrence of the issue.

PART 4: TO BE COMPLETED BY THE PROJECT MANAGER:

Verified By:

Verification Date:

CAR Close Date:



DEMOLITION MATERIAL ACCOUNTABILITY FORM

Project:	Site Location:	Date:
-----------------	-----------------------	--------------

Work Area/ Grid ID/ Transect ID:	Action:
---	----------------

EXPLOSIVES ISSUED

Signature of Team Leader:

Item Description	Manufacturer Identification	Quantity	Initials of Verifier

EXPLOSIVES EXPENDED

Signature of Team Leader:

Item Description	Manufacturer Identification	Quantity	Initials of Verifier

EXPLOSIVES RETURNED

Signature of Senior UXO Supervisor:

Item Description	Manufacturer Identification	Quantity	Initials of Verifier

The signatures in each section of this form indicate the items listed in that section were in fact issued, expended, or returned to storage and the quantities listed were verified through a physical count.

AUTHORIZED TO PURCHASE & SIGN FOR/RECEIVE LIST

INSTRUCTIONS

1. COMPLETE ALL APPLICABLE BLANKS ON FORM.
2. CORPORATIONS, PROVIDE TAXPAYER ID NUMBER
3. PRINT OR TYPE REQUESTED INFORMATION

4. RETURN TO: _____

Fax Number: _____

ATF License #1-AL-089-33-4H-00461

COMPANY NAME: Weston Solutions, Inc. Tax ID # 23-1501990

PRINCIPAL BUSINESS ADDRESS 4801 University Square, STE 25, Huntsville, AL 35816

Ship To: _____

PHONE NUMBER: _____

FAX NUMBER: _____

INDIVIDUALS AUTHORIZED TO PURCHASE/ORDER EXPLOSIVES

NAME:
ADDRESS:
CITY: STATE: _ ZIP:
PLACE OF BIRTH:
DATE OF BIRTH:

NAME:
ADDRESS:
CITY: STATE: _ ZIP:
PLACE OF BIRTH:
DATE OF BIRTH:

NAME:
ADDRESS:
CITY: STATE: _ ZIP:
PLACE OF BIRTH:
DATE OF BIRTH:

NAME:
ADDRESS:
CITY: STATE: _ ZIP:
PLACE OF BIRTH:
DATE OF BIRTH:

I CERTIFY THAT THE PERSON LISTED ABOVE (AND ON THE ATTACHED SHEETS, IF ANY) ARE AUTHORIZED TO SIGN FOR/RECEIVE EXPLOSIVE MATERIALS FOR THE BUSINESS DESCRIBED ABOVE.

DATE

SIGNATURE

PRINTED NAME

TITLE

MOTOR VEHICLE INSPECTION (TRANSPORTING HAZARDOUS MATERIALS)

(Read Instructions before completing this form.)

This form applies to all vehicles which must be marked or placarded in accordance with Title 49 CFR. 1. GOVERNMENT BILL OF LADING/TRANSPORTATION CONTROL NUMBER

SECTION 1 - DOCUMENTATION	ORIGIN a.	DESTINATION b.
2. CARRIER/GOVERNMENT ORGANIZATION		
3. DATE/TIME OF INSPECTION		
4. LOCATION OF INSPECTION		
5. OPERATOR(S) NAME(S)		
6. OPERATOR(S) LICENSE NUMBER(S)		
7. MEDICAL EXAMINER'S CERTIFICATE*		

8. <i>(X if satisfactory at origin)</i>				9. CVSA DECAL DISPLAYED ON COMMERCIAL EQUIPMENT				
a. MILITARY HAZMAT ENDORSEMENT		d. ERG OR EQUIVALENT COMMERCIAL:	YES	NO		a. TRUCK/TRACTOR	YES	NO
b. VALID LEASE*		e. DRIVER'S VEHICLE INSPECTION REPORT*				b. TRAILER		
c. ROUTE PLAN		f. COPY OF 49 CFR PART 397						

SECTION 11 - MECHANICAL INSPECTION
All items shag be checked on empty equipment prior to loading. Items with an asterisk shag be checked on all incoming loaded equipment.

10. TYPE OF VEHICLE(S)	11. VEHICLE NUMBER(S)
------------------------	-----------------------

12. PART INSPECTED <i>(X as applicable)</i>	ORIGIN (1)		DESTINATION (2)		COMMENTS (3)
	SAT	UNSAT	SAT	UNSAT	
a. SPARE ELECTRICAL FUSES					k EXHAUST SYSTEM
b. HORN OPERATIVE					1. BRAKE SYSTEM*
c. STEERING SYSTEM					m. SUSPENSION
d. WINDSHIELD/WIPERS					n. COUPLING DEVICES
e. MIRRORS					o. CARGO SPACE
f. WARNING EQUIPMENT					p. LANDING GEAR*
g. FIRE EXTINGUISHER*					q. TIRES, WHEELS, RIMS
h. ELECTRICAL WIRING					r. TAILGATE/DOORS*
i. LIGHTS AND REFLECTORS					s. TARPAULIN*
j. FUEL SYSTEM*					t. OTHER (Specify)

13. INSPECTION RESULTS (X one) ACCEPTED	REJECTED
---	----------

(If rejected give reason under "Remarks ". Equipment will be approved if deficiencies are corrected prior to loading.)

14. SATELLITE MOTOR SURVEILLANCE SYSTEM: (X one) ACCEPTED	REJECTED
---	----------

15. REMARKS

16. INSPECTOR SIGNATURE (Origin)	17. INSPECTOR SIGNATURE (Destination)
----------------------------------	---------------------------------------

SECTION III - POST LOADING INSPECTION

This section applies to Commercial and Government/Military vehicles. All items will be checked prior to release of loaded equipment and shall be checked on all incoming loaded equipment.

	ORIGIN (1)		DESTINATION (2)		COMMENTS (3)
	SAT	UNSAT	SAT	UNSAT	
18. LOADED IAW APPLICABLE SEGREGATION/COMPATIBILITY TABLE OF 49 CIFR					
19. LOAD PROPERLY SECURED TO PREVENT MOVEMENT					
20. SEALS APPLIED TO CLOSED VEHICLE; TARPAULIN APPLIED ON OPEN EQUIPMENT					
21. PROPER PLACARDS APPLIED					
22. SHIPPING PAPERS/DD FORM 836 FOR GOVERNMENT VEHICLE SHIPMENTS					
23. COPY OF DID FORM 626 FOR DRIVER					
24. SHIPPED UNDER DOT EXEMPTION 868					

25. INSPECTOR SIGNATURE (Origin)	26. DRIVER(S) SIGNATURE (Origin)
----------------------------------	----------------------------------

27. INSPECTOR SIGNATURE (Destination)	28. DRIVER(S) SIGNATURE (Destination)
---------------------------------------	---------------------------------------

INSTRUCTIONS

SECTION I - DOCUMENTATION

General Instructions.

All items (2 through 9) will be checked at origin prior to loading. Items with an asterisk (*) apply to commercial operators or equipment only. Only Items 2 through 7 are required to be checked at destination.

Items 1 through 5. Self explanatory.

Item 6. Enter operator's Commercial Driver's License (CDL) number or Military OF-346 License Number. CDL and OF-346 must have the HAZMAT and other appropriate endorsements IAW Part 383.

Item 7. *Enter the expiration date listed on the Medical Examiner's Certificate.

Item 8.a. APPLIES TO MILITARY OPERATORS ONLY. Military Hazardous Materials Certification. In accordance with applicable service regulations, ensure operator has been certified to transport hazardous materials.

b. *Valid Lease. Shipper will ensure a copy of the appropriate contract of lease is carried in all leased vehicles and is available for inspection. (Defense Transportation Regulation (DTR) requirement.)

c. Route Plan. Prior to loading any Hazard Class/Division 1.1, 1.2, or 1.3 (Explosives) for shipment, ensure that the operator possesses a written route plan in accordance with 49 CFR Part 397. Route Plan requirements for Hazard Class 7 (Radioactive) materials are found in 49 CFR 397.101.

d. Emergency Response Guidebook (ERG) or Equivalent. Commercial operators must be in possession of an ERG or equivalent document. Shipper will provide applicable ERG page(s) to military operators.

e. *Driver's Vehicle Inspection Report. Review the operator's Vehicle Inspection Report. Ensure that there are no defects listed on the report that would affect the safe operation of the vehicle.

f. Copy of 49 CFR Part 397. Operators are required by regulation to have in their possession a copy of 49 CFR Part 397 (Hazardous Materials Driving and Parking Rules). If military operators do not possess this document, shipper may provide a copy to operator.

Item 9. *Commercial Vehicle Safety Alliance (CVSA) Decal. Check to see if equipment has a current CVSA decal and mark applicable box. Vehicles without CVSA, check documentation of the last vehicle periodic inspection.

SECTION 11 - MECHANICAL INSPECTION

General Instructions.

All items (12.a. through 12.t.) will be checked on all incoming empty equipment prior to loading. All UNSATISFACTORY conditions must be corrected prior to loading. Items with an asterisk (*) shall be checked on all incoming loaded equipment. Unsatisfactory conditions that would affect the safe off-loading of the equipment must be corrected prior to unloading.

SECTION 11 (Continued)

Item 12.a. Spare Electrical Fuses. Check to ensure that at least one spare fuse for each type of installed fuse is carried on the vehicle as a spare or vehicle is equipped with an overload protection device (circuit breaker). (49 CFR 393.95)

b. Horn Operative. Ensure that horn is securely mounted and of sufficient volume to serve purpose. (49 CFR 393.81)

c. Steering System. The steering wheel shall be secure and must not have any spokes cracked through or missing. The steering column must be securely fastened. Universal joints shall not be worn, faulty or repaired by welding. The steering gear box shall not have loose or missing mounting bolts or cracks in the gear box mounting brackets. The pitman arm on the steering gear output shaft shall not be loose. Steering wheel shall turn freely through the limit of travel in both directions. All components of a power steering system must be in operating condition. No parts shall be loose or broken. Belts shall not be frayed, cracked or slipping. The power steering system shall not be leaking. (49 CFR 396 Appendix G)

d. Windshield/Wipers. Inspect to ensure that windshield is free from breaks, cracks or defects that would make operation of the vehicle unsafe; that the view of the driver is not obscured and that the windshield wipers are operational and wiper blades are in serviceable condition. Defroster must be operative when conditions require. (49 CFR 393.60, 393.78 and 393.79)

e. Mirrors. Every vehicle must be equipped with two rear vision mirrors located so as to reflect to the driver a view of the highway to the rear along both sides of the vehicle. Mirrors shall not be cracked or dirty. (49 CFR 393.80)

f. Warning Equipment. Equipment must include three bidirectional emergency reflective triangles that conform to the requirements of FMVSS No. 125. FLAME PRODUCING DEVICES ARE PROHIBITED. (49 CFR 393.95)

g. Fire Extinguisher. Military vehicles must be equipped with two serviceable fire extinguishers with an Underwriters Laboratories rating of 10 BC or more. (Commercial motor vehicles must be equipped with one serviceable 10 BC Fire Extinguisher). Fire extinguisher(s) must be located so that it is readily accessible for use and securely mounted on the vehicle. The fire extinguisher must be designed, constructed and maintained to permit visual determination of whether it is fully charged. (49 CFR 393.95)

h. Electrical Wiring: Electrical wiring must be clean and properly secured. Insulation must not be frayed, cracked or otherwise in poor condition. There shall be no uninsulated wires, improper splices or connections. Wires and electrical fixtures inside the cargo area must be protected from the lading. (49 CFR 393.28, 393.32, 393.33)

INSTRUCTIONS

SECTION 11 (Continued)

i. Lights/Reflectors. (Head, tail, turn signal, brake, clearance, marker and identification lights, Emergency Flashers). Inspect to see that all lighting devices and reflectors required are operable, of proper color and properly mounted. Ensure that lights and reflectors are not obscured by dirt or grease or have broken lenses. High/Low beam switch must be operative. Emergency Flashers must be operative on both the front and rear of vehicle. (49 CFR 393)

j. Fuel System. Inspect fuel tank and lines to ensure that they are in serviceable condition, free from leaks, or evidence of leakage and securely mounted. Ensure that fuel tank filler cap is not missing. Examine cap for defective gasket or plugged vent. Inspect filler necks to see that they are in completely serviceable condition and not leaking at joints. (49 CFR 393.83 and 396 Appendix G)

k. Exhaust System. Exhaust system shall discharge to the atmosphere at a location to the rear of the cab or if the exhaust projects above the cab, at a location near the rear of the cab. Exhaust system shall not be leaking at a point forward of or directly below the driver compartment. No part of the exhaust system shall be located where it will burn, char or damage electrical wiring, fuel system or any other part of the vehicle. No part of the exhaust system shall be temporarily repaired with wrap or patches. (49 CFR 393.83 and 396 Appendix G)

1. Brake System (to include hand brakes, parking brakes and Low Air Warning devices). Check to ensure that brakes are operational and properly adjusted. Check for audible air leaks around air brake components and air lines. Check for fluid leaks, cracked or damaged lines in hydraulic brake systems. Ensure that parking brake is operational and properly adjusted. Low Air Warning devices must be operative. (49 CFR 396 Appendix G)

m. Suspension. Inspect for indications of misaligned, shifted or cracked springs, loosened shackles, missing bolts, spring hangers unsecured at frame and cracked or loose U-bolts. Inspect for any unsecured axle positioning parts, and sign of axle misalignment, broken torsion bar springs (if so equipped). (49 CFR 396 Appendix G)

n. Coupling Devices (Inspect without uncoupling). Fifth Wheels: Inspect for unsecured mounting to frame or any missing or damaged parts. Inspect for any visible space between upper and lower fifth wheel plates. Ensure that the locking jaws are around the shank and not the head of the kingpin. Ensure that the release lever is seated properly and safety latch is engaged. Pintle Hook, Drawbar, Towbar Eye and Tongue and Safety Devices: Inspect for unsecured mounting, cracks, missing or ineffective fasteners (welded repairs to pintle hook is prohibited). Ensure safety devices (chains, hooks, cables) are in serviceable condition and properly attached. (49 CFT 396 Appendix G)

o. Cargo Space. Inspect to ensure that cargo space is clean and free from exposed bolts, nuts, screws, nails or inwardly projecting parts that could damage the lading. Check floor to ensure it is tight and free from holes. Floor shall not be permeated with oil or other substances. (49 CFR 177.815(e)(1) and 398.94)

p. Landing Gear. Inspect to ensure that landing gear and assembly are in serviceable condition, correctly assembled, adequately lubricated and properly mounted.

SECTION 11 (Continued)

q. Tires, Wheels and Rims: Inspect to ensure that tires are properly inflated. Flat or leaking tires are unacceptable. Inspect tires for cuts, bruises, breaks and blisters. Tires with cuts that extend into the cord body are unacceptable. Thread depth shall not be less than: 4/32 inches for tires on a steering axle of a power unit, and 2/32 inches for all other tires. Mixing bias and radial on the steering axle is prohibited. Inspect wheels and rims for cracks, unseated locking rings, broken, loose, damaged or missing lug nuts or elongated stud holes. (49 CFR 396 Appendix G)

r. Tailgate/Doors. Inspect to see that all hinges are tight in body. Check for broken latches and safety chains. Doors must close securely. (49 CFR 177.835(h))

s. Tarpaulin. If shipment is made on open equipment, ensure that lading is properly covered with fire and water resistant tarpaulin. (49 CFR 177.835(h))

t. Other Unsatisfactory Condition. Note any other condition which would prohibit the vehicle from being loaded with hazardous materials.

Item 14. For AA&E and other shipments requiring satellite surveillance, ensure that the Satellite Motor Surveillance System is operable. Shipper will instruct the driver to send a "test" emergency message to DTTS by having the driver activate the "emergency (panic) button". Shipper will contact DTTS at 1-800-826-0794 to verify that test message was received. Message must be received by DTTS for system to be considered operational.

SECTION III - POST LOADING INSPECTION

General Instructions.

All items will be checked prior to the release of loaded equipment. Shipment will not be released until deficiencies are corrected. All items will be checked on incoming loaded equipment. Deficiencies will be reported in accordance with applicable service regulations.

Item 18. Check to ensure shipment is loaded in accordance with 49 CFR Part 177.848 and the applicable Segregation or Compatibility Table of 49 CFR 177.848.

Item 19. Check to ensure the load is secured from movement in accordance with applicable service outload drawings.

Item 20. Check to ensure seal(s) have been applied to closed equipment; fire and water resistant tarpaulin applied on open equipment.

Item 21. Check to ensure each transport vehicle has been properly placarded in accordance with 49 CFR Part 172 Subpart F.

Item 22. Check to ensure operator has been provided shipping papers that comply with 49 CFR Part 172 Subpart C. For shipments transported by Government vehicle, shipping paper will be DD Form 836.

Item 23. Ensure operator(s) sign DD Form 626, are given a copy and understand the hazards associated with the shipment.

Item 24. Applies to Commercial Shipments Only. If shipment is made under DOT Exemption 868, ensure that shipping papers are properly annotated and copy of Exemption 868 is with shipping papers.



APP/SSHP ACKNOWLEDGEMENT

Project:

Document Name:

I understand, agree to, and will conform to the information set forth in the Site Safety and Health Plan and discussed in the daily safety tailgate meetings.

Acknowledgement

Name	Company	Signature/ Date

Attach additional pages as necessary.

Approved By:

Approval Date:



DAILY SAFETY AND QC TAILGATE MEETING

Project:

Site Name:

Date/ Time:

Weather Conditions:

Temperature:

Safety Discussion and Issues:

QC Discussion and Issues:

Other Discussion and Issues:

Acknowledgement

Name	Company	Signature

Acknowledgement		
Name	Company	Signature

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

Meeting Organizer:

Signature:

Daily Summary Report

Project Name Here



CONTRACT NO. / D.O. NO.:	WORK ORDER NO.:	DATE
---------------------------------	------------------------	-------------

WORK LOCATION:

WORK COMPLETED:

<input type="checkbox"/> Surveyor activities.	<input type="checkbox"/> Munitions Constituents Sampling.
<input type="checkbox"/> Mag and Dig activities (List grid or location).	<input type="checkbox"/> UXO Technician Escort activities.
<input type="checkbox"/> DGM activities (List grids).	<input type="checkbox"/> Equipment Transport (mob/demob to/from site-List).
<input type="checkbox"/> Reacquisition of DGM anomaly targets (List grids).	<input type="checkbox"/> Equipment Maintenance
<input type="checkbox"/> Grid QC List (List completed grids).	<input type="checkbox"/> Equipment Issues (List below).
<input type="checkbox"/> Grid QA (CENAB-List completed grids).	<input type="checkbox"/> Background Soil Sampling

Comments:

MATERIALS DELIVERED (Amount, Condition, and Purpose):

PROBLEMS/RESOLUTIONS:

DATA TRACKING:

Analog Survey Transects (ID, quantity):

Analog Survey Grids (ID, quantity):

DGM Grids (ID, quantity):

DGM Grids Reacquired (ID, quantity):

Items Found Today:
Munitions Debris (description, quantity, weight):
MPPEH (description, quantity, disposition):
DMM (description, quantity, disposition):
UXO (description, quantity, disposition):

Comments:

FURTHER DISCUSSION (List Topic and Comment):

PREPARED BY:	SIGNATURE:
---------------------	-------------------

Attach applicable logs and reports below (QC Report, photo log, etc.)



GRID ID:

Dataset:

Date:

Operator:

Origin (0/0) at corner:

Notes/Comments:

Repeatability Dataset:

Repeat Lines:



FIELD VARIANCE FORM

FVF No.:

Project:

Site Location:

Date:

Applicable Document/Section:

Subject:

FIELD CHANGE CONDITION DESCRIPTION

RECOMMENDED APPROACH/ REVISION

IMPACT ON PRESENT AND COMPLETED WORK

Requested By:

Approved By:

Approval Date:



Daily Geophysics Checklist

Date:

Team:

Instrument

Configuration:

EM61-MK2 Single Unit:

EM61-MK2 Underwater:

EM-31 MK2:

EM61-MK2:

Instrument Function Checks - AM

Filename _____

Instrument Warm-up

Null Instrument

Personnel Test

	Line #	Response
Static Background		
Static Spike		
Cable Connection		

Instrument Verification Strip - AM

Filename _____

IVS Transect	Line #
Seeded	
Offset	
Background	

Instrument Function Checks - PM

Filename _____

Instrument Warm-up

Null Instrument

Personnel Test

	Line #	Response
Static Background		
Static Spike		
Cable Connection		

Instrument Verification Strip - PM

Filename _____

IVS Transect	Line #
Seeded	
Offset	
Background	

EM31-MK2:

Instrument Warm-up

Instrument Calibration

Instrument Function Checks - AM

	Line #	Response
Static Background		
Dynamic Spike		
Cable Connection		

Instrument Function Checks - PM

	Line #	Response
Static Background		
Dynamic Spike		
Cable Connection		

Notes:



GRID NOTES

Project:

Site Location/ MRS:

Grid ID:

Grid Size: _____ X _____

Team ID:

Method: Anomaly Reacquisition | Analog Detection
(circle one)

Instrumentation:

Date Started: _____ Date Completed: _____

Total Anomalies: _____

Quantity of Munitions Debris: _____

Weight of Munitions Debris: _____

Quantity of Cultural Debris: _____

Weight of Cultural Debris: _____

Observations/ Remarks:

MEC (UXO or DMM) / MPPEH Log			
Item Type	Item Description	Quantity	Depth

Quality Control

Date QC Completed: _____

Pass: Fail:

Observations/ Remarks:

UXOQCS Signature: _____

License #: _____
 Inspected By: _____ Date/Time: _____/_____/_____

Make: _____
 Model: _____
 Color: _____
 Mileage: _____
 Plate #: _____
 Registration **yes** / no. Expiry: _____
 Insurance **yes** / no. Expiry: _____
 Fuel: _____
 Drive Train: _____

Tires OK - See Comments
 Spare OK - See Comments
 AC Ops **OK** - See Comments
 Wiper Ops **OK** - See Comments

FLUIDS:
 Oil OK - Low - Filled
 Trans. OK - Low - Filled
 Brake OK - Low - Filled
 Steering OK - Low - Filled
 Coolant OK - Low - Filled
 Washer OK - Low - Filled

VISUAL INSPECTION:
 Floor **OK** - See Comments
 Seats **OK** - See Comments
 Cargo **OK** - See Comments
 Headliner **OK** - See Comments
 Paneling **OK** - See Comments
 Mirrors **OK** - See Comments
 Hitch **OK** - See Comments
 Hitch Pin & Cotter Pin **OK** - See Comments
 Hitch Chains **OK** - See Comments
 Jack **OK** - See Comments

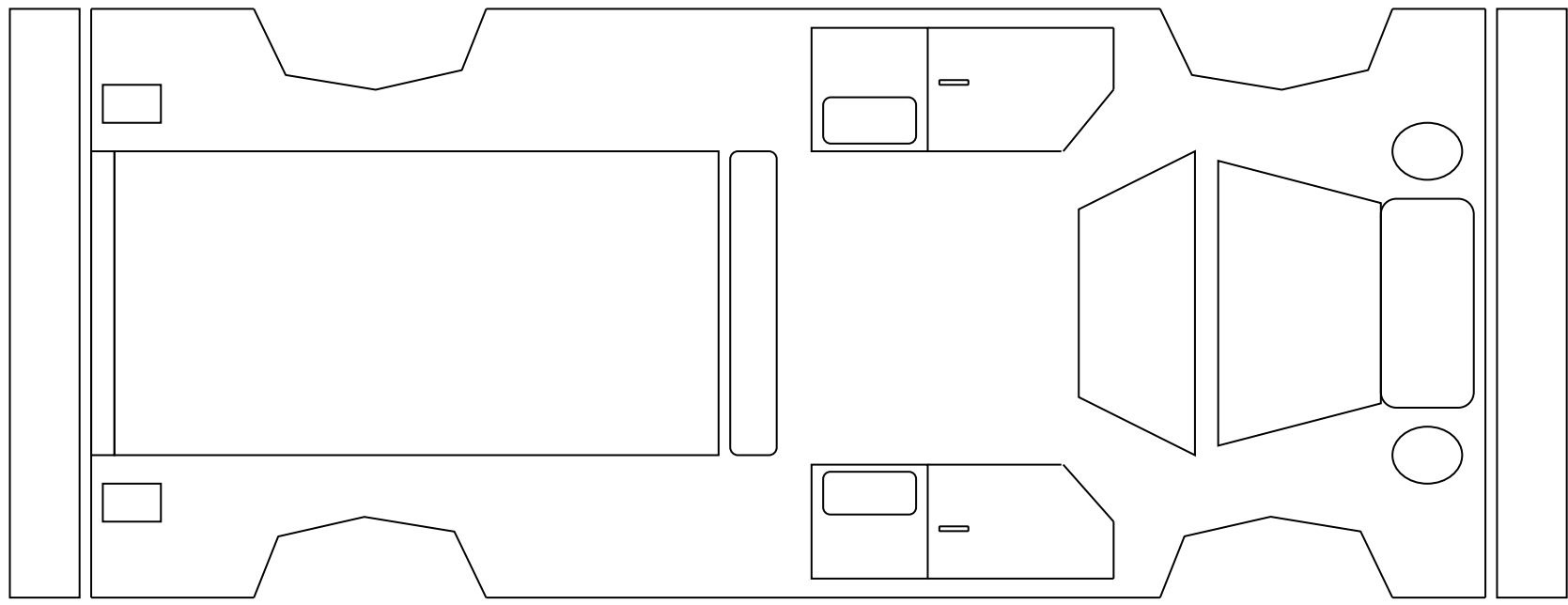
ITEMS:
 DC/AC Power Inverter **OK** - See Comments
 Garmin Nuvi GPS **OK** - See Comments
 DOT Guidebook **OK** - See Comments
 Tire Pres. Gauge **OK** - See Comments
 Lug Wrench OK - See Comments
 Emergency OK - See Comments
 Ice Scraper **OK** - See Comments
 Air Compressor OK - See Comments

LIGHTS:
 Headlights (Hi) **OK** - See Comments
 Headlights (Lo) **OK** - See Comments
 Fog/Driving **OK** - See Comments
 4-Way Flashers **OK** - See Comments
 Running Brake **OK** - See Comments
 Reverse **OK** - See Comments

LIGHTS:
 L Turn **OK** - See Comments
 R Turn **OK** - See Comments
 Rear Bed Light **OK** - See Comments

Fuel: Full 7/8 **3/4** 5/8 1/2 3/8 1/4 1/8

EXTERIOR INSPECTION
 (or indicate damage on diagram below)



Comments: _____



WORK PLAN ACKNOWLEDGEMENT

Project:

Document Name:

I understand, agree to, and will conform to the information set forth in the project work plan, attachments, appendices and discussed in the daily safety tailgate meetings.

Acknowledgement

Name	Company	Signature/ Date

Attach additional pages as necessary.

APPENDIX E

DEMOLITION OPERATIONS SOP



STANDARD OPERATING PROCEDURE DEMOLITION/DISPOSAL OPERATIONS

1. PURPOSE

The purpose of the Demolition/Disposal Operations Standard Operating Procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to conducting demolition/disposal operations of munitions and explosives of concern (MEC) for the Fort Indiantown Gap (FIG) Ricochet Area Munitions Response Site (MRS).

2. SCOPE

The SOP applies to all Weston Solutions, Inc. (WESTON[®]) site personnel, including contractor and subcontractor personnel, involved in conducting MEC demolition/disposal operations. The SOP is not intended to contain all of the requirements needed to ensure complete compliance, and should be used in conjunction with approved project plans and applicable referenced regulations. Consult the documents listed in Section 18 of the SOP for additional compliance issues.

3. RESPONSIBILITIES

3.1 PROJECT MANAGER

The Project Manager (PM) will be responsible for ensuring the availability of the resources needed to implement this SOP, and will also ensure that this SOP is incorporated into plans, procedures, and training for sites where this SOP will be implemented.

3.2 SENIOR UXO SUPERVISOR

The Senior UXO Supervisor (SUXOS) will be responsible for assuring that adequate safety measures and housekeeping are performed during site operations, including demolition activities, and will visit site demolition locations, as deemed necessary, to ensure that demolition operations are carried out in a safe, clean, efficient, and economic manner. The demolition activities will then be conducted under the direct control of the SUXOS, who will be responsible for supervising demolition operations within the area.

The SUXOS will be responsible for training on-site UXO personnel on the nature of the materials handled, the hazards involved, and the precautions necessary. The SUXOS will also ensure that the Daily Summary Report, MEC Accountability Log, WESTON Demolition Shot Records, and inventory records are properly filled out and accurately depict the demolition events and demolition material consumption for each day's operations. The SUXOS will be present during demolition operations or designate a competent, qualified person to be in charge during any absences.

3.3 UXO SAFETY OFFICER

The UXO Safety Officer (UXOSO) for the site is responsible for ensuring that all demolition operations are being conducted in a safe manner, and is required to be present during MEC demolition operations. The UXOSO will ensure the compliance of the demolition team with the above referenced documents that are applicable to the particular task being performed. The UXOSO will be responsible for notifying the WESTON PM, United States Army Corps of Engineers (USACE) PM, and local emergency responders in the event of an accident requiring medical attention or the possibility of lost time. The emergency response plan will be used, and first aid, notification, and evacuation will be accomplished as required. The accident site will then be shut down and the scene preserved/secured for the accident investigation team.

3.4 UXO QUALITY CONTROL SPECIALIST

The UXO Quality Control Specialist (UXOQCS) is responsible for ensuring the completeness of demolition operations records and for weekly inspection of the MEC Accountability Log, the Daily Summary Report, the WESTON Demolition Shot Record, and the inventory of MEC and demolition material. The UXOQCS, assisted by demolition team personnel, will inspect each demolition pit and an area of appropriate radius after each demolition shot, in accordance with the approved explosive siting plan, to ensure that there are no kick-outs, hazardous MEC components, or other hazardous items. In addition, the pit may be checked with a magnetometer, and large metal fragments and any hazardous debris will be removed on a per use basis and stored in sealed containers at the designated project lay down area. Any MEC or material potentially presenting an explosive hazard (MPPEH) discovered during the QC check will be properly disposed of using the demolition procedures presented in Section 3 of the Work Plan. Extreme caution must be exercised when handling MEC or MPPEH that has been exposed to the forces of detonation. Personnel must adhere to acceptable safe practices and procedures when determining the condition of munitions and fuzes that have not been consumed in the disposal process.

4. GENERAL OPERATIONAL AND SAFETY PROCEDURE

Personnel, including contractor and subcontractor personnel, involved in operations on munitions response sites (MRS) will be familiar with the potential safety and health hazards associated with the conduct of demolition/disposal operations, and with the work practices and control techniques used to reduce or eliminate these hazards.

During demolition operations, the general safety provisions listed below will be followed by demolition personnel at all times. Noncompliance with the general safety provisions listed below will result in disciplinary action, which may include termination of employment.

Safety regulations applicable to demolition activities and demolition and MEC materials involved will be complied with.

- Demolition of any kind is prohibited without an approved Explosives Safety Submission (ESS).

- If a recovered item cannot be identified by the UXO Team or if the filler is unknown, the UXO Team will not perform the demolition operations. Also, if the minimum separation distances for a known item encompasses critical infrastructure (buildings and utilities) and the item cannot be moved away from the critical infrastructure, the UXO Team will not perform the demolition operations. These circumstances will require EOD support. Notify the USACE OESS.
- The quantity of MEC to be destroyed will be determined by the fragmentation and K-Factor distance calculations, as specified in the approved ESS.
- In the event of an electrical storm, dust storm, or other hazardous meteorological conditions, immediate action will be taken to cease demolition operations and to evacuate the area.
- In the event of a fire, which does not include explosives or energetic materials, put out the fire using the firefighting equipment located at the site? If unable to do so, notify the fire department and evacuate the area. If injuries are involved, remove the victims from danger, administer first aid, and seek medical attention.
- The UXOSO is responsible for reporting all injuries and accidents that occur.
- Personnel will not tamper with any safety devices or protective equipment.
- Any defect or unusual condition noted that is not covered by this SOP will be reported immediately to the SUXOS or UXOSO for evaluation and/or correction.
- Methods of demolition will be conducted in accordance with this SOP and approved changes or revisions thereafter.
- Adequate fire protection and first aid equipment will be provided at all times.
- Personnel engaged in the destruction of MEC will wear clothing made of natural fiber, close-weave clothes, such as cotton. Synthetic material such as nylon is not authorized unless treated with anti-static material.
- Care will be taken to restrict exposure to the smallest number of personnel, for the shortest time, to the least amount of hazard, consistent with safe and efficient operations.
- Work locations will be maintained in a neat and orderly condition.
- Hand tools will be maintained in a good state of repair.
- Each heavy equipment and/or vehicle operator will have a valid operator's permit or license for the equipment being operated.
- Equipment and other lifting devices designed and used for lifting will have the load rating and date of next inspection marked on them. The load rating will not be exceeded and the equipment will not be used without a current inspection date.
- Leather or leather-palmed gloves will be worn when handling wooden boxes, munitions, or MEC.
- Eye protection will be worn when handling wooden boxes, munitions, or MEC.
- Lifting and carrying require care. Improper methods cause unnecessary strains. Observe the following preliminaries before attempting to lift or carry:
 - When lifting, keep your arms and back as straight as possible, bend your knees and lift with your leg muscles.

- Be sure to have good footing and a firm hold on the object, and lift with a smooth, even motion.
- The demolition area will be provided with two forms of communication, capable of contacting appropriate personnel or agencies (i.e., medical response, Quick Response Force (QRF)).
- Exhaust systems will be kept in good mechanical repair at all times.
 - Lighting systems will be an integral part of the vehicle.
 - One Class 10B:C rated, portable fire extinguisher will, if possible, be mounted on the vehicle outside of the cab on the driver's side, and one Class 10B:C fire extinguisher will be mounted inside the cab.
 - Wheels of carriers must be chocked and brakes set during loading and unloading.
 - No demolition material or MEC will be loaded into or unloaded from motor vehicles while their motors are running.
- Motor vehicles and MHE used to transport demolition material and MEC will be inspected prior to use to determine that:
 - Fire extinguishers are filled and in good working order.
 - Electrical wiring is in good condition and properly attached.
 - Vehicles transporting energetics will have the transport area-beds lined with a non-metallic material.
 - Vehicles transporting energetics will have a clean transport area-bed free of debris or combustibles.
 - Fuel tank and piping are secure and not leaking.
 - Brakes, steering, and safety equipment are in good condition.
 - The exhaust system is not exposed to accumulations of grease, oil, gasoline, or other fuels, and has ample clearance from fuel lines and other combustible materials.
- Employees are required to wear leather, or rubber, gloves when handling demolition materials. The type of glove worn is dependent on the type of demolition material.
- Vehicles transporting energetics will stay on explosive truck routes at all times. If this is not possible, the local police will be notified and will need to approve alternate routes prior to use.
- Unless otherwise directed or authorized by the approved ESS, demolition shots will be tamped with an appropriate amount of earth/dirt.
- An observer will be stationed at a location where there is a good view of the air and surface approaches to the demolition area, before material is detonated. It will be the responsibility of the observer to order the SUXOS to suspend firing if any aircraft, vehicles, or personnel are sighted approaching the general demolition area.
- Two-way radios (to include cell phones) will not be operated in close proximity of the demolition area during the priming process and while the pit is primed. Radio transmissions will be kept at a minimum of 50 ft from the explosives.
- No demolition operation will be left unattended during the active portion of the operation (i.e., once any explosives or MEC are brought to the demolition area).

- A minimum radius (approximately 50 feet) around the demolition pit will be cleared of dry grass, leaves, and other extraneous combustible materials.
- No demolition activities will be conducted if there is less than a 2,000 ft ceiling or if the wind velocity is in excess of 20 mph.
- Demolition shots must be fired during daylight hours (minimum time for sunrise and sunset is determined by the firing procedure used (i.e., electric, non-electric, shock tube 30/60/60).
- Notification of the local authorities will be made in accordance with the site requirements.
- No more than two persons will ride in a truck transporting demolition material or MEC, and no person will be allowed to ride in the trailer/bed.
- Vehicles will not be refueled when carrying demolition material or MEC, and must be 100 ft from magazines or trailers containing such items before refueling.
- Explosive vehicles will be cleaned of visible explosive and other contamination, before releasing the vehicles for other tasks.
- After handling demolition material or MEC and prior to conducting any other task, personnel will wash their faces and hands.

5. SPECIAL REQUIREMENTS FOR DEMOLITION ACTIVITIES

The following safety and operational requirements will be met during demolition operations. Any deviations from this procedure will be allowed only after receipt of written approval from USACE, ARNG, PAARNG, and the Pennsylvania Game Commission. Failure to adhere to the requirements and procedures listed in the paragraphs below could result in serious injury or death; therefore, complete compliance with these requirements and procedures will be strictly enforced. Any deviations from the approved ESS will require a request for approval and a change to the ESS prior to implementation. The change will be submitted through appropriate channels—the Weston Project Manager, USACE PM, PAARNG PM, and the Army National Guard PM.

6. GENERAL REQUIREMENTS

The general demolition requirements listed below will be followed at all times:

- The USACE “Procedures for Demolition of Multiple Rounds (Consolidated Shots) on Munitions and Explosives of Concern (MEC) Sites,” will be followed when destroying multiple munitions by detonation on site. This document will be available on-site during site operations. Department of Defense Explosives Safety Board (DDESB) TP 16 and/or the Demolition Tables will be used to calculate the required buried model and protective works.
- White phosphorus (WP) and propellant will be disposed of only in an approved manner and following the guidance for maximum temperature exposure (90 degrees Fahrenheit). Note there is no designated area for the disposal or use of WP at the FIG Ricochet Area MRS. If suspected WP is encountered, arrangements will be made through USACE, ARNG, PAARNG and PGC to designate and document a WP demolition area.
- Material awaiting destruction will be stored at not less than intra-line distance, based on the largest quantity involved, from adjacent explosive materials and from explosives being destroyed. The material will be protected against accidental ignition or explosion from

fragments, grass fires, burning embers, or detonating impulses originating in materials being destroyed.

- Requirements may be found in the ESS, TP 16 and or the Demolition Tables will be used to calculate the required burial and protective works. The components should be placed on their sides or in a position to expose the largest area to the influence of the demolition material. The demolition material should be placed in direct contact with the item to be detonated and held in place by tape or earth packed over the material.
- Detonations will be counted to ensure detonation of the pit. After each series of detonations, a search will be made of the surrounding area for explosive hazards. Items such as lumps of explosives or unfuzed ammunition may be picked up and prepared for the next shot. Fuzed ammunition, or items that may have internally damaged components, will be detonated in place, if possible.
- Prevailing weather condition information can be obtained from the local weather service, or other acceptable source and the data logged in the Demolition Shot Log before each shot or round of shots.
- All shots will be dual primed with an electrical/remote firing device (RFD) whenever possible.
- Whenever possible, during the excavation of the demolition pits, the ground should be contoured so that runoff water will be channeled away from the pits. If demolition operations are discontinued for more than 2 weeks, the pits should be backfilled until operations resume.
- Upon completion of the project, disturbed demolition areas will be thoroughly inspected for MEC. Depending upon contract requirements, the site may have to be backfilled and leveled. If necessary, this will be coordinated with the government representative.
- An individual who will be excavating on a demolition area will be trained in anomaly avoidance to ensure a reduced risk of encountering MEC or residue from previous demolition operations.
- Before and after each shot, the WESTON Demolition Shot Record will be filled out by the SUXOS with all applicable information. This record will be kept with the MEC Accountability Log and will reflect each shot.

7. ELECTRIC DETONATOR USE

The following requirements are necessary when using electric detonators and blasting circuits:

- Electric detonators and electric blasting circuits may be energized to dangerous levels from outside sources such as static electricity, induced electric currents, and radio communication equipment. Safety precautions will be taken to reduce the possibility of a premature detonation of the electric detonator and the explosive charges. Radios will not be operated during the priming process or while the pit is primed.
- When uncoiling or straightening the detonator leg wires, keep the explosive end of the detonator pointing away from the body and away from other personnel. When straightening the leg wires, do not hold the detonator itself; rather, hold the detonator leg wires approximately 1 inch from the detonator body. Straighten the leg wires by hand; do not throw or wave the wires through the air to loosen them.

- Prior to use, the detonators will be tested for continuity. To conduct the test, place the detonators in a pre-bored hole in the ground or place them under a sand bag, and walk facing away from the detonators and stretch the wires to their full length, being sure not to pull the detonators from the hole or sand bag. With the leg wires stretched to their fullest length, test the continuity of the detonators one at a time by un-shunting the leg wires and attaching them to the galvanometer and checking for continuity. After the test, re-shunt the wires by twisting the two ends together. Repeat this process for each detonator until all detonators have been tested. This process will be accomplished at least 50 ft from and downwind of any MEC or demolition materials and out of the demolition personnel and vehicle traffic flow pattern. In addition, all personnel on the demolition area will be alerted prior to the test being conducted.

NOTE: When testing the detonator, prior to connecting the detonator to the firing circuit, the leg wires of the detonator must be shunted by twisting the bare ends of the wires together immediately after testing. The wires will remain short circuited until time to connect them to the firing line or RFD receiver.

- At the power source end of the blasting circuit, the ends of the wires will be shorted or twisted together (shunted) at all times, except when actually testing the circuit or firing the charge. The connection between the detonator and the circuit firing wires must not be made, unless the power ends of the firing wires are shorted and grounded or the firing panel is off and locked.
- The firing line will be checked using pre-arranged hand signals. If the demolition pit is not visible from the firing point, two-way radios will be used. If radios are used, communication will be accomplished a minimum of 50 ft from the demolition pit and detonators. The firing line will be checked for electrical continuity in both the open and closed positions, and will be closed/shunted after the check is completed.
- MEC to be detonated will be placed in the demolition pit and the demolition material placed/attached in such a manner as to ensure the total detonation of the MEC. Once the MEC and demolition material are in place and the shot has been tamped, the detonators will be connected to the detonating cord. Prior to handling any detonators that are connected to the firing line or RFD, personnel will ensure that they are grounded. The detonators will then be carried to the demolition pit with the end of the detonators pointed away from the individual. The detonators will then be connected to the detonation cord, NON-EL, etc., ensuring that the detonator is not covered with tamping material to allow for ease of recovery/investigation in the event of a misfire.
- Prior to making connections to the blasting machine or RFD transmitter, the firing circuit will be tested for electrical continuity and ohms resistance, or transmitting power (as applicable), to ensure the blasting machine or RFD transmitter (distance) has the capacity to initiate the shot.
- The individual assigned to make the connections at the blasting machine or panel will not complete the circuit at the blasting machine or panel, and will not give the signal for detonation, until satisfied that all personnel in the vicinity have been evacuated to a safe distance. When in use, the blasting machine, or its actuating device, will be in the blaster's

possession at all times. When using the panel, the switch must be locked in the open position until ready to fire, and the single key must be in the blaster's possession.

- Prior to initiating a demolition shot(s), a warning will be given. The type and duration of such warning will be determined by the prevailing conditions at the demolition area. At a minimum, this should be an audible signal using a siren, air horn, or megaphone, which is sounded for duration of 1 minute, 5 minutes prior to the shot and again 1 minute prior to the shot.

8. NON-EL USE (SHOCK TUBE)

The following requirements are necessary when using NON-EL (shock tube) systems:

- After cutting a piece of shock tube, either immediately tie a tight overhand knot in one or both cut ends or splice one exposed end and tie the other.
- Always use a sharp knife or razor blade to cut shock tube to prevent the tube from being pinched or otherwise obstructed.
- Always cut shock tube squarely across and make sure the cut is clean.
- Use only the splicing tubes provided by the manufacturer to make splices.
- Every splice in the shock tube reduces the reliability of the priming system; therefore, keep the number of splices to a minimum.
- Always dispose of short, cut-off pieces in accordance with local laws as they relate to flammable material.

The shock tube system is a thin plastic tube of extruded polymer with a layer of pentaerythritol tetranitrate (PETN) coated on its interior surface. The PETN propagates a shock wave, which is normally contained within the plastic tubing. The shock tube offers the controlled instantaneous action of electric initiation without the risk of premature initiation of the detonator by radio transmissions, high-tension power lines, or static electricity discharge. The NON-EL system uses detonators in the bunch blocks and in the detonator assembly, which will be handled in accordance with approved procedures.

The shock tube initiating system is highly reliable because all of the components are sealed and, unlike standard non-electric priming components, cannot be easily degraded by moisture. Cutting the shock tube makes the open end vulnerable to moisture and foreign contamination; therefore, care must be taken to prevent moisture and foreign matter from getting into the exposed ends of the shock tubes.

8.1 SHOCK TUBE DEMOLITION PROCEDURES

WARNING

Although the detonation along the shock tube is normally contained within the plastic tubing, burns may occur if the shock tube is held.

8.1.1 Shock Tube Assembly

- Spool out the desired length of shock tube from the firing point to the demolition site and cut it off with a sharp knife or razor blade. Weight down the loose end of the trunk line.
- Immediately seal the shock tube remaining on the spool by tying a tight overhand knot on the cut-off end or use a push-over sealer.
- Using a sharp knife or razor, cut the sealed end off the detonator assembly.
- Push one of the shock tube ends to be spliced firmly into one of the pre-cut splicing tubes provided by the manufacturer at least $\frac{1}{4}$ inch. Push the other shock tube end firmly into the other end of the splicing tube at least $\frac{1}{4}$ inch. Secure splice with tape if needed.

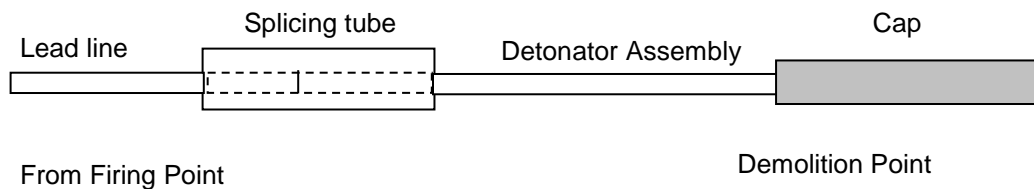


Figure 1

8.1.2 Firing Assembly Setup

1. If there are multiple items to be destroyed using bunch block(s) supplied by the manufacturer, lay out lead lines at the demolition site to the shot(s) and secure the bunch block with a sandbag, or some other item which will keep it from moving.

NOTE: No more than six leads may be used from any one bunch block.

2. If the detonator assembly has not been attached yet, use the splicing tube to splice the detonator assembly to the shock tube branch line as explained in the splicing instructions above.
3. If this is a non-tamped shot, place the detonator assembly into the demolition material. If the shot is to be tamped, prepare the demolition material with a detonating cord lead long enough to stick out of the tamping at least 1 ft.

4. Tape the detonator assembly with the cap to the detonating cord lead as shown in Figure 2.

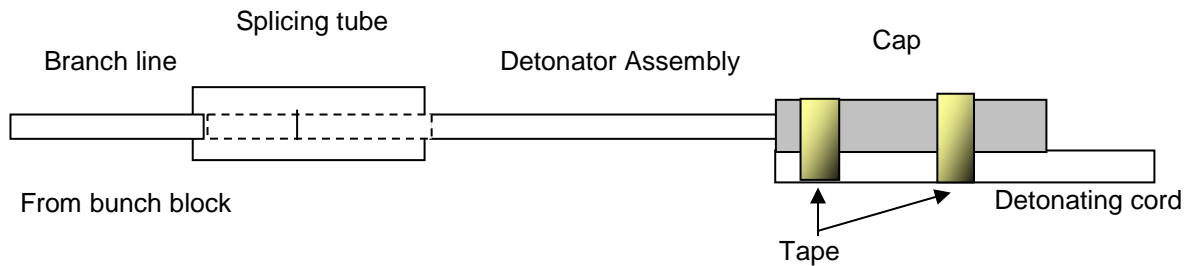


Figure 2

5. Return to the firing position.
6. Cut off the sealed end of the shock tube and proceed to the directions listed in Step 7. If you are using a previously cut piece of shock tube, use a sharp knife or razor blade to cut approximately 18 inches from the previously cut end, whether or not it was knotted in accordance with the above guidance.
7. Insert a primer into the firing device and connect the shock tube lead line to the firing device ensuring that the shock tube is properly seated in the firing device.
8. Take cover.
9. Signal **"fire in the hole"** three times and initiate charge.
10. Observe a 5-minute wait time after the detonation.
11. Remain in designated safe area until Demolition Supervisor announces **"All Clear."**

9. DETONATING CORD USE

The following procedures are required when using detonating cord (det cord):

- The det cord should be cut using approved crimpers, and only the amount required should be removed from inventory.
- The det cord should be cut outside the magazine.
- For ease of inventory control, remove the det cord only in 1 ft increments.
- The det cord should not be placed in clothing pockets or around the neck, arm, or waist, and should be transported to the demolition location in either an approved "day box," original container, or a cloth satchel, depending upon the magazine location and proximity to the demolition area.
- The det cord should be placed at least 50 ft away from the detonators and the demolition materials until the det cord is ready to use. To ensure consistent safe handling, each classification of demolition material will be separated by at least 25 ft until ready to use.
- When the det cord is ready to be connected to the demolition materials or the detonator, the det cord will be secured to the item. The cord is then strung out of the hole and secured in place with soil, or filled sandbags, leaving a minimum of 6 ft of det cord exposed outside the hole.

- Once the hole is filled, make a loop in the det cord large enough to accommodate the detonator, place the detonator in the loop, and secure it with tape. The detonator's explosive end will face down the det cord toward the demolition material or parallel to the main line.
- Always ensure that there is a minimum of 6 ft of det cord extending out of the hole to make it easier to attach and inspect the detonator and replace it should a misfire occur.
- If the det cord detonators are electric, they will be checked, tied in to the firing line, and shunted prior to being taped to the loop. If the det cord detonators are non-electric, the time/safety fuse will be prepared with the igniter in place prior to taping the detonators to the det cord loop. If the det cord detonators are NON-EL, tape the detonators into the loop as described above.
- In the event that a time/safety fuse is used, an igniter is not available, and a field expedient initiation system is used (i.e., matches), do not split the safety fuse until the detonator is taped into the det cord loop.

10. TIME/SAFETY FUSE USE

The following procedures are required when using a time/safety fuse:

- Prior to each daily use, the burn rate for the time/safety fuse must be tested to ensure the accurate determination of the length of time/safety fuse needed to achieve the minimum burn time of 5 minutes needed to conduct demolition operations.
- To ensure both ends of the time/safety fuse are moisture free, use approved crimpers to cut 6 inches off the end of the time/safety fuse roll, and place the 6-inch piece in the time/safety fuse container.
- If quantity allows, accurately measure and cut off a 6-ft-long piece of the time/safety fuse from the roll.
- Take the 6-ft section out of the magazine, and attach a fuse igniter.
- In a safe location, removed from demolition materials and MEC, ignite the time/safety fuse, measure the burn time from the point of initiation to the "spit" at the end, and record the burn time in the SUXOS's Log.
- To measure the burn time, use a watch with a second hand or chronograph.
- To calculate the burn rate in seconds per foot, divide the total burn time (in seconds) by the length (in feet) of the test fuse.
- When using a time/safety fuse for demolition operations, the minimum amount of fuse to be used for each shot will be the amount needed to permit a minimum burn time of 5 minutes.

11. DEMOLITION INSPECTION SCHEDULE

The schedule for the demolition inspection will be followed when demolition operations are being conducted. This inspection will be conducted by the UXOSO or UXOQCS and will be documented in the Site Safety or QC Log. If any deficiencies are noted, demolition operations will be suspended and the deficiency will be reported to the SUXOS. Once the deficiencies are corrected, demolition operations may be resumed.

12. METEOROLOGICAL CONDITIONS

To control the effects of demolition operations and to ensure the safety of site personnel, the following meteorological limitations and requirements will apply to demolition operations:

- Demolition operations will not be conducted during electrical storms or thunderstorms.
- No demolition operations will be conducted if the surface wind speed is greater than 20 miles per hour.
- Demolition operations will not be conducted during periods of visibility of less than 1 mile caused by, but not limited to, dense fog, blowing snow, rain, sand storms, or dust storms.
- Demolition will not be carried out on extremely overcast days with more than 80% cloud cover, with a ceiling of less than 2,000 ft.
- Demolition operations will not be initiated until an appropriate time after sunrise, and will be secured at an appropriate time prior to sunset (see Section 4).

13. PRE-DEMOLITION/DISPOSAL PROCEDURES

13.1 PRE-DEMO/DISPOSAL OPERATIONAL BRIEFING

WESTON'S philosophy is that a successful operation is dependent upon a thorough briefing, covering all phases of the task, which is presented to all affected personnel. The SUXOS will brief personnel involved in demolition operations in the following areas:

- Type of MEC being destroyed.
- Type, placement, and quantity of demolition material being used.
- Method of initiation (electric, non-electric, or NON-EL).
- Means of transporting and packaging MEC.
- Route to the disposal site.
- Equipment being used (i.e., galvanometer, blasting machine, firing wire).
- Misfire procedures.
- Post-shot clean-up of demolition area.

13.2 PRE-DEMO/DISPOSAL SAFETY BRIEFING

The WESTON SUXOS, Team Leader, or UXOSO will conduct a safety brief for personnel involved in demolition operations in the following areas:

- Care and handling of explosive materials.
- Personal hygiene.
- Two man rule and approved exceptions.
- Personnel roles and responsibilities.
- Potential trip/fall hazards.
- Horseplay on the demolition area.

- Staying alert for any explosive hazards in the demolition area.
- Calling a safety stop for hazardous conditions.
- Location of emergency shelter, if available.
- Parking area for vehicles (vehicles must be positioned for immediate departure, with the keys in the ignition).
- Location of emergency vehicle.
- Wind direction (to assess potential toxic fumes).
- Locations of first aid kit and fire extinguisher.
- Route to nearest hospital or emergency aid station.
- Type of communications in the event of an emergency.
- Storage location of demolition materials and MEC awaiting disposal.
- Demolition schedule.

13.3 TASK ASSIGNMENTS

Individuals with assigned tasks will report the completion of the task to the SUXOS. The types of tasks that may be required are:

- Contact local military authorities and fire response personnel, and get air clearance, as required.
- Contact hospital/emergency response/medevac personnel, if applicable.
- Secure all access roads to the demolition area.
- Visually check demolition area for any unauthorized personnel.
- Check firing wire for continuity and shunt.
- Prepare designated pits as required.
- Check continuity of detonators.
- Check time/safety fuse and its burn rate.
- Designate a custodian of the blasting machine, RFD, fuse igniters, or NON-EL initiator.
- Secure detonators in a safe location.
- Place MEC in pit, and place charge in desired location.

13.4 PREPARING EXPLOSIVE CHARGE FOR INITIATION

To prepare the explosive charge for initiation, the procedures listed below will be followed:

- Ensure firing wire is shunted.
- Connect detonator to the firing wire.
- Isolate or insulate all connections.
- Prime the demolition charge.
- Place demolition charge on MEC.

- Depart to firing point (if using non-electric firing system, obtain head count, pull igniters, and depart to designated safe area).
- Obtain a head count.
- Give the 1 minute warning signal, using a bullhorn or siren, 5 minutes prior to detonation, and again at 1 minute prior to detonation.
- Check the firing circuit.
- Take cover.
- Signal **“fire in the hole”** three times (or an equivalent warning).
- If using electric firing system, connect firing wires to blasting machine, and initiate charge.
- Remove firing wires from blasting machine and shunt or turn off RFD transmitter.
- Remain in designated safe area until SUXOS announces **“All Clear.”** This will occur after a post-shot waiting period of 5 minutes and the SUXOS has inspected the pit(s).

14. POST DEMOLITION/DISPOSAL PROCEDURES

Do not approach a smoking hole or allow personnel out of the designated safe area until cleared to do so, and follow the procedures listed below:

- After the **“All Clear”** signal, check pit for low orders or kick-outs.
- Examine pit, and remove any large fragmentation, as needed.
- Back fill hole, as necessary.
- Police all equipment.
- Notify military authorities, fire department, etc., that the operation is complete.

15. MISFIRE PROCEDURES

A thorough check of all equipment, firing wire, and detonators will prevent most misfires. However, if a misfire does occur, the procedures outlined below will be followed.

15.1 ELECTRIC MISFIRES

To prevent electric misfires, one technician will be responsible for all electrical wiring in the circuit. If a misfire does occur, it must be cleared with extreme caution, and the responsible technician will investigate and correct the situation, using the steps outlined below:

- Check firing line and blasting machine connections, and make a second initiation attempt.
- If unsuccessful, disconnect and connect to another blasting machine (if available), and attempt to initiate a charge.
- If unsuccessful, commence a 30-minute wait period.
- After the maximum delay predicted for any part of the shot has passed, the designated technician will proceed down range to inspect the firing system, and a safety observer must watch from a protected area.

- Disconnect and shunt the detonator wires, connect a new detonator to the firing circuit, check the replacement detonator for continuity, and prime the charge without disturbing the original detonator.
- Follow normal procedures for effecting initiation of the charge.

15.2 NON-ELECTRIC MISFIRES

Working on a non-electric misfire is the most hazardous of all operations. Occasionally, despite all painstaking efforts, a misfire will occur. Investigation and corrective action should be undertaken only by the technician who placed the charge, using the following procedure:

- If the charge fails to detonate at the determined time, initiate a 60-minute wait period plus the time of the safety fuse, i.e., 5-minute safety fuse plus 60 minutes for a total of 65 minutes.
- After the wait period has expired, a designated technician will proceed down range to inspect the firing system. A safety observer must watch from a protected area.
- Prime the shot with a new non-electric firing system, and install a new fuse igniter.
- Follow normal procedures for initiation of the charge.

15.3 NON-EL MISFIRE

The use of a shock tube for blast initiation can result in misfires, which require the following actions:

- If the charge fails to detonate, it could be the result of the shock tube not firing. Visually inspect the shock tube. If it is not discolored (i.e., slightly black), it has not fired.
- If it has not fired, cut a 1 ft piece off the end of the tube, re-insert the tube into the firing device, and attempt to fire again.
- If the device still does not fire, wait 60 minutes and proceed down range to replace the shock tube in accordance with the instructions outlined below.
- If the tube is slightly black, then a "Black Tube" misfire has occurred, and the shock tube will have to be replaced, after observing a 60-minute wait time. When replacing the shock tube, be sure to remove the tube with the detonator in place. Without removing the detonator from the end of the tube, dispose of by demolition.

15.4 DETONATING CORD MISFIRE

WESTON uses det cord to tie in multiple demolition shots, and to ensure that electric detonators are not buried. Since det cord initiation will be either electrical or non-electrical, the procedures presented in Sections 15.1, 15.2, or 15.3, as appropriate to the type of detonator used, will be used to clear a det cord misfire. In addition, the following will be conducted:

- If there is no problem with the initiating system, wait the prescribed amount of time, and inspect the connection between the initiator and the cord to ensure that it is properly connected. If the connection was faulty, attach a new initiator, and follow the appropriate procedures for the type of initiator.

- If the initiator detonated but the cord did not, inspect the cord to determine if the problem is with the det cord and not time fuze. Also, check to ensure that there is PETN in the cord at the connection to the initiator.
- It may be necessary to uncover the det cord and replace it. This must be accomplished carefully, to ensure that the demolition charge and the MEC item are not disturbed.

16. RECORD-KEEPING REQUIREMENT

To document the demolition operation procedures and the completeness of the demolition of MEC, the following recordkeeping requirements will be met:

- WESTON (as directed) will obtain and maintain all required permits.
- The SUXOS will ensure that logs are completed accurately, and the SUXOS and UXOQCS will monitor the entries in the log for completeness, accuracy, and compliance with meteorological conditions.
- The SUXOS will enter the appropriate data on the Ordnance Accountability Log and the Demolition Shot Record, to reflect the MEC destroyed, and will complete the appropriate information on the Explosives Accountability Log (the Magazine Data Card), which indicates the demolition materials used to destroy the MEC.
- The quantities of MEC recovered must match the quantities of MEC destroyed or disposed.
- WESTON will retain a permanent file of demolition records, including permits, magazine data cards, training and inspection records, waste manifests if applicable, and operating logs.
- Copies of the ATF License and required permits must be made available on site.

17. SAFETY AND PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The following safety measures and personal protective equipment (PPE) will be used in preventing or reducing exposure to the hazards associated with MEC demolition/disposal operations. These requirements will be implemented unless superseded by site-specific requirements stated in the SSHP.

- Hard hats are required only when working around heavy equipment or when an overhead or head impact hazard exists.
- Composite toe/shank boots in accordance with EM 385-1-1 are required during surface/subsurface location of anomalies.
- Safety glasses will be required whenever an eye hazard exists, for example, when working around flying dirt/debris and using hand tools. Safety glasses will provide protection from impact hazards and, if necessary, ultraviolet radiation (i.e., sunlight).
- Positive means will be required to secure the PPE and prevent it from falling and causing an accidental detonation.
- Reflective vests will be worn when in proximity to roads or construction equipment (e.g., excavators)

18. REGULATORY GUIDANCE AND REFERENCES

Applicable sections and paragraphs in the documents listed below will be used as references for the conduct of UXO demolition/disposal operations:

- WESTON Corporate Safety and Health Program.
- OSHA General Industry Standards, 29 CFR 1910.
- OSHA Construction Standards, 29 CFR 1926.
- DDESB TP-16, Methodology for Calculation of Fragmentation Characteristics.
- HNC-ED-CS-S-98-7, Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions.
- DoD 4160.21-M, Defense Reutilization and Marketing Manual.
- DoD Manual 6055.09-M, DoD Ammunition and Explosives Safety Standards.
- AR 385-64, U.S. Army Explosives Safety Program.
- AR 385-10, Army Safety Program.
- DA PAM 385-64, U.S. Army Explosives Safety Program.
- TM 9-1300-200, Ammunition General.
- TM 9-1300-214, Military Explosives.
- Applicable TM 60 Series Publications.
- AR 190-11, Physical Security of Arms, Ammunition, and Explosives.
- ATF 5400.7, Alcohol, Tobacco, and Firearms Explosives Laws and Regulations.
- DOT, 49 CFR, Parts 100 to 199, Transportation (applicable sections).
- EPA, 40 CFR Parts 260 to 299, Protection of Environment (applicable sections).
- AR 385-40 w/ USACE Supplement 1, Accident Reporting & Records.
- USACE EM 385-1-1, Safety and Health Requirements Manual.
- USACE 385-1-97, Explosives Safety and Health Requirements.
- AMC Regulation 385-100.

APPENDIX F

**SOP FOR MINIMIZING DISRUPTION OF SPECIAL
PLANT AND ANIMAL SPECIES**

STANDARD OPERATING PROCEDURE (SOP):

MINIMIZING DISRUPTION OF SPECIAL PLANT AND ANIMAL SPECIES

1. INTRODUCTION

The purpose of this SOP is to provide guidance and methodology for minimizing/eliminating the disruption to special plant and animal species within the Ricochet Area Munitions Response Site (MRS).

2. SCOPE AND APPLICABILITY

This procedure applies to all project personnel conducting remedial activities in the MRS.

3. SPECIES OF CONCERN

3.1 PLANT SPECIES

American holly (*Ilex opaca*) – Pennsylvania Natural Diversity Inventory (PNDI) listed Threatened Species. American holly is an evergreen shrub or small tree that grows to 50 ft in height. It can be easily recognized by its semi-thick, evergreen leaves with a sharp spine at the tip and additional spines along the margin. The flowers, which appear in May and June, are unisexual, so that the familiar berry-like fruit, red at maturity, can be found only on female plants. This species has been previously found within the project area along Rattling Run, Dresden Lake, and in multiple locations along Stony Creek.



Woodwardia areolata (Netted chainfern) – PNDI listed Special Concern Species. Found in moist or wet woods and acidic bogs. No netted chainfern were observed during the Remedial Investigation (RI) fieldwork. However, this species has been previously found along Rauch Run (located near



the MRS), and potential habitat for this species exists in other locations within the project area.

Minniebush (*Menziesia pilosa*) – Unlisted potential species of concern. Found in dry to wet woods and stream banks; flowering in late May. This species has been previously found outside the project area along Rauch Run. The minniebush was not listed in the PNDI request and response and no minniebush were observed during the RI fieldwork. However, potential forested stream bank habitat exists for this species within the project area so it is being considered as a potential species of concern.



3.2 ANIMAL SPECIES

Allegheny woodrat (*Neotoma magister*) – PNDI listed Threatened Species. The Allegheny woodrat ranges in size from 14 to 17 inches in total length (including tail). The fur is brownish-gray with slightly darker coloration in the middle of the back. The belly and paws are white and the sides are buff. The Allegheny woodrat has large ears and a furry, bi-colored tail. Its habitat includes cliff faces, in boulder piles, talus slopes, and sometimes in limestone caves. Nests composed of shredded plant fibers are found in dry cave entrances, along narrow ledges and in rock crevices. This species feeds on nuts, bark, grasses, fruits, and berries. They are nocturnal and a relatively shy species. Distribution of the Allegheny woodrat is primarily along the Appalachian Mountains from New York to Georgia and west to Indiana.



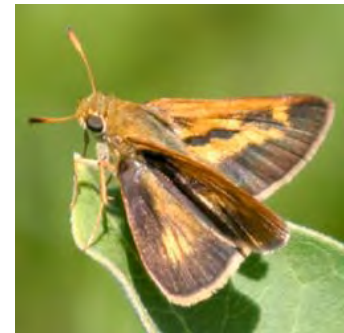
photo source: Cal Butchkowski

A Hand-maid Moth (*Datana ranaeiceps*) – PNDI listed Special Concern Species. The hand-maid moth has a wing span of 1 to 1 ½ inches with dark-brown forewings and light brown hindwings. Its distribution is largely known to occur in Pennsylvania, New Jersey, and New York but may reside in other states. Larvae are known to feed on staggerbushes (*Lyonia* spp.) as a host plant and nocturnal adults do not feed. It requires mixed hardwood forests, hardwood-pine mixes, and scrubland-grassland-woodland mixes.



photo source: Jim Vargo
<http://mothphotographersgroup.msstate.edu/species.php?hodges=7911>

Black Dash (*Euphyes conspicua*) – PNDI listed Special Concern Species. The Black Dash has a wingspan of 1 to 1 3/8 inches, is richly colored, has a medium-sized skipper and is best distinguished by its hindwing pattern. In both males and the dark females both above and below, there is a distinctive vaguely diamond-shape patch of yellow surrounded by the much more extensive darker background. The forewing pattern above in males is dominated by a thick, sooty-black stigma under a patch of yellow. The female’s forewing above has a bold crescent of yellow spots, some of them translucent. Its distribution is Southern Ontario, Minnesota, and eastern Nebraska around the southern periphery of the Great Lakes; southern New England south through eastern Pennsylvania, New Jersey, Maryland, and Virginia. Larval food plants consist of Tussock-Sedge (*Carex stricta*) and adults can be found nectaring on flowering plants, and common and swamp milkweeds. The habitat of the Black Dash consists of wetlands where its food plant occurs, including marshy edges, river meadows, and bogs as well as in nearby uplands with nectaring sources.



Source: unknown

Pine Barrens Zale (*Zale sp.1 nr. lunifera*) – PNDI listed Special Concern Species. Information on behavior and general biology are lacking at this time.

Allegheny Cave Amphipod (*Stygobromus allegheniensis*) – PNDI listed Special Concern Species. Amphipods are small invertebrate species (crustaceans) that inhabit cold water springs, seeps, on hillsides and in caves. Allegheny Cave Amphipod has one of



the broadest ranges of any species in the genus. Yet, species is still relatively uncommon. These rare invertebrate species are threatened by habitat destruction and poor water quality.

Timber rattlesnake (*Crotalus horridus*) – Unlisted potential species of concern. Timber rattlesnakes occur in the forested, mountainous regions of the Commonwealth. They prefer forested areas to forage for small mammals (e.g., mice and chipmunks) and talus, south to southeastern facing rocky slopes for hibernating and other thermoregulatory activities. The



timber rattlesnake is threatened by overhunting, poaching, and habitat alteration. The timber rattlesnake was not listed in the PNDI request and response. However, timber rattlesnakes were commonly found among the scattered boulder areas of the MRS during the RI fieldwork so it is being considered as a potential species of concern.

4. OPERATIONAL PROCEDURES

The intent of this SOP is for personnel conducting field activities to be able to

- **Recognize,**
- **Identify,** and conduct
- **Avoidance**

of all special plant and animal species that have been identified as endangered or threatened. Each phase of the fieldwork will require separate methods and procedures to ensure the protection of special plant and animal species. Prior to any field work activities commencing, awareness training will be conducted for field staff for recognition of sensitive plant and animal

species which are expected to be encountered within the site. In addition, field staff will be provided a hands-on, in-field training prior to the start of removal activities. The awareness training and in-field training will be conducted by a field biologist. It is acknowledged that the American Holly will be easiest plant for identification based on physical appearance year round. The Netted chainfern may not immediately be able to be recognized in early spring activities. Minniebush also falls within a late spring budding process, which will make visual recognition by the untrained eye difficult.

The first phases of field work will include mobilization, survey control installation, and installation of the instrument verification strip. These activities will require minimal to no intrusive activity which could adversely affect plant and animal communities within State Game Land (SGL) 211. One field team member of each team will be assigned the responsibility to identify and document occurrence of plants during fieldwork. The field biologist will complete periodic inspections. Pennsylvania Department of Conservation and Natural Resources (DCNR) recommends focusing on all areas within 500 ft of both banks of Stony Creek, Rauch Run, and any unnamed or unmapped springs or seeps within the project area to locate specimens for training purposes.

The second phase of work will include the removal of munitions and explosives of concern (MEC). A MEC surface removal will be conducted only in a focused area limited to the portions of the MRS with MEC/munitions debris (MD) densities greater than 0.5 surface items per acre. This area is a 1,334 acre portion of the overall Ricochet Area MRS. During the MEC surface removal, no excavations will be performed unless MEC is observed protruding from the ground surface. A focused subsurface MEC removal will be performed at the Cold Spring and Yellow Spring herbaceous openings located within the Ricochet Area MRS. These herbaceous openings are maintained by the Pennsylvania Game Commission (PCG) as feed plots and it is unlikely sensitive plant species will be encountered. The subsurface removal area is 11 acres in size and potential subsurface MEC will be excavated if detected.

Based on the type of instrumentation being used to detect surface MEC within the 1,334 acre portion of the Ricochet Area MRS, the removal action team can meander around trees and brush to minimize the thinning of tree limbs and brush. As such, minimal disturbance to plant species

is expected during the removal action. All efforts will be made to limit intrusive operations on anomalies within sensitive plant or animal areas. However, if MEC is encountered, the necessary safety and disposal procedures will be implemented. If MEC items are identified, trained personnel will survey within a 20-foot radius of the item to identify sensitive plant species. If sensitive plant species are identified, the project team will coordinate with the PGC and DCNR for input on the most appropriate method to address protecting the plants on a case by case basis. Mitigation steps will be dictated based on type and numbers of plants, location (terrain) and access and the sensitivity of the munitions item to be detonated. For instance, if the item is safe to move, the item could be moved nearby in an area not within 30 feet of american holly, minniebush, or netted chainfern. Transplant of plants may also be considered after consultation with PCG and DCNR. It should be noted that all detonations will include the use of engineering controls (sand bag blast mitigation) to significantly reduce effects from the detonation.

American Holly

Ilex opaca

Description

American holly is an evergreen shrub or small tree that grows to 50 feet (15 meters) in height. It can be easily recognized in any season by its alternately arranged, thickish, evergreen leaves that have a sharp spine at the tip and additional spines along the margin. The flowers, appearing in May and June, are unisexual, so that the familiar berry-like fruit, red at maturity, can be found only on female plants.

Distribution & Habitat

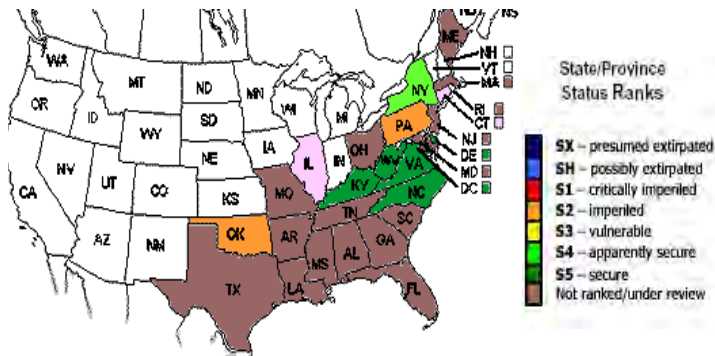
American holly has a distribution from coastal New England south and west into Florida and Texas. In Pennsylvania, it is near the northern end of its range, and occurs mostly in the southeastern counties. The species grows on wooded slopes and streambanks. It has also been grown as an ornamental, particularly in the southeastern counties, and may escape locally to woodlots, thickets, and fencerows.



Photo source: John Kunsman (PNHP)

North American State/Province Conservation Status

Map by NatureServe 2007

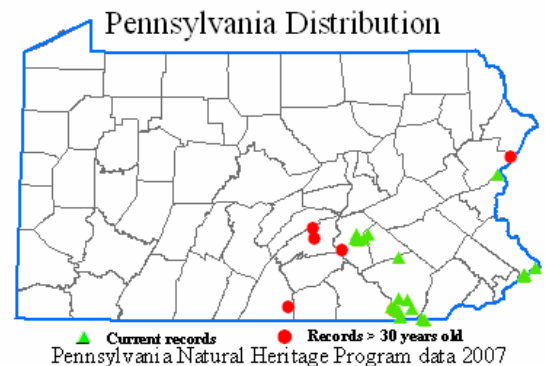


Current State Status

The PA Biological Survey (PABS) considers American holly to be a species of special concern, based on the relatively few native occurrences that have been recently confirmed. The species has a PA legal rarity status and a PABS suggested rarity status of Threatened.

Conservation Considerations

The conservation of American holly in Pennsylvania has concentrated on protecting populations that are believed to be indigenous and that represent native genotypes. Occurrences of the species that have resulted from escapes from plantings are of uncertain genetic origin and are considered to be of much lower conservation significance. As a woodland species, proper forest management and control of invasive species are important for the long term viability of American holly. Gathering of the branches of wild trees for winter decoration should be discouraged.



NatureServe conservation status ranks

G5 – Globally secure; S2 – Imperiled in Pennsylvania

References

- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>.
- Rhoads, A.F. and T.A. Block. 2007. The Plants of Pennsylvania: An Illustrated Manual. 2nd edition. University of Pennsylvania Press, Philadelphia.



Netted Chainfern

Woodwardia areolata

Description

Netted Chainfern grows from 1½ to 2½ feet (5-8 dm) in height, and may form small colonies due to the presence of creeping underground stems. The leaves are easily distinguishable into vegetative and fertile types. The vegetative leaves have a typical fern-like appearance, being green, flattened, and divided into 7 to 12 very deep lobes (or distinct leaflets on the lower part of the leaf) that are not further subdivided into smaller lobes. The leaf veins are conspicuous and have a net-like or chain-like arrangement, as the common name implies. The fertile leaves of Netted Chainfern are dark colored, much narrower, not flattened and leaf-like, and have spore-producing structures on their underside. The vegetative leaf of this species resembles the leaf of the Sensitive Fern (*Onoclea sensibilis*), a common species in Pennsylvania, but the lobes in Netted Chainfern tend to be alternately arranged along the leaf stalk while the lobes of Sensitive Fern tend to be oppositely arranged.



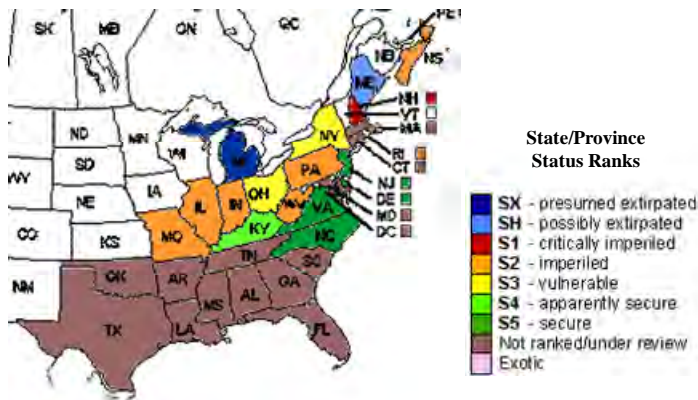
Photo source: Andrew Strassman (PNHP)

Distribution & Habitat

Netted Chainfern has a distribution centered mainly on the Atlantic coastal plain from Nova Scotia south and west into Texas and Florida. In Pennsylvania, the species has been documented historically in scattered counties, particularly in the Delaware River drainage. It grows in swamps, seepages, wet woods, boggy wetlands and along the margins of streamlets.

North American State/Province Conservation Status

Map by NatureServe 2010

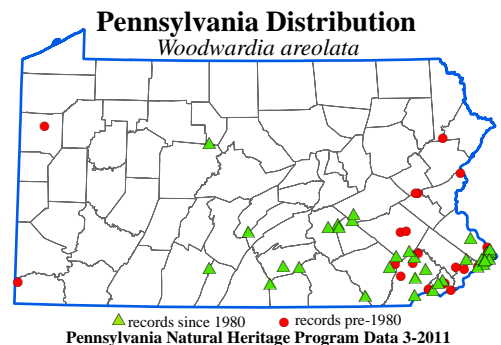


Current State Status

The PA Biological Survey (PABS) considers Netted Chainfern to be a species of special concern, based on the relatively few occurrences that have been recently confirmed and the wetland habitat. It has no PA legal rarity status, but has been assigned a suggested rarity status of Threatened by PABS. About 30 populations are currently known from the state.

Conservation Considerations

The viability of populations of netted chainfern and its habitat may be enhanced by establishing buffers around wetlands, controlling invasive species, and protecting the natural hydrology surrounding wetlands.



NatureServe conservation status ranks

G5 – Globally Secure; S2 – Imperiled in Pennsylvania

References

- NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://www.natureserve.org/explorer>
- Pennsylvania Natural Heritage Program. 2011.
- Rhoads, A.F. and W.M. Klein, Jr. 1993. The Vascular Flora of Pennsylvania. American Philosophical Society, Philadelphia, Pennsylvania.
- Rhoads, A.F. and T.A. Block. 2007. The Plants of Pennsylvania: An Illustrated Manual. 2nd edition. University of Pennsylvania Press, Philadelphia, Pennsylvania.

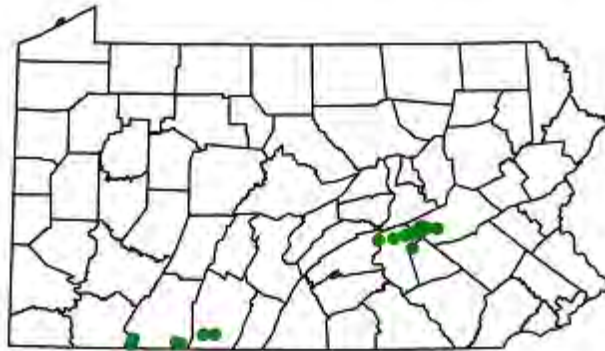


Minniebush *Menziesia pilosa*

Description

More common in the southern Appalachians, minniebush (*Menziesia pilosa*), a relative of the blueberry, has a limited distribution in Pennsylvania. Though historically reported from a few counties in western Pennsylvania, this shrub is currently known to occur only in Cumberland, Dauphin, Lebanon and Schuylkill Counties.

Pennsylvania Map



Map produced from the Pennsylvania Flora Database, Morris Arboretum of the University of Pennsylvania based on herbarium

Map Source: Pennsylvania Science Office

Photos

In bloom



Menziesia pilosa

Gary P. Fleming

Common view



Photo Source: Peter Linehan

APPENDIX G

FLOW CHART FOR INADVERTENT DISCOVERY OF CULTURAL REMAINS

FLOW CHART FOR INADVERTENT DISCOVERY OF CULTURAL REMAINS IN SGL 211

Work crews/Contractors find known or likely human remains, unmarked graves, Native American and Euro-American artifacts or archaeological features.

WESTON SUPERVISORS NOTIFY Pennsylvania Army National Guard (PAARNG) Project Manager (PM) and PAARNG Cultural Resource Manager (CRM)



WESTON Supervisors

- (1) Ensures that all work/training in the area of the find is STOPPED.
- (2) Secures the area of the find and establishes a 30-meter buffer zone.
- (3) Notifies the CRM (717-861-9415 or 717-222-1258) and waits for further instructions.



Cultural Resources Manager

- (1) Confirm that all work/training has STOPPED and that area of find has been secured and a buffer zone established.
- (2) Notifies the PA State Historic Preservation Officer (PASHPO), Tribes and any other appropriate state and/or federal agencies by telephone.
- (3) Notifies the PAARNG Judge Advocate General (JAG) and Facilities Management Office (FMO).
- (4) Visits the find within 24 hours with appropriate experts.



Archaeological Deposit = NO
Human remains, funerary objects, sacred objects, or objects of cultural patrimony = NO

CRM gives PAARNG PM permission for work to resume.



Archaeological deposit = YES
Human remains, funerary objects, sacred objects or objects of cultural patrimony = NO

CRM, PASHPO and Tribes conduct preliminary investigation to determine if work has impacted deposit. If so, mitigative measures are defined.

Area of find remains off-limits.



Archaeological deposit = YES
Human remains, funerary objects, sacred objects or objects of cultural patrimony = YES

CRM notifies State Archaeologist/SHPO, State Medical Examiner, and State Police to determine age of remains and whether work/training has impacted the remains or deposit. Depending on age and ethnicity of the remains, CRM notifies tribal representatives, applies for permits for excavation, and prepares appropriate reports.

Area of find remains off-limits.

APPENDIX H

PGC SPECIAL USE PERMIT



PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA
 2001 ELMERTON AVENUE
 HARRISBURG PA 17110

SPECIAL USE PERMIT

PERMIT TYPE STUDIES-ENVIRONMENTAL
PERMIT # 31059

DESCRIPTION REMEDIAL ACTION WORK PLAN FOR RICOCHET AREA MUNITIONS RESPONSE SITE SGL 211

PERMITTEE

WALTER HALLA
 111 S GEORGE MASON DR
 ARLINGTON VA 22204 - 1373

DOB 11/18/1969
PHONE 703-607-7995

BUSINESS ARMY NATIONAL GUARD DIRECTORATE

DISTRICT 6-38-1, 6-22-1

SGL/AREA 211

COUNTY LEBANON, DAUPHIN

LMG 6-1

REGION SE

EFFECTIVE DATE 11/15/2013 - 12/31/2014

FEE \$ 0

REPORT REQUIRED NONE

RENEWABLE NO

PITTMAN-ROBERTSON NO

CONDITIONS

- 1 THE VALIDITY OF THIS PERMIT IS CONDITIONED UPON THE RECEIPT AND MAINTENANCE OF ANY OTHER APPLICABLE FEDERAL, STATE OR LOCAL PERMITS REQUIRED BY LAW.
- 2 A COPY OF THIS PERMIT SHALL BE CARRIED AND PRESENTED UPON REQUEST OF ANY DULY AUTHORIZED OFFICER OR REPRESENTATIVE OF THE COMMISSION.
- 3 ALL PERMITTED ACTIVITIES SHALL AT ALL TIMES BE CONDUCTED IN CONFORMANCE WITH ALL APPLICABLE REQUIREMENTS OF THE GAME AND WILDLIFE CODE (34 PA.C.S. § 101 ET SEQ.) AND ITS ATTENDANT REGULATIONS (58 PA. CODE § 131.1 ET SEQ.).
- 4 THIS PERMIT CANNOT BE TRANSFERRED IN WHOLE OR IN PART TO ANOTHER PARTY.
- 5 PERMITTEE OR SUBPERMITTEE DOES NOT HAVE SOLE USE OF THE GAME LANDS ON DATES LISTED ABOVE. PERMITTED ACTIVITIES CANNOT IMPACT OTHER USERS OF THE GAME LANDS.
- 6 NO ACTIVITIES ARE TO BE CONDUCTED DURING THE REGULAR FIREARMS DEER SEASON, OR ON SATURDAYS DURING THE EARLY GOOSE/DOVE SEASON, FALL ARCHERY OR MUZZLELOADER DEER SEASON, REGULAR SMALL GAME SEASON, FALL TURKEY SEASON, BEAR SEASON, OR BEFORE NOON DURING THE OPENING DAY AND SATURDAYS OF WATERFOWL SEASONS OR BEFORE NOON DURING THE OPENING DAY AND SATURDAYS OF SPRING TURKEY SEASON UNDER THIS PERMIT OR AREAS ACCESSED USING THIS PERMIT



PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA
2001 ELMERTON AVENUE
HARRISBURG PA 17110

SPECIAL USE PERMIT

PERMIT TYPE STUDIES-ENVIRONMENTAL
PERMIT # 31059

- 7 PERMITTEE SHALL MAINTAIN ANY ROADS EFFECTED IN A DRIVABLE CONDITION, AND SHALL TAKE SUCH MEASURES AS ARE NECESSARY (WHICH MAY INCLUDE GRADING, APPLYING STONE AND KEEPING DRAINAGE STRUCTURES CLEAR AND FUNCTIONING, AS DETERMINED BY THE LAND MANAGEMENT OFFICER) TO PREVENT THE ROAD FROM BECOMING IMPASSABLE TO NORMAL COMMISSION USE ON A DAY TO DAY BASIS.
- 8 SHOULD ADDITIONAL DAMAGE TO THE COMMONWEALTH RESULT AT ANY TIME FROM THE CONSTRUCTION, OPERATION OR MAINTENANCE OF SAID PROJECT NOT HEREIN CONTEMPLATED OR SPECIFICALLY MENTIONED, "PERMITTEE" SHALL MAKE FULL COMPENSATION TO "COMMISSION" TO BE ESTIMATED AND CALCULATED BY "COMMISSION" AS NEAR AS MAY BE BY THE METHODS THEN IN USE BY "COMMISSION" FOR THE COMPUTATION OF DAMAGES.
- 9 PERMITTEE MUST COMPLY WITH ALL OTHER GAME LAWS AND REGULATIONS. PERMITTEE SHALL BE RESPONSIBLE FOR ALL DAMAGES DONE BY PERMITTEE OR SUBPERMITTEES TO TREES OR FAUNA, ROADS, BRIDGES, PROPERTY LINES, TELEPHONE OR POWER LINES CROSSING GAME LANDS OR ADJACENT THERETO, OR DAMAGE TO ANY OTHER IMPROVEMENTS OR STRUCTURES THEREON AS REFERENCED IN THE GAME AND WILDLIFE CODE SECTION 721(A) AND REGULATIONS PROMULGATED UNDER 58 REGULATIONS SECTIONS 135.2 AND 135.41. PERMITTEE IS RESPONSIBLE FOR THE REMOVAL OF TRASH GENERATED BY PERMITTED ACTIVITIES AS REFERENCED IN THE GAME AND WILDLIFE CODE SECTION 2510, LITTERING AND RESTRICTIONS ON VEHICLES. NO COMMERCIAL ACTIVITY OR VENDORS WILL BE PERMITTED.
- 10 A COPY OF THIS PERMIT SHALL BE CARRIED AND PRESENTED UPON REQUEST OF ANY DULY AUTHORIZED OFFICER.
- 11 ACCESS MAY BE DENIED AT CERTAIN TIMES DUE TO HUNTING SEASONS, INCLEMENT WEATHER, ROAD CONDITIONS OR OTHER CONFLICTS AS DETERMINED BY THE LAND MANAGEMENT GROUP SUPERVISOR.
- 12 ANY PERSON ON STATE GAME LANDS BETWEEN NOVEMBER 15 AND DECEMBER 15[SUNDAYS EXCEPTED] MUST WEAR AT LEAST 250 SQUARE INCHES OF DAYLIGHT FLUORESCENT ORANGE COLORED MATERIAL ON THE HEAD, CHEST AND BACK COMBINED. THE WEARING OF THESE MATERIALS IS STRONGLY RECOMMENDED DURING OTHER FALL HUNTING SEASONS AND THE SPRING TURKEY SEASON
- 13 NO MOTORIZED VEHICLES SHALL BE USED ON THE SGL WITHOUT THE SPECIFIC ADVANCE PERMISSION OF THE LAND MANAGEMENT GROUP SUPERVISOR. TRAVEL BY ALL VEHICLES UPON THE SGL ASSOCIATED WITH THIS ACTIVITY IS LIMITED TO LICENSED AND INSURED MOTORIZED VEHICLES.
- 14 PERMITTEE SHALL AT ALL TIMES HEREAFTER INDEMNIFY AND SAVE HARMLESS THE PGC AND COMMONWEALTH FROM AND AGAINST ANY AND ALL DETRIMENT, DAMAGES, LEASES, CLAIMS, DEMANDS, SUITS, COSTS, AND EXPENSES NOT HEREIN PROVIDED FOR WHICH THE PGC AND COMMONWEALTH MAY SUFFER, SUSTAIN OR BE SUBJECTED TO, DIRECTLY OR INDIRECTLY, BY REASON OF THIS AUTHORIZATION.
- 15 THE LAND MANAGEMENT GROUP SUPERVISOR SHALL BE NOTIFIED 5 DAYS PRIOR TO THE START OF ACTIVITY.
- 16 TRAVEL BY ALL VEHICLES UPON THE SGL ASSOCIATED WITH THIS ACTIVITY IS LIMITED TO LICENSED AND INSURED MOTORIZED VEHICLES.
- 17 ALL WORK DONE ON SGL 211 WILL BE COMPLETED AS OUTLINED IN THE REMEDIAL ACTION WORK PLAN FOR THE RICOCHET AREA MUNITIONS RESPONSE SITE ON SGL 211. NO WORK OUTSIDE OF THIS PLAN WILL BE COMPLETED ON SGL 211 WITHOUT THE APPROVAL OF THE PENNSYLVANIA GAME COMMISSION.
- 18 CONTACT PERSON FOR THIS ACTIVITY IS LAND MANAGER SCOTT BILLS. HE CAN BE REACHED AT 610/926-3136.

PERMITTEE SIGNATURE

DATE



Thomas P. Herbel

REGIONAL DIRECTOR,
SOUTHEAST REGION

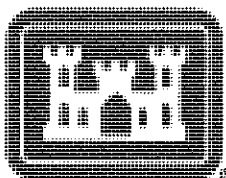
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**REMEDIAL ACTION WORK PLAN
FOR RICOCHET AREA MUNITIONS RESPONSE SITE
IN STATE GAME LANDS 211, PENNSYLVANIA**

Contract No.: W912DR-09-D-0006

October 2013

Prepared for:



**U.S. Army Corps of Engineers
Baltimore District
Baltimore, MD 21203**



**Army National Guard Directorate
Arlington, VA 22204**

and

**Pennsylvania Army National Guard
Department of Military and Veterans Affairs
Fort Indiantown Gap Military Reservation
Annville, PA 17003**

Prepared by:



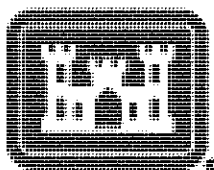
**Weston Solutions, Inc.
West Chester, PA 19380**

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WORK PLAN**

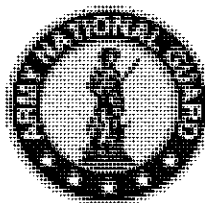
**FOR RICOCHET AREA MUNITIONS RESPONSE SITE
IN STATE GAME LANDS 211, PENNSYLVANIA**

**CONTRACT No.: W912DR-09-D-0006
DELIVERY ORDER No. 0009**

Prepared For:



**U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT**
10 South Howard Street
Baltimore, MD 21203



**ARMY NATIONAL GUARD
DIRECTORATE**
111 South George Mason Drive
Arlington, VA 22204

and

PENNSYLVANIA ARMY NATIONAL GUARD
Department of Military and Veterans Affairs
Fort Indiantown Gap Military Reservation
Annville, PA 17003

Prepared by:



Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380

WESTON PROJECT No.: 03886.551.009.3120

OCTOBER 2013

**DRAFT FINAL
REMEDIAL ACTION WORK PLAN
FOR RICOCHET AREA MUNITIONS RESPONSE SITE
IN STATE GAME LANDS 211, PENNSYLVANIA**

CONTRACT No.: W912DR-09-D-0006



John Gerhard
Project Manager

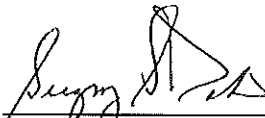
10/07/2013

Date

TBD

MEC Operations Manager

Date



Gregory Daloisio, PMP
Program Manager

10/07/2013

Date

TABLE OF CONTENTS

Section	Page
1. INTRODUCTION.....	1-1
1.1 AUTHORIZATION.....	1-1
1.2 PURPOSE AND SCOPE.....	1-1
1.3 SITE DESCRIPTION	1-1
1.3.1 Site Location	1-1
1.3.2 Historical Information.....	1-2
1.3.3 Munitions and Explosives of Concern.....	1-2
1.4 SITE SETTING	1-2
1.4.1 Topography.....	1-2
1.4.2 Climate.....	1-3
1.4.3 Geological and Soil Conditions	1-3
1.4.4 Hydrology	1-3
1.4.5 Current and Future Site Use.....	1-3
1.5 WORK PLAN ORGANIZATION	1-4
2. TECHNICAL MANAGEMENT PLAN	2-1
2.1 TECHNICAL APPROACH OVERVIEW	2-1
2.1.1 Remedial Action Objective.....	2-1
2.1.2 Differing Site Conditions.....	2-1
2.2 PROJECT ORGANIZATION	2-2
2.2.1 Site Management	2-2
2.2.2 UXO Teams	2-2
2.3 PROJECT COMMUNICATION AND REPORTING.....	2-2
2.3.1 Monthly Status Reports.....	2-3
2.3.2 Daily and Weekly Status Reports	2-3
2.3.3 Phone Conferences/Informal Site Meetings	2-3
2.3.4 Regulatory Coordination.....	2-3
2.3.5 Administrative Record/Project Documents File	2-3
2.4 PROJECT SCHEDULE.....	2-3
2.5 PUBLIC INVOLVEMENT	2-4
2.6 SUBCONTRACTOR MANAGEMENT.....	2-4
3. FIELD PLAN	3-1
3.1 APPLICABLE GUIDANCE AND REGULATIONS.....	3-1
3.2 ANTICIPATED MEC	3-1
3.3 GEOGRAPHIC INFORMATION SYSTEM MANAGEMENT	3-1
3.4 MOBILIZATION	3-1
3.4.1 Site Office Establishment	3-2

TABLE OF CONTENTS (Continued)

Section	Page
3.4.2	Site Utilities 3-2
3.4.3	Grid Survey Activities and Removal Action Area Delineation..... 3-2
3.4.4	Brush Clearing 3-4
3.5	GEOPHYSICAL INVESTIGATION PLAN 3-4
3.5.1	Geophysical Instrumentation 3-5
3.5.2	Geophysical System Verification 3-7
3.5.3	Site Utilities 3-9
3.5.4	Manmade Features Potentially Affecting Geophysical Operations.... 3-10
3.5.5	Overall Site Accessibility and Impediments..... 3-10
3.5.6	Measurement Quality Objectives..... 3-10
3.5.7	Instrument Standardization 3-10
3.5.8	Records Management..... 3-11
3.5.9	Digital Data Processing..... 3-12
3.6	GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS 3-15
3.6.1	Geographic Information System Incorporation 3-15
3.6.2	Plotting..... 3-16
3.6.3	Mapping 3-16
3.6.4	Electronic Submittal..... 3-16
3.7	SURFACE AND SUBSURFACE REMOVAL OPERATIONS 3-16
3.7.1	Accountability and Records Management for Munitions and Explosives of Concern 3-16
3.7.2	UXO Personnel Qualifications 3-17
3.7.3	Removal Action Area Description..... 3-17
3.7.4	Removal Action Procedures 3-17
3.7.5	Munition with the Greatest Fragmentation Distance 3-19
3.7.6	Minimum Separation Distances..... 3-19
3.7.7	MEC Removal 3-20
3.7.8	MEC Storage..... 3-21
3.7.9	MEC Demolition and Disposal..... 3-21
3.7.10	Material Potentially Presenting an Explosive Hazard 3-22
3.8	SITE RESTORATION 3-24
3.9	WORK SCHEDULE 3-24
4.	QUALITY CONTROL PLAN..... 4-1
4.1	QUALITY MANAGEMENT STRUCTURE..... 4-1
4.1.1	UXO Operations QC Manager..... 4-1
4.1.2	Project Manager..... 4-1
4.1.3	Senior UXO Supervisor 4-1
4.1.4	UXO Quality Control Specialists..... 4-1
4.1.5	Geophysics QC Manager 4-2

TABLE OF CONTENTS (Continued)

Section	Page
4.2	PERSONNEL QUALIFICATIONS AND TRAINING 4-2
4.2.1	Qualifications and Training for UXO Personnel 4-2
4.3	THREE PHASE INSPECTION PROCESS 4-2
4.3.1	Definable Features of Work..... 4-2
4.3.2	Preparatory Phase Inspection..... 4-3
4.3.3	Initial Phase Inspection 4-3
4.3.4	Follow-Up Phase Inspection (Surveillance) 4-4
4.3.5	Final Phase Inspection 4-4
4.4	DOCUMENTING DEFICIENCIES AND CORRECTIVE ACTIONS..... 4-5
4.4.1	Corrective Action Process..... 4-5
4.4.2	Continuous Improvement..... 4-5
4.4.3	Deficiency Identification and Resolution 4-5
4.4.4	Corrective Action Request..... 4-5
4.4.5	Corrective Action Tracking 4-6
4.4.6	Lessons Learned..... 4-6
4.5	PROJECT COMMUNICATION..... 4-6
4.5.1	Weekly Project Meeting 4-6
4.5.2	Project Documentation..... 4-6
4.5.3	Logs, Records, and Reports 4-7
5.	EXPLOSIVES MANAGEMENT PLAN 5-1
5.1	GENERAL 5-1
5.2	LICENSES/PERMITS 5-1
5.3	ACQUISITIONS..... 5-1
5.4	INITIAL RECEIPT..... 5-1
5.5	STORAGE 5-2
5.6	TRANSPORTATION..... 5-2
5.7	DOCUMENTATION 5-3
5.8	RETURN OF UNUSED EXPLOSIVES 5-3
5.9	DISPOSAL OF REMAINING EXPLOSIVES 5-3
5.10	LOSS, THEFT, AND UNAUTHORIZED USE OF EXPLOSIVES 5-3
6.	ENVIRONMENTAL PROTECTION PLAN 6-1
6.1	GENERAL 6-1
6.2	EXISTING CONDITION SURVEY..... 6-1
6.2.1	Biological Resources 6-1
6.2.2	Wetland Swamps 6-6
6.2.3	Water Resources 6-6
6.2.4	Cultural and Archeological Resources..... 6-6

TABLE OF CONTENTS (Continued)

Section	Page
6.3	PROCEDURES FOR PROTECTION OF RESOURCES..... 6-7
6.3.1	Trees and Shrubs..... 6-7
6.3.2	Waste Disposal..... 6-7
6.3.3	Security of Hazardous Materials..... 6-8
6.3.4	Burning Activities..... 6-8
6.3.5	Dust and Emission Control 6-8
6.3.6	Noise Control and Prevention..... 6-8
6.3.7	Spill Control and Prevention..... 6-9
6.3.8	Storage Areas 6-10
6.3.9	Access Routes 6-10
6.3.10	Control of Water Runon and Runoff 6-10
6.3.11	Temporary Facilities 6-10
6.3.12	Decontamination and Disposal of Equipment 6-11
6.3.13	Minimizing Areas of Disturbance..... 6-11
7.	PROPERTY MANAGEMENT PLAN 7-1
8.	INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS..... 8-1
9.	PHYSICAL SECURITY PLAN FOR RCWM PROJECTS 9-1
10.	REFERENCES..... 10-1