STAFF EXHIBIT 16

RAS 14583

U.S. NUCLEAR REGULATORY COMMISSION
In the Matter of USArmy (Jefferson Proving Ground)
Docket No. 40-8838-MLA Official Exhibit No. 16
OFFERED by: Applicant/Licensee Intervenor
NRC Staff Other
IDENTIFIED on Witness/Panel
Action Taken: ADMITTED REJECTED WITHDRAWN
Reporter/Clerk

DEPARTMENT OF THE ARMY
U.S. ARMY GARRISON-ROCK ISLAND ARSENAL
1 ROCK ISLAND ARSENAL
ROCK ISLAND, IL 61299-5000

REPLY TO
ATTENTION OF:

Office of the Garrison Manager

07 JUL 2006

Dr. Tom McLaughlin
Materials Decommissioning Branch
Division of Waste Management and Environmental Protection
Office of Nuclear Materials Safety and Safeguards
Two White Flint North
11545 Rockville Pike
Rockville, Maryland 20852-2738

Dear Dr. McLaughlin:

Reference Nuclear Regulatory Commission License No. SUB-1435. Provided as enclosure are Addendums No. 2 and 3 to the previously submitted Field Sampling Plan and the Health and Safety Plan that address the soil verification, the electrical imaging and stream gauge installation respectively.

If you have any questions, please contact either Mr. Paul Cloud, Jefferson Proving Ground (JPG) License Radiation Safety Officer, U.S. Army JPG, at (410) 436-2381, E-mail address: paul.d.cloud@us.army.mil, or Mr. John J. Welling, Chief Counsel, U.S. Army Garrison-Rock Island Arsenal, at (309) 782-8433, E-mail address: wellingj@ria.army.mil.

Sincerely,

Alan G. Wilson
Garrison Manager

DOCKETED
USNRC
October 25, 2007 (2:00pm)
OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF
Docket No. 40-8838-MLA

Enclosures

CF:
Paul Cloud

Printed On Recycled Paper

TEMPLATE = SECY-027

SECY-02

FIELD SAMPLING PLAN ADDENDUM 2

Depleted Uranium Impact Area
Site Characterization – Soil Verification
Jefferson Proving Ground, Madison, Indiana

Final

Prepared for:

U.S. Department of Army
Installation Support Management Activity
5183 Blackhawk Road
Aberdeen Proving Ground, Maryland 21010-5424

and

U.S. Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King, Jr. Place
Louisville, Kentucky 40202-2230

Submitted by:

From Science to Solutions™

Science Applications International Corporation
11251 Roger Bacon Drive
Reston, Virginia 20190

Contract No: W912QR-04-D-0019
Delivery Order No. 0012

July 2006

FIELD SAMPLING PLAN ADDENDUM 2

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Contract No: W912QR-04-D-0019
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Nuclear Regulatory Commission License SUB-1435

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COMMITMENT TO IMPLEMENT THE ABOVE FIELD SAMPLING PLAN ADDENDUM

Joseph N. Skibinski Project Manager	(703) 810-8994 Telephone	7/7/06 Date
Joseph E. Peters Quality Assurance Officer	(703) 318-4763 Telephone	7/7/06 Date
Randy C. Hansen Health and Safety Officer	(314) 770-3027 Telephone	7/7/06 Date
Harold W. Anagnostopoulos Radiation Safety Officer/Radiation Protection Officer	(314) 770-3059 Telephone	7/7/06 Date
Seth T. Stephenson Field Manager	(765) 278-3520 Telephone	7/7/06 Date

The approved Field Sampling Plan (FSP) Addendum will be provided to subcontractors (i.e., drillers, surveyors, and laboratories) at the time of subcontract execution.

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CERTIFICATION 4

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Science Applications International Corporation (SAIC) has prepared this Field Sampling Plan (FSP) Addendum 2 for performing site characterization at Jefferson Proving Ground's Depleted Uranium Impact Area, located in Madison, Indiana. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan (QCP). During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.

Joseph N. Skibinski
Project Manager
Science Applications International Corporation

7/7/06
Date

JES for Joseph E. Peters
Joseph E. Peters
Quality Assurance Officer
Science Applications International Corporation

7/7/06
Date

Corinne Shia
Independent Technical Review Team Leader
Alion Science and Technology Corporation

7/7/06
Date

Significant concerns and explanation of the resolutions are documented within the project file.

As noted above, all concerns resulting from independent technical review of the project have been considered.

Lisa D. Jones-Bateman
Vice President
Science Applications International Corporation

7/7/06
Date

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LIST OF FIGURES

LIST OF ACRONYMS

CHP	Certified Health Physicist
CSP	Certified Safety Professional
DO	Delivery Order
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DU	Depleted Uranium
EOD	Explosive Ordnance Disposal
FSP	Field Sampling Plan
GPS	Global Positioning System
HASP	Health and Safety Plan
HPT	Health Physics Technician
IDW	Investigation-derived Waste
JPG	Jefferson Proving Ground
NCSS	National Cooperative Soil Survey
NGB	National Guard Bureau
NRCS	Natural Resources Conservation Service
NRC	U.S. Nuclear Regulatory Commission
PPE	Personal Protective Equipment
QC	Quality Control
SAIC	Science Applications International Corporation
SOW	Statement of Work
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UXO	Unexploded Ordnance

1. INTRODUCTION

This document is the second Addendum to the previous Field Sampling Plan (FSP) (SAIC 2005a) prepared for the Depleted Uranium (DU) Impact Area Site Characterization Project for Jefferson Proving Ground (JPG), Madison, Indiana, in May 2005. Science Applications International Corporation (SAIC) has prepared this Addendum in accordance with the statement of work (SOW) requirements under the U.S. Army Corps of Engineers (USACE) Contract No. W912QR-04-D-0019, Delivery Order (DO) No. 0012.

This FSP Addendum documents and describes specific activities and details of the JPG DU Impact Area soil verification task that were not addressed in the FSP or have been modified from the information presented in the FSP. With this understanding, this Addendum follows the same format and relevant sections of the FSP are referenced. This document is to be used in conjunction with the existing FSP, not as a replacement. The information provided in this plan was developed for use by SAIC in support of JPG's site characterization program to assist with the soil verification. SAIC assumes no liability for the use of this information for any other purpose than as stated in this Addendum or the FSP.

The following is a brief scope of this task:

> Available relative published materials consisting of soil studies and mapping will be compiled and reviewed. Typical soil survey maps are prepared by the National Cooperative Soil Survey (NCSS). In addition, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) will be contacted to identify and acquire available materials. Reviewed materials will be used to select transects for field verification activities. After review of the published materials, onsite verification of the soil mapping units is proposed to confirm the soil characteristics related to the mapped soils, as well as any inclusions of similar or contrasting soil types, that need to be considered in interpretations on the site. Results of the soil verification task will be used to assist in developing future soil sampling plans, corrosion studies, K_d studies, and modeling of contaminant mobility.

Note that further details concerning the scope and objectives of the soil verification task are presented in Section 5 of the FSP (SAIC 2005a).

Additional information on the project schedule is provided in Section 2, investigation-derived waste (IDW) in Section 3, and data use and reporting in Section 4. Responsibility for work under a U.S. Nuclear Regulatory Commission (NRC) radioactive materials license is described in Section 5, and the references used in preparing this report are provided in Section 6.

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2. SOIL VERIFICATION PLAN

This section describes the soil verification activities to be conducted at JPG. The objective of this task is to identify existing soil types from the available published soil reporting and maps, which will be confirmed with field verification of the soil types. Following the review of the relevant available published materials, SAIC will conduct field verification activities during a planned 2-day field event. All field activities will be completed in accordance with the approved site Health and Safety Plan (HASP) (SAIC 2005b) and any relevant Addenda.

SAIC is proposing to complete the publications search and review prior to initiating the field verification task. Weather conditions will be assessed to determine if significant rain has occurred 2 days prior to mobilization of the field crew to JPG to conduct the soil verification. The schedule will be modified if significant rain has occurred in the preceding days. This decision criterion is based on the fact that most soils typically will drain below field capacity within 24 to 48 hours of a 1-inch rain event. Soils that have not drained by this time period are probably wet normally and this condition may be an indication of the presence of hydric soils and/or wetlands conditions. Soil colors are best characterized when moist, a condition desired for successful completion of the soil verification.

Because the entire DU Impact Area is north of the firing line where the potential to encounter unexploded ordnance (UXO) is likely, anomaly avoidance procedures will be followed[1]. This includes the scanning of work areas by visual and instrument surveys conducted by one of SAIC's qualified UXO specialists (i.e., graduate of the U.S. Department of Defense [DOD] Explosive Ordnance Disposal [EOD] School in Indian Head, Maryland). The surveyed areas will be temporarily marked until the completion of field activities. Non-UXO personnel will operate only within the designated cleared areas. All field work in nonscanned areas where UXO reasonably may be exposed at the surface will be subject to continuous surveillance by qualified UXO personnel. Additional safety precautions for work in UXO areas are included in Appendix D of the HASP Addendum (SAIC 2006).

The field soil verification task team will consist of a soil scientist, project hydrogeologist, SAIC's UXO specialist, and a Health Physics Technician (HPT). The SAIC soil scientist along with the hydrogeologist will identify transects across appropriate portions of the DU Impact Area for placement of shallow (up to 3 feet deep) soil hand auger borings to identify the field characteristics in order to confirm or identify the soil series. The number of hand auger borings completed will be determined in the field by the variability of the soils, physical access along the transects, UXO avoidance, and radiation monitoring activities. It is anticipated that a limited number (approximately 20 to 40) of hand auger borings will be completed during this field verification task as determined to be necessary by the soil scientist based on the literature review and observed soils conditions in the field. The transects and hand auger borings will be completed in order of importance as determined by the soil scientist to provide field verification in areas determined to be needed. The soil scientist and hydrogeologist, under the direct supervision of the qualified UXO specialist, will complete the hand auger borings. The UXO specialist will complete UXO avoidance screening prior to initiating the borings and downhole during the boring advance in accordance with procedures presented in the HASP Addendum (SAIC 2006). The HPT will provide support for field verification by screening soils returned to the surface with the hand auger and screening the hand auger between boring locations and prior to leaving the site.

The locations of all of the soil borings will be located horizontally using a global positioning system (GPS). In areas where adequate satellite contact can not be acquired (such as under tree cover), the location of the boring will be located by measuring by wheel or tape to the closest GPS located boring.

[1] SAIC will not be completing any UXO clearance activities as part of this investigation. Anomaly avoidance activities using a magnetic locator will be completed by SAIC's Senior UXO Supervisor. The avoidance activities will identify and mark areas where UXO possibly exists and safe work areas where UXO is not present.

The soil characteristics that are specifically able to be identified from hand auger samples include soil texture (USDA classification system); Munsell soil color; soil horizons (layers); and any evidence of redoximorphic features (iron accumulations or depletions), manganese coatings or nodules, or free carbonates (concretions or masses). The determination of soil texture is made in the field by feeling the soil between the fingers to estimate the percentage of sand, silt, and clay fractions. Stickiness, soft and floury, and grittiness are typical field observations of clay, silt, and sand, respectively. Formation of a "ribbon" also indicates relative percentages of sand, silt, and clay. Soil structure is a valuable characteristic, but is usually destroyed during the hand boring excavation. The carbonate concretions or masses (free carbonates) will be verified with a dilute solution of hydrochloric acid (10 percent).

The information will be recorded on a spreadsheet form that includes the following information:

- Site location identifier
- Soil mapping unit/series
- Horizon depths
- Horizon designation
- Munsell color
- Soil Texture
- Redoximorphic features
- Manganese coatings or nodules
- Evidence of free carbonates
- *Other information, such as size and abundance of roots and any other pertinent characteristics.*

Between boring locations, the hand auger equipment will be decontaminated by dry methods consisting of scraping and removing the loose soil and material clinging to the equipment. The HPT will survey the equipment and additional decontamination will be completed if determined to be radioactive. Additional decontamination, if necessary, will consist of a water and Alconox® wash with a water rinse. All equipment will be surveyed by the HPT for radioactivity prior to demobilizing from the site.

SAIC personnel are required to comply with all of the policies and procedures specified in this FSP Addendum, associated plans (SAIC 2005a, b, and c; SAIC 2006), and other referenced documents. The following summarizes the roles and responsibilities of the SAIC personnel responsible for conducting the soil verification:

- Mr. Joseph N. Skibinski is SAIC's overall JPG Project Manager. He is responsible for all activities conducted at JPG, including the soil verification and all external coordination.
- Mr. Charley L. Klinger is SAIC's Lead Soil Scientist for the soil verification activities. He is responsible for assisting in developing the plans associated with the soil verification task and will be present at JPG during the field verification.
- Mr. Todd D. Eaby is SAIC's Lead Hydrogeologist for the soil verification activities. He is responsible for developing the plans associated with the soil verification task and will be present at JPG during the field verification. While present at JPG, he will be the primary point of contact for SAIC.
- Mr. Seth T. Stephenson will serve as the Field Manager and provide UXO avoidance support. He is a graduate of the EOD School in Indian Head, Maryland, and has served as the UXO Team Member and UXO Supervisor on surveys and removal actions at DOD sites. When Mr. Eaby is not present at JPG, he will be the primary point of contact for SAIC and will be responsible for ensuring work activities are conducted in accordance with the procedures and policies specified in this FSP Addendum and other related project plans.

- Mr. Randy C. Hansen will serve as the Project Health and Safety Officer. He is a certified safety professional (CSP) and has supervised the environmental radiation protection program on remedial action projects involving radiological contamination. He has experience supporting field operations at JPG.
- Mr. Harry W. Anagnostopoulos will serve as the Radiation Safety Officer. He is a certified health physicist (CHP) in SAIC's St. Louis office who specializes in environmental compliance, occupational safety, and radiation protection.
- Mr. Joseph E. Peters will be the Quality Control (QC) Manager for all of SAIC's work at JPG. He will conduct a laboratory surveillance to ensure that project personnel training requirements are properly documented and up to date. He is the QC Manager for USACE, National Guard Bureau (NGB), and U.S. Department of Energy (DOE) contracts and has extensive experience in working with laboratories and validating chemical and radiological data.

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3. INVESTIGATION-DERIVED WASTE

Soil cuttings generated from the hand auger borings will be returned into the open borehole and/or spread on the ground surface at the location of the boring.

Decontamination liquids (if any) will be disposed of on the grounds within the DU Impact Area. This is acceptable as bulk soils will be removed from the equipment and the equipment will be surveyed by a HPT prior to the use of decontamination liquids. Wide-scale use of decontamination fluids is not expected.

Any materials such as disposable personal protective equipment (PPE) and paper towels will be surveyed by a HPT for unrestricted release or placed into plastic bags, labeled as radioactive materials, and stored in an approved radioactive material storage location at JPG (for eventual shipment and disposal by a licensed radioactive waste broker). It is anticipated that all PPE will be able to be released and disposed of as nonradioactive.

If nonradioactive IDW disposal is determined to be necessary, a change order will be requested to include the services of a qualified and experienced IDW subcontractor (i.e., either Onyx or Clean Harbors).

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4. DATA USE

A report will be prepared that summarizes the data collected from field observations. The report will include the information acquired from the published material review. Included in the report will be a map illustrating the locations of transects and the hand auger boring locations, as well as published and observed soil type mapping unit boundaries. The report and revised soil survey map will be used to provide more accurate site-specific soils data to be used in modeling, soil sample investigation planning, and analysis.

Photographs of the individual hand auger borings/locations are not planned and will not be included in the reports because of their limited value. Soil colors depicted in photographs usually are not representative of the colors observed in the field and can be misleading unless taken by a professional. However, photographs may be taken showing the general locations/orientations of the transects that hand auger borings were collected from, along and of significant features, such as breaks in topography, where divisions in soil types occur. Photographs of transects will have hand auger boring locations marked with pin flags.

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5. RADIOLOGICAL RESPONSIBILITY AND LICENSING

The possession of radioactive materials at JPG is authorized and governed under a radioactive materials license granted by NRC to the Army. The license number is SUB-1435. The current amendment is No. 13, dated April 26, 2006. The license authorizes the possession of up to 80,000 kilograms (approximately 177,000 pounds) of DU metal, alloy, and/or other forms. The material must remain onsite, within the restricted area known as the "Depleted Uranium Impact Area."

The Army has requested that SAIC be responsible for the work that is described in this FSP Addendum, and obtain and utilize a license from NRC that authorizes the contractor to provide radiological services for the Army. SAIC has obtained and will utilize such a license.

The SAIC St. Louis office is authorized to provide certain radiological services to clients under a radioactive materials license granted by NRC to SAIC. The license number is 24-32591-01. License condition number 14 requires that SAIC enter into a written agreement with the Army so that roles, responsibilities, and lines of authority for work at the site are clearly defined. This written agreement will be issued in letter form and must be signed by authorized persons from both SAIC and the Army prior to initiating work under this FSP. Once the agreement is signed, Figure 5-1 will be used to document the true date and time that responsibilities are transferred between the Army and SAIC.

Section 1 – Acceptance by SAIC Under NRC License No. 24-32591-01

Form ID No. (MM-DD-YYYY-XX):	
Task Description and Working location (be very specific):	
Governing Work Document(s) (e.g., Field Sampling Plan, HASP Addenda):	
Client Contacted (print name):	Method of Notification:
☐ Check to confirm that the client has agreed to remit the working area(s) to SAIC	
SAIC Approval to Accept	
SAIC Name (print):	Signature:
Date Accepted:	Time Accepted:
Follow-on Client Approval to Remit	
Client Name (print):	Signature:

Section 2 – Remittance by SAIC to the Army Under NRC License No. SUB-1435

Client Contacted (print name):	Method of Notification:
☐ Check to confirm that the client has agreed to accept the working area(s) from SAIC	
SAIC Approval to Remit	
SAIC Name (print):	Signature:
Date Remitted:	Time Remitted:
Follow-on Client Approval to Accept	
Client Name (print):	Signature:

Figure 5-1. Acceptance and Remittance of Radiological Responsibility at JPG

6. REFERENCES

SAIC (Science Applications International Corporation). 2005a. Field Sampling Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2005b. Health and Safety Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2005c. Quality Control Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2006. Health and Safety Plan Addendum: Site Characterization – Soil Verification of the Depleted Uranium Impact Area. Draft. April.

U.S. Army. 2000. Jefferson Proving Ground Firing Range Memorandum of Agreement. Signed on May 11, 2000 by Deputy Assistant Secretary of the Air Force for Installations, 12 May 2000 by the Deputy Assistant Secretary of the Army (Installations and Housing), and 19 May 2000 by the Director of U.S. Fish and Wildlife Services.

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HEALTH AND SAFETY PLAN ADDENDUM 2

Depleted Uranium Impact Area
Site Characterization:
Soil Verification
Jefferson Proving Ground, Madison, Indiana

Final

Prepared for:

U.S. Department of Army
Installation Support Management Activity
5183 Blackhawk Road
Aberdeen Proving Ground, Maryland 21010-5424

and

U.S. Army Corps of Engineers
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600 Dr. Martin Luther King, Jr. Place
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HEALTH AND SAFETY PLAN ADDENDUM 2
SOIL VERIFICATION
Depleted Uranium Impact Area Site Characterization
Jefferson Proving Ground, Madison, Indiana

Contract No. W912QR-04-D-0019
Delivery Order No. 0012

Nuclear Regulatory Commission License SUB-1435

July 2006

Final

COMMITMENT TO IMPLEMENT THE ABOVE FIELD SAMPLING PLAN ADDENDUM

Joseph N. Skibinski Project Manager	(703) 810-8994 Telephone	7/7/06 Date
Joseph E. Peters Quality Assurance Officer	(703) 318-4763 Telephone	7/7/06 Date
Randy C. Hansen Health and Safety Officer	(314) 770-3027 Telephone	7/7/06 Date
Harold W. Anagnostopoulos Radiation Safety Officer/Radiation Protection Officer	(314) 770-3059 Telephone	7/7/06 Date
Seth T. Stephenson Field Manager	(765) 278-3520 Telephone	7/7/06 Date

The approved Health and Safety Plan (HASP) Addendum 2 will be provided to subcontractors at the time of subcontract execution.

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CERTIFICATION 4

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Science Applications International Corporation (SAIC) has prepared this Health and Safety Plan (HASP) Addendum 2 for conducting soil verification at Jefferson Proving Ground's Depleted Uranium Impact Area, in Madison, Indiana. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan (QCP). During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures, and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.

Joseph N. Skibinski — 7/7/06
Joseph N. Skibinski — Date
Project Manager
Science Applications International Corporation

JES for Joseph E. Peters — 7/7/06
Joseph E. Peters — Date
Quality Assurance Officer
Science Applications International Corporation

Corinne Shia — 7/7/06
Corinne M. Shia — Date
Independent Technical Review Team Leader
Alion Science and Technology Corporation

Significant concerns and explanation of the resolutions are documented within the project file.

As noted above, all concerns resulting from independent technical review of the project have been considered.

Lisa D. Jones-Bateman — 7/7/06
Lisa D. Jones-Bateman — Date
Vice President
Science Applications International Corporation

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APPENDICES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
AR	Army Regulation
CFR	Code of Federal Regulations
CHP	Certified Health Physicist
CSP	Certified Safety Professional
CWM	Chemical Warfare Material
DO	Delivery Order
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DU	Depleted Uranium
EC&HS	Environmental Compliance and Health and Safety
EM	Engineer Manual
EOD	Explosive Ordnance Disposal
ER	Engineer Regulation
FSHO	Field Safety and Health Officer
FSP	Field Sampling Plan
HASP	Health and Safety Plan
HPT	Health Physics Technician
HSO	Health and Safety Officer
HSWP	Health and Safety Work Permit
HTRW	*Hazardous, Toxic* and Radioactive Waste
JPG	Jefferson Proving Ground
NGB	National Guard Bureau
NRC	U.S. Nuclear Regulatory Commission
OE	Ordnance and Explosives
OSHA	Occupational Safety and Health Administration
PAM	Pamphlet
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
SAIC	Science Applications International Corporation
SOW	Statement of Work
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UXO	Unexploded Ordnance

1. INTRODUCTION

This document is the second Addendum to the Health and Safety Plan (HASP) (SAIC 2005a) prepared for the Depleted Uranium (DU) Impact Area Site Characterization Project for Jefferson Proving Ground (JPG), Madison, Indiana. Science Applications International Corporation (SAIC) has prepared this Addendum in accordance with the statement of work (SOW) requirements under the U.S. Army Corps of Engineers (USACE) Contract No. W912QR-04-D-0019, Delivery Order (DO) No. 0012.

This Addendum was produced to define the additional policies and procedures that will ensure safe working conditions during field activities involving soil verification sampling at the JPG DU Impact Area and surrounding areas. This document is to be used in conjunction with the existing HASP, and not as a replacement. With this understanding, this Addendum follows the same format of the HASP and relevant sections of the HASP are referenced. This document was developed to prevent and minimize the potential for personal injuries, illnesses, and physical damage to equipment and property. The information provided in this plan was developed for use by SAIC in support of JPG's site characterization program to assign responsibilities, establish personal protection standards and mandatory safety procedures, and plan for contingencies. SAIC assumes no liability for the use of this information for any other purpose than as stated in this Addendum or the HASP. The evaluations of potential hazards and their controls reflect professional judgments subject to the accuracy and completeness of information available when the plan was prepared.

This Addendum has been prepared in accordance with the *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, Engineer Regulation (ER) 385-1-92 (USACE 2003b); *USACE Safety and Health Requirements Manual*, Engineer Manual (EM) 385-1-1 (USACE 2003a); *U.S. Department of Defense (DOD) Contractors' Safety Manual for Ammunition and Explosives, DOD 4145.26-M* (DOD 1997); *DOD Standard 6055.9-STD, Ammunition and Explosives Safety Standards* (DOD 2004); *U.S. Army Explosives Safety Program, Army Regulation (AR) 385-64* (U.S. Army 1997); *U.S. Ammunition and Explosives Safety Standards, Department of Army Pamphlet (PAM) 385-64* (U.S. Army 1999); U.S. Nuclear Regulatory Commission (NRC) Radioactive Materials License SUB-1435; NRC Service Providers License 24-32591-01; and SAIC's Environmental Compliance and Health and Safety (EC&HS) Manual. Note that SAIC's corporate EC&HS program includes EC&HS Procedure number 120 UXO/OE/CWM (Unexploded Ordnance/Ordnance and Explosives/Chemical Warfare Material) Safety (SAIC 2002a) that also was used to develop this Addendum and is included in Appendix A. The HASP, this HASP Addendum, and relevant portions of EM 385-1-1 will be available onsite during field work activities. The provisions of this Addendum also implement the Occupational Safety and Health Administration (OSHA) standards and requirements contained in 29 Code of Federal Regulations (CFR) 1910, 1926, and 1960.

Additional details on the soil verification activities are provided in Section 2. An analysis of the potential contaminants and hazards associated with the soil verification activities is provided in Section 3.

Appendices provide supporting documentation, as summarized below:

- Appendix A – SAIC'S EC&HS Procedure 120
- Appendix B – Activity Hazard Analysis for Soil Verification Activities
- Appendix C – Health and Safety Work Permit
- Appendix D – Anomaly Avoidance Safety Briefing Sheet
- Appendix E – JPG Biological Hazard Survey Form.

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2. SOIL VERIFICATION PLAN

The objective of the soil verification task is to identify and classify existing soil types at JPG, using available published soil reports and area soil maps as a reference, supplemented by field verification via soil sampling. Following the review of the relevant available published materials, SAIC will conduct field verification activities during a planned 2-day field event. All field activities will be completed in accordance with the approved Field Sampling Plan (FSP) (SAIC 2006) and the Site HASP (SAIC 2005a) and relevant plan addendums.

For work in areas north of the firing line, anomaly avoidance procedures will be followed. This includes the avoidance screening of work areas by visual and instrument surveys. These surveys will be conducted by one of SAIC's qualified UXO specialists (i.e., graduate of DOD Explosive Ordnance Disposal [EOD] School in Indian Head, Maryland). The surveyed and cleared areas will be marked temporarily during the execution of field activities. Non-UXO personnel will operate only within the designated cleared areas. All other field work will be subject to continuous surveillance by qualified UXO personnel. The procedures for work in UXO areas are included in Appendix A of this HASP Addendum. The procedure is supplemented by a safety briefing sheet that is provided in Appendix D of this HASP Addendum.

The field soil verification task team will consist of a soil scientist, project hydrogeologist, SAIC's UXO specialist, and a health physics technician (HPT). The SAIC soil scientist and hydrogeologist will identify transects across appropriate portions of the DU Impact Area for placement of shallow (up to 3 feet deep) soil hand auger borings. The number of hand auger borings completed will be determined in the field based upon the variability of the soils, availability of physical access along the transects, UXO concerns, and radiation monitoring results. It is anticipated that 20 to 40 hand auger borings will be necessary, as determined by the soil scientist, based on the literature review and expected soils conditions in the field. The transects and hand auger borings will be completed in order of importance as determined by the soil scientist. The soil scientist and hydrogeologist, under the direct supervision of the qualified UXO specialist, will complete the hand auger borings. The UXO specialist will complete UXO avoidance screening prior to initiating the borings and down hole during advancement of the boring in accordance with procedures presented in Appendix A. The HPT will provide support for field verification by screening soils returned to the surface with the hand auger for unusual levels of radioactivity and survey of the sampling equipment for DU contamination (if any) prior to its leaving the site.

The soil characteristics that are specifically able to be identified from hand auger samples include soil texture (U.S. Department of Agriculture [USDA] classification system), Munsell soil color, soil horizons (layers) and any evidence of redoximorphic features (iron accumulations or depletions), manganese coatings or nodules or free carbonates (concretions or masses). The determination of soil texture is made in the field by feeling the soil between the fingers to estimate the percentage of sand, silt, and clay fractions. Stickiness, soft and floury, and grittiness are typical field observations of clay, silt, and sand, respectively. Formation of a "ribbon" also indicates relative percentages of sand, silt, and clay.

Between boring locations, the hand auger equipment will be decontaminated by dry methods consisting of scraping and removing the loose soil and material clinging to the equipment. The HPT will survey the equipment and additional decontamination will be completed if the equipment is determined to be contaminated with DU. Additional decontamination will consist of a water and Alconox® wash with a water rinse, if deemed necessary. All soil verification equipment that entered the DU Impact Area will be surveyed for radioactive contamination and released for unrestricted use by the HPT prior to de-mobilizing from the site.

SAIC personnel are required to comply with all of the policies and procedures specified in this HASP Addendum, associated plans (SAIC 2005a, b, c and SAIC 2006), and other referenced documents.

The following bullets summarize the roles and responsibilities of the SAIC personnel responsible for conducting the soil verification:

- Mr. Joseph N. Skibinski is SAIC's overall JPG Project Manager. He is responsible for all activities conducted at JPG, including the soil verification and all external coordination.
- Mr. Charley L. Klinger is SAIC's Lead Soil Scientist for the soil verification activities. He is responsible for assisting in developing the plans associated with the soil verification task and will be present at JPG during the field verification.
- Mr. Todd D. Eaby is SAIC's Hydrogeology and Multimedia Sampling and Analysis Lead and Field Safety and Health Officer (FSHO) for the soil verification activities. He is responsible for developing the plans associated with the soil verification task and will be present at JPG during the field verification. While present at JPG, he will be the primary point of contact for SAIC.
- Mr. Seth T. Stephenson will serve as the Field Manager and provide UXO avoidance support. He is a graduate of the EOD School in Indian Head, Maryland, and has served as the UXO Team Member and UXO Supervisor on surveys and removal actions at DOD sites. When Mr. Eaby is not present at JPG, he will be the primary point of contact for SAIC and will be responsible for ensuring work activities are conducted in accordance with the procedures and policies specified in this HASP Addendum and other related project plans.
- Mr. Randy C. Hansen will serve as the Health and Safety Officer. He is a certified safety professional (CSP) and has supervised the environmental radiation protection program on remedial action projects involving radiological contamination. He has experience supporting field operations at JPG.
- Mr. Harold W. Anagnostopoulos will serve as the Radiation Safety Officer. He is a certified health physicist (CHP) in SAIC's St. Louis office who specializes in environmental compliance, occupational safety, and radiation protection.
- Mr. Joseph E. Peters will be the Quality Control (QC) Manager for all of SAIC's work at JPG. He will conduct a laboratory surveillance to ensure that project personnel training requirements are properly documented and up to date. He is the QC Manager for USACE, National Guard Bureau (NGB), and U.S. Department of Energy (DOE) contracts and has extensive experience in working with laboratories and validating chemical and radiological data.

3. CONTAMINANT AND HAZARD DESCRIPTION

Site tasks will include, but are not limited to, collecting and analyzing soil verification samples and conducting UXO and radiological surveys to ensure protection of project staff. Because DU projectiles remain in the area, there is some small potential for exposure to very low levels of ionizing radiation in contaminated soil and the spread of radioactive contamination (DU penetrator corrosion products) to previously uncontaminated areas. Exposure to chemical contaminants also is possible, but unlikely. Physical hazards include, but are not limited to, contact with UXO; being struck by moving equipment or other objects; slips, trips, or falls due to uneven terrain; exposure to inclement weather; and potential for exposure to very low levels of radiation or radioactive contamination. Changes (i.e., upgrades and downgrades) in protective measures require prior approval of the Health and Safety Officer (HSO) or FSHO and concurrence from the Radiation Safety Officer.

Table 3-1 is a checklist of common hazards that were considered and that may be encountered during soil verification activities.

Table 3-1. Hazards Inventory
Jefferson Proving Ground, Madison, Indiana

Yes	No	Hazard
	X	Use of sharp tools
X		Biological hazards (e.g., insects, snakes, and plants)
	X	Confined space entry (potential for entry)
	X	Drowning
	X	Electrical shock
	X	Excavation entry (excavations will not be entered)
X		Exposure to chemicals
	X	Fire
X		Unexploded ordnance
	X	Heavy equipment
	X	Noise
X		Ionizing radiation or radioactive contamination
X		Temperature extremes
X		Lifting
X		Slips, trips, and falls
X		Inclement weather

An activity hazard analysis (AHA) has been prepared for this HASP Addendum and is presented as Appendix B. Potential hazards and controls are listed on the AHA for each step of the soil verification sampling process.

Potential exposures for the site are documented in the main body of the JPG HASP for all other site activities.

The following sections present information on site contaminants, radiological hazards, and nonradiological hazards as they pertain to the HASP Addendum for soil verification sampling activities.

3.1 RADIOLOGICAL HAZARDS

Radiological hazards will be controlled in accordance with the HASP, the relevant HASP Addendum, AHA (Appendix B), the Health and Safety Work Permit (HSWP, Appendix C), and SAIC's health physics procedures (SAIC 2002b). The primary radiological hazard will be contact with intact DU

penetrators in the DU Impact Area. Contact with potentially contaminated soil in the DU Impact Area is also a possibility, but poses less of a hazard. DU penetrators will not be handled without the use of personal protective equipment (PPE) and SAIC personnel and tools will be surveyed for radiological contamination prior to exiting the DU Impact Area. Air sampling will not be required for soil verification sampling activities.

3.2 NONRADIOLOGICAL HAZARDS

Although the sampling areas and associated access routes are not expected to contain UXO, the target areas, impact areas, ricochet areas, and other surrounding areas may contain UXO. UXO may be found on the surface and/or in the subsurface. The varying types of ammunition, angles of fire, types of soil, and depths to bedrock preclude the accurate estimation of the depth of any subsurface UXO. For these reasons, the general UXO safety precautions presented in Appendix D to this HASP Addendum will be followed.

While within areas where anomaly avoidance has not been conducted inside the DU Impact Area, all personnel lacking EOD training will be restricted from traversing any areas while outside their vehicles unless anomaly avoidance procedures have been conducted.

All SAIC personnel supporting the soil verification sampling will be trained in UXO awareness and avoidance and will follow the UXO safety procedures and precautions documented in this HASP Addendum. In addition to reading this HASP Addendum and all related plans, field personnel are required to view a safety video that illustrates the types of munitions that could be encountered at JPG and procedures for non-UXO personnel to follow when contact with UXO is a possibility. SAIC personnel will conduct daily safety tailgate briefings that will address hazards associated with all activities planned for that day.

To mitigate potential cases of hypersensitivity or allergic reactions due to exposures to natural biological hazards present at JPG, the Field Manager will ensure appropriate precautions, such as PPE use, repellents, and barrier creams, are provided to personnel. The JPG Biological Hazard Survey form is included in Appendix E to solicit information supplied by field personnel regarding potential allergies or sensitivities.

Except for the potential use of a dilute solution of hydrochloric acid (10 percent), the use of hazardous chemicals is not anticipated for this activity. The health effects/potential hazards associated with exposures to dilute hydrochloric acid are included in the approved HASP (SAIC 2005a).

4. HEALTH AND SAFETY PROCEDURES

All health and safety requirements and procedures defined in the main HASP (SAIC 2005a) will apply to this soil verification sampling event, except as noted in Table 3-1. Appendix A to this HASP Addendum provides SAIC's UXO/OE/CWM safety procedure (SAIC 2002a), which establishes the minimum requirements under which field work may be conducted when the work involves a real or potential UXO hazard. This procedure is supplemented by the UXO Avoidance Safety Briefing Sheet included in Appendix D.

Additional SAIC-specific procedures also are noted in the AHA (Appendix B to this HASP Addendum). The Field Sampling Plan (FSP) for soil verification integrates specific UXO and radiation monitoring requirements based upon the hazards identified in this HASP Addendum. Finally, safety precautions for UXO avoidance have been developed, based on SAIC's UXO/OE/CWM Safety Procedure 120, USACE guidance, and DOD guidance, and is included in Appendix D to this HASP Addendum.

SAIC has elected to utilize an HSWP for the soil verification activities. This permit is included in Appendix C to this HASP Addendum.

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5. REFERENCES

DOD (U.S. Department of Defense). 1997. DOD Contractors' Safety Manual for Ammunition and Explosives, DOD 4145.26-M, Under Secretary of Defense Acquisition and Technology.

DOD. 2004. U.S. Department of Defense Standard 6055.9-STD, DoD Ammunition And Explosives Safety Standards, Under Secretary of Defense for Acquisition, Technology and Logistics. October.

SAIC (Science Applications International Corporation). 2002a. Engineering and Environmental Management Sector. EC&HS Procedure No. 120 – UXO/OE/CWM Safety, Science Applications International Corporation. May 10.

SAIC. 2002b. St. Louis Health Physics Procedures Manual. February.

SAIC. 2005a. Health and Safety Plan, Site Characterization of the Depleted Uranium Impact Area, Jefferson Proving Ground, Madison, Indiana. Final. May.

SAIC. 2005b. Field Sampling Plan, Site Characterization of the Depleted Uranium Impact Area, Jefferson Proving Ground, Madison, Indiana. May.

SAIC. 2005c. Quality Control Plan, Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana. Final. May

SAIC. 2006. Field Sampling Plan Addendum 2. DU Impact Area Site Characterization, Soil Verification. Jefferson Proving Ground, Madison, Indiana. Draft. April.

USACE (U.S. Army Corps of Engineers). 2003a. *Safety and Health Requirements Manual*, EM 385-1-1. November.

USACE. 2003b. *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities*, Appendix B, ER 385-1-92. July.

U.S. Army. 1997. U.S. Army Explosives Safety Program, Army Regulation (AR) 385-64. Headquarters Department of the Army, Washington, DC. November 28.

U.S. Army. 1999. U.S. Ammunition and Explosives Safety Standards, Department of Army Pamphlet (PAM) 385-64. Headquarters Department of the Army, Washington, DC. December 15.

APPENDIX A

SAIC's EC&HS PROCEDURE 120

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SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

ENGINEERING AND ENVIRONMENTAL MANAGEMENT SECTOR

CONTROLLED DOCUMENTS

The following document is controlled by the Engineering and Environmental Management Sector (EEMS), Health and Safety Officer. If you print this document, this page must be attached to the front of the document and you must fill in the information required below. The hard copy should be signed and dated the day it is printed by the user.

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Manual Name: **Engineering and Environmental Management Sector Procedure**

Document Number: EEMS EC&HS-120

Revision Number: 0

Date Printed: _____

Person Checking the Revision Number: _____

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION ENGINEERING AND ENVIRONMENTAL MANAGEMENT SECTOR			
Title: UXO/OE/CWM Safety			
Procedure No: EEMS EC&HS 120	***Revision: 0***	***Date: 5/10/2002***	***Page : 1 of 17***
Sector Manager:	**Date:** 5/24/02	**H&S Manager**	**Date:** 5/29/02

1.0 PURPOSE

The purpose of this procedure is to establish the minimum requirements under which field work that may involve exposure to unexploded ordnance/ordnance and explosives/chemical warfare materials (UXO/OE/CWM) may be performed.

2.0 SCOPE

This procedure applies to SAIC and SAIC subcontractor field activities involving potential exposure to UXO/OE/CWM. SAIC subcontractors who perform UXO/OE/CWM field work may operate under their own programs and procedures if those programs and procedures satisfy the applicable regulatory and client requirements, and provide for a safe working environment.

3.0 REFERENCES AND DEFINITIONS

3.1 REFERENCES

3.1.1 EM 385-1-1, U.S. Army Corps of Engineers Safety and Health *Requirements Manual, September* 3, 1996.

3.1.2 EP-385-1-95a, Basic Safety Concepts and Considerations for OE Operations, 29 June 2001.

3.1.3 DoD 6055.9-STD, Department of Defense Ammunition and Explosives Safety Standards, October 30, 1992.

3.1.4 U.S. Bureau of Alcohol, Tobacco, and Firearms (BATF) Publication 5400.7, ATF – Explosives Law and Regulations, June 1990.

3.1.5 U.S. Army Corps of Engineers Regulation 385-1-92, Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities, March 18, 1994.

3.1.6 U.S. Army Engineering and Support Center-Huntsville, Center of Expertise (CX) Guidance Document 97-09, Determination of Public Withdrawal Distances (PWD) for Fragmentation on Ordnance and Explosives (OE) Sites, September 30, 1997.

3.1.7 DA PAM 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, and HT.

3.1.8 ER 385-1-92, Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities, 1 September 2000.

3.1.9 ER 1110-1-8153, Engineering and Design – Ordnance and Explosive Response, 14 May 1999.

3.1.10 EP 75-1-2, Unexploded Ordnance (UXO) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities, 2 November 2000.

3.1.11 EP 1110-1-17, Establishing a Temporary Open Burn and Open Detonation Site for Conventional Ordnance and Explosives Projects, 16 July 1999.

3.1.12 EP 1110-1-18, OE Response, 24 April 2000.

3.1.13 EP 1110-1-24, Establishing and Maintaining Institutional Controls for Ordnance and Explosives (OE) Projects, 15 December 2000.

3.1.14 EP 1110-3-8, Public Participation in the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS).

3.1.15 EM 1110-1-4009, Engineering and Design – Ordnance and Explosives Response, 23 June 2000.

3.1.16 DoD Directive 4715.11, Environment and Explosives Safety Management on DoD Active and Inactive Ranges Within the United States, 17 August 1999.

3.1.17 DoD Directive 4715.12, Environment and Explosives Safety Management on DoD Active and Inactive Ranges Outside the United States, 17 August 1999.

3.1.18 EP 75-1-3, Recovered Chemical Warfare Materiel (RCWM) Response, 4 January 2002.

3.1.19 DA PAM 50-6, Chemical Accident or Incident Response and Assistance (CAIRA) Operations, 17 May 1991.

3.1.20 DA PAM 385-61, Toxic Chemical Agent Safety Standards, 6 June 1997.

3.1.21 AMC Reg 50-6, Chemical Surety, 1 February 1995.

3.1.22 AMC Reg 190-11, Physical Security of Arms, Ammunition and Explosives.

3.1.23 U.S. Army TM 9-1375,213-12, Operator's and Organization Maintenance Manual (Including Repair Parts and Special Tools List); Demolition Materials, 1 November 1988.

3.1.24 U.S. Army TM 60A-1-1-4, Protection of Personnel and Property, Change 2, 24 September 1990.

3.1.25 U.S. Army TM 60A-1-1-31, Explosive Ordnance Disposal Procedures: General Information on EOD Disposal Procedures, Change 7, 1 November 1988.

3.1.26 TB 700-2, Department of Defense Ammunition and Explosives Hazard Classification Procedures.

3.1.27 AR 385-64, U.S. Army Explosives Safety Program.

3.1.28 DA PAM 385.64, Ammunition and Explosives Safety Standards.

3.1.29 HNC-ED-CS-S-98-1, Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives, January 1998.

3.1.30 HNC-ED-CS-S-98-2, Method for Calculating Ranges to No More Than One Hazardous Fragment per 600 Square Feet, January 1998.

3.1.31 EEMS QAAP 2.2 Readiness Review.

3.1.32 EC&HS Procedure 4, Accident Reporting.

3.1.33 EC&HS Procedure 12, Medical Surveillance.

3.1.34 EC&HS Procedure 20, Hazardous Waste Operations.

3.2 DEFINITIONS

3.2.1 Ammunition Storage Unit (ASU) – All types of explosives storage magazines including outdoor or indoor, open storage areas, bunkers, and earth-covered and aboveground magazines.

3.2.2 Barricade – An intervening barrier, natural or artificial, of such type, size, and construction as to limit in a prescribed manner the effect of an explosion on nearby buildings or exposures.

3.2.3 Blast overpressure – The pressure, exceeding the ambient pressure, manifested in the shock wave of an explosion.

3.2.4 Chemical agent – A substance that is intended for military use with lethal or incapacitating effects upon personnel through its chemical properties.

3.2.5 Compatibility – Ammunition or explosives are considered compatible if they may be stored or transported together without increasing significantly either the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident.

3.2.6 Debris – Any solid particle thrown by an explosion or other strong energetic reaction. For aboveground detonations, debris usually refers to secondary fragments. For underground storage facilities, debris refers to both primary and secondary fragments, which are transported by a strong flow of detonation gasses.

3.2.7 Detonation – A violent chemical reaction within a chemical compound or mechanical mixture evolving heat and pressure. A detonation is a reaction that proceeds through the reacted material toward the unreacted material at a supersonic velocity. The result of the chemical reaction is exertion of extremely high pressure on the surrounding medium forming a propagating shock wave that

originally is of supersonic velocity. A detonation, when the material is located on or near the surface of the ground, is normally characterized by a crater.

3.2.8 Donor/Acceptor – A total quantity of stored ammunition may be subdivided into separate storage units in order to reduce the most credible event (MCE) and consequently, the quantity distance of an accidental detonation. The separation distances, with or without an intervening barrier, should be sufficient to ensure that a detonation does not propagate from one unit to another. For convenience the storage unit which detonates is termed the donor, and the nearby units, which may be endangered, are termed the acceptors. The locations of the donor and acceptor define the PES and ES, respectively.

3.2.9 Explosion – A chemical reaction of any chemical compound or mechanical mixture that, when initiated, undergoes a very rapid combustion or decomposition releasing large volumes of highly heated gases that exert pressure on the surrounding medium. Also, a mechanical reaction in which failure of the container causes the sudden release of pressure from within a pressure vessel, for example, pressure rupture of a steam boiler. Depending on the rate of energy release, an explosion can be categorized as a deflagration, a detonation, or pressure rupture.

3.2.10 Exposed Site (ES) – A location exposed to the potential hazardous effects (blast, fragments, debris, and heat flux) from an explosion at a potential explosion site (PES). The distance to a PES and the level of protection required for an ES determine the quantity of ammunition or explosives permitted in a PES.

3.2.11 Fragmentation – The breaking up of the confining material of a chemical compound or mechanical mixture when an explosion takes place. Fragments may be complete items, subassemblies, pieces thereof, or pieces of equipment or buildings containing the items. Nearby items including, but not limited to building materials, equipment, rocks, etc. in the vicinity of an explosion can also become caught up in the explosion and contribute to fragmentation.

3.2.12 Inhabited buildings – Buildings or structures, other than operating buildings, occupied in whole or in part by human beings. They include, but are not limited to schools, churches, residences, aircraft passenger terminals, stores, shops, factories, hospitals, theaters, etc.

3.2.13 Magazine – Any building or structure, except an operating building, used for the storage of ammunition and explosives.

3.2.14 Maximum Credible Event (MCE) – In hazards evaluation, the MCE from a hypothesized accidental explosion, fire, or agent release is the worst single event that is likely to occur from a given quantity and disposition of ammunition and explosives. The event must be realistic with a reasonable probability of occurrence considering the explosion propagation, burning rate characteristics, and physical protection given to the items involved. The MCE evaluated on this basis may then be used as a basis for effects calculations and casualty predictions.

3.2.15 Ordnance and Explosives (OE) – Includes (but is not necessarily limited to) all items of U.S.-titled (owned by the U.S. Government through DoD Components) ammunition; propellants, liquid and solid; pyrotechnics; high explosives; guided missiles; warheads; devices; devices and chemical agent substances and components presenting real or potential hazards to life, property and the environment. Excluded are wholly inert items and nuclear warheads and devices, except for considerations of storage and stowage compatibility, blast, fire, and non-nuclear fragment hazards associated with the explosives.

3.2.16 Public Access Exclusion Distance – The distance arc (calculated) from the agent source at which no more than 10.0, 4.3, and 150 milligrams per minute per cubic meter is present for GB, VX, and mustard respectively.

3.2.17 Public Traffic Route – Any public street, road, highway, navigable stream, or passenger railroad (includes roads on a military reservation that are used routinely by the general public for through traffic).

3.2.18 Quantity Distance (Q-D) – The quantity of explosive material and distance separation relationships that provide defined types of protection. These relationships are based on levels of risk considered acceptable for the stipulated exposures and are tabulated in the appropriate Q-D tables. Separation distances are not absolute safe distances, but are relative protective or safe distances. Greater distances than those shown in the tables shall be used whenever practicable.

3.2.19 Unexploded Ordnance (UXO) – Explosive ordnance that has been primed, fuzed, armed, or other wise prepared for action, and that has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material and remains unexploded either by malfunction or design or for any other cause.

4.0 RESPONSIBILITIES

4.1 EEMS Sector Manager

The EEMS Sector Manager is responsible for reviewing and approving this procedure and subsequent revisions thereto.

4.2 EEMS H&S Manager

The EEMS H&S Manager is responsible for:

4.2.1 approving this procedure;

4.2.2 verifying implementation of this procedure;

4.2.3 modifying this procedure as appropriate to meet changing needs;

4.2.4 reviewing/approving Site Specific Safety and Health Plans, and Explosives Safety Submissions for UXO/OE Projects; and

4.2.5 providing technical assistance to Project Managers as required.

4.3 Project Manager/Field Manager

The project chain of command is collectively and individually responsible for:

4.3.1 enforcing the requirements of this procedure;

4.3.2 approving hazard assessments for sampling pursuant to this procedure;

4.3.3 approving sampling plans for sampling pursuant to this procedure;

4.3.4 approving reports for work pursuant to this procedure;

4.3.5 ensuring compliance with related applicable requirements including, but not limited to, EC&HS Procedures 4, 9, 11, 13, 20, 24 and 25;

4.3.6 assuring hazard analysis/risk assessments are prepared and approved for each operation involving UXO/OE exposure or potential exposure;

4.3.7 assuring an approved Site Specific Safety and Health Plan is in place for each UXO/OE project under his/her control, and that the requirements are implemented;

4.3.8 assuring that, where required, an Explosives Safety Submission approved by the Department of Defense Explosives Safety Board is in place and that the requirements are implemented; and

4.3.9 assuring that all employees are trained in the UXO/OE hazards anticipated on the site and the correct procedures for working safely on the project site, and all required OSHA training;

4.4 Division Manager

The Division Manager is responsible for:

4.4.1 ensuring the application of this procedure at the division level; and

4.4.2 providing support for Project Managers as required.

4.5 UXO Safety Officer

The UXO Safety Officer is responsible for:

4.5.1 administering the safety and health program on the project site;

4.5.2 providing training in UXO/OE hazards to all workers on the site, as well as site visitors;

4.5.3 providing routine tailgate safety briefings;

4.5.4 coordinating with applicable emergency response agencies for emergency preparedness;

4.5.5 performing daily inspections of all UXO/OE operations and support functions and following up on deficiencies;

4.5.6 designating site control zones for UXO/OE/CWM hazards; and

4.5.7 Acting as the on site safety observer during all demo/venting operations.

4.6 Team Members

Team members are responsible for:

4.6.1 performing assigned tasks in a safe and effective manner;

4.6.2 according to established operating procedures;

4.6.3 attending required training and understanding all tasks assigned;

4.6.4 using all required personal protective equipment;

4.6.5 inspecting all equipment prior to use for condition and function; and

4.6.6 reporting any unsafe or questionable conditions to a supervisor.

5.0 GENERAL

5.1 SAIC will manage all work involving UXO/OE/CWM in compliance with EM 385-1-1, DoD 6055.9-STD, and all recognized rules, regulations, standards and requirements applicable to work involving UXO/OE/CWM.

5.2 All UXO/OE/CWM project work will also comply with all federal, state and local requirements regarding protection of workers in hazardous operations including, but not limited to, 29 CFR 1910 and 29 CFR 1926.

5.3 Deviation from this procedure may result in disciplinary action, up to and including termination, in accordance with EC&HS Program Implementation Guide C-2.

5.4 Only authorized personnel with requisite training and experience in UXO/OE operations will be permitted inside the exclusion zone of a UXO/OE project during operations.

5.5 Site Visitors must meet training and physical requirements of site personnel, and must wear required PPE in order to be admitted onto the site. Visitors will receive a briefing on site operations, site hazards, and emergency procedures from the UXO Safety Officer prior to site entry, and will be escorted by the UXO Safety Officer at all times while inside the exclusion zone. If the visitor is not UXO qualified, all UXO work will stop for the duration of the visitor's presence within the exclusion zone.

6.0 PROCEDURE

6.1 Hazard Analysis and Risk Assessment

The UXO Safety Officer will prepare an Activity Hazard Analysis and Risk Assessment for each planned operation in areas of the site that may contain UXO/OE/CWM. Information will be obtained regarding past uses of the site, past studies of the site, types of UXO/OE/CWM previously identified on the site, and types of UXO/OE/CWM potentially expected to be located on the site in order to accurately characterize the site and its inherent hazards. A hazard analysis will be prepared for each operation in accordance with EM 385-1-1 Figure 1-1. These will be the planning documents for the Site Specific Safety and Health Plan. If additional hazards are discovered, or there is a change in operations, or equipment during the course of operations, existing hazard analyses will be updated before proceeding, or new ones will be prepared.

6.2 UXO/OE Detection

UXO/OE detection methods will vary from visual observance on a surface clearance project to the use of geophysical instruments for the detection of buried items in a subsurface clearance. In all cases, the requirements of EP 385-1-95a will be applied to the operation. Even on a surface clearance, geophysical instruments may also be required to detect UXO/OE items prior to clearing and grubbing operations, or in areas of thick vegetation, where clearing and grubbing operations are not an option. Geophysical instruments are limited in the depth at which UXO/OE can be accurately detected (normally two foot depth is acceptable). Heavy equipment may be required to remove soil in two foot intervals, and the geophysical instruments are then used to detect UXO/OE for the next two-foot interval, etc. until the desired depth is achieved.

6.3 UXO/OE Recovery

All UXO/OE recovery operations will be performed in accordance with the requirements of EP 385-95a. On a surface clearance if part of a UXO/OE item is visible on the surface, the UXO-qualified personnel will clear the soil around the item by hand in order to recover it. If an item is within 12 inches of the surface, it will be recovered by hand. If it is more deeply buried, heavy equipment may be used to clear to within 12 inches of the item and then, it will be recovered by hand.

6.4 UXO/OE Storage

Storage of UXO/OE as well as explosives for use in disposal operations will be in accordance with the requirements of DoD 6055.9 STD, AMC Reg 190-11, and BATF Publication 5400.7. Strict attention will be given to storage compatibility of all explosive items, as well as to quantity distance requirements of the storage area from inhabited buildings, operating areas, site boundaries, other storage sites, and public transportation routes. Security of the UXO/OE and demolition explosives will also be a site priority to assure the general public is not exposed to the hazards presented.

6.5 UXO/OE Transportation

Transportation of UXO/OE offsite will be in accordance with the requirements of 49 CRF 177, EP 1110-1-18, and TB 700-2. Strict attention will be given to explosive compatibility issues, as well as packaging and bracing of the load. Security of the load will not be compromised during transport. Transportation onsite will be in accordance with EP 385-95a.

6.6 UXO/OE Disposal

UXO/OE Disposal Operations will be in accordance with the requirements of EP 385-1-91a, TM 60A-1-1-31, and TM-9-1375,213-12. Where a temporary open burn/open detonation pit must be prepared on the site, it will be in accordance with the requirements of EP-1110-1-17. Where possible, disposal will take place at the location where the UXO/OE is encountered per EP 385-1-95a. Where the UXO/OE is considered too hazardous to move, the disposal operation must take place at the location where the UXO/OE is found. Generally, electrical means will be used in all disposal operations, unless proximity of electromagnetic radiation sources makes this impossible. If engineering controls will be used to reduce shock, blast over-pressure, and/or fragmentation, the design and use must be approved through the DDESB. Separation distances for personnel during disposal operations will be in accordance with DoD 6055.9 STD. The UXO Safety Officer will act as the on site safety observer during all disposal operations.

6.7 Training

6.7.1 The following training will be required of all personnel entering the exclusion zone of a UXO/OE/CWM site.

6.7.2 Current OSHA HAZWOPER Training in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations.

6.7.3 UXO/OE Training. All employees performing work involving the handling and destruction of UXO/OE must be graduates of the Naval Explosive Ordnance Disposal School (at a minimum Phase I, chemical; and Phase II, surface) or other DOD-approved UXO/OE training program. Currently, the only other DOD approved training program is the International UXO Training Program (IUTP) UXO Technician I Course conducted by the Texas Engineering Extension Service (TEEX), Texas A&M University. UXO qualified

personnel shall have knowledge and experience in military ordnance, ordnance components, and explosives location, identification, render safe, recovery/removal, transportation, and disposal safety precautions.

6.7.4 Current Hazard Communication training in accordance with SAIC EC&HS Procedure 8, Hazard Communication and Hazardous Chemical Control. Information regarding specific types of UXO/OE/CWM expected to be encountered on the site will be presented in this training, to include ordnance recognition; safety and health hazards; required PPE; and safe storage, handling, transportation and disposal requirements.

6.7.5 Tailgate Safety Briefings will be conducted routinely in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations. These briefings will include UXO/OE hazards and related safety issues on the project site.

6.7.6 Visitor Briefings will be given in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations. The UXO Safety Officer will provide UXO/OE/CWM recognition and avoidance training and UXO/OE/CWM emergency procedures training, and will act as escort for all visitors while in the exclusion zone.

6.8 Medical Surveillance on UXO/OE/CWM sites will be in accordance with the requirements of SAIC EC&HS Procedure 12, Medical Surveillance and Procedure 20, Hazardous Waste Operations. For personnel who will be working on CWM project sites, the medical surveillance will also incorporate the requirements of DA PAM 40-173, Appendix B, which includes a slit lamp examination and an interocular pressure test in addition to the normal HAZWOPER physical requirements.

6.9 Equipment

Personal Protective Equipment on UXO/OE/CWM sites will follow the requirements of SAIC EC&HS Procedure 13, Personal Protective Equipment and Procedure 20, Hazardous Waste Operations. In addition to these requirements, personnel who will be using geophysical equipment for the detection of buried UXO/OE, will not be permitted to wear steel-toe safety boots, as it interferes with the detection equipment per EM 385-1-1. If they will be working in a foot hazard area, they must wear composite toe safety boots. Hard hats will not be worn on UXO/OE sites unless an overhead hazard exists. The potential for a hard hat falling off and striking

a UXO/OE item on the ground creates additional risks for site personnel. When worn, hard hats will be secured by chin straps or other means, to prevent falling off.

6.10 Engineering Controls

Wherever possible, engineering controls will be used to reduce the hazards of UXO/OE operations as much as practicable for the protection of employees as well as the general public. Barricades, shielding, and distance, or a combination of these will reduce the potential for fragmentation and blast effects injuries on UXO/OE sites. Fragmentation distances based on net explosive weight (NEW) can be obtained from DoD 6055.9 STD. These will be used unless fragmentation information relative to the specific UXO/OE encountered is available. Sandbags may be used as a barricade to contain fragments during disposal operations in accordance with U.S. Army TM 60A-1-1-4 and Army TM 60A1-1-31. Directional shields may be used to direct the fragmentation hazards away from buildings, highways, etc. Personnel shields may also be used to protect workers who may be positioned within fragmentation distance of a potential hazard. Engineering controls used for mitigating the effects of fragmentation and/or blast over pressure must be approved in accordance with EP 385-1-95a.

6.11 Site Control will be handled in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations.

6.11.1 On UXO/OE sites, the boundaries of the exclusion zone are based on the fragmentation distance for the maximum credible event (MCE), which is the largest UXO/OE item expected to be encountered at the project site. If specific information on fragmentation characteristics of this item is available, planning will be based on that information. Fragmentation distances based on NEW found in DoD 6055.9 STD will be used if specific information on the item is not available. If a larger item is identified on the site, the fragmentation distances will be re-evaluated and the boundaries of the exclusion zone will be adjusted accordingly. Public withdrawal distances identified in U.S. Army Engineering and Support Center-Huntsville, Center of Expertise (CX) Guidance Document 97-09, will be incorporated into the site control plan where there is a potential for exposure of the general public to the hazards of site operations.

6.11.2 On CWM sites, the boundaries of the exclusion zone are based on the No Significant Effects (NOSE) zone for the maximum credible event for CWM exposure on the site in accordance with DA PAM 835-61 and DoD 6055.9 STD. This zone is calculated using the most hazardous CWM item expected to be located on the site, in combination with wind rose data obtained from the National Weather Service which gives expected wind speed and direction in order to determine dispersion of CWM material should it become airborne.

6.11.3 On sites containing both UXO/OE and CWM hazards, the fragmentation distance will be determined based on the explosive hazards at the site per paragraph 7.10.1. The NOSE zone will be determined for the MCE CWM exposure scenario per paragraph 7.10.2. The larger of the two distances will be the determining distance for the exclusion zone.

6.12 Emergency procedures will be in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations.

6.12.1 Emergency procedures on UXO/OE sites must comply with DOD 6055.9-STD and address coordination with the local emergency authorities to assure that all parties are aware of procedures during an explosion or fire situation on the site. Local emergency response personnel will not be permitted within fragmentation distance of the site either during or after the emergency until it has been cleared for entry by UXO qualified personnel, and they will be escorted at all times while on the site. The UXO Safety Officer will make the required coordination prior to start of site operations. As not all hospitals are equipped with a trauma unit, the nearest hospital equipped to handle this type of potential injury will be identified in advance of site operations. Emergency site evacuation plans must also be included which must include evacuation beyond fragmentation distance of the site operations. If this distance goes beyond the boundaries of the site owner, the evacuation plan must extend to all other property owners within this distance who could potentially be impacted by operations and they must be included in the emergency planning coordination.

6.12.2 Emergency Procedures on CWM sites will include the requirements of DA PAM 50-6, DA PAM 385-61, and EP 75-1-3. This includes the presence of an ambulance and Emergency Medical Technician Paramedics (EMTPs) on site during CWM operations, as well as the normal and emergency decontamination procedures required during an emergency situation.

6.13 Site Specific Safety and Health Plans (SSHP) will be prepared in accordance with SAIC EC&HS Procedure 20, Hazardous Waste Operations and contract/Delivery Order requirements.

6.13.1 SSHPs on UXO/OE sites will also include Activity Hazard Analyses for all UXO operations. Storage of demolition explosives for use in disposal operations will be addressed and sited in accordance with DoD 6055.9, AMC Reg 190-11, and U.S. BATF Publication 5400.7. Transportation of both demolition explosives and UXO/OE recovered on site will be addressed per EP 385-1-95a. Emergency procedures addressing UXO/OE emergencies and fires on UXO/OE sites will be incorporated into the SSHP. Site Control issues regarding fragmentation distances for the protection of workers and the general public will be addressed.

6.13.2 CWM sites will include wind rose data for the site and the calculated NOSE zone. It will also include the normal and emergency decontamination requirements as well as planned emergency response personnel and equipment.

6.14 Explosives Safety Submissions

6.14.1 A DDESB-approved Explosives Safety Submission is required on certain UXO/OE projects in accordance with DoD 6055.9 STD. Conditions requiring this document include: project sites without a DDESB-approved explosives safety site plan in place; projects involving changes in the approved plan such as a new building for explosive operations or storage, a change in the approved NEWs for an area; or modifications to an approved explosive operation. This document is an engineering evaluation of all aspects of the explosive operations, procedures, barricades and shielding, explosive quantity distances, etc. to assure the safety of the operations and the general public.

6.15 CWM Site Safety Submission

6.15.1 A DDESB-approved Site Safety Submission is required on all CWM projects in accordance with DoD 6055.9 STD prior to starting work on the site. This document is a thorough engineering analysis of all operations taking place on the site, the anticipated site hazards and steps taken to reduce hazard levels, standard operating procedures in place, monitoring program, personal protective equipment program, decontamination program, and emergency response planning, etc.

8.0 RECORDS

Documentation generated as a result of this procedure will be collected and maintained in accordance with requirements specified in QAAP 17.1, Records Management and EC&HS Procedure 18, Environmental Compliance & Health and Safety Records Management and contract requirements. In addition, copies of EOD or UXO training certificates for all UXO-qualified personnel working on the project will be maintained on site per ER 385-1-92. All accidents and near misses on the site will be documented per EC&HS Procedure 4, Accident Reporting and copies of the records will be kept on site for the duration of site activities. All unplanned functioning of UXO/OE on the site will be investigated and reported, regardless if injury and/or property damage occurred in accordance with DoD 6055.9 STD.

9.0 ATTACHMENTS

None.

APPENDIX B

ACTIVITY HAZARD ANALYSIS FOR SOIL VERIFICATION ACTIVITIES

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ACTIVITY HAZARD ANALYSIS FOR SOIL VERIFICATION SAMPLING

Work Location: Jefferson Proving Ground, Indiana

Task Title: Soil Verification Sampling

Work Phase:	**List Work Groups Needed for Each Phase:**
A. General Site Safety	A. All
B. Soil Sampling Preparation	B. All
C. Soil Sampling	C. All

Activity Steps	Work Groups	Hazards	Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)
A. General Site Safety	All	Heat/Cold Related Stress Risk Assessment Code (RAC): Low (L)	Heat/cold related stress will be monitored and controls will be implemented as necessary per the HASP. (EM385-1-1 06.J)
		Slips/Trips/Falls (RAC: L)	Tripping hazards will be identified and avoided or removed, if possible.
		Faulty/Damaged Equipment (RAC: L)	Equipment will be inspected upon arrival and at the start of each shift. (EM385-1-1 16.A)
		Lifting (RAC: L)	Use proper lifting techniques, size up load, use teamwork, never twist or turn when lifting, keep load close to the trunk of the body. (EM385-1-1.A)
		Hand Injury (RAC: L)	Leather work gloves will be worn when handling rough material where pinch point hazards exist and for handling sharp material. (EM385-1-1 05)
		Foot Injury (RAC: L)	Steel-toed safety shoes will be worn by all personnel conducting work in the area. (EM385-1-1 05)
		Hypersensitivity or Allergic Reactions (RAC: L)	Personnel who are knowingly hypersensitive or allergic to insects or plants will be identified and appropriate precautions will be taken. (EM385-1-1 06.D)
		Lack of Communication (RAC: L)	Personnel will use the buddy system and remain in verbal or visual site of one another. Cellular telephones or radios will be used in remote locations in order to contact emergency services. (EM385-1-1 01.E)
		Severe Weather (RAC: L)	Check the weather forecast for the day prior to work. Take cover in a building/vehicle if lightning is spotted. (EM385-1-1 06.J)
		Vehicle Accidents (RAC: L)	All site personnel operating motor vehicles shall comply with all Federal, state, and local traffic regulations. Personnel shall only use vehicles that are in good condition and are safe to operate. Personnel shall routinely inspect vehicles. All personnel will drive defensively, wear seatbelts while vehicles are in motion, and comply with site speed limits. Backing of vehicles shall be avoided when possible. Extra care shall be taken to back vehicles when unavoidable. Follow the requirements of EC&HS 110. (EM385-1-1 01.D; EM385-1-1 18.A, B, C)
		Fire (RAC: L)	Engines shall be shut off before refueling. An appropriate portable fire extinguisher shall be available at refueling areas. Smoking shall not be permitted near fueling areas. Fuel will be stored in safety cans with flame arrestors. (EM385-1-1 09.A, B)

Work Location: Jefferson Proving Ground, Indiana			
Task Title: Soil Verification Sampling			
Work Phase: A. General Site Safety B. Soil Sampling Preparation C. Soil Sampling		**List Work Groups Needed for Each Phase:** A. All B. All C. All	
Activity Steps	**Work Groups**	**Hazards**	**Hazard Controls (Engineered, Operational, Documents, PPE, Qualifications)**
		First Aid and Emergencies (RAC: L)	Follow emergency procedures outlined in the HASP. Two onsite personnel will be trained in first aid and CPR. (EM385-1-1 03.A; EM385-1-1 01.E)
		Radiological Contamination (RAC: L)	Unescorted personnel accessing and working in the DU Impact Area will be trained in accordance with the HASP. Radiological surveys will be conducted in accordance with the HSWP. Minimize contact with radioactive material.
B. Soil Sampling Preparation		Transect Selection (RAC: L)	Personnel will be trained to safely use the equipment they will be required to operate.
		UXO Hazards (RAC: L)	Personnel will be trained in the recognition of UXO and will follow the UXO Safety Procedure in the HASP (SAIC UXO/OE/CWM Safety Procedure). Survey potential UXO areas prior to accessing. Avoid all UXO. (EM 385-1-1, EP 385-1-95a, and ER 385-2-92)
C. Soil Sampling		Hand Auger Boring (RAC: L)	All personnel will be familiar with the function of the equipment before use. Soil boring will take place only in areas that have been cleared of UXO. UXO avoidance procedures will be ongoing as boring continues to depth. Soils and auger will be scanned for radiation contamination during and after boring activities.
		UXO Hazards (RAC: L)	Personnel will be trained in the recognition of UXO and will follow the UXO Safety Procedure in the HASP (SAIC UXO/OE/CWM Safety Procedure). Survey potential UXO areas prior to accessing. Avoid all UXO. (EM 385-1-1, EP 385-1-95a, and ER 385-2-92)

APPENDIX C

HEALTH AND SAFETY WORK PERMIT

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HEALTH AND SAFETY WORK PERMIT

HSWP No: S-06-002.0 Date Issued: 4/14/2006 Expiration Date: 4/14/2007

Client: US Army Location: Jefferson Proving Ground Site: DU Area

Job Description: Soil Verification Activities (collection of soil samples, up to 3 feet in depth, via manual boring, for the purposes of soil classification) in the DU Impact Area.

H/S COVERAGE

- ☐ Continuous
- ☒ Intermittent
- ☒ Buddy System
- ☐ Confined Space Entry Permit.
- ☒ Notify H/S upon entry to area.
- ☐ HSWP Entry / Exit Log Required
- ☐ HPT perform all personnel frisk surveys
- ☒ Radiological Workers may perform personnel frisk surveys (note 1)

DRESS REQUIREMENTS

- ☐ Cotton Coverall
- ☐ Canvas Hood
- ☐ Paper Coveralls
- ☐ Plastic Coveralls
- ☐ Tyvek Coveralls
- ☐ Skull Cap
- ☐ Cloth Gloves
- ☐ Rubber Gloves
- ☐ Plastic Booties
- ☐ Lab Coat
- ☒ Surgeon's gloves
- ☐ Rubber Apron
- ☐ Rubber Shoe covers
- ☐ No personal outer-clothing.
- ☐ Tape gloves and booties to PCs
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____

DOSIMETRY REQUIREMENTS

- ☐ Self Reading Dosimeter
- ☐ Whole Body TLD
- ☐ Ring TLD
- ☐ Electronic Dosimeter
- ☐ Multi-Badging

RESPIRATORY PROTECTION

- ☐ Air Purifying Respirator
- ☐ Powered Air Purifying Respirator
- ☐ Air Line Respirator
- ☐ SCBA
- ☐ Other_____
- ☐ Other_____

SAFETY EQUIPMENT

- ☒ Safety Glasses
- ☒ Steel-toed Shoes
- ☐ Goggles
- ☒ Hard Hat (note 2)
- ☐ Face-Shield
- ☐ Leather Apparel
- ☐ Hearing Protection
- ☐ Welding Shield w/ _____ number lens
- ☐ Other _____
- ☐ Other _____
- ☐ Other _____
- ☐ Other _____

ADDITIONAL REQUIREMENTS (ALARA considerations, pen and ink changes, safety, job specific):

1. Frisk hands and feet prior to leaving the work area and/or prior to leaving the DU Impact Area.
2. When overhead hazards are present.
3. Follow Department of the Army radiation safety requirements associated with implementation of the JPG ERM Program Plan, AHA, and FSP.
4. Follow SAIC EC&HS Procedure 120 UXO/OE/CWM Safety.

A PRE-JOB BRIEFING IS REQUIRED PRIOR TO ENTRY ON THE HSWP

Reviewed By: _____ **Date:** _____
Local EC&HS Representative

Approved By: _____ **Date:** _____
Radiation Protection Manager

Collective dose goal: 0.0 **Approved by:** _____ **Date:** _____

Terminated by: _____ **Date:** _____

Revision termination____ **HSWP termination:**_____ **(check one)**

Reason for termination: _____

HSWP CONTINUATION SHEET

Page 2 of 2

QUARTERLY ASSESSMENT VERIFICATION HSWP Number S-06-002.0			
Date (month/day/year)	**Signature of RPM/HPT**	**Revision Required Yes***	**No**

*If "Yes", state the reason a revision is required and whether a pen and ink change or complete revision is necessary:

Revision approved: _____ Date: _____
RPM

PRE-JOB BRIEFING

HSWP No. S-06-002.0 **Date:** _____

PRE-JOB BRIEFING CHECKLIST	INITIALS
• Discuss Pre-job ALARA review, if applicable	
• Review requirements of HSWP	
• Review the step-by-step aspects of the job, ensuring all personnel are aware of their required actions	

Job Description: Soil Verification Activities (collection of soil samples, up to 3 feet in depth, via manual boring, for the purposes of soil classification) in the DU Impact Area.

PERSONNEL ATTENDING PRE-JOB BRIEFING for HSWP 06-002.0

Printed Name	Signature*	HPID No.

*** By signature, personnel certify they have read, understand, and will comply with the requirements of the HSWP.**

Signature _____ _____

RPM Date

APPENDIX D

ANOMALY AVOIDANCE SAFETY BRIEFING SHEET

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ANOMALY AVOIDANCE SAFETY BRIEFING SHEET

INTRODUCTION

This safety briefing sheet summarizes the minimum precautions to be taken when accessing areas containing unexploded ordnance (UXO). Additional SAIC requirements related to UXO safety are provided in Appendix A.

The DU Impact Area may contain UXO, which may be found on the surface and/or in the subsurface. The varying types of ammunition, angles of fire, types of soil, and depths to bedrock at JPG preclude the accurate estimation of the depth of any subsurface UXO. Some of the activities planned at JPG during the soil verification are intrusive. Therefore, the primary objective during soil verification sampling activities will be avoidance of UXO. Avoidance of UXO will be accomplished by training field personnel on UXO awareness, conducting magnetometer surveys in areas where UXO may be located, and conducting intrusive work only in cleared areas.

RESPONSIBILITIES

SAIC's Senior UXO Supervisor and/or UXO subcontractors have the following responsibilities for UXO avoidance:

- Conduct a UXO safety briefing for all site personnel and visitors
- Obtain any and all utility clearances and/or excavation permits for underground utilities as required
- Complete an access clearance of the proposed work area that is large enough to support all planned activities
- Maintain onsite authority on all UXO procedures and safety issues with the Senior UXO Supervisor having final authority.

All **Field Sampling Team Members** are responsible for conducting their tasks in a safe manner, attending required UXO training, understanding and adhering to the UXO safety precautions, and reporting any unsafe or questionable conditions to the UXO Safety Officer.

Instructions for Conducting Anomaly Avoidance

- SAIC's Senior UXO Supervisor or UXO subcontractor will conduct an access survey (visual and of the footpath lanes approaching and leaving all areas where the soil verification will be conducted and gauges will be installed).
- SAIC's Senior UXO Supervisor or UXO subcontractor must complete an access survey of an area around the proposed investigation site that is large enough to support all planned operations (assume ingress/egress is 100 feet long and 10 feet wide and work areas are 50 feet in diameter so a backhoe can be used, if required).
- A Schoenstedt® Fluxgate Magnetometer will be used to locate anomalies just below the surface.
- If subsurface anomalies are identified or surface UXO is encountered, they will be clearly marked using pin flags or using glo-sticks for night operations. SAIC's Senior UXO Supervisor or UXO subcontractor will establish a system of flagging colors that will distinguish subsurface anomalies and surface UXO and establish ingress/egress route boundaries based on subsurface anomalies and surface UXO.
- Only UXO qualified personnel will perform anomaly avoidance operations.

Instructions When Encountering UXO

- If UXO is encountered during soil verification activities, SAIC's Senior UXO Supervisor or UXO subcontractor will immediately cease all activity. The Senior UXO Supervisor or UXO subcontractor will immediately notify Dr. Joe Robb of U.S. Fish and Wildlife Service (USFWS) (812-273-0783). The Senior UXO Supervisor or UXO subcontractor will identify the location of the UXO for further disposal by the Explosive Ordnance Disposal (EOD) Response Team.
- All SAIC and subcontractor personnel will proceed to a safe evacuation distance (1 mile) from the UXO and avoid that area until the item has been disposed of by the EOD Response Team.
- DO NOT touch or move any munitions regardless of the markings or apparent condition.

General UXO Information

- The cardinal principle to be observed involving UXO is to limit the exposure of a minimum number of personnel, for the minimum amount of time, to a minimum amount of hazardous material consistent with a safe and efficient operation.
- The age or condition of ordnance does not decrease its effectiveness. Ordnance that has been exposed to the elements for extended periods becomes more sensitive to shock, movement, and friction due to the fact that the stabilizing agent in the explosives may be degraded.

Site-specific UXO Rules

- All SAIC and subcontractor workers will be trained to recognize the types of ordnance that may be present (e.g., JPG UXO safety video from USFWS).
- The UXO Team composition will consist of at least two personnel, one who must be a UXO Technician II. The UXO Team will be onsite during all sampling activities. The UXO Team may include additional UXO personnel, geophysicists, or any other team members, depending on site- and task-specific conditions/requirements.
- Local fire, police, rescue authorities, and medical facilities that would be utilized for emergency treatment of injured personnel will be notified prior to the start of any UXO operations to ascertain their response capabilities and to obtain a response commitment.
- All individuals will receive a safety briefing and sign the visitors' log prior to entering the exclusion zone.
- Daily "tailgate" safety briefings will reiterate the hazards and controls as they pertain to UXO avoidance at this site.
- All individuals will be escorted by SAIC's Senior UXO Supervisor or UXO subcontractor when not in a cleared area. Escorted personnel will follow behind the UXO escort. No personnel, except for SAIC's Senior UXO Supervisor or UXO subcontractor while performing avoidance, are allowed outside the surveyed areas.
- Personnel subject to this guidance will not handle, move, or otherwise disturb ordnance or any items that cannot be identified as not being ordnance.
- Consider ordnance that has been exposed to fire as extremely hazardous. Chemical and physical changes may have occurred to the contents, which render them more sensitive than they were in their original state.
- Always assume that ordnance contains a live charge until it can be ascertained otherwise.
- Employ the "buddy system" at all times.

- No personnel will be allowed into nonsurveyed UXO areas without an escort by a UXO qualified individual.
- First aid equipment and fire extinguishers will be available onsite during UXO avoidance activities.
- During soil verification, the area must be visually surveyed and each location must be cleared to a minimum depth of 1 foot before additional hand augering can take place. If UXO is detected at the proposed soil verification location, SAIC's Field Manager will select a alternate location to verify the soil properties
- DO NOT be misled by markings on the ordnance stating "practice bomb," "dummy," or "inert." Even practice bombs contain explosive charges that are used to mark/spot the point of impact. The item(s) also could be mismarked.
- DO NOT rely on color codes for positive identification of ordnance item(s) or their contents.
- DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek shelter.
- DO NOT use radios or cellular telephones in the vicinity of suspect ordnance.
- DO NOT walk across an area where the ground surface cannot be seen. If dead vegetation or animals are observed, leave the area immediately because of potential contamination by chemical agents.
- DO NOT drive vehicles into a suspected UXO area; use clearly marked lanes. Clearance lanes must be at least twice as wide as the widest vehicle.
- DO NOT carry matches, cigarettes, lighters, or other flame or spark-producing devices into UXO areas of the site.

REFERENCES:

DOD (U.S. Department of Defense). 1997. DOD Contractors' Safety Manual for Ammunition and Explosives, DOD 4145.26-M, Under Secretary of Defense Acquisition and Technology.

DOD. 2004. U.S. Department of Defense Standard 6055.9-STD, DoD Ammunition And Explosives Safety Standards, Under Secretary of Defense for Acquisition, Technology and Logistics. October.

SAIC (Science Applications International Corporation). 2002. Engineering and Environmental Management Sector. EC&HS Procedure No. 120 – UXO/OE/CWM Safety. May 10.

U.S. Army. 1997. U.S. Army Explosives Safety Program, Army Regulation (AR) 385-64. Headquarters Department of the Army, Washington, DC. November 28.

U.S. Army. 1999. U.S. Ammunition and Explosives Safety Standards, Department of Army Pamphlet (PAM) 385-64. Headquarters Department of the Army, Washington, DC. December 15.

USACE (U.S. Army Corps of Engineers). 2000. Ordnance and Explosive Response. EP 1110-1-18. Headquarters Department of the Army, Washington, DC. April 24.

USACE. 2003a. *Safety and Health Requirements Manual*, EM 385-1-1. November.

USACE. 2003b. *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities*, Appendix B, ER 385-1-92. July.

USACE. 2004a. Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities, Engineering Pamphlet (EP) 75-1-2. Headquarters Department of the Army, Washington, DC. August 01.

USACE. 2004b. Basic Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations, EP 385-1-95a. Headquarters Department of the Army, Washington, DC. August 27.

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APPENDIX E

JPG BIOLOGICAL HAZARD SURVEY

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JPG BIOLOGICAL HAZARD SURVEY

Please take a moment to fill out this survey. It will help us in providing you with the best and most efficient prevention and emergency response measures should you need medical attention from contact with biological hazards in the field:

Thank you for your help in this matter.

Name: _____ Employer:_____

Signature: _____ Date: _____

Are you allergic or have you had adverse reactions to, including phobia, to any of the following:

☐ Bees	☐ Poison Ivy
☐ Wasps	☐ Poison Oak
☐ Hornets	☐ Poison Sumac
☐ Ticks	☐ (other)
☐ Spiders *	☐ (other)
☐ Snakes *	☐ (other)

* List the type(s): _____

_____

_____

Is there any particular first aid item we should have on hand to minimize adverse reactions from contact with these hazards as prescribed by a doctor due to a past adverse reaction (e.g., injectable epinephrine or "epi pen" for bee stings)?

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NOTE:

The Job Safety Analysis (JSA) for each field activity lists controlling biological hazards in the following ways:

- Tape interfaces of clothing
- Use insect repellant
- Perform self-inspection for ticks
- Inform supervisors of allergies to biological hazards
- Wash hands and face when leaving areas where poisonous plants are present.

First aid kits are located in the site office and each work vehicle.