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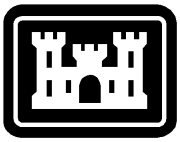

US Army Corps
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EP 1110-1-18
24 April 2000

ENGINEERING AND DESIGN

# ORDNANCE AND EXPLOSIVES RESPONSE

**ENGINEER PAMPHLET**

## AVAILABILITY

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DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

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Pamphlet
No. 1110-1-18

24 April 2000

Engineering and Design
ORDNANCE AND EXPLOSIVES RESPONSE

1. Purpose. This pamphlet provides the U.S. Army Corps of Engineers (USACE) personnel with detailed procedures on the process to be used to manage and execute all aspects of ordnance and explosives (OE) response actions.

2. Applicability. This pamphlet applies to all Headquarters, USACE (HQUSACE) elements and all USACE commands having responsibility for performing OE response activities.

3. Distribution Statement. Approved for public release; distribution is unlimited.

4. References. Required and related references are at Appendix A.

5. Explanation of Abbreviations and Terms. Abbreviations/acronyms and special terms used in this pamphlet are explained in the glossary.

FOR THE COMMANDER:

RUSSELL L. FUHRMAN
Major General, USA
Chief of Staff

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(See Table of Contents)

DEPARTMENT OF THE ARMY
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# CHAPTER 1
# GENERAL

1-1. Policy. The policy of the USACE is to plan and execute ordnance and explosives (OE) activities in a manner which fully meet customers' expectations of quality, timeliness, and cost effectiveness within the bounds of legal responsibility. An acceptable level of quality does not imply perfection; however, there should be no compromise of functional, health, or safety requirements. Adherence to the Quality Management principles outlined in Engineer Regulation (ER) 5-1-11, Program and Project Management and ER 1110-1-12, Quality Management, will contribute to achieving this goal. OE response procedures must be formulated to ensure harmony with the USACE Strategic Vision and should be executed in concert with activities presented in other USACE guidance.

1-2. Program Overview.

a. Description of the OE Response Process.

(1) Formerly Used Defense Sites (FUDS). An OE response is an action taken to reduce the risk to human health and the environment from exposure to OE resulting from past Department of Defense (DOD) operations at a site. The OE response process at FUDS is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). The OE response process at FUDS typically follows the non-time critical removal action process (NTCRA). This process is discussed in detail in Chapters 6 through 17 of this pamphlet. Emergency and time critical removal actions (TCRA) may be conducted during the OE response process, as presented in further detail in Chapter 5.

(2) Active and Transferring Installations. OE response actions at active installations are conducted under the Installation Restoration Program (IRP). OE response actions at transferring installations are conducted under the Base Realignment and Closure (BRAC) program. The installation is responsible for determining the OE response action at active and transferring installations.

b. OE Response Objective. The primary objective of an OE response action is to reduce the risk to the general public in a manner that ensures the safety of OE response specialists, is cost-effective, and complies with all applicable legal requirements. In certain circumstances, it may be appropriate to seek a waiver of certain legal requirements. The process for seeking such waivers will be initiated only after consultation with the OE Mandatory Center of Expertise (OE MCX) and the Office of Counsel (OC) supporting the OE MCX. The requesting agency will submit a letter documenting the policy/procedures that require a waiver. The letter should

present the benefits of applying the waiver, if approved. The letter should be submitted to the OC supporting the OE MCX for resolution.

c. Execution of OE Response Activities. DOD is the lead agency for all OE response actions. Responsibility for executing an OE response action depends on whether the site is a FUDS or an active or transferring installation.

(1) FUDS.

(a) OE response actions at sites that were contaminated while under the jurisdiction of DOD, but which subsequently have been transferred out of DOD control (i.e., FUDS) are conducted under the Defense Environmental Restoration Program-FUDS (DERP-FUDS). OE response actions at FUDS are the subject of this pamphlet.

(b) Authority for executing OE response actions at FUDS has been delegated to USACE by DOD through Headquarters, Department of the Army (HQDA).

(2) Active and Transferring Installations. USACE may or may not be involved in OE response actions at active and transferring installations. This pamphlet does not discuss these programs specifically; however, the phases of an OE response action at these sites may be similar to those discussed for the FUDS program, depending on the installation's requirements.

1-3. OE Response Regulatory Authorities.

a. Major Subordinate Commands (MSC), district commands, OE Design Centers, and the OE MCX will comply with all applicable laws and regulations. The district, which serves as the Project Manager (PM), will provide general legal services. For FUDS projects, the determination of the laws and regulations governing environmental aspects for any specific OE project will be made in consultation with the OC supporting the OE MCX. In the event of any sort of dispute with a regulator over the governing laws on a FUDS project, the district providing general legal services will represent the agency in negotiations or adversary proceedings. For non-FUDS projects performed by the USACE under a different program or authority (i.e., BRAC, IR, Work for Others), the appropriate legal representative of the sponsoring agency will be the lead counsel for all legal matters, although USACE counsel will be available for consultation. OE response actions will be executed in compliance with 40 CFR Part 260 et al - Military Munitions Rule; the OE requirements of DOD 6055.9-STD; Army Regulation (AR) 385-61; AR 385-64; Department of the Army Pamphlet (DA Pam) 385-61; HQDA LTR 385-98-1 "Explosives Safety Policy for Real Property Containing Conventional Ordnance and Explosives"; and any other applicable OE publications listed at Appendix A. All USACE elements will comply with DOD and DA safety and health regulations and procedures. The following paragraphs present an overview of the legal authorities governing OE response actions.

b. CERCLA. CERCLA was enacted by Congress in 1980 and subsequently amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). CERCLA authorizes federal action to respond to the release or threatened release of hazardous substances into the environment, or a release or threat of release of a pollutant or contaminant into the environment that may present an imminent or substantial danger to the public health or welfare. The CERCLA process is intended to ensure that contaminated sites are cleaned up in a timely manner, cleanup objectives are reasonable and achievable, and the affected community participates in selection of the removal measure(s), as appropriate for the site. All references to CERCLA in this document refer to CERCLA as amended by SARA.

(1) NCP. The NCP, which was established in 1972 under the Clean Water Act and revised in February 1990, designated DOD as the removal response authority for incidents involving munitions. The NCP presents a procedural and organizational framework for preparing and conducting response actions.

c. DERP.

(1) DERP was established by Congress in 1986 under Chapter 160 of SARA. DERP directed the Secretary of Defense to "carry out a program of environmental restoration" at facilities under the jurisdiction of the Secretary of Defense.

(2) The three program goals of DERP, as stated in 10 U.S.C. 2701, are:

(a) Identification, investigation, research and development, and cleanup of contamination from hazardous substances, pollutants, and contaminants.

(b) Correction of other environmental damage, such as the detection and disposal of unexploded ordnance (UXO), which create an imminent and substantial endangerment to the public health, its welfare or to the environment.

(c) Demolition and removal of unsafe buildings and structures, including buildings and structures of the DOD at property formerly used by or under the jurisdiction of the Secretary of Defense.

(3) DERP includes the FUDS program and the IRP. These programs are discussed in the following paragraphs.

(a) FUDS Program. The objective of the DERP-FUDS program is to reduce, in a timely, cost-effective manner, the risk to human health, safety and the environment of hazards which have resulted from past DOD activities. The DERP-FUDS program is authorized under DERP and CERCLA Section 104, in which the Secretary of Defense is authorized to conduct response actions at sites that were contaminated while under the jurisdiction of the DOD or its predecessor agencies. The Secretary of the Army, acting through USACE, serves as the DOD executive

agent for environmental restoration activities on FUDS, including OE response actions, and must ensure these activities are executed in accordance with DERP.

(b) IRP. The IRP addresses contamination resulting from past operations at active installations. The IRP is a comprehensive program to identify, investigate, and clean up such contamination. The IRP does not address maintenance, repair, remediation, or clearing of active ranges or disposal sites at active installations.

d. BRAC. The Base Realignment and Closure Act of 1988 (Public Law 100-526, 102 Stat. 2623) and the Defense Base Realignment and Closure Act of 1990 (Public Law 101-510, 104 Stat. 1808) provide for a recurring, systematic review and evaluation of all installations operated by the U.S. Armed Forces. The purpose of the process is to create operational, economic, and strategic efficiency by recommending closure and/or realignment of installations to best serve the defense needs of the United States.

e. Resource Conservation and Recovery Act (RCRA).

(1) For OE response actions, RCRA will apply mainly as an Applicable or Relevant and Appropriate Requirement (see paragraph 1-3g). OE recovered from an OE response action on a FUDS, if transported off-site, may be a solid waste. This is determined on a site-specific basis and could require application of other requirements.

(2) On-site treatment of discarded munitions on FUDS are not subject to RCRA permitting and manifesting requirements. When OE is moved off-site, however, it must be managed in accordance with all applicable RCRA and Department of Transportation (DOT) requirements.

f. Environmental Protection Agency (EPA) Military Munitions Rule. The EPA Military Munitions Rule amends 40 CFR 260-266, and 270. This Rule was implemented to clarify the application of RCRA requirements to military munitions. Six major issues are addressed:

(1) Conditions specifying when military munitions become subject to regulation as a solid waste or hazardous waste under RCRA.

(2) The application of RCRA hazardous waste standards to the use of military munitions in weapons testing and military training exercises.

(3) The standards applicable to emergency responses to incidents involving military munitions and explosives.

(4) The applicability of RCRA requirements to unexploded ordnance (UXO) and environmental contamination at closed or transferred military firing ranges.

(5) Management standards necessary for the protection of human health and environmental quality during the transportation and storage of military munitions determined to be hazardous waste.

(6) Hazardous waste manifesting requirements during transportation on public or private right-of-ways on or along the borders of contiguous properties under the control of the same person.

g. Applicable or Relevant and Appropriate Requirements (ARARs).

(1) OE response actions must comply with all ARARs. Applicable requirements are cleanup standards, standards of control, and other substantive environmental protection requirements promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, response action, location or other circumstance found at a CERCLA site. Relevant and appropriate requirements are cleanup standards that, while not "applicable", address situations sufficiently similar to those encountered at a CERCLA site that their use is well-suited to the particular site.

(2) When selecting the most suitable OE response action, ARARs must be identified and considered on a site-specific basis. OE response actions will attain ARARs under federal or state laws to the extent practicable considering the urgency of the situation and the scope of the removal. For an NTCRA, the district must identify potential ARARs during the Engineering Evaluation/Cost Analysis (EE/CA) planning process and comply with them whenever possible. For TCRAs, the deferral of ARARs may be warranted.

# CHAPTER 2
# RESPONSIBILITIES

2-1. Introduction.

a. This chapter describes the responsibilities and functional roles of the USACE organizations and potential stakeholders in the OE response process.

b. ER 1110-1-8153, OE Response, provides further detail regarding the roles and responsibilities of USACE elements (i.e., HQUSACE, MSCs, districts, OE Design Centers, and OE MCX) involved in the management and execution of OE response projects. ER 1110-1-8153 provides responsibility matrices delineating organizational responsibilities throughout the process.

c. Throughout this document, district review and approval responsibilities for project activities are discussed. These responsibilities have been delegated by the MSC to the assigned district within their geographic area.

d. Districts requiring additional information beyond that discussed in this document should contact the OE MCX.

2-2. USACE Organizational Responsibilities.

a. MSC Commanders are assigned overall responsibility for the safe and efficient execution of OE response actions for all projects for which they are the PM in accordance with ER 5-1-11.

b. The responsibilities detailed herein are FUDS specific. For projects under the management of an active or transferring installation, the installation may want to retain some degree of management control. In such cases, the PM will hire the appropriate OE Design Center to provide USACE assistance in a manner that is transparent to the customer, but the PM will remain the interface with the installation.

c. It is the responsibility of all USACE personnel involved with the OE Program to safely execute OE response projects in accordance with applicable laws, regulations, and policies. All USACE organizations will ensure that all personnel involved with on-site activities at project sites are familiar with and have access to copies of the approved Safety Plans prepared for the site-specific activities to be conducted. In addition, each organization will ensure that such personnel have received appropriate training, medical surveillance, and personal protective equipment required by the safety plan, contract specifications, Occupational Safety and Health Administration (OSHA) Standards, USACE regulations, and applicable DOD and DA regulations.

d. All USACE elements will ensure that OE response actions include provisions for meaningful stakeholder involvement pursuant to all applicable laws, regulations, and policies.

e. The Director, Military Programs, will assign the OE mission and delegate appropriate authorities to a proposed OE Design Center. The proposed center's MSC and the OE MCX will provide written positions to the Director, Military Programs, outlining capabilities, missions, and functions recommended for the proposed OE Design Center.

2-3. Functional Roles. The following section provides a general description of key functional roles in the OE response process.

a. PM. The PM is located at the district executing the OE response project. The PM leads the OE project team, coordinates all project activities, serves as a liaison with other stakeholders, and reviews/approves project documents as required. The PM will manage OE response projects in accordance with ER 5-1-11.

b. OE Design Center Point of Contact (POC). The OE Design Center POC is the central figure responsible for coordination of the OE Design Center functions for the OE response project, and acts as the liaison between the OE Design Center and the PM.

c. Safety. Safety is a primary consideration during all OE response projects. Safety-specific functional roles for OE response are discussed below.

(1) OE Safety Manager. The OE Safety Manager is located in the OE Design Center. Responsibilities of the OE Safety Manager include:

(a) Executes and approves Site Safety and Health Plans (SSHP).

(b) Ensures OE response activities occur in accordance with OSHA guidance; Engineer Manual (EM) 385-1-1, U.S. Army Corps of Engineers Safety and Health Requirements Manual; and ER 385-1-92, Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste and Ordnance and Explosives Activities.

(c) Ensures project document reviews are coordinated with the appropriate systems safety function within the organization.

(d) Executes and approves Abbreviated SSHPs (ASSHPs) for the Site Inspection and EE/CA Reconnaissance.

(e) Executes and approves Work Plans for OE response projects prior to field activities.

(2) OE Safety Specialist. The OE Safety Specialist is located within the USACE element executing the OE response project. The functions of the OE Safety Specialist include:

(a) Provides on-site safety support for OE activities.

(b) Verifies UXO qualifications of contractor employees.

(c) Advises the contractor on safety procedures.

(d) Coordinates exclusion zone activities with and advise the PM, OE Design Center POC, and the OE Safety Manager.

(e) Facilitates military Explosive Ordnance Disposal (EOD) response, when needed.

(f) Provides technical OE safety support to USACE districts and contractors.

(g) Conducts government quality assurance inspections of completed work.

(h) If located at a district, the OE Safety Specialist will assist with the review of Statements of Work (SOW), Work Plans, SSHPs, and Explosive Safety Submissions (ESS) (if required). If located at an OE Design Center, the OE Safety Specialist will assist with the execution and approval of SOWs, Work Plans, SSHPs and ESSs (if required).

d. OE MCX.

(1) Responsibilities of the OE MCX include:

(a) Reviews federal, DOD, and DA regulations related to OE and propose implementation guidance to HQUSACE to ensure USACE compliance.

(b) Reviews and approve OE and OE-related products in accordance with ER 1110-1-8153.

(c) Provides OE technical support throughout USACE.

(d) Reviews and evaluates OE detection and removal technology.

(e) Develops OE-specific contract requirements and maintain current OE contract Data Item Descriptions (DID).

(f) Assists HQUSACE in identifying OE program training requirements.

(2) Additional OE MCX responsibilities are presented in ER 1110-1-8153.

e. Engineering. The OE Design Center provides multi-discipline engineering support to the OE project team. Engineering support during OE response projects may include, but is not limited to, the following:

(1) Engineering design of structures, facilities, and excavations.

(2) Blast effects analysis.

(3) Surveying.

(4) Geographic Information Systems.

(5) Geophysical investigations.

(6) Soil sampling and analysis.

(7) Risk assessment.

(8) Permitting.

(9) Planning.

(10) Cost estimating.

(11) Systems safety.

(12) Other efforts requiring engineering and technical expertise contained within the OE Design Center.

f. Contracting.

(1) The appropriate contracting function provides acquisition support to the OE project team on all acquisition matters. Responsibilities include:

(a) Assures all OE-related Request for Proposals (RFP), Commerce Business Daily (CBD) Announcements, new contracts, SOWs, and delivery orders have been reviewed by an OE Safety Specialist prior to issuing/awarding.

(b) Assures an OE Safety Specialist is a member of the proposal evaluation team for all OE-related contracts.

(c) Assures current OE Data Item Descriptions (DID) are used in all OE-related contracts. Current DIDs are available on the OE MCX website at http://www.usace.army.mil/oew.

(d) Plans, directs, coordinates, and accomplishes actions required to select, negotiate, award, administer, modify, and terminate contracts for OE projects.

(e) Appoints a Contracting Officer's Representative (COR) when applicable.

(2) The Contracting Officer (CO) is the only person with the authority to enter into, administer, or terminate contracts. The CO and the officially designated COR may bind the government only to the extent of the authority delegated to them. Regardless of the exigencies of the site, the CO/COR are the only individuals who can "direct" a contractor to perform work, within the limits of delegated authority.

g. Construction. The district Construction Division oversees field activities outside of the exclusion zone; administers construction contracts; provides administration support; and may be assigned as the COR on a case-by-case basis.

h. Office of Counsel (OC).

(1) The district OC renders legal assistance to the OE project team. The OC provides legal interpretation and advice on applicability of environmental statutes and regulatory requirements, contract acquisition and claim issues, including review for legal sufficiency of all associated settlement agreements and environmental restoration decision documents.

(2) Due to the nature of OE response projects, the OC should be consulted on all matters involving questions of regulatory or statutory authority or requirements. The OC supporting the OE MCX is available to the OE project team for consultation.

i. Real Estate. The district Division of Real Estate performs real estate functions to support an OE response action, such as obtaining rights-of-entry, reviewing deed restrictions, and preparing real property transfer documents.

j. Public Affairs. The district Public Affairs Office (PAO) provides for planning, developing, and managing public involvement and media relations for OE response projects. PAO personnel will coordinate with the OE Safety Specialist prior to discussing any specific OE-related matters. The district PAO should contact the OE Design Center POC and PAO to coordinate OE technical content prior to release.

2-4. Other Stakeholders' Roles. Stakeholders will actively participate in the OE response process. Additional information on stakeholder involvement during OE response projects will be published in EP 1110-3-8, Public Participation in the Defense Environmental Restoration Program. Stakeholders typically include: private landowners; federal land managers; Indian Tribal Governments; Restoration Advisory Boards; and federal, state, and local regulators. A description of the roles of these stakeholders is presented below.

a. Landowners.

(1) Provide rights-of-entry or other real estate interest, as applicable, for activities performed on their property.

(2) Review and provide comments on technical documents.

b. Federal Land Managers.

(1) Provide rights-of-entry for activities performed on property under their control.

(2) Serve as a member of the OE project team.

(3) Review project documents and provide concurrence on formal decision documents.

c. Native American Tribal Governments. Native American Tribal Governments are recognized as domestic dependent nations under the protection of the United States and with the right to self-government. As such, additional considerations are required throughout OE response projects which affect tribal lands. This includes coordination with Native American Tribal Governments in order to obtain rights-of-entry and designation of a POC within or designated by the tribal government to serve as a member of the OE project team. The affected Native American tribe must have the opportunity to review project documents and provide concurrence on formal decision documents.

d. Restoration Advisory Boards.

(1) Review technical documents.

(2) Provide comments/concerns and individual advice to the OE project team.

e. Regulators.

(1) Review environmental and historical aspects of project documents.

(2) Provide comments on formal decision documents.

# CHAPTER 3
# PROJECT EXECUTION

3-1. Introduction.

a. This chapter discusses project execution requirements for USACE elements involved in OE response projects. Topics discussed in this chapter include: Business Management Practices; Project Prioritization; the Project Team Approach; Project Management Plans; Scheduling; Project Funding; Project Reporting Requirements; Contracting; Estimating; Property Management; Real Estate Activities; and Environmental Considerations.

b. Project Management for OE projects will be implemented in accordance with ER 5-1-11.

3-2. Business Management Practices. USACE has instituted business processes that will enhance service to its customers, provide a focal point for interface with customers, effectively leverage available resources across functional and geographic boundaries, and produce high quality, cost-effective services and products for its customers. Business management practices will be implemented in accordance with ER 5-1-11.

3-3. Project Prioritization.

a. USAESCH is responsible for providing an annual recommendation on the priority listing of OE projects to each MSC. The list is divided into four parts: Conventional Archives Search Reports (ASR) complete; non-stockpile Chemical Warfare Materiel (CWM) ASRs complete; Conventional Future ASRs; and CWM Future ASRs. A sample list is provided on the website: http://www.usace.army.mil/inet/usace-docs. MSC Commanders will review the list and make final decisions for project prioritization.

b. The priority list ranks each project in descending order by Risk Assessment Code (RAC) score, which is discussed in further detail in Chapter 6. Based on the list, the district will give funding prioritization to the sites with higher RAC scores. The list will require periodic maintenance as ASRs are completed and discrepancies are resolved.

3-4. Project Team Approach.

a. USACE implements a project team approach to execute OE response projects. The OE project team is led by the PM, who is responsible for overall coordination of OE project team members. Each OE response project will have a single PM, regardless of how many USACE organizations are on the OE project team, to ensure single point accountability for the overall management and leadership of the project.

b. The OE project team members include the PM; representatives from the district as required; the OE Design Center; the OE MCX, as required; the Hazardous, Toxic, and Radioactive Waste (HTRW) MCX and/or HTRW Design Center, as required; federal land managers; the prime contractor PM; the Native American Tribal Government POC, if applicable; and other key technical and non-technical individuals, as appropriate.

3-5. Project Management Plans. For each project, the PM will develop a Project Management Plan (PMP) in accordance with ER 5-1-11. This plan will present the baseline SOW, project execution strategy, project schedule, and resources (dollars and manpower) including contingencies. The PMP is a living, working level document that records the project history, project requirements, and depicts the future direction of the project.

3-6. Scheduling. The PM is responsible for establishing and maintaining the project schedule in coordination with the OE project team, as set forth in applicable regulations and guidelines, and as stipulated in the PMP.

3-7. Funds Control and Financial Reporting.

a. General. Funding may be received through a direct funding allotment (i.e., Funding Authorization Document) or on a reimbursable basis by DD Form 448, Military Interdepartmental Purchase Request (MIPR). Funding from an outside customer will be received by MIPR.

b. District Funding. The PM is responsible for programming all OE project funding needs regardless of executing command. Districts will request and receive funding from HQUSACE through the annual work plan.

c. OE Design Center Funding. The OE Design Center will submit funding requirements to the PM for inclusion in the annual OE work plan. Work will be initiated upon receipt of funds.

(1) In-House Funding. The OE Design Center will receive in-house project funds from HQUSACE based on the approved annual work plan.

(2) Contract Funds. The OE Design Center will receive contract funds from HQUSACE by written request through the PM.

(3) For projects other than FUDS, the OE Design Center will receive funds from the PM by MIPR.

d. OE MCX Funding. The OE MCX will receive program-related funds for OE program tasks from HQUSACE. The OE MCX may receive OE project funding from the OE Design Center or district for project-related tasks.

e. Funding by an Outside Agency. Project funding may also be provided by an outside agency for which work is being performed.

f. Financial Reports. The PM is responsible for project financial reporting. Reports will be submitted as required by ER 5-1-11. The OE Design Center will provide funding information to the PM as requested.

3-8. Project Reporting Requirements. The PM will prepare all project-related reports as required by HQUSACE. The PM will also ensure that the Project Management Information System and Defense Site Environmental Restoration Tracking System databases are kept up to date. The OE Design Center will provide project information to the PM, as requested.

3-9. Contracting. The following general guidance on the organizational functions, contracting procedures, contract types, and solicitation process for OE-related contracts has been established to standardize OE response contracting activities and improve consistency in services obtained from contractors. Contracts include Architect-Engineer (A-E) Contracts and Service Contracts.

a. USACE Organizational Functions for OE Response Contracting.

(1) OE Design Center.

(a) The OE Design Center will evaluate its contract requirements and solicit and award OE response contracts as needed. Items to consider include customer needs, project workload, reasonable contingencies for unknown requirements, resources available within the government, and private sector capabilities.

(b) When a removal action is transferred to a district, the OE project team will determine whether the OE Design Center or the district will award the contract. The OE MCX must review and provide comments for safety and technical adequacy on all contracts for OE actions. The project file will contain full documentation regarding the decision reached on project execution strategy including actions taken to address each issue.

(c) The OE Design Center will perform all contracting actions for TCRAs and sites containing ordnance for which the risk of accidental detonation is unusually high. Sites with unusual risk include impact areas, test ranges or open burn/open detonation sites where scatterable mine systems and other sensitive electronically fuzed ordnance items have been disposed or fired. Such sites also include manufacturing and disposal facilities that have been subjected to accidental fires or explosions and require remediation.

(d) The US Army Corps of Engineering and Support Center, Huntsville (USAESCH) OE Design Center will perform all contracting actions for non-stockpile CWM sites.

(2) OE MCX.

(a) The OE MCX will provide comments or written concurrence or non-concurrence for safety and technical adequacy on all contract packages for OE-related services. The project file must include documentation of actions taken in response to the OE MCX comments.

(b) The OE MCX will maintain the current OE contract DIDs for inclusion in every OE contract. The OE Design Center and/or district approved to execute response actions may consult the OE MCX website for these items (http://www.hnd.usace.army.mil/oew).

(c) OE MCX personnel are available to participate in the Contract Review Board process for award of OE contracts, as requested.

b. Acquisition Planning. Acquisition planning should be completed prior to the OE response contract solicitation process. The acquisition plan, a coordinated and integrated plan for fulfilling an agency's need in a timely manner and at a reasonable cost, contains the overall strategy for managing the acquisition. If new or stand-alone contracts are developed for a removal action, the acquisition plan will document the types of contracts considered. All OE project team members should participate in the acquisition planning stage to select the appropriate contract type in terms of job accomplishment and cost efficiency. Federal Acquisition Regulation (FAR), Part 7 contains general procedures for the acquisition planning process.

c. Contract Types. The nature of OE response projects requires maximum contract flexibility. This flexibility is normally achieved by using contracts with provisions for issuing both fixed-price and cost-reimbursable task orders. The CO will make the final determination of contract type and will serve as the PM's principal advisor on all contract matters.

(1) Fixed-price contracts/task orders. Whenever possible, fixed-priced contracting should be used to complete EE/CA and OE removal actions. For example, if data exists that identifies or defines the quantities of UXO to be removed (e.g., geophysical mapping and analysis has been completed), fixed-price contracts are preferred over cost-reimbursable contracts. In most cases, however, it is not possible to estimate EE/CA and OE removal action costs to the degree of confidence necessary to negotiate and award a fixed-price contract.

(2) Cost-reimbursable contracts/task orders.

(a) Cost-Plus-Fixed-Fee (CPFF) and Time-and-Materials (T&M) are the most commonly used cost-reimbursable contracts for EE/CAs and OE removal actions. These contracts allow flexibility when the removal quantities cannot be sufficiently estimated prior to execution. The disadvantage of using CPFF contracts is that they place an additional administrative burden on the government. Similarly, T&M contracts have a disadvantage in that they require oversight of the contractor to ensure that efficient methods and effective cost controls are being used. The

PM, project engineers, OE Safety Specialist, and other members of the OE project team may be assigned contract surveillance duties and should become familiar with the provisions and terms of the cost-reimbursable contract.

(b) Other cost-reimbursable contracts (e.g., Cost-Plus-Incentive-Fee and Cost-Plus-Award-Fee) may also be used for EE/CA and OE removal action contracts.

d. Contracting for EE/CAs.

(1) Requirements for EE/CA contracts can be obtained from the OE MCX but generally include the following items: engineering and design; geophysical mapping; sampling; risk assessment; cost analyses; report preparation; public meeting support; UXO personnel qualifications; and OE removal procedures. The UXO related portions of the RFP for OE contracts (i.e., SOW, DIDs, and Contract Data Requirements Lists [CDRL]) will be submitted to the OE MCX for review prior to solicitation.

(2) A-E contracts are generally utilized for EE/CAs.

e. Contracting for OE Removal Actions.

(1) Contracts for OE removal actions will include OE specific requirements such as UXO personnel qualifications and OE removal procedures. Requirements can be obtained from the OE MCX.

(2) OE removal actions should be executed through a site-specific stand-alone contract or a task order to an existing OE Design Center Indefinite Delivery Order (IDO) contract. When an OE Design Center awards a stand-alone contract, full contracting authority may be transferred to the district. When awarding a task order to an established OE Design Center IDO contract, the district must agree to management controls and reporting mechanisms established by the OE Design Center CO/COR.

(3) When a removal action is transferred to a district, the OE project team will determine whether the OE Design Center or the district will award the contract. The OE MCX must review and provide comments for safety and technical adequacy on all contracts for OE actions. If the OE project team does not reach a consensus regarding project execution strategy, the MSC Commander will determine the contract to be used. The project file will contain full documentation regarding the decision reached on project execution strategy including actions taken to address each issue.

f. Contract Solicitation Process. USACE follows normal contracting procedures, as established in the FAR, Defense Federal Acquisition Regulation Supplement, Army Federal Acquisition Regulation Supplement, and Engineer Federal Acquisition Regulation Supplement in soliciting OE contracts.

3-10. Estimating. This section presents an overview of the resources available and requirements for estimating the cost of an OE response action.

a. Cost Estimating Tools. In preparing cost estimates for the OE program, the government cost estimator or project engineer must first consider the intent of the cost estimate in order to select the best cost estimating tool.

(1) Parametric Estimating.

(a) If the objective is to estimate an order of magnitude cost for budgetary purposes, then a parametric model is used to provide costs for various phases of the project. The recommended USACE software program is the Remedial Action Cost Engineering and Requirements System (RACER) 99.

(b) There are eight RACER OE parametric models, each applicable to different phases or purposes within an OE response project. These models are parametric in design (i.e., a top down system with equations or algorithms that model the conditions entered). The models calculate quantities of equipment, materials, and labor needed for the project by associating user inputs with the required and secondary parameters presented by the models. A detailed cost estimate can be produced by inputting the required and secondary parameters.

(2) Detailed Estimates.

(a) The OE program requires detailed contract procurement cost estimates for EE/CAs and Removal Actions. The recommended USACE software programs for detailed estimates are Micro Computer Aided Cost Engineering System (MCACES) Gold Version 5.3, MCACES for Windows, Lotus 123™ spreadsheets or Excel™ spreadsheets.

(b) The detailed cost estimate is the independent government estimate (IGE) to be used as the basis for negotiation on individual task orders under a particular IDO contract. The structure of the cost estimate should vary depending on the contract type, which for OE removal actions may include T&M, CPFF, Cost-Plus-Incentive Fee, or Fixed-Price.

(c) The cost estimator or project engineer may develop crew and productivity sheets for the various field activities or tasks in the SOW to determine the duration or number of hours for the various labor categories needed to support each task. The labor rates are burdened rates and reflect all contractor mark-ups.

(d) Materials and travel and per diem are duration driven and totaled separately from the labor. The materials estimated can be purchased, rented, or allocated to overhead.

3-11. Property Management. As a general policy, contractors are normally required to furnish all equipment and materials necessary to perform their contract tasks. However, when deemed to be in the best interest of the government, equipment/materials (e.g., vehicles, engineering controls, explosives, magnetometers, etc.) may be provided to the contractor by the government. If Government Furnished Property (GFP) is not provided but the contract requires specialized equipment or materials that are not included in the contractor's overhead rate, procurement or lease may be authorized. In all cases, property management will comply with the FAR, other applicable DOD and DA policies, and with the internal policies of the district or OE Design Center, as appropriate.

a. GFP Provided to Contractor. If GFP is provided to the contractor, the OE project team must be familiar with the FAR requirements concerning management of government property under the control of contractors. The district or OE Design Center property management personnel should be contacted prior to and during the response action to clarify and help resolve issues concerning GFP or property management.

b. Acquisition Planning. The decision to provide GFP to the contractor is normally made when the acquisition is being planned. A recommendation concerning GFP will be made to the CO/COR by a team consisting of the PM, project engineer, contract specialist, cost engineer, and property management specialist. If the government provides GFP, the contract will include appropriate clauses and the GFP will be identified in the contract's SOW. For all projects which exceed three months in field duration, the OE project team will either arrange to provide General Services Administration vehicles for the contractor's use or will document and explain the decision to have the contractor use commercial vehicles. Even in those cases where GFP is provided, it is likely that additional or other types of equipment will be required to complete the contract. Additional equipment may be purchased or leased by the contractor, if agreed upon at the time of contract award, or if subsequently requested in writing and approved by the CO/COR.

c. Acquisitions. Acquisitions must be carefully managed. The PM, with assistance from the team members, should ensure that the contractor submits the required number of quotes and the appropriate analyses for new acquisitions. Normally this means three quotes for each item and a comparison of rental versus purchase cost for each item. The team's cost engineer should review the contractor's Property Management Plan and each acquisition request from the contractor to determine whether the proposed costs are in line with the costs estimated in the IGE. The cost engineer and property management specialist should advise the PM and CO/COR whether the acquisition should be approved. It is important that the property management specialist be consulted and provided with all correspondence when acquisitions are approved, since the procured items become GFP as specified by the contract. The PM and OE project team should become familiar with the specific contract language which will specify the requirements for disposition of GFP not consumed during the contract.

d. Property Management Plan.

(1) The contractor is required to submit a Property Management Plan as part of the Work Plan for a specific project. This plan should be carefully reviewed by the OE project team and primarily by the district or OE Design Center property management specialist.

(2) The property management plan will, as a minimum, include the following:

(a) A description and quantity of materials to be used.

(b) The source and rental/purchase costs of all materials.

(c) Adequate quotes for materials to be acquired.

(d) List of consumable supplies and personal property that are included in the contractor's overhead rate.

(e) A proposed storage plan.

(f) An ultimate disposal plan.

e. Quality Assurance.

(1) The government's on-site inspector should be completely familiar with the approved Property Management Plan in the Work Plan and should be notified by the PM of subsequently approved purchases. The on-site inspector may be the COR, if one is appointed for the project, or the on-site OE Safety Specialist if there is no COR appointed. The inspector should alert the PM or CO if items are procured without approval. Items costing less than the amount stated in the contract for minor purchases need not be reported unless they are questionable as to purpose and applicability to the project.

(2) The PM, contract specialist, and property management specialist should visit the project site during execution of the contract/task order to ensure that the contractor has the proper controls in place to manage and account for the project's property in accordance with the Work Plan.

(3) For other than fixed-price contracts, project personnel will carefully check the contractor's invoices to ensure that the procured items were approved as necessary prior to purchase and that all required documentation is included or maintained on file.

3-12. Real Estate Activities. The district is responsible for real estate activities for OE response actions at FUDS. The district Chief of Real Estate and/or the HQUSACE Deputy Chief of Staff for Real Estate should be consulted for additional information and project specific issues. The

purpose of real estate activities is to ensure that appropriate access agreements are obtained prior to entering a property to conduct an OE response action. Legally executed access agreements protect the government and contractor personnel from civil and/or criminal penalties for trespassing.

a. Landowner Notification.

(1) Prior to an OE Response Action. As a policy requirement rather than a legal requirement, immediately after a DERP-FUDS project is approved and prior to initiation of an OE response action, the district will forward to each current landowner a copy of the signed Findings and Determination of Eligibility (FDE) via a cover letter briefly explaining the proposed project and relevant policy decision, as appropriate. Properties having multiple owners may be notified through group mailings or public notices, where warranted. Figure 3-1 is an example of a landowner notification letter for a conventional OE site. This letter should be changed, as needed, so that it accurately reflects the situation for the specific site. A copy of the notification will be sent to the MSC and the Corps of Engineers Directorate of Military Programs, Environmental Division (CEMP-R), FUDS Branch. At such time an approved FDE will normally be available, upon request, to anyone who may have an interest. A general statement, without cost information, concerning FUDS funding and project priority based on risk management may be provided.

(2) Following an OE Response Action.

(a) If residual OE remains or is suspected after a response action at a FUDS, the owners will be apprised of the potential migration of OE. This information will be available in the Final Report and Project Completion Memorandum for the site.

(b) For OE response actions on active and BRAC sites, any residual or suspected OE will be documented in a Statement of Clearance and in the Finding of Suitability to Transfer (FOST). The FOST is needed to transfer the real property from DOD ownership. AR 200-1, Environmental Protection and Enhancement, provides additional details on a FOST. An example Statement of Clearance is presented later in this document as Figure 17-2.

b. Access Agreements.

(1) Legally executed access agreements are required for all OE response activities. The PM is responsible for obtaining the access agreements (i.e., rights-of-entry or easements) from the property owners and lessees, if applicable, affected by the activities. Access agreements are required regardless of whether the property is owned by a government entity (Federal, state, or local), Native American Tribal Government, private organization, citizen, etc.

(a) Right-of-Entry (ROE). A ROE is a legal instrument that allows legal access to property owned by another. A ROE can be used to provide protection to the government for projects that

Sample Landowner Notification Letter
For
Confirmed ordnance and explosives (OE) site - (conventional):

A confirmed OE site means OE is clearly present or there are reliable reports of OE being found.

1. The U.S. Army Corps of Engineers, under the Defense Environmental Restoration Program, has been assigned responsibility by the Department of Defense (DOD) to identify, investigate, and respond to environmental hazards that are a direct result of DOD activities at former installations.

2. As part of this program, a preliminary assessment of eligibility has been performed for the former (Former Site Name) located in (City), (County), (State) Site No. (FUDS INPR Site No.). This preliminary review of historical information and real estate records indicates that the site was used to (land use that initiated the INPR). The results of this investigation have confirmed the potential presence of OE. A danger therefore exists to anyone coming in contact with OE. Because we are not able to determine the full extent of this OE contamination, additional investigation has been recommended. This will include a search of historical archives, interviews of local residents and former workers at the site, and a site visit.

3. Since a potential hazard exists, (MSC or District) strongly recommends that no excavation work be performed at this time. The possibility of encountering OE is highly likely.

4. A (CERCLA Response Action such as PAE/SI, EE/CA, TCRA, or NTCRA) has been planned and is scheduled to begin as funds become available (Date or Fiscal Year). The results of this (Response Action) will determine if any further actions are necessary.

5. If you have any questions regarding the investigation of this site, please contact (Name, Office Symbol, Phone Number).

Figure 3-1. Conventional OE Site - Sample Landowner Notification Letter

are relatively small. Figure 3-2 is a sample ROE to be used for OE response actions. The language of this form may be used, without variance, without approval from the HQUSACE Office of the Deputy Chief of Staff for Real Estate. If any variance to the language of this form is proposed, then proposed documents, estates, and authorities should be included and approval by the HQUSACE Office of the Deputy Chief of Staff for Real Estate should be requested.

(b) Easement. An easement differs from a ROE in several ways. In theory, an easement is an interest in real estate whereas a ROE is not. Therefore, more authority and formality is required for the acquisition of an easement. Additionally, an easement provides protection for the government that a ROE lacks. For example, an irrevocable ROE binds only the current landowner, and may become void if the owner sells the land. Moreover, the title search and other processes required for the acquisition of an easement ensure that the owner has the authority to grant the interest the government needs. This protection would be important for a project on which the government intends to spend a considerable amount of money on contractor mobilization and project operation or requires access to the property for long-term monitoring.

(2) The HQUSACE INPR Approval Memorandum authorizes initiation of access agreement negotiation for the approved FUDS project. The district Chief of Real Estate is authorized to obtain ROEs for survey and exploration only. Work involving construction activities, such as excavation, could require a greater interest (e.g., an easement) which may necessitate HQUSACE authorization, depending on the length of time the activity will last. Requests for authority to acquire such other interests should be submitted to HQUSACE Office of the Deputy Chief of Staff for Real Estate. Refer to the DERP-FUDS Program Manual for additional guidance.

3-13. Environmental Considerations.

a. The district, in consultation with their OC and the OC supporting the OE MCX, as required, is the lead USACE agency on environmental issues related to OE response actions and is responsible for coordinating with regulators on these issues. Environmental issues will be addressed in project work plans prior to field work.

b. OE response actions must be conducted in compliance with current environmental regulations implemented by Federal, state, and local governments. The impact of these regulations will not be the same at each site due to differences in site geography and differences among state/local regulations, for example. Vigilance must be constantly exercised to ensure that applicable changes in Federal, state, or local regulations are addressed.

(1) Federal. The Federal statutes and regulations applicable to OE response actions are discussed in Chapter 1. These statutes include CERCLA, DERP, and RCRA. Regulations and

DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR
OE RESPONSE ACTIONS

(Project, Installation or Activity)

Tract No., Address or Property I.D.

The undersigned, herein called the "Owner", in consideration for the mutual benefits of the work described below, hereby grants the UNITED STATES OF AMERICA, hereinafter called the "Government", a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government an irrevocable and assignable right to enter in, on, over and across the land described in Schedule A, for a period not to exceed _____ months, beginning with the date of the signing of this instrument, and terminating with the earlier of the completion of the remediation or the filing of a notice of termination in the local land records by the representative of the United States in charge of the (Project Name), for use by the United States, its representatives, agents, and contractors, and assigns, as a work area for environmental investigation and response; including the right to store, move, and remove equipment and supplies; erect and remove temporary structures on the land; investigate and collect samples; (excavate and remove ordnance and explosives, pollutants, hazardous substances, contaminated soils, containerized waste, and replace with uncontaminated soil)*; (and perform any other such work which may be necessary and incident to the Government's use for the investigation and response on said lands, subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowner(s), their heirs, executors, administrators, successors and assigns, all such right, title, interest, and privilege as may be used and enjoyed without interfering with or abridging the rights and right-of-entry hereby acquired.

* Add or substitute the following, as appropriate:

a. demolish and dispose of former military structures and debris;

b. dispose of ordnance and explosives by detonation;

(cont.)

Figure 3-2. Sample Right-of-Entry for OE Response Actions

DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR
OE RESPONSE ACTIONS
(cont.)

(Project, Installation or Activity)

Tract No., Address or Property I.D.

2. The Owner also grants the right to enter and exit over and across any other lands of the Owner as necessary to use the described lands for the purposes listed above.
3. All tools, equipment, and other property taken upon or placed upon the land by the Government will remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this permit of right of entry.
4. Upon expiration or termination of this right of entry, the Government will ensure restoration of the ground contour, replace any pavement or other cover which was removed or damaged for this work, establish a groundcover of grass on areas not otherwise covered, and reconnect any operating utility lines that were required to be disconnected or otherwise disrupted.
5. The land affected by this permit or right of entry is located in _____, State of _____ and is described as follows:

(INSERT SCHEDULE A - DESCRIPTION OF THE PROPERTY)

WITNESS MY HAND AND SEAL this _____ day of _____, 20__.

_____ (SEAL)
Owner

_____ (SEAL)
Owner

UNITED STATES OF AMERICA

By_____

Figure 3-2. Sample Right-of-Entry for OE Response Actions (Continued)

policies include the NCP, the DERP-FUDS Program Manual, and the EPA Military Munitions Rule.

(2) State Laws and Regulations. Environmental standards promulgated by the state in which the project is being performed must also be considered as potentially applicable to OE response actions. States may have primacy for enforcement of some of the above listed federal laws. Consultation with state environmental regulatory agencies is required to ensure that appropriate requirements have been addressed before implementing an NTCRA.

(3) Local Regulations. OE response actions must proceed in accordance with applicable local regulations. Local regulations that may apply to OE response actions include, but are not limited to, noise ordinances, traffic laws, and requirements for notifying utility companies prior to intrusive activities.

(4) Other Environmental Laws. Table 3.1 presents a summary of other primary environmental laws that may be applicable to OE response actions and Table 3.2 summarizes addtional environmental laws and regulations that may be applicable at specific OE contaminated sites. Similarly, Table 3.3 presents a summary of DOD directives, instructions, and regulations relevant to environmental aspects of OE response actions. These tables may be used as a checklist in determining the applicable environmental laws for a specific project.

Table 3.1
Other Primary Environmental Laws to be Considered During an OE Response Action

| Law | Summary | Applicable (Y/N) |
|---|---|---|
| Clean Air Act<br>*(42 USC 1857-18571; 40 CFR 50-100)* | The Clean Air Act (CAA) regulates releases of specific substances into the air. Pursuant to the CAA, USEPA has promulgated National Ambient Air Quality Standards (40 CFR 50), National Emission Standards for Hazardous Air Pollutants (40 CFR 61), and New Source Performance Standards (40 CFR 60, 63). These standards must be consulted to identify those applicable to expected air releases resulting from OE response actions which utilize commercially available equipment to demilitarize explosives. | |
| Clean Water Act<br>*(33 USC 1251-1387; 40 CFR 100-149)* | The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA regulations that are most likely to apply to OE response actions include: surface water quality standards, permitting for direct discharges into surface waters, standards for indirect discharges to Publicly Owned Treatment Works, control of discharges of dredge and fill materials into surface waters, and storm water management requirements. | |
| Coastal Zone Management Act<br>*(16 USC 1451-1464; 15 CFR 921-933)* | Federal projects that are anticipated to affect a coastal zone of a state with an approved State coastal zone management program (all coastal states except Georgia, Texas, Ohio, Indiana, Illinois, and Minnesota) must be consistent with the state's plan. | |

Table 3.1 (continued)
Other Primary Environmental Laws to be Considered During an OE Response Action

| Law | Summary | Applicable (Y/N) |
|---|---|---|
| Endangered Species Act<br>*(16 USC 1531-1544; 50 CFR 17, 401-424, 450-453)* | Requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat. All NTCRAs must be performed in accordance with these requirements through completion of a species presence determination, performance of a biological assessment, completion of a biological opinion, and, if required due to expected impacts, completion of an application of exemption. | |
| Fish and Wildlife Coordination Act<br>*(16 USC 661-666)* | A project which will result in the structural modification of a natural stream or body of water must conform to the requirements of the Fish and Wildlife Coordination Act. The statute requires consultation with the US Fish and Wildlife Service to develop any appropriate protective measures before implementation of the project. | |
| National Environmental Policy Act of 1969 (NEPA) | When performing an OE response action, compliance with the procedural requirements of NEPA is not required. The overall NEPA requirement for a fully-informed and well-considered decision will be achieved through compliance with the NCP and DERP. | |

Table 3.1 (continued)
Other Primary Environmental Laws to be Considered During an OE Response Action

| Law | Summary | Applicable (Y/N) |
|---|---|---|
| National Historic Preservation Act *(16 USC 470; 36 CFR 60, 63, 68, 800; Executive Order 11593)* | Provides for the preservation of historical and archaeological resources. If a response action is expected to impact an historical or archeological location (e.g., properties included on or eligible for the National Register of Historic Places), steps must be identified and enacted to preserve the data associated with the site's historical or archeological value. These steps are included in the EE/CA as a Cultural Resources Survey consisting of a literature search, field investigations, findings review, a determination of eligibility, removal action impact evaluation, and proposed mitigation methods for impacted historical and cultural resources. | |
| Occupational Safety and Health Act *(29 USC 651-667)* | This Act authorizes the OSHA to set and enforce safety and health standards to promote worker protection. OE response actions must be conducted in a manner which enforces OSHA Safety Standards. | |
| Wild and Scenic Rivers Act *(16 USC 1271 et seq.; 36 CFR 297.4)* | CERCLA actions which may affect the free-flowing characteristics, scenic, or natural values of a river designated on the National Rivers Inventory or within the National Wild and Scenic Rivers System are required to evaluate the primary impacts for consistency with the character of the river and develop mitigative measures as appropriate. | |
| Wilderness Act *(16 USC 1131-1136; 50 CFR 35.5)* | Response actions carried out under the preview of CERCLA must acquire exemption from the requirements of the Wilderness Act if the action will potentially impact designated wilderness areas as defined in 16 USC 1132. Actions in wilderness areas must be coordinated with federal and state environmental regulatory agencies to pursue this exemption. | |

Table 3.2
Additional Environmental Laws and Regulations for Consideration During OE Response Actions

| Law/Regulation | Summary | Applicable (Y/N) |
|---|---|---|
| Abandoned Shipwreck Act<br>*(43 U.S.C. § 2101 et seq.)* | Transfers title of abandoned shipwrecks on or eligible for the National Register of Historic Places or in protected formations (except shipwrecks on federal or Native American lands) to state jurisdiction. | |
| American Indian Religious Freedom Act<br>*(42 U.S.C. § 1996)* | Protects and preserves religious freedoms of Native Americans, including access to religious sites and consultation with tribal leadership concerning human burial sites that federal projects might disturb. | |
| Antiquities Act of 1906<br>*(16 U.S.C. § 431-433)* | Protects historic and prehistoric ruins and objects of antiquity on federal lands. Authorizes scientific investigation of antiquities on federal lands, subject to permits and other regulatory requirements, including paleontological resources. | |
| Archeological and Historic Preservation Act<br>*(16 U.S.C. § 469-469c)* | Directs federal agencies to notify the Secretary of the Interior when they find that any federal construction project or federally licensed activity or program may cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archeological data. Also funds historical and archeological protection in such projects. | |
| Archeological Resources Protection Act<br>*(16 U.S.C. §§ 470aa-47011)* | Prohibits the removal, sale, receipt, and interstate transportation of archeological resources obtained illegally (without permits) from public or Indian lands. Sets substantial criminal and civil penalties and authorizes federal agency permit procedures for investigations of archeological resources on public lands under the agency's control. | |

Table 3.2 (continued)
Additional Environmental Laws and Regulations for Consideration During OE Response Actions

| Law/Regulation | Summary | Applicable (Y/N) |
|---|---|---|
| Bald and Golden Eagle Protection Act<br>*(16 U.S.C. § 668)* | Governs activities and facilities that may threaten protected birds. | |
| Coastal Barrier Resources Act<br>*(16 U.S.C. § 3501 et seq.)* | Restricts federal expenditures and financial assistance encouraging development of coastal barriers and associated habitats. | |
| Estuary Protection Act<br>*(16 U.S.C §§ 1221-1226)* | Requires consideration by states and federal agencies of the need to protect, conserve, and restore estuaries. | |
| Farmland Protection Act<br>*(7 U.S.C. § 4201 et seq.)* | Requires federal agencies to consider the effects of programs on farmland and to prevent conversion of farmland to nonagricultural uses. | |
| Federal Land Policy and Management Act<br>*(43 U.S.C. § 1701 et seq.)* | Governs retention, management, land-use planning, disposal, and acquisition of public lands; requires regulation of use and occupancy of public lands. | |
| Fish and Wildlife Conservation Act<br>*(16 U.S.C. § 2901 et seq.)* | Provides financial and technical assistance to states for creation and implementation of conservation programs for nongame fish and wildlife and encourages federal agencies to conserve nongame fish and wildlife. | |
| Forest and Rangeland Resources<br>*(16 U.S.C. §§ 1600-1614, 1641-1647, 1671-1676, 1681-1687)* | Four acts that govern the management, conservation, and utilization of national forest and rangeland renewable resources. | |

Table 3.2 (continued)
Additional Environmental Laws and Regulations for Consideration During OE Response Actions

| Law/Regulation | Summary | Applicable (Y/N) |
|---|---|---|
| Hazardous Materials Transportation Law | Provides for the adequate protection against the risks to life and property inherent in transporting hazardous materials in commerce. | |
| Historic Sites Act *(16 U.S.C. §§ 461-467)* | Authorizes designation of national historic sites and landmarks and interagency efforts to preserve historic resources. | |
| Marine Mammal Protection Act *(16 U.S.C. § 1361 et seq.)* | Requires protection of threatened and endangered marine mammals; provides fines for harming marine mammals. | |
| Marine Protection, Research, and Sanctuaries Act, *(33 U.S.C. §§ 1401-1445)* | Declares that it is national policy to regulate dumping of all types of materials into ocean waters, and to prevent or strictly limit ocean dumping of any material that would adversely affect human health or the marine environment. | |
| Migratory Bird Conservation Act *(16 U.S.C. § 715 et seq.)* | Establishes Migratory Bird Conservation Commission to recommend for purchase, rental, or acquisition by the Department of the Interior land or water suitable for use for migratory bird conservation. | |
| Migratory Bird Treaty Act *(16 U.S.C. § 703-712)* | Governs activities that may affect or threaten migratory birds or their habitats. | |

Table 3.2 (continued)
Additional Environmental Laws and Regulations for Consideration During OE Response Actions

| Law/Regulation | Summary | Applicable (Y/N) |
|---|---|---|
| Native American Graves Protection and Repatriation Act<br>*(25 U.S.C. § 3001-3013)* | Prohibits the intentional removal of Native American cultural items from federal or tribal lands except under an Archeological Resource Protection Act permit and in consultation with the appropriate Native American groups. Requires returning burial remains, associated funerary objects, and objects of cultural patrimony to the appropriate Indian or Native Hawaiian organizations and tribes. Establishes Native American ownership of human remains and associated funerary objects discovered on federal lands. | |
| Public Buildings Cooperative Use Act<br>*(40 U.S.C. §§ 490, 601a, 606, 611, 612a)* | Encourages adaptive reuse of historic buildings as administrative facilities for federal agencies or activities. | |
| Rivers and Harbors Act<br>*(33 U.S.C. § 401 et seq.)* | Requires approval of the Secretary of the Army and the Chief of Engineers for construction of a bridge, dam, or dike over navigable waters. | |
| Sikes Act<br>*(16 U.S.C. § 670a-670o)* | Authorizes the Secretary of Defense to carry out a program of planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation on military reservations. Also requires the Departments of the Interior and Agriculture to establish conservation programs on public lands. | |

Table 3.2 (continued)
Additional Environmental Laws and Regulations for Consideration During OE Response Actions

| Law/Regulation | Summary | Applicable (Y/N) |
|---|---|---|
| Soil and Water Resources Conservation Act<br>*(16 U.S.C. § 2001 et seq.)* | Creates coordinated soil and water conservation program to identify and address long-term national needs. | |
| Watershed Protection and Flood Prevention Act (WPFPA)<br>*(6 U.S.C. § 1001 et seq.; 33 U.S.C. § 701-1; Executive Order 11988)* | Governs reservoir development and stream modification projects including specific wildlife habitat improvements. | |
| Wild Free-Roaming Horses and Burros Act<br>*(16 U.S.C. §§ 1331-1340)* | Protects from capture, harassment, and death free-roaming horses and burros, and considers them part of the natural system of public lands. | |

Table 3.3
Department of Defense Directives, Instructions and Regulations for OE Response Actions

| Directive/Regulation | Title | Contents/Regulations | Applicable (Y/N) |
|---|---|---|---|
| Department of Defense Explosives Safety Board DOD 6055.9-STD | DOD Ammunition and Explosives Safety Standards | Primary DOD regulation that requires UXO cleanup of DOD lands prior to transfer. | |
| DOD Directive 1000.3 | Safety and Occupational Health Policy for the Department of Defense | Establishes the basis for all DOD safety, fire protection, and occupational health programs | |
| DOD Directive 4165.60 | Solid Waste Management-Collection, Disposal, Resource Recovery and Recycling Program | Sets DOD policy and procedures for the DOD comprehensive program of solid waste collection, disposal, material recovery, and recycling in accordance with USEPA guidelines, NEPA, and RCRA. | |
| DOD Directive 4500.9 | Transportation and Traffic Management | Describes general DOD transportation and traffic management policies. | |
| DOD Directive 4700.4 | Natural Resource Management Program | Sets DOD policy for management and protection of natural resources. | |
| DOD Directive 4710.1 | Archeological and Historical Resources Management Program | Establishes DOD policies and procedures for protection and management of archeological and historical resources. | |

Table 3.3 (continued)
Department of Defense Directives, Instructions and Regulations for OE Response Actions

| Directive/Regulation | Title | Contents/Regulations | Applicable (Y/N) |
|---|---|---|---|
| DOD Directive 5100.50 | Protection and Enhancement of Environmental Quality | Assigns responsibilities and establishes policies and procedures for protection and enhancement of environmental quality in consonance with federal policy and other DOD issuances. | |
| DOD Directive 6050.1 | Environmental Effects in the United States of DOD Actions | Implements Council on Environmental Quality regulations and provides policy and procedures to enable DOD officials to take into account environmental considerations when considering the authorization or approval of major DOD actions in the United States. | |
| AR 200-1 | Environmental Protection and Enhancement | Prescribes Army policies, responsibilities, and procedures to protect and preserve the quality of the environment. | |
| AR 200-2 | Environmental Effects of Army Actions | Contains Army procedures for implementing NEPA. | |
| ER 385-1-92 | Safety and Health Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities | Identifies the safety and occupational health documents and procedures required to be developed and implemented by USACE elements and their contractors responsible for executing HTRW and OE activities. | |

Table 3.3 (continued)
Department of Defense Directives, Instructions and Regulations for OE Response Actions

| Directive/Regulation | Title | Contents/Regulations | Applicable (Y/N) |
|---|---|---|---|
| ER 1110-1-263 | Chemical Data Quality Management for Hazardous Waste Remedial Activities | Prescribes responsibilities and procedures for planning and executing chemical data acquisition including sampling and analysis. It is applicable to all phases of all projects, regardless of program or whether the work is done under contract or in-house. Includes OE projects where environmental samples are collected for chemical analysis. | |
| ER 1110-1-8153 | Ordnance and Explosives Response | Establishes roles and responsibilities for USACE elements in managing and executing OE response actions and authorizes and provides for the delegation of such roles and responsibilities. | |

# CHAPTER 4
# PUBLIC PARTICIPATION

4-1. Introduction.

a. This chapter outlines key features of the public participation process for OE response actions at FUDS. Public participation is an integral component of the OE response process. The USACE is committed to providing public participation activities during OE response projects.

b. Public participation activities serve many purposes during OE response actions, including the following:

(1) Serve the community's information needs by keeping local residents, officials, and other stakeholders informed in a timely manner of major OE actions or phases of operation being conducted at the site.

(2) Provide local residents, officials and other stakeholders an opportunity to review and comment on studies being conducted and on suggested response alternatives and decisions.

(3) Foster and maintain a climate of understanding and trust between stakeholders and USACE.

c. For FUDS, the district, with support from the OE Design Center and the OE MCX as needed, will be responsible for public participation activities. Under the BRAC and IR programs, public participation activities at OE contaminated sites are the responsibility of the installation.

d. Detailed information on public participation activities is published in Engineer Pamphlet (EP) 1110-3-8, Public Participation in the Defense Environmental Restoration Program.

4-2. Public Participation Requirements. The major public participation and community involvement activities associated with OE response projects include: the Community Relations Program, the Restoration Advisory Board, and the Administrative Record.

a. Community Relations Program.

(1) USACE establishes and maintains community relations programs at FUDS for OE response projects. A central component of the community relations program is the Community Relations Plan (CRP).

(2) The PM is responsible for the preparation and approval of a CRP. The CRP will serve as the framework to establish a successful information exchange with the public for OE response actions. The CRP applies to all USACE elements responsible for managing OE sites.

(3) Additional guidance on the community relations program and the CRP is published in EP 1110-3-8.

b. Restoration Advisory Board (RAB).

(1) The PM must determine if there is sufficient, sustained community interest to establish a RAB. The purpose of a RAB is to serve as a forum for discussion and exchange of information between agencies and affected communities. The RAB provides an opportunity for stakeholders to have a voice and actively participate in the review of technical documents, review restoration progress, and provide individual advice to decision makers regarding restoration activities. Procedures for establishing and maintaining a RAB are published in EP 1110-3-8.

(2) RABs can receive technical assistance from independent sources to interpret scientific information and engineering issues through the Technical Assistance for Public Participation program (TAPP). Detailed information on the TAPP process is published in EP 1110-3-8.

c. Administrative Record.

(1) The PM is responsible for establishing and maintaining the Administrative Record for every OE response project. The Administrative Record contains documents generated during the OE response process and presents the rationale for the selection of a response action. Additionally, comments that reflect the USACE's consideration of all public comments are included in this record.

(2) The Administrative Record serves as the basis for judicial review of the response action selection process. Failure to implement the required steps and to document these activities may result in the government being unable to support and defend its decision and increase the government's liability in OE response actions.

(3) Procedures for establishing and maintaining the Administrative Record are published in EP 1110-3-8.

# CHAPTER 5
# OE RESPONSE OVERVIEW

## 5-1. Introduction.

a. The purpose of an OE response action is to reduce, in a timely, cost-effective manner, the risk to human health, safety, and the environment resulting from past DOD activities. The reduction of risk to the public and the environment is achieved through an OE removal action. This chapter discusses the types of removal actions that may be implemented during the OE response process.

b. A removal action is the cleanup or removal of OE from the environment to include the disposal of removed materiel. This term also includes without being limited to, security fencing or other measures to prevent, minimize, or mitigate damage to public health, welfare, or to environment.

## 5-2. Types of Removal Actions.

a. There are three types of removal actions: emergency, time critical, and non-time critical. The circumstances under which each type of removal action is implemented is illustrated in Figure 5-1 and discussed below. Military EOD units have execution authority for emergency removals. USACE has been given execution authority at FUDS for TCRAs and NTCRAs by the Army.

b. Selection of Removal Action Type.

(1) The selection of the appropriate type of OE removal action is based on an evaluation of the following site-specific features:

(a) The nature of the OE contamination.

(b) The urgency/threat of release or potential release of OE.

(c) The timeframe required for initiating a removal action.

(2) Following the evaluation of the above features, either an emergency, time critical, or non-time critical removal action is selected.

c. Emergency Removal Actions. Emergency removal actions address immediate, unacceptable hazards. Military EOD units are responsible for executing emergency removal actions. In situations where EOD support is required, the USAESCH will coordinate with EOD in accordance with “The Memorandum of Agreement Between the US Army 52nd Ordnance

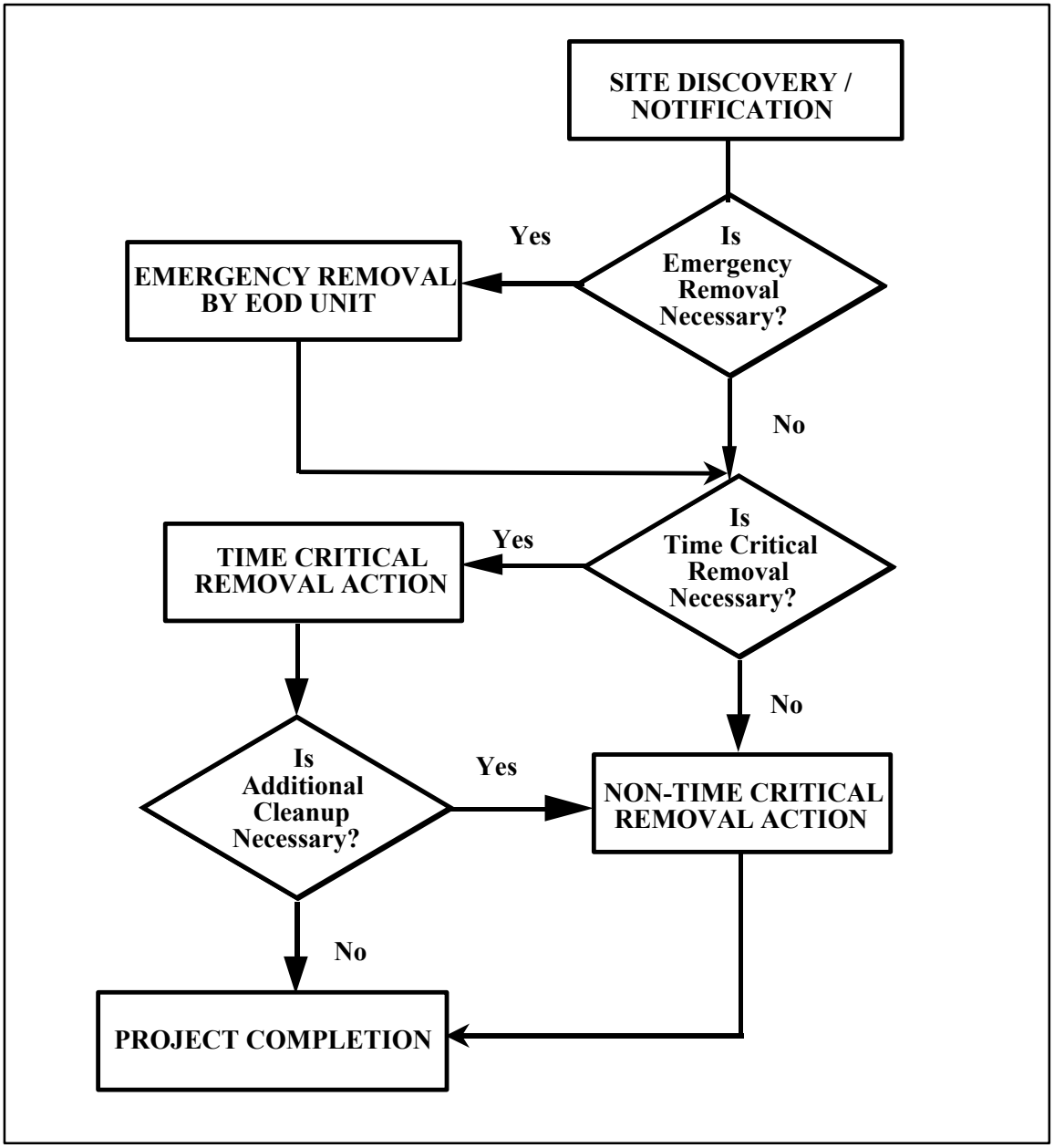



Figure 5-1. Types of OE Removal Actions

Group and US Army Engineering and Support Center, Huntsville." Since emergency removal actions are not normally a USACE responsibility, they are not further addressed in this document.

d. Time Critical Removal Actions.

(1) Purpose.

(a) TCRAs are removal actions conducted to respond to an imminent danger posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment. Once the imminent threat at a site is addressed through the TCRA, additional work that is necessary is completed through the NTCRA process.

(b) A TCRA is intended to address only the imminent safety hazard posed by the presence of OE, not the cleanup requirements that can be deferred for later action during the NTCRA process. If the TCRA occurred before the EE/CA process was initiated, the risk at the site will be re-evaluated by the completion of a RAC Worksheet, which is discussed in Chapter 6. Based on the RAC score, the site will be reprioritized for a response action through the NTCRA process.

(2) Action Memorandum.

(a) Contents. The Action Memorandum for a TCRA will provide the following information:

- Location and description of the site, including DERP-FUDS project number, if applicable.
- Description of the OE hazards existing at the site.
- Description of the current land use activities and risk of exposure.
- Previous actions that have taken place to address the OE hazard.
- An endangerment determination with the following statement: "There is a significant possibility that an individual may encounter OE hazards at this site, and that these hazards may cause injury or death to individuals who encounter the hazards if not addressed through the response action described in the Action Memorandum".
- Rationale for clearance depth selection and justification for exceeding clearance depths specified for TCRAs.

- An explanation of the proposed action and how the action addresses the actual threat. The explanation should differentiate between a minimum scope TCRA and expanded scope TCRA, which are discussed below.

(b) Review and Approval Process. The Action Memorandum for a TCRA is executed by the OE Design Center.

- The Director for Environmental Programs, ACSIM approves all Action Memorandums projects greater than $6 million, including National Priorities List (NPL) projects. The OE MCX will review the Action Memorandum. Concurrence by CECC-C and CEMP-R is required.

- The MSC Commander approves Action Memorandums for projects between $2 million and $6 million, in addition to all NPL projects under $6 million.

- The District Commander approves non-NPL Action Memorandums for projects less than $2 million.

(3) Types of TCRAs. There are two types of TCRAs that may be selected during an OE response action: a minimum scope TCRA and an expanded scope TCRA.

(a) Minimum Scope TCRA. During a minimum scope TCRA, the minimum resources necessary to address the imminent threat should be allocated. This type of TCRA will be restricted to the following:

- Fences to limit access to the property.

- Removal of surface OE items.

- Restrictive signs to warn of the OE hazard.

- Capping or containment of the OE contamination.

- A combination of the above.

(b) Expanded Scope TCRA. An expanded scope TCRA may be selected if it is deemed as cost effective to address cleanup requirements in order to avoid future remobilization costs. For this to occur, a high degree of confidence must exist such that a subsurface clearance will complete the removal response for a site. An expanded scope TCRA is usually only initiated for known burial caches or well-defined target areas. The depth of clearance should not exceed the limits of UXO detection equipment and the depth that is consistent with future land use.

(4) Conclusion of the TCRA. Following the completion of the removal action tasks, which are discussed in Chapters 11 and 12 of this pamphlet, the TCRA is concluded with the preparation and approval of a Project Completion Memorandum or a Finding of Suitability to Transfer (FOST). The FOST is discussed in Chapter 17 of this pamphlet.

(5) Administrative Record. Because of the exigent nature of a TCRA, the Administrative Record does not need to be available prior to the implementation of the removal action. However, the Administrative Record must be available within 60 days of initiation of fieldwork. Since a formal EE/CA is not prepared during a TCRA, careful records must be maintained. Additional information on the Administrative Record will be published in EP 1110-3-8.

e. Non-Time Critical Removal Actions.

(1) NTCRAs are actions initiated in response to a release or threat of a release that poses a risk to human health or the environment where more than six months planning time is available. There are several formal steps required to execute a NTRCA. These steps include:

(a) Preliminary assessment of eligibility to determine property and project eligibility.

(b) Site inspection to confirm the presence of OE at the site.

(c) EE/CA investigation to evaluate the site and risk, identify and evaluate removal alternatives, and select a removal action.

(d) Removal design to plan for the implementation of the removal action.

(e) Removal action.

(f) Project completion.

(2) The NTCRA process is illustrated in Figure 5-2. Each phase of the NTCRA process is discussed in detail in Chapters 6 through 17 of this pamphlet.

(3) During the NTCRA process, a TCRA may be conducted due to the discovery of an imminent danger. As shown in Figure 5-2, a TCRA may be initiated during the following phases of a NTCRA: preliminary assessment of eligibility, site inspection, EE/CA, or NTCRA. Following the completion of the TCRA, the NTCRA will resume.

(4) As illustrated in Figure 5-2, a decision of No DOD Action Indicated (NDAI) may be reached during the NTCRA process at the conclusion of the preliminary assessment of eligibility, site inspection, or EE/CA phases. At any time during the OE response process, the OE project team, in consultation with the OC supporting the OE MCX, may propose that a removal action be conducted based on site-specific circumstances. If the removal action will be conducted with

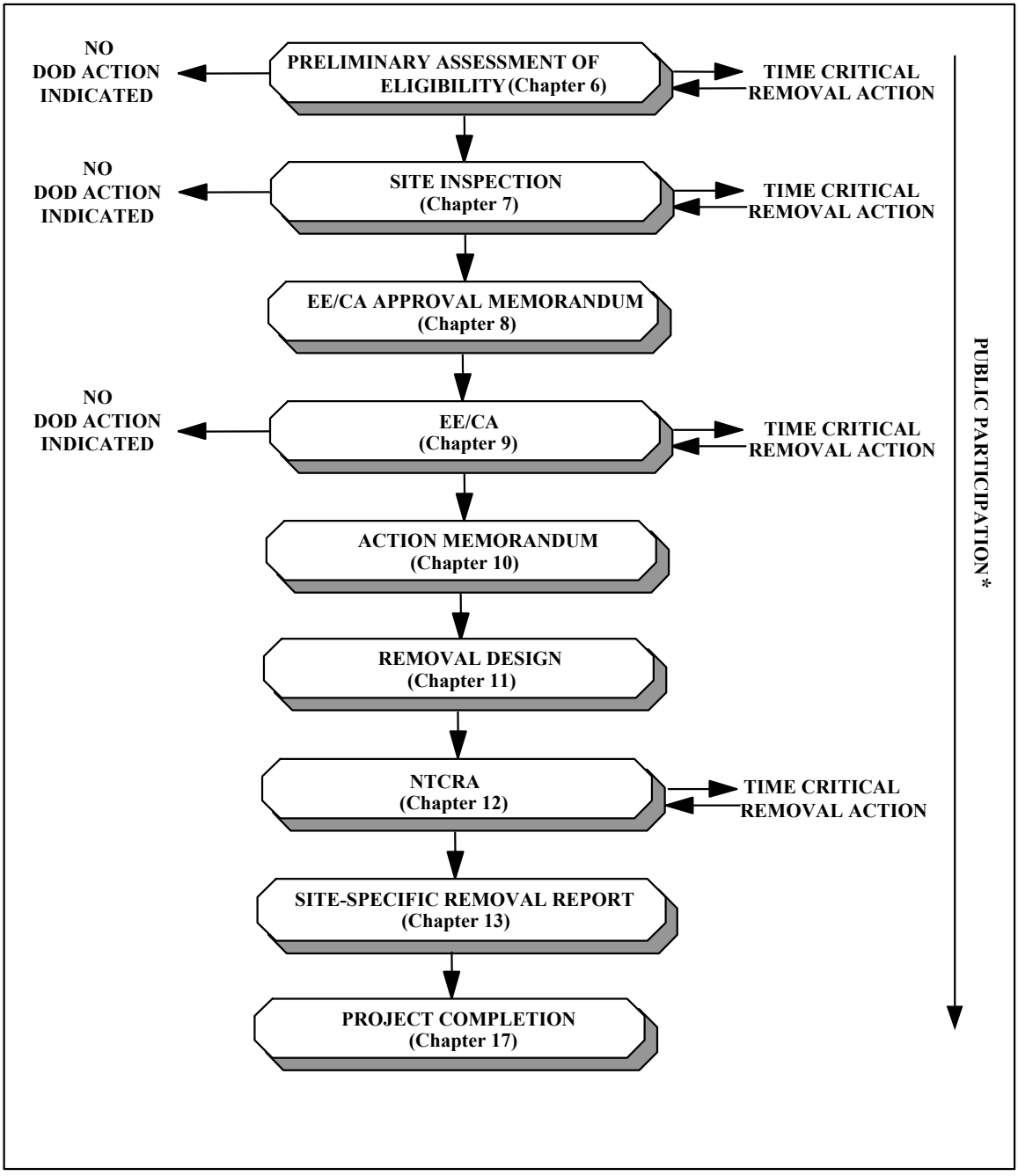



Figure 5-2. Non-Time Critical Removal Action Process **

* Public Participation is an integral component of the NTCRA process.
**Additional removal actions may occur at any time depending on the exigencies of site conditions.

a planning period of less than six months, the lead agency must publish the Action Memorandum within 60 days of initiating the removal action. Any information gathered during this response action must be incorporated into the EE/CA document. The OE MCX should be contacted for further information about the circumstances in which a removal action may be appropriate during the OE response process.

# CHAPTER 6
# PRELIMINARY ASSESSMENT OF ELIGIBILITY

## 6-1. Introduction.

a. This chapter discusses the preliminary assessment of eligibility (PAE) phase of an OE response action. The topics discussed include the purpose of the PAE, determination of property/project eligibility, historical records review, site visits, and the Inventory Project Report (INPR). The district is responsible for executing and approving the SOW and IGE for the PAE.

b. The purpose of the PAE is to determine property and project eligibility. This is accomplished by conducting a historical records search to examine the title of the property and determine if DOD formerly used the site. In conjunction with the historical records search, a site visit may also be conducted to obtain information on the type of activities that occurred at the site during its operation,

c. The PAE follows a two-step process to determine property and project eligibility. The first step is the confirmation that a potentially eligible property fulfills the requirements of the FUDS program. The second step is the confirmation of contamination on the eligible property. Following the determination of property and project eligibility, an INPR is prepared.

## 6-2. Property Eligibility.

a. Under DERP-FUDS policy, a property is defined as a former Army fort, Air Force base, Naval yard, ammunition plant, Army depot, or any other defense component facility, including those operated by contractors.

b. Determination of property eligibility will be made for potential FUDS independent of the effective date of the DERP statute (SARA, 17 October 1986). A determination that a facility fits within the definition of DERP-FUDS does not constitute admission of DOD cleanup liability. As a policy decision, any property excessed after 17 October 1986 will not be cleaned up with FUDS money.

c. During the PAE, a potentially eligible property is classified as either eligible, ineligible, or categorically excluded. Figure 6-1 illustrates the process for determining property eligibility.

(1) Eligible Property.

(a) A potentially eligible property is one that was formerly owned or used by a defense component. A FUDS is a real property that was formerly owned by, leased by, possessed by, or otherwise under the jurisdiction of the Secretary of Defense or military components that predate

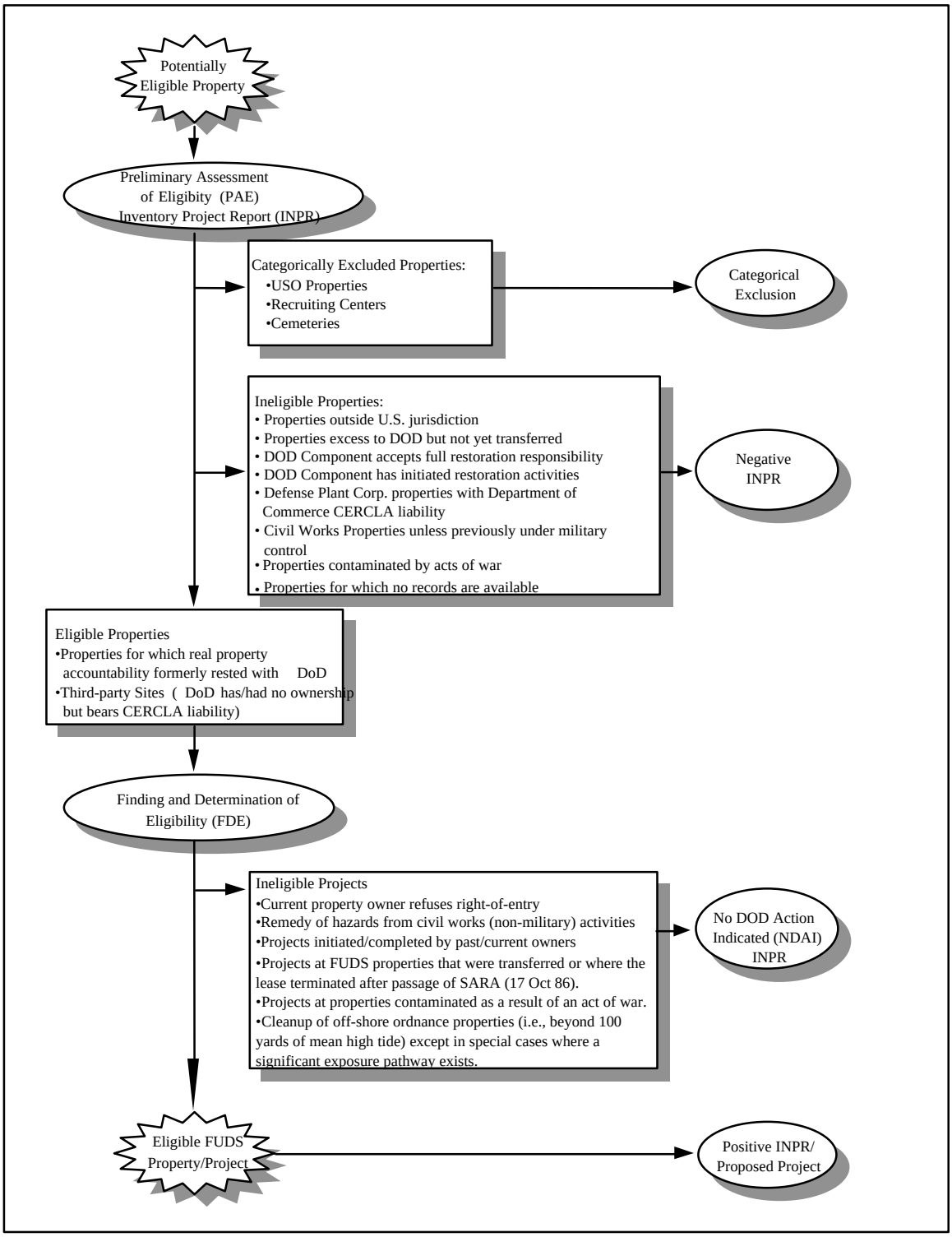



Figure 6-1. Determining Formerly Used Defense Site Property/Project Eligibility

DOD. DERP-FUDS include: all property for which real property accountability previously rested with DOD irrespective of current ownership or current responsibility for accountability within the Federal Government; all properties previously used by DOD components under lease or other agreements; and all properties previously occupied by DOD components over which significant control was exercised without the benefit of a formal real estate instrument or other agreements. FUDS may also include manufacturing facilities which were owned by DOD components and real property accountability rested with DOD but were operated by contractors, and National Guard (state controlled) and Reserve facilities where property accountability at one time rested with DOD. Third party sites are not considered active or former DOD property, but may be considered for DERP-FUDS funding if the contamination was wholly or partly caused by previous DOD controlled activities.

(b) Following the determination of property eligibility, a FDE is prepared and included in the INPR. The eligible property is then evaluated for project eligibility.

(2) Ineligible Property. An ineligible property does not qualify for restoration under the FUDS program. Once a determination of property ineligibility is made, a negative INPR is prepared. Examples of ineligible properties include:

(a) Properties outside U.S. jurisdiction.

(b) Properties excessed to DOD but not yet transferred.

(c) Properties where the responsible DOD component accepts full restoration responsibility.

(d) Properties where the responsible DOD component has initiated restoration activities.

(e) Defense Plant Corporation properties with Department of Commerce CERCLA liability.

(f) Civil Works Properties unless previously under military control.

(g) Properties contaminated by acts of war.

(h) Properties for which no records are available.

(3) Categorically Excluded Property. A categorically excluded property is not eligible for the FUDS program because of the nature of its operation or control. The preparation of an INPR is not necessary for a categorically excluded property. Examples of a categorically excluded property include:

(a) United Services Organizations.

(b) Recruiting Centers.

(c) Cemeteries.

(d) Properties currently controlled by the DOD components (Army, Navy, Air Force, Marines, National Guard [not state controlled]; Reserves, Defense Logistics Agency, and Defense Nuclear Agency) which resulted in hazards.

6-3. Project Eligibility.

a. Following a determination of property eligibility, the property is evaluated for confirmation of contamination in order to establish project eligibility.

b. A project is defined as an activity undertaken to clean up a hazardous condition on a property. A potentially eligible project is one where a DOD component has or shares potential responsibility for the hazardous condition, after applying applicable policy considerations. Figure 6-1 also illustrates the process for determining project eligibility.

(1) Eligible Projects. An eligible project is one in which there is confirmed contamination on the property requiring a response action or where a DOD component has or shares potential responsibility. At an eligible property, cleanup of foreign ordnance may be proposed as an eligible project. Following the determination of project eligibility, a positive INPR is prepared.

(2) Ineligible Projects. Following the determination of project ineligibility, a NDAI INPR is prepared. The discovery of new information can change the status of a project from ineligible to eligible. Ineligible projects are described in the following paragraphs.

(a) Projects identified on property where the current owner refuses ROE. The appropriate authorities (e.g., USEPA, state environmental agency, Office of Public Safety, etc.) should be notified if a hazard exists. Such a project may become eligible if the property owner provides ROE at a later date.

(b) Projects to remedy hazards which resulted from civil works activities rather than military activities.

(c) Projects initiated or completed by a past or current owner. Property owners cannot be reimbursed under DERP-FUDS for any response activities.

(d) Projects at FUDS properties that were transferred or where the lease terminated after the passage of SARA (17 October 86). In these cases, any environmental cleanup project must be undertaken by the DOD component who disposed of the property. The component will conduct the cleanup under it’s active-site Installation Restoration Program and the project determined as

NDAI under the FUDS program (i.e., the project is not eligible for the FUDS program). This is based on SARA's mandate that a DOD property be cleaned up prior to disposal.

(e) Projects at properties which were contaminated as a result of an act of war.

6-4. Historical Records Review. Review of locally available historical records provides information such as the past use of the facility; types of OE used, tested, stored, disposed, or produced at the site; and whether an OE clearance has been performed in the past. Sources of historical information include local officials and real estate records.

6-5. Site Visit. The PAE site visit can provide information regarding the type, extent, and magnitude of OE contamination at a site. Sites that are no longer owned or controlled by DOD require an ROE prior to conducting a site visit. Acquisition of an ROE is discussed in Chapter 3.

a. Safety Considerations.

(1) Safety is a primary consideration when conducting a site visit at a property that is potentially contaminated with OE. An ASSHP is required for the site visit per ER 385-1-92. The district is responsible for executing and approving the ASSHP for the PAE site visit. Additional information on ASSHPs is provided in Chapter 20.

(2) The site visit should be executed using anomaly avoidance techniques. If ordnance is found during the site visit, extreme caution must be exercised. Personnel conducting the PAE should not touch, move, or jar an apparent OE item in any way, regardless of its apparent condition. Markings such as "practice bomb", "dummy", or "inert" should not be interpreted to mean the item is not hazardous. Practice bombs can have explosive charges that are used to spot the point of impact or the item may be mismarked. If items are found with green band markings, which indicate the item may contain chemical fillers, then personnel should leave the area immediately. A full description of the items should be provided, including a photograph or video, an estimate of the diameter and length, and any visible markings or other identifiers.

(3) If OE is found at a site and may present an imminent danger to the public, USAESCH must be contacted by phone as soon as possible to discuss interim actions. USAESCH may ask that local law enforcement officials be instructed to secure the site and contact the local EOD unit. USAESCH will then coordinate with EOD and may provide an OE Safety Specialist to assess the risks and recommend a course of action.

b. Visible Evidence of OE Contamination. The most obvious evidence of OE contamination is visible evidence at the surface. Due to the time difference between the actual contamination of the site and current assessment visits, however, OE items may not be apparent due to the effects of erosion on land markings and oxidation of metal parts or fragments. The following paragraphs describe visual evidence of OE that may be encountered on the site visit.

(1) True Craters. These are formed when an ordnance item penetrates the ground and explodes. The size varies with the depth of penetration, size of the ordnance, and the geology of the site. They can be identified by striation marks leading out from the crater, the slanted sides, and a raised lip around the crater edge.

(2) False Craters. These are formed by large unexploded projectiles and are actually just a point of entry. A false crater has vertical sides, flat bottom, and non-raised lips. False craters can be as large as 10 feet in diameter.

(3) Ordnance Items or Fragments. It may be possible to find intact OE items at the surface. In many cases, however, only fragments or parts will be found. In training ranges, the detonation or impact may shatter the item into many unrecognizable pieces. Open Burn/Open Detonation (OB/OD) operations will create the same effect.

(4) Soil Stains. An unnatural soil color may indicate bulk explosive contamination. The particular color of soil stain is not a very good indicator of the type of explosive due to weathering effects and the vast number of possible explosive mixtures. Only chemical analysis can provide reliable explosive identification. The only responsibility of the personnel performing the PAE is to note these areas in the site visit report.

6-6. Inventory Project Report.

a. General. The results of the PAE are reported in an INPR. The district executes the INPR.

b. Types of INPRs. The MSC Commander uses the information in the INPR to make eligibility determinations. An INPR may be classified as positive, negative, or NDAI.

(1) A positive INPR is one that reports an eligible property with an eligible project. The INPR Approval Memorandum authorizes the project eligibility and initiation of additional ROE, easement, or other access agreement negotiation.

(2) A negative INPR is one that reports on a property that is ineligible for DERP-FUDS funding.

(3) An NDAI INPR is one that reports on an eligible property at which there are no eligible hazards (i.e., ineligible project). Ineligible OE projects in an NDAI INPR will be confirmed by the OE MCX.

c. Contents. The contents of the INPR are dependent upon the property eligibility, project eligibility, and project category. Table 6.1 lists the documents required for the INPR. These documents include the Property Survey Summary Sheet, the FDE, Project Summary Sheet(s), Risk Assessment, and a cost estimate.

Table 6.1
Documents Included in the Inventory Project Report

| Documents | Property Status | | | |
|---|---|---|---|---|
| | NOT ELIGIBLE | CATEGORICAL EXCLUSION | ELIGIBLE | |
| | | | Project Type | |
| | | | NDAI | OE |
| MSC Commander's Memorandum | Yes | Yes | Yes | Yes[1] |
| District Engineer's Memorandum | Yes | Yes | Yes | Yes |
| Property Survey Summary Sheet | No | No | Yes | Yes |
| Findings and Determination of Eligibility | Yes | No | Yes | Yes |
| Project Summary Sheet | No | No | No | Yes |
| Project Cost Estimate | No | No | No | Yes[2] |
| Risk Assessment Code | No | No | Yes[3] | Yes[3] |
| Categorical Exclusion Form | No | Yes | No | No |

[1] The OE MCX will make a project recommendation to the MSC Commander for OE projects prior to the MSC Commander's INPR Approval Memorandum.
[2] The OE Design Center will prepare the cost estimate for OE projects.
[3] A Risk Assessment Code is required for all OE projects.

GENERAL NOTES:
1. The District Engineer's and MSC Commander's Memoranda are for the transmittal of the INPR (including amendments).
2. The FDE is for the eligibility of the property. When more than one project is included in the INPR, only one FDE, one property survey summary sheet, one District Engineer's Memo, and one MSC Memo are needed for the INPR.
3. If an eligible property with a hazard, but no project, is being proposed due to policy considerations, prepare a project summary sheet. There will not be a reason to have a cost estimate with those INPRs.

(1) Property Survey Summary Sheet. The Property Survey Summary Sheet provides information including property name (current and former); property location; property history as prepared by the geographic real estate district; description of site visit, if applicable; category of hazard (e.g., HTRW, OE, etc.); brief project description by category; listing of available studies and reports; and a POC.

(2) FDE. The FDE documents whether the property is eligible for DERP-FUDS. There are two components of the FDE: the Findings of Fact and the Determination. The Findings of Fact explains when and in what manner the site was formerly owned or used by DOD. The Determination is a summary of the MSC Commander's determination of property eligibility. The FDE is signed by the MSC Commander.

(3) Project Summary Sheet. The project summary sheet includes a description of the problem or suspected problem; project description; cost-to-complete estimate; completed RAC worksheet for OE projects; description of project eligibility; policy considerations; a description of the next step in the proposed project; and a POC. A description of the types of ordnance manufactured, stored, or utilized must be included. If no information is available, this must be stated and the source of information searched must be documented.

(4) Risk Assessment. A risk assessment will be performed for all sites under investigation for potential OE contamination. Paragraph 6-6d describes the risk assessment procedures.

(5) Cost Estimate. Due to the great uncertainty associated with determining the type, extent, and magnitude of ordnance contamination, the district providing the INPR is not required to develop a cost estimate for ordnance response actions. The OE MCX will determine the type of response action needed and the OE Design Center will prepare an estimate. The project will then be recommended to HQUSACE for inclusion into the program work plan.

d. Risk Assessment Code Worksheet.

(1) The risk assessment will be performed using the RAC Worksheet. The RAC worksheet relies on the best available information to assess the risk involved based on the potential OE hazards identified at a site. The RAC Worksheet is used to generate a RAC score, which is used to prioritize the response actions taken at FUDS. The RAC is executed by the district, reviewed by the OE MCX, and approved by the MSC. Appendix B provides an example of a RAC Worksheet.

(2) There are four general steps to performing an explosives safety risk assessment using the RAC Worksheet.

(a) Step 1 - Identify the hazard in terms of the types of OE known or expected to be present and the known or suspected distribution. Consideration must be given to effects of aging and environmental exposure on the susceptibility of energetic response.

(b) Step 2 - Determine the severity of the hazard by considering the threats the OE poses to personnel and property. Hazard severity categories are defined to provide a qualitative measure of the worst credible event resulting from personnel exposure to various types and quantities of UXO. The five hazard severity categories are: catastrophic, critical, marginal, negligible, and none.

(c) Step 3 - Determine the probability of the hazard by considering the type and amount of OE likely to be encountered, suspected condition/ease of initiation, accessibility, and the degree of current and anticipated personnel activity which could create situations for contact. The hazard probability descriptions are: frequent, probable, occasional, remote, and improbable.

(d) Step 4 - The hazard severity and hazard probability are considered together to determine the RAC score for the site. This score is used to prioritize response actions as follows:

- RAC 1 - Expedite the INPR, recommend further action by the OE MCX, immediately contact the OE Safety Manager if a TCRA situation exists.
- RAC 2 - Give high priority to completion of the INPR, recommend further action by the OE MCX.
- RAC 3 - Complete the INPR, recommend further action by the OE MCX.
- RAC 4 - Complete the INPR, recommend further action by the OE MCX.
- RAC 5 - Usually indicates that NDAI is necessary. Submit NDAI and RAC to the OE MCX.

e. INPR Review and Approval Process.

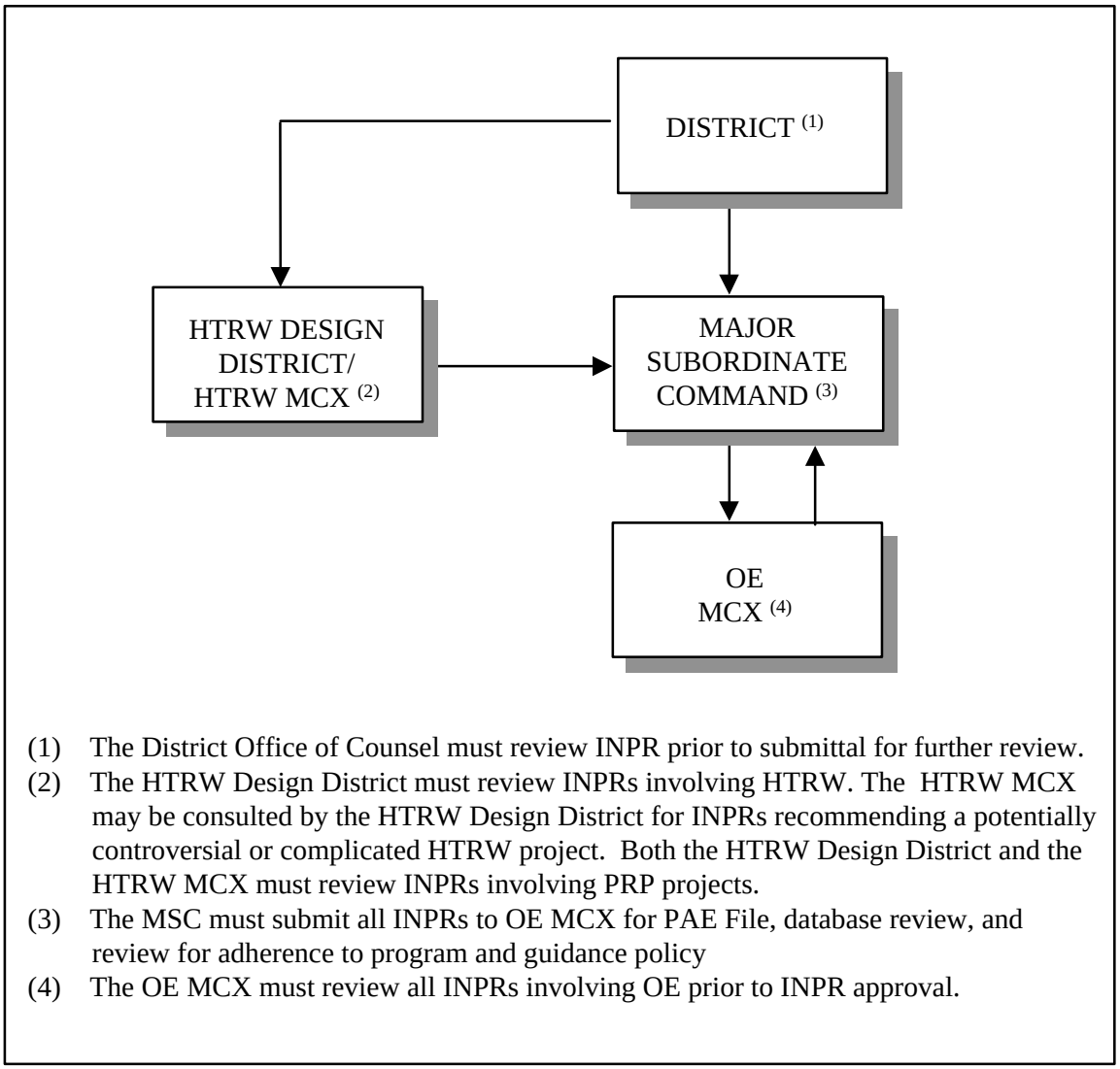
(1) The INPR must be reviewed by the district OC prior to submittal to the MSC. If a project also involves HTRW or is a potentially responsible party project, the INPR must also be reviewed by the appropriate HTRW Design District and reviewed for technical content by the HTRW MCX.

(2) The MSC must forward an OE INPR to the OE MCX. The OE MCX is responsible for returning the OE INPR, with project recommendations, within 20 days of receipt to the MSC for approval.

(3) If a project is approved, the MSC will prepare an INPR Approval Memorandum. The INPR Approval Memorandum authorizes the project eligibility and initiation of ROE, easement, or other access agreement negotiation. Additional information regarding landowner notification and access agreements is included in Chapter 3 of this pamphlet.

(4) The MSC must forward a copy of the INPR Approval Memorandum to the OE MCX for the PAE file and to authorize project approval for an ASR.

(5) The district should forward a copy of the signed FDE to each landowner as well as to the USEPA for NPL projects. Figure 6-2 illustrates the INPR review process.




(1) The District Office of Counsel must review INPR prior to submittal for further review.
(2) The HTRW Design District must review INPRs involving HTRW. The HTRW MCX may be consulted by the HTRW Design District for INPRs recommending a potentially controversial or complicated HTRW project. Both the HTRW Design District and the HTRW MCX must review INPRs involving PRP projects.
(3) The MSC must submit all INPRs to OE MCX for PAE File, database review, and review for adherence to program and guidance policy
(4) The OE MCX must review all INPRs involving OE prior to INPR approval.

Figure 6-2. Inventory Project Report Review Process

# CHAPTER 7
# SITE INSPECTION

7-1. Introduction.

a. This chapter discusses the site inspection (SI) phase of an OE response action. An SI is performed following the approval of a positive INPR. The SI may be conducted prior to INPR approval only if an exception is granted by CEMP-R. The results of the SI are reported in an ASR. The OE Design Center is responsible for executing the SI. The district is responsible for reviewing the SOW, IGE, ASSHP, and RAC updates and providing written comments or concurrence or non-concurrence to the OE Design Center.

b. The purpose of the SI is to augment the data collected during the PAE, generate additional data, confirm any contamination on-site, reevaluate relative risk, and identify areas of known or suspected ordnance contamination. A historical summary of the site will be generated based on records reviews including maps, drawings and aerial photographs; interviews; and visual inspection of the site.

7-2. Site Inspection Process. There are four general steps in an SI: records search, ASSHP, site assessment, and risk assessment.

a. Records Search.

(1) The purpose of the records search is to locate and retrieve all appropriate documents regarding the site. The research team must include a team leader, an archivist/historian, and an OE Safety Specialist. Information gathered during the records search should include dates of operations or testing, the types and quantities of ordnance used or manufactured at the site, any actual or rumored incidents of OE contamination, and any former removal operations.

(2) Copies should be made of all documents applicable to the site and marked using standard archival techniques as to the location of the original document. A master record will be maintained which shows the location of the file, POC, address and telephone number, record group, and file and box number. All interviews will be documented and maintained as part of the Administrative Record.

(3) Possible sources of historical information include the following:

(a) Local Officials. The local fire department or law enforcement agencies would normally have information if ordnance has been found at a site. They may also have historical knowledge of activities at a site.

(b) Real Estate Records. Historical real estate records can be found at the district that provides or provided support for the site. These records may contain information concerning prior clearance actions. If the property has been sold or transferred to the public, current and historical property records at the local courthouse may provide clues to actual or possible contamination. In addition, if the property was leased by the government, the lease agreement should indicate the intended use at the time the lease was signed.

(c) National Archives. Official historical Army records are stored at the National Archives in Suitland, MD. These records can provide information concerning the site mission and use.

(d) Local Military Museums. Museums may contain information that indicates the potential ordnance hazards at a site. If the site has recently undergone closure, records concerning possible ordnance hazards may be located at the 52nd Ordnance Group company responsible for the particular geographical area. Records are maintained by the company for a maximum of three years and by EOD centralized records for a maximum of five years.

(e) The Industrial Operations Command (IOC). IOC is responsible for the Army's firearms and munitions. IOC is an excellent source of information on past munitions and chemical warfare production, testing, and storage sites. Headquarters IOC is located at Rock Island, Illinois and can be reached at 309-782-1272. IOC also maintains an archive at Aberdeen Proving Ground, MD.

(f) The Army Materiel Command (AMC). AMC Technical Escort Units (TEU) have the mission of responding to and rendering safe chemical agents and munitions. The TEUs are also responsible for escorting these items while in transit to safe storage or disposal areas. The TEUs would therefore be a good source of information for sites potentially contaminated with CWM. The main POC is located at Aberdeen Proving Ground, MD.

(g) Cartographic Records Office. This office is located in Washington, DC, and may be able to provide additional information, including maps and drawings.

b. ASSHP. After the records search phase has been completed and prior to the site survey, an ASSHP should be prepared and approved in accordance with the guidance provided in Chapter 20.

c. Site Assessment.

(1) A site assessment team is required for all properties being investigated. This is a multi-disciplinary team. The team must include an OE Safety Specialist classified in the 0018 series. The purpose of the site assessment is to research local archives, interview former employees of the site activity or others who may have valuable information on site history, and conduct a visual survey to determine the presence of OE. The site survey will be conducted

using avoidance techniques; intrusive activities and sampling will not be performed. The site survey will cease once the presence of OE is confirmed. The extent of OE contamination will not be determined during the site survey.

(2) The site survey team should identify the use of the property at present and attempt to locate evidence of previous ordnance use in the area. A Global Positioning System locator may be used to identify coordinates of areas identified by the site survey team. Magnetometers or other ordnance detectors may be used only for safety purposes by the OE Safety Specialist to reduce any possible threat of unseen ordnance hazards. The magnetometer or other ordnance detector should not be used as the sole safety precaution while walking in dense brush or heavy vegetation, which prevents seeing the ground and possible exposed ordnance. Areas that cannot be safely accessed should not be entered.

(3) If OE is found at a site which may present an imminent danger to the public, USAESCH must be contacted by phone as soon as possible to discuss interim actions. USAESCH may ask that local law enforcement officials be contacted in order to secure the site and that the local EOD unit be contacted. USAESCH will then coordinate with EOD and may provide an OE Safety Specialist to assess the risks and recommend a course of action.

d. Risk Assessment. The additional information collected during the SI is used to reevaluate the risk assessment performed during the PAE and subsequently reevaluate what further action, if any, is necessary at a site. The risk assessment will be performed using the RAC Worksheet included in Appendix B. Risk assessments must be performed by personnel experienced in evaluating explosive safety risks. Details regarding the risk assessment and RAC worksheet are presented in Chapter 6.

7-3. Archives Search Report.

a. The results of the SI are documented in the ASR. Archives Assessment Sheets will be completed in conjunction with the ASR, but are forwarded to the OE MCX under separate cover.

b. ASR Format. The format of the ASR is dependent on whether further action is recommended for the site.

(1) Recommendation of Further Action. If further action is recommended for a site, the ASR will be a two-volume document following the outline shown in Table 7.1. Appendix C contains a more detailed outline of the contents of each volume.

(2) Recommendation of No DOD Action Indicated (NDAI). If NDAI is recommended for a site, the ASR will follow the same general outline as shown in Table 7.1 but will not include Section 8, “Site Ordnance and Technical Data”. The ASR will be formatted in such a manner that the recommendations and conclusions may be easily separated from the rest of the report.

This may be accomplished by the development of two volumes as shown in Appendix C, or by the development of a single volume with a separate cover sheet indicating the conclusions.

c. ASR Technical Review. The ASR must be technically reviewed by the district and the OE MCX. The OE Design Center is responsible for ASR approval.

Table 7.1
Outline of Archives Search Report when Further Action is Recommended

| Section | Title |
|---|---|
| 1 | Introduction |
| 2 | Previous Investigations |
| 3 | Site Description |
| 4 | Historical Ordnance Presence |
| 5 | Site Eligibility |
| 6 | Visual Site Inspection |
| 7 | Evaluation of Ordnance Hazards |
| 8 | Site Ordnance Technical Data |
| 9 | Other Environmental Hazards |

d. USAESCH ASR Technical Advisory Group.

(1) The USAESCH ASR Technical Advisory Group (TAG) consists of representatives from the Directorate of Engineering, the OE Design Center, and the OE MCX. The ASR TAG is responsible for assessing the results of archives searches and providing a consensus of strategy for subsequent response actions. Only ASRs recommending further action are reviewed by the TAG. The TAG is not responsible for technical review of ASRs.

(2) Once an ASR recommending further action has been technically reviewed, the activity responsible for preparing the ASR will provide the ASR along with a fact sheet to the ASR TAG. Appendix D includes a sample ASR fact sheet to be used for this purpose.

(3) The ASR TAG will review the fact sheet, ASR, and comments; discuss the options available; and agree on a strategy for further action. Subsequent actions recommended by the ASR TAG may include TCRA, NTCRA (beginning with an EE/CA), a combination of TCRA and NTRCA actions, or NDAI.

(4) Upon completion of this review, the ASR TAG will create a revised fact sheet (including a strategy for subsequent action) for submittal to the OE Design Center. The recommendation from the TAG must be thoroughly justified in writing with reference to the potential for and significance of any imminent threat to human health, safety, and the environment. The TAG's recommendation will also include a time frame for initiation of the recommended subsequent action. The OE Design Center is then responsible for developing the programmatic cost estimate required to get the project onto the correct fiscal year work plan. The OE Design Center will perform project cost estimates.

# CHAPTER 8
# ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) APPROVAL MEMORANDUM

8-1. Introduction.

a. This chapter discusses the purpose, format, and approval process for the EE/CA Approval Memorandum.

b. If the PAE and SI phases determine that a NTCRA is appropriate for a site, an EE/CA Approval Memorandum is required. The EE/CA Approval Memorandum, which is executed by the OE Design Center, is the decision document that authorizes execution of an EE/CA. Documentation to support the EE/CA Approval Memorandum may be available from the INPR, ASR, and other sources. Once completed, the EE/CA Approval Memorandum becomes a part of the Administrative Record for the site.

8-2. EE/CA Approval Memorandum Functions. The EE/CA Approval Memorandum serves four functions:

a. Secures management approval to conduct the EE/CA.

b. Documents that the situation meets the NCP criteria for initiating a response action and that the proposed action is non-time critical.

c. Provides detailed information pertaining to the site background; threats to public health, welfare, or the environment posed by the site; and projected costs.

d. Denotes completion of the PAE and SI phases of the OE response process for a site.

8-3. EE/CA Approval Memorandum Approval Process. The EE/CA Approval Memorandum is executed by the OE Design Center and forwarded to the district for subsequent submittal to HQUSACE. The District Commander, as delegated by the MSC Commander, should sign the EE/CA Approval Memorandum.

8-4. EE/CA Approval Memorandum Format. The EE/CA Approval Memorandum will be prepared in accordance with the format shown in Table 8.1. In addition to the items listed in Table 8.1, the EE/CA Approval Memorandum will include an explanation that justifies the need for the response action. Additional guidance is available in the DERP-FUDS Program Manual.

Table 8.1
EE/CA Approval Memorandum Format

| Section | Title |
|---|---|
| 1 | Subject |
| 2 | Background |
| 3 | Threat to Public Health, Welfare, or the Environment (Includes Expected Change if No Action Taken) |
| 4 | Imminent and Substantial Endangerment, if present |
| 5 | Enforcement Actions |
| 6 | Proposed Project/Oversight and Cost |
| 7 | Approval/Disapproval |

# CHAPTER 9
# ENGINEERING EVALUATION/COST ANALYSIS

## 9-1. Introduction.

a. This chapter presents an overview of the EE/CA phase of an OE response action. An EE/CA must be completed for all NTCRAs, as required by the NCP. The OE Design Center is responsible for executing the EE/CA phase.

b. The purpose of the EE/CA is to identify the most appropriate response action to address an OE risk at a project site. The determination of the recommended response alternative occurs following the completion of a site characterization, risk assessment of OE hazards present at the site, and evaluation of potential response alternatives. The data generated to support the selection of a response alternative is presented in an EE/CA report. The components of the EE/CA phase are illustrated in Figure 9-1 and explained in paragraphs 9-2 through 9-8 of this chapter.

c. If an imminent hazard is discovered during the EE/CA phase, a TCRA may be initiated. Upon completion of the TCRA, the NTCRA process will resume. The TCRA process is discussed in Chapter 5.

## 9-2. EE/CA Reconnaissance.

a. Overview. EE/CA Reconnaissance (RECON) is an optional task within the EE/CA phase. If implemented, the RECON task is the first element of the EE/CA phase. The decision to implement the RECON task is made by the OE project team on a project-by-project basis following an evaluation of the site-specific data gathered during the PAE and SI phases. The government or its A-E may complete the RECON task.

b. Objectives.

(1) The objectives of the RECON task are to:

(a) Build upon site-specific data gathered during the PAE and SI phases.

(b) Gather detailed information that can be used by the OE project team to refine the SOW and IGE for the subsequent EE/CA investigation.

(c) Determine whether the OE response should proceed directly to a removal action.

(d) Reduce the study areas or modified sector approaches for the EE/CA investigation.

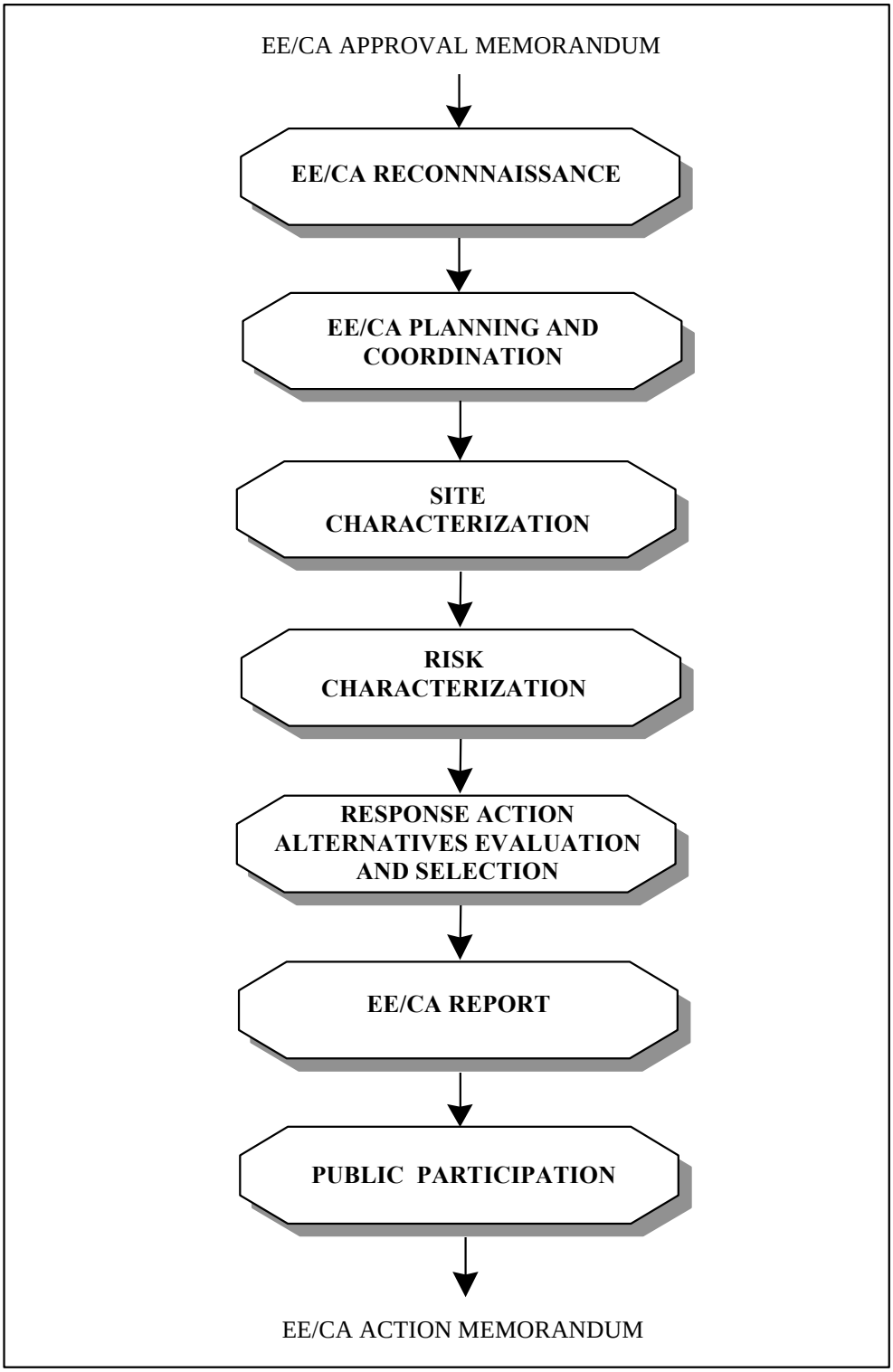



Figure 9-1. EE/CA Process

(e) Reduce the cost and time required to conduct the EE/CA through the implementation of sound engineering methods.

(2) These objectives may be achieved by:

(a) Obtaining additional historical and site-specific data to determine the nature and scope of the EE/CA site investigation. The data collected during the RECON task should be suitable for incorporation into the Geographic Information System (GIS).

(b) Defining the geographical extent of the ordnance contamination at the site through the use of aerial photography and a GIS.

(c) Determining the best type of OE detection equipment to use at a site during the EE/CA site characterization.

(d) Determining the best field methodology for completing the EE/CA phase.

c. RECON Elements. The RECON task consists of six sub-elements: Work Plan/ASSHP; Analysis of the ASR; Spatial Analysis (Aerial Survey); Ground Reconnaissance; Technology Evaluation; and Analysis Report and Data Archive. These sub-elements are illustrated in Figure 9-2 and discussed in the following paragraphs.

(1) Work Plan/ASSHP.

(a) The OE Design Center is responsible for executing the Work Plan. The Work Plan will be submitted to the district for review and written concurrence or non-concurrence. The OE MCX will monitor the Work Plan.

(b) Since RECON activities will be non-intrusive and anomaly avoidance techniques will be implemented, an ASSHP will be prepared in accordance with the guidance provided in Chapter 20.

(2) Analysis of the ASR. The OE project team will build upon existing ASR data and any subsequent data; for example, local law enforcement or EOD records. The data will be converted into a spatially coincident digital format. This conversion of data will allow the historical and site information to be used throughout the project.

(3) Spatial Analysis (Aerial Survey). The OE project team will complete a detailed analysis of spatial data. Spatial analysis may provide information to assist in making valid decisions regarding predicted areas of interest at the site by differentiating potentially contaminated areas from uncontaminated areas. This is accomplished through spatial analysis of the ASR data and, if necessary, by completing an aerial survey of the site. The aerial survey may be either specifically flown for the project or a recent aerial survey may be obtained from a local

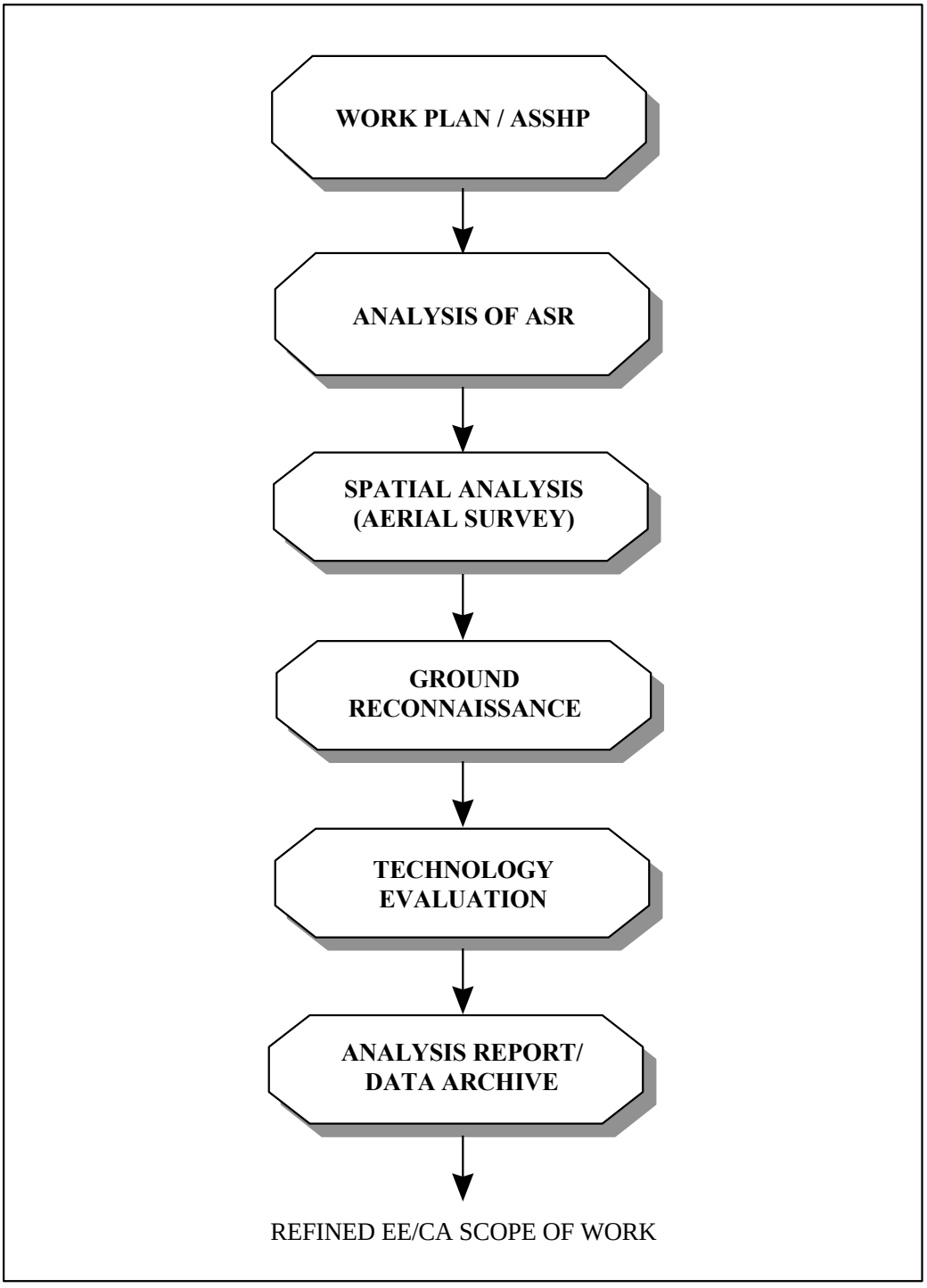



Figure 9-2. EE/CA Reconnaissance Process

air survey company. The aerial survey should be current so that all improvements are shown and must also meet established OE Design Center requirements for aerial mapping.

(4) Ground Reconnaissance.

(a) The OE project team will conduct a ground reconnaissance (ground RECON) to verify the results of the spatial analysis. During the ground RECON, the OE project team (which will include an OE Safety Specialist) will look for evidence of OE contamination such as changes in vegetation, soil characteristics, and ground scars. A ROE may be required prior to the ground RECON.

(b) If no evidence of OE contamination is found, then NDAI will be recommended. If OE that may present an imminent danger to the public is found at a site, USAESCH must be contacted by phone to discuss interim actions. USAESCH should coordinate with local law enforcement officials to secure the site and ensure that the local EOD unit has been contacted. USAESCH will then coordinate with EOD and may provide an OE Safety Specialist to assess the risks and recommend a course of action.

(5) Technology Evaluation.

(a) The purpose of the technology evaluation is to determine which OE detection instrument is most appropriate for a specific site within a reasonable cost. During this task, various OE detection instruments will be evaluated by establishing a test grid.

(b) The location of the test grid will be based upon ASR information, visual review, and a sweep with an ordnance detector. The test grid will then be seeded with representative inert OE items within the range of depths that the ordnance is expected to be found at the site. When the test grid is established on a property, a ROE may be required. ROE requirements are discussed in Chapter 3.

(6) Analysis Report and Data Archive. The results of the ASR analysis, spatial analysis, ground RECON, and technology evaluation will be compiled into an Analysis Report and Data Archive. The OE project team will use this information to:

(a) Develop the EE/CA SOW.

(b) Develop EE/CA planning documents (i.e., Work Plan, SSHP).

(c) Provide evidence that, in some cases, the OE response should proceed directly into a removal action without further study. If the removal action will be conducted with a planning period of less than six months, the Action Memorandum must be published within 60 days of initiating the removal action. A 30 day public review period is also required. Any information gathered during this response action should be incorporated into the EE/CA document.

9-3. EE/CA Planning and Coordination. The EE/CA planning and coordination process includes the preparation of the EE/CA SOW, IGE, and schedule; completion of a site visit; preparation and approval of all required planning documentation; and fulfillment of the project management, regulatory, real estate, and public participation requirements.

a. Preparation of the EE/CA SOW. The site-specific data gathered during the PAE, SI, and RECON (if implemented) is used to prepare the EE/CA SOW. The OE project team will manage the preparation of the SOW and ensure that all applicable technical disciplines are appropriately involved. Since safety is a primary concern during OE response projects, the EE/CA SOW must be closely coordinated with the project OE Safety Specialist. Additionally, the OE MCX may be consulted to provide the appropriate statements concerning the background or authority for the task order's award. An example EE/CA SOW is provided on the OE MCX website at http:\\www.hnd.usace.army.mil\oew.

b. Preparation of the IGE. The IGE for an EE/CA will be prepared in accordance with the guidance provided in Chapter 3.

c. Site Visit.

(1) General. If the EE/CA A-E performed the RECON task, then a site visit should not be necessary. However, if a RECON was not included in the A-E's SOW, then the EE/CA A-E will conduct a site visit.

(2) Site Visit SOW. The site visit may be authorized as either a purchase order or as the first task of an incrementally funded contract. Sample SOWs for the stand-alone site visit and the site visit included as a task in a larger task order are found on the OE MCX website at http:\\www.hnd.usace.army.mil\oew.

(3) Purpose. The purpose of the site visit is to provide the A-E with the opportunity to gather pertinent information for use in preparing the Work Plan and other planning documents. The information collected from the site visit allows the A-E to gain a better understanding of the nature and extent of OE contamination and verify the locations of the proposed areas of interest. This information, which is instrumental in planning the EE/CA, includes:

(a) Site features, such as terrain, access, and amount of brush clearance required.

(b) Location of/coordination with nearest hospital.

(c) Location of/coordination with nearest fire station.

(d) Coordination with local airport/Federal Aviation Administration representatives.

(e) Coordination with local police, sheriff, and/or military police to assess security.

(f) Fencing requirements for explosives storage magazines.

(g) Location for support zone and explosive storage magazines.

(h) Logistical coordination for lodging, equipment and vehicle rental, office space, explosives dealers, etc.

(i) Coordination with Range Control, Defense Reutilization Management Office, Ammunition Supply Point, and Post Provost Marshall, if applicable.

(4) Site Visit Requirements. The following paragraphs present requirements that should be fulfilled for the site visit:

(a) Prior to the site visit, the A-E will be provided with copies of the ASR and any other site-specific information for review.

(b) An ASSHP will be prepared in accordance with the guidance provided in Chapter 20.

(c) Generally, no more than three A-E personnel are required to participate. One A-E participant must be a PM and one must be a qualified Senior UXO Supervisor.

(d) Since the site visit will be non-intrusive and anomaly avoidance techniques will be implemented, site visit participants are not required to have Hazardous Waste Operations (HAZWOPER) training.

(e) The district will coordinate with the property owner/operator prior to the site visit if a ROE is required.

(f) A site visit for a typical project should take no longer than five days, including travel time.

d. Preparation of Contractor Planning Documents.

(1) Work Plan.

(a) A site-specific Work Plan is required for all EE/CA projects. The Work Plan documents the methodology that will be used to complete the EE/CA. Following the site visit, the Work Plan will be developed in accordance with the SOW. An example of the contents for an EE/CA Work Plan is provided in Table 9.1. Additional information on the EE/CA Work Plan requirements is provided in the OE MCX DID OE-001, “Work Plan”, which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

Table 9.1
EE/CA Work Plan Outline

| Chapter | Title |
|---|---|
| Cover Page | |
| Table of Contents | |
| 1 | Introduction |
| 2 | Site Description |
| 3 | Project Management |
| 4 | Overall Approach to OE EE/CA |
| 5 | Scope of Work By Task |
| 6 | Site Characterization Planning and Operations |
| 7 | OE Planning and Operations |
| 8 | Site Safety and Health Plan |
| 9 | Environmental Protection Plan |
| 10 | Data Management Plan |
| 11 | Quality Control |
| 12 | References |
| Appendices | |

(b) The OE Design Center executes the Work Plan. The district is responsible for reviewing the Work Plan and providing comment and written concurrence or non-concurrence. The OE MCX monitors the Work Plan.

(c) When review of the draft document is completed, the government will provide comments to the A-E for incorporation into the final document. A minimum turnaround is expected, and the final document will be back-checked for adequate revisions. Once the draft comments are incorporated, the document may be sent to regulators or other stakeholders for review and comment.

(d) Following the approval of the Work Plan from the OE Design Center and the CO, and if other prerequisite documents are approved, a Notice-to-Proceed will be issued.

(e) The Work Plan will be placed in the Administrative Record for the project. The PM and project team members should also maintain a current copy of the Work Plan.

(f) Any changes to the approved Work Plan will be reviewed by the OE project team and approved by the OE Design Center and CO prior to implementation. Changes to the Work Plan should be incorporated within 21 days.

(2) SSHP. As a part of the Work Plan, the A-E will also prepare a SSHP in accordance with the guidance provided in Chapter 20.

(3) Environmental Protection Plan.

(a) The A-E will prepare an Environmental Protection Plan as a part of the Work Plan. This plan should include an assessment of ARARs, which must be identified during the EE/CA planning process. ARARs are defined in paragraph 1-3g of this pamphlet.

(b) ARARs are identified on a chemical-specific, location-specific, and action-specific basis. ARARs require an analysis for applicability, relevance, and appropriateness. First, the determination is made whether a requirement is applicable. If it is not applicable, then a determination is made whether it is both relevant and appropriate. When this analysis concludes that a requirement is both relevant and appropriate, then the requirement must be complied with to the same extent as if it were an applicable requirement.

(c) Non-promulgated advisories or guidance documents issued by Federal or state governments do not have the status of potential ARARs. However, these “to be considered” criteria may be used in determining the necessary level of cleanup for human safety and protection of the environment.

(4) Real Estate and Regulatory Requirements. During the EE/CA planning and coordination process, the PM must ensure that all applicable real estate and regulatory requirements, as discussed in Chapter 3, have been satisfied. The PM should also ensure that the public involvement requirements discussed in Chapter 4 have been satisfied. Additionally, the applicable safety and training requirements, as specified in Chapters 20 and 24 respectively, must be fulfilled. The PM may also consider the establishment of an Anomaly Review Board (ARB). ARBs are only used in exceptional circumstances (e.g., an ARB may be used during an EE/CA investigation at a highly contaminated site in a heavily urbanized area). Information on ARB procedures is provided in Appendix E.

9-4. Site Characterization.

a. Overview.

(1) The purpose of an OE site characterization is to obtain surface and subsurface OE data to characterize the site and to generate recommendations for the proposed OE response action. This characterization should include data from any OE that has been located and/or disposed of by EOD or local law enforcement. Potential sources for this data include the ASR, EOD records, or local law enforcement records. The following types of data should be collected:

(a) Type(s) of OE.

(b) Location of OE.

(c) Density of OE.

(d) Penetration Depth.

(2) The components of the site characterization phase include:

(a) Implementation of the sampling methodology.

(b) OE Detection Instrument Testing, if not completed during the RECON task.

(c) Area preparation.

(d) Field sampling.

b. Statistical Tools. During an EE/CA site characterization, the following statistical tools may be used to collect site-specific data: SiteStats/GridStats or UXO Calculator. Contact the OE MCX for additional detail on these statistical tools.

(1) SiteStats/GridStats. SiteStats may be used during sampling efforts to aid in establishing the boundaries of contaminated areas and estimating the density of contamination within an area. SiteStats provides for sequential sampling procedures and a statistical determination of sampling termination points. SiteStats accepts a small amount of uncertainty in characterizing individual subareas (grids) in exchange for a much greater understanding of the contamination of the overall site. GridStats provides a statistical sampling methodology for estimation of ordnance contamination density within individual grids.

(2) UXO Calculator. The UXO Calculator is a statistical model for determining the amount of UXO in a sector. The UXO Calculator assumes homogeneous OE contamination within an identified area. It is used to determine statistical confidence intervals for UXO density and to perform statistical tests concerning UXO densities.

c. OE Detection Instrument Testing. OE detection instruments should be field tested prior to each project to ensure their applicability to the unique geographical characteristics of the site. If the RECON task is included in the EE/CA process, the OE detection instrument with the best documented performance for reasonable cost should be selected for the EE/CA field investigation. If the RECON task was not included in the EE/CA process, then the A-E should complete OE detection instrument testing as part of the initial field effort. The procedures for OE detection instrument testing are described in Chapter 21.

d. Area Preparation. Area preparation includes the identification and marking of geophysical sampling grids and the removal of sufficient vegetation and other obstacles which may restrict sampling efforts.

(1) Location Surveys and Mapping. Location surveys and mapping will be performed by the A-E to establish the boundaries of the areas under investigation. The procedures to be used in the execution of location surveys and mapping are discussed in Chapter 21.

(2) Brush Clearance.

(a) Prior to conducting any field sampling, brush clearance may be required. The purpose of brush clearance is to remove sufficient vegetative growth from the areas to be investigated in order to effectively locate, investigate, and remove subsurface anomalies.

(b) The vegetation removal techniques used must be coordinated with the district environmental staff and documented in the Work Plan. A UXO Technician II must always escort the brush clearing crew in areas not previously cleared of OE. The safety requirements listed in EM 385-1-1 must be followed. Personal Protective Equipment (PPE) will be provided to the brush clearance crew and used as required for protection. All brush clearance personnel must be trained in the safe operation of the equipment and have obtained site-specific safety training in accordance with Chapter 24.

e. Field Sampling. During the field sampling task, surface and subsurface sampling are conducted to obtain the data necessary to conduct an accurate EE/CA investigation.

(1) Surface Sampling. Surface sampling is conducted by UXO personnel. The UXO personnel will visually inspect the site investigation area; identify grids; mark any located UXO; and record UXO type, location, density, and level of hazard.

(2) Subsurface Sampling.

(a) Prior to the subsurface sampling effort, the A-E will perform a geophysical survey to locate subsurface anomalies. The procedures for conducting OE detection surveys are discussed in Chapter 21. OE or suspected OE identified by the OE sampling protocol will be intrusively

investigated. Only approved UXO personnel will perform intrusive operations. OE removal actions will proceed in accordance with 29 CFR 1926, Subpart P.

(b) Once an OE item has been exposed, it will be inspected, identified, and transported to a designated area for cataloging and eventual disposal. If an OE item cannot be safely moved to an alternate location for destruction, it will be blown-in-place.

(c) If a subsurface anomaly is removed, then the excavated location will be rechecked with a magnetometer or other ordnance detector. Upon completion of the recheck, if the location does not produce another anomaly, then the excavated area will be backfilled. If an OE item is recovered from the area, the location will be marked and the item disposed of in accordance with approved project procedures.

(d) Evacuations are sometimes necessary when conducting intrusive investigations to minimize the risk of the operation. An exclusion zone distance is calculated to ensure that all non-essential personnel are outside of that distance during the conduct of the excavation. The exclusion zone distance may be reduced by implementing engineering controls. The use of engineering controls is discussed in Chapter 21.

(e) There are several other considerations which must be accounted for during the intrusive investigation, including: explosives storage, engineering controls, exclusion zone management, disposal and transportation of OE, and quality assurance. These topics are discussed in detail in later chapters of this pamphlet.

9-5. Institutional Analysis.

a. Purpose. An institutional analysis should be conducted to show what opportunities exist to implement an institutional control program at a specific site. The institutional analysis also identifies the existence of any local, state, federal, or private agencies that may be available to assist in the implementation or maintenance of the institutional controls program. An institutional analysis is necessary in order to evaluate whether institutional controls are viable at a particular site as a stand-alone response action or as a supplement to other cleanup activities. The institutional analysis will also aid in developing the most effective institutional control program, if it is selected as the response alternative or as part of a response alternative.

b. Components.

(1) There are five elements of an institutional analysis which should be evaluated for each local, state, federal or private agency that may be able to assist in the implementation or monitoring of a proposed institutional controls program. These elements include:

(a) Jurisdiction of the agency.

(b) Authority exercised by the agency within its jurisdiction.

(c) Mission of the agency.

(d) Capability of the agency.

(e) Desire of the agency to implement the institutional control being considered.

(2) Contact the OE MCX for additional information on the application of institutional controls to the EE/CA process.

c. Determination of Existing Institutional Controls. The existence of any current deed restrictions or other type of institutional control that may have been placed on the property in the past as a result of some other activity should be determined. If such restrictions are found to already exist at a site, it may be easier to modify the existing restriction to address the OE risk than to implement an entirely new institutional control.

9-6. Risk Characterization.

a. Purpose. A risk characterization is required as part of the EE/CA process. A risk characterization of an OE site is conducted to determine the level of safety risk that exists at a site as a result of the OE contamination. The risk characterization is a key component in determining the level of removal action necessary to address the safety risk and the basis on which subsequent cost-benefit analyses are conducted in the EE/CA.

b. Types of Risk Characterization Tools. There are two main types of risk characterization tools: qualitative and quantitative. Either type of risk characterization tool may be used, depending upon which most appropriately fulfills project requirements. For additional information on the selection of risk characterization tools, contact the OE MCX.

9-7. Development and Evaluation of Response Action Alternatives.

a. Development of Response Action Alternatives. Once site-specific data has been gathered and analyzed, potential site-specific response action alternatives will be developed. A response action alternative may include physical OE removals, as well as any other alternatives that reduce risk to the public. The alternatives will be developed based on existing site conditions, historic use of the site, the existing or proposed land use, and the extent and depth of OE. Site-specific alternatives must ensure the most effective use of resources, while providing maximum return to the public.

b. Response Action Categories. Response action alternatives are classified into four general categories: No DOD Action Indicated, Institutional Controls, Surface Clearance, and

Subsurface Clearance. A proposed removal action may include a combination of these alternatives.

(1) No DOD Action Indicated. This response action involves the continued use of the site in its current condition. An NDAI may be appropriate if some removal action has already occurred at the site or sector of the site or if the risk evaluation has determined that there is a very low-level of safety risk.

(2) Institutional Controls. Institutional controls may be used either as a stand-alone response action or as a supplement to other cleanup activities in order to address the residual risk that remains at a site after a cleanup has been completed. Institutional controls are a response action alternative used to restrict access to the site. Access can be restricted by imposing administrative restrictions and/or by installing physical barriers. Administrative restrictions could take the form of a deed restriction limiting the future use of the parcel or requiring that precautions be taken during any future construction activities. Physical barriers may involve fencing and posting the area to ensure that the local populace does not enter the property and inadvertently come into contact with OE. Contact the OE MCX for additional information on institutional controls.

(3) OE Surface Clearance. The OE surface clearance alternative includes the investigation and removal of all potentially hazardous OE items to a depth of six inches. An OE surface clearance alternative may be recommended for a site based on the nature and extent of the OE contamination, the current and projected use of the site, and local community and regulatory acceptance of the alternative. An OE surface clearance must be performed by UXO-qualified personnel.

(4) OE Subsurface Clearance.

(a) The subsurface OE clearance alternative includes the investigation and removal of all potentially hazardous OE items to a certain depth at a site. The depth of the OE clearance is based on the nature and extent of the OE contamination, the current and projected use of the site, and local community and regulatory acceptance of the proposed alternative. When there is insufficient data to develop site-specific clearance depths, refer to DOD 6055.9-STD for subsurface clearance default depth. However, it is more cost effective to develop site-specific clearance depths based on current and future use of the site and the actual depth of OE found during the EE/CA investigation.

(b) An OE subsurface clearance is typically conducted using geophysical instruments to map the subsurface conditions and to determine the locations of anomalies that may be buried OE items. Upon completion of the geophysical survey and an analysis of the data, UXO-qualified personnel perform intrusive investigations to determine the nature of the geophysical anomalies.

c. Evaluation of Response Action Alternatives. Once the cleanup objectives have been established for a site, the various response action alternatives developed in the EE/CA must be evaluated in terms of how well they will meet these objectives.

(1) Three general evaluation categories are used to evaluate the proposed response action alternatives: effectiveness, implementability, and cost. The following paragraphs and Table 9.2 provide criteria which should be considered in the evaluation of each response action alternative.

(a) Effectiveness. The effectiveness of each response action alternative is evaluated based on its level of protection of human health and the environment, compliance with ARARs, and its ability to achieve the response action objectives. The effectiveness category is divided into four evaluation criteria:

- Overall Protection to Human Health and the Environment.
- Compliance with ARARs.
- Long-Term Effectiveness.
- Short-Term Effectiveness.

(b) Implementability. The implementability of each response action alternative is evaluated based on the following evaluation criteria including:

- Technical Feasibility.
- Administrative Feasibility.
- Availability of Services and Materials.
- Stakeholder Acceptance.

(c) Cost. The cost of each response action alternative is based on:

- Capital Costs.
- Post Removal Site Control Costs.

d. Comparative Analysis of Response Action Alternatives. Those alternatives which still appear feasible after the evaluation described above are then compared to each other using the same evaluation criteria described above. During this comparative analysis, the alternatives are ranked and the recommended response action alternative is selected.

Table 9.2
Criteria to Be Considered During Evaluation of Response Action Alternatives

| Evaluation Category | Criteria to be Considered |
|---|---|
| Effectiveness | • Protectiveness:<br>– Protective of public health and community<br>– Protective of workers during implementation<br>– Protective of the environment<br>• Complies with ARARS<br>• Long Term Effectiveness<br>• Short Term Effectiveness |
| Implementability | • Technical Feasibility:<br>– Construction and operational considerations<br>– Demonstrated performance/useful life<br>– Adaptable to environmental conditions<br>– Can be implemented in 1 year<br>• Administrative Feasibility:<br>– Permits required<br>– Easements or right-of-ways required<br>– Impact on adjoining property<br>– Ability to impose institutional controls<br>• Availability of Services and Materials:<br>– Equipment<br>– Personnel Services<br>– Outside laboratory testing capacity<br>– Off-site treatment and disposal capacity<br>– Post removal site control<br>• Stakeholder Acceptance |
| Cost | • Capital Cost<br>• Post-removal site control cost |

9-8. EE/CA Report.

a. The EE/CA Report documents the methodologies used during the site characterization and presents the findings of the EE/CA evaluation. The EE/CA Report is a flexible document tailored to the scope, goals, and objectives of the NTCRA process. It should contain only those data necessary to support the selection of a response alternative and future five-year recurring reviews. Existing documentation should be relied on whenever possible. A sample format for an EE/CA Report is presented in Table 9.3.

Table 9.3
EE/CA Report Sample Format

| Chapter | Title |
|---|---|
| Executive Summary | |
| 1 | Introduction |
| 2 | Site Description |
| 3 | Site Characterization |
| 4 | Risk Evaluation |
| 5 | Institutional Analysis |
| 6 | Identification of Response Action Objectives |
| 7 | Identification and Analysis of Response Action Alternatives |
| 8 | Comparative Analysis of Response Action Alternatives |
| 9 | Recommended Response Action Alternative |
| 10 | Recurring Reviews |
| Appendices | |

b. The EE/CA Report is executed and approved by the OE Design Center. The EE/CA Report is reviewed by the district and the OE MCX.

c. ESS Requirement During the EE/CA Process.

(1) An ESS is typically prepared as part of the removal action planning process, as discussed in detail in Chapter 11. However, an ESS is also prepared if the Draft EE/CA Report recommends the response action alternative of either NDAI or Institutional Controls. Examples

of the content and format of an NDAI ESS and Institutional Controls ESS are presented in Appendices F and G, respectively.

(2) Both the NDAI ESS and Institutional Controls ESS must receive concurrence from the US Army Technical Center for Explosives Safety (USATCES) and the Department of Defense Explosives Safety Board (DDESB). Once the ESS has been approved, and all other comments on the Draft EE/CA have been incorporated, the Final EE/CA Report may be prepared.

9-9. EE/CA Public Participation and Approval Process.

a. Once the EE/CA Report has been prepared and reviewed by the OE Design Center, the OE MCX, the district, and other stakeholders, the EE/CA becomes part of the Administrative Record for the site. The EE/CA is made available for public review and comment. A formal 30-day (minimum) public comment period is required, during which time public meetings may be held to discuss the results of the field investigation and the alternative selection process.

b. Upon completion of the public comment period, a responsiveness summary is prepared that discusses any significant public comments received and the actions taken to address those comments. The responsiveness summary becomes part of the Administrative Record.

c. Once the comments received during the public comment period have been incorporated into the EE/CA, the final EE/CA, along with the responsiveness summary, becomes part of the Administrative Record for the site.

d. If OE remains or is suspected to remain after completion of a response action, the property owner(s) will be apprised through the Administrative Record or other written agreements, and all documentation will be annotated accordingly.

# CHAPTER 10
# ACTION MEMORANDUM

10-1. Introduction.

a. This chapter discusses the purpose and format of the Action Memorandum. Specific language to be used in an Action Memorandum for OE response actions is also provided.

b. The Action Memorandum is a concise document that identifies the response action chosen for implementation at a site. The Action Memorandum may also reserve the appropriate funding needed for the proposed response action. An Action Memorandum is required prior to implementation of TCRAs and NTCRAs.

c. As the primary decision document for the OE response action, the Action Memorandum serves the following functions:

(1) Substantiates the need for the response action.

(2) Identifies the proposed action.

(3) Explains the rationale for the response action selection.

(4) Documents that the appropriate process was followed in the selection of the response action.

10-2. Applicability.

a. NTCRAs. An Action Memorandum will be prepared for all NTCRAs performed under CERCLA after the EE/CA has been made available for public review and comment. For NTCRAs, the Action Memorandum is based on information contained in the EE/CA Report and consideration of public comments and community concerns. The same agency that prepared the EE/CA should prepare the EE/CA Action Memorandum.

b. TCRAs. The contents and review process for a TCRA Action Memorandum are discussed in Chapter 5.

10-3. Action Memorandum Format.

a. Since the Action Memorandum records the decision of the selected alternative or substantiates an NDAI recommendation, it must be written in a clear, concise manner. For NTCRAs, detailed information from the EE/CA should not be repeated in this document but rather should be incorporated by reference to the EE/CA Report, as appropriate.

b. The format for the Action Memorandum is shown in Table 10.1 and discussed in the following paragraphs.

Table 10.1
Action Memorandum Format

| Section | Topic |
|---|---|
| 1 | Introduction |
| 2 | Statement of Basis and Purpose |
| 3 | Project Justification |
| 4 | Alternatives Considered |
| 5 | Highlights of Community Participation |
| 6 | Coordination Summary |
| 7 | Selection Criteria |
| 8 | Description of Selected Remedies |
| 9 | Trade Off Analysis |
| 10 | Documentation of Significant Changes |
| 11 | Responsiveness Summary |

(1) Introduction. This section identifies the site and provides a short declaration of intent. For example: "A project including the physical removal of explosives is proposed to eliminate explosive ordnance hazards and to manage residual risk is approved for (site name and location)."

(2) Statement of Basis and Purpose. This section provides a brief background of the site, including the basis and purpose for the response action. Include the statement "This decision document presents the selected action for (Site Name) in (Location) which was chosen in accordance with the (Defense Environmental Restoration Program or BRAC, as appropriate)." The Ordnance Response Program addresses "other environmental damage (such as the detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health, welfare, or the environment." The decision process is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan. The basis for this decision is documented in the Administrative Record for the site. This record is available at (location). The State/Commonwealth of _____ (concurs or does not concur) with the selected alternative."

(3) Project Justification. This section provides a brief justification for the project, including a statement that the results of any investigations at the site reveal the presence of ordnance contamination and that the public has access to the site, which would create a situation in which the ordnance poses an imminent and substantial endangerment to public safety, welfare, and the environment. It provides a brief summary of the findings of any site investigations.

(4) Alternatives Considered. This section provides a brief summary of the alternatives that have been considered for the site.

(5) Highlights of Community Participation. This section includes a statement that all public involvement requirements have been satisfied and a summary of all coordination efforts (e.g., dates of public meetings, media days).

(6) Coordination Summary. This section provides a summary of all coordination efforts and should include the following statement, as applicable: "This project has been coordinated with (state agencies, etc.). All phases from Work Plans through field work to the draft and final EE/CA were reviewed by (state agencies, etc.). (Both, all) were active participants in the project and support the findings of the EE/CA."

(7) Selection Criteria. This section provides a summary of the criteria used to evaluate the alternatives. Include the following statement, as applicable: "The selection criteria used to evaluate the alternatives included effectiveness in reducing the public safety risks, implementability, and cost criteria. These criteria are further discussed in Section (_) of the EE/CA."

(8) Description of Selected Remedies. This section presents the remedy(ies) selected for the site or each sector of the site, as applicable.

(a) When further action is recommended, the Action Memorandum will include a brief summary of the OE risk factors identified and documented in the EE/CA. These sections should highlight land use, development, and access considerations for the site or sector of the site as well as any activities that could increase the risk of an OE accident.

(b) When an NDAI determination is recommended, the Action Memorandum must fully substantiate the recommendation in a manner consistent with the approved NDAI ESS and EE/CA Report. The Action Memorandum should also address any long-term monitoring activities which may be required.

(9) Trade Off Analysis. This section includes the following statement, as applicable: "The alternative recommended for each sector is the best alternative for that sector, as determined by the EE/CA."

(10) Documentation of Significant Changes. This section includes the following statement: "If the actions outlined in this Action Memorandum are delayed or not taken, the potential exists for continued and substantial endangerment to public health, welfare, and the environment."

(11) Responsiveness Summary. This section provides a summary of all public involvement activities.

10-4. Action Memorandum Review and Approval Process.

a. The Action Memorandum is executed by the OE Design Center. Assistant Chief of Staff for Installation Management approves all Action Memorandums for projects greater than $6 million, including NPL projects. The OE MCX will review the Action Memorandum and concurrence by HQUSACE is required.

b. The MSC Commander approves Action Memorandums for projects between $2 million and $6 million, in addition to all NPL projects under $6 million.

c. The District Commander approves non-NPL Action Memorandums for projects less than $2 million.

# CHAPTER 11
# REMOVAL DESIGN

11-1. Introduction.

a. This chapter provides information on the removal design process that occurs prior to the removal action phase of an OE response action. The OE Design Center is responsible for the removal design in coordination with the PM.

b. Instead of completing a formal removal design, USACE typically performs the tasks associated with removal design during the development of the SOW, Work Plan and ESS for the removal action. The level of detail for the removal design phase is dependent on the complexity of the work to be performed and the type of contract to be utilized.

c. The purpose of the removal design process is to describe the technical details of how the removal action will be performed. The removal design process includes the following components, which are illustrated in Figure 11-1 and discussed below:

(1) Preparation of the removal action SOW and IGE.

(2) Completion of a site visit to gather additional information on the nature and extent of contamination at the site.

(3) Preparation of planning documentation (e.g., Work Plan, SSHP, and ESS) and completion of all coordination tasks prior to the Notice-to-Proceed for the removal action.

11-2. Preparation of the Removal Action Scope of Work and Independent Government Estimate. The OE Design Center is responsible for executing and approving the OE removal action SOW and IGE. SOW and IGE preparation and quality excellence will be accomplished through the conscientious, cooperative efforts of each design team member. The district reviews the SOW and IGE and provides comments and written concurrence or non-concurrence.

a. Removal Action SOW.

(1) The OE removal action SOW must comply with the approved Action Memorandum for the project. The OE project team will manage the preparation of the SOW and ensure that all applicable technical disciplines are appropriately involved. Project safety is a primary concern during OE removal design and execution. The removal action SOW must be closely coordinated with the project OE Safety Specialists.

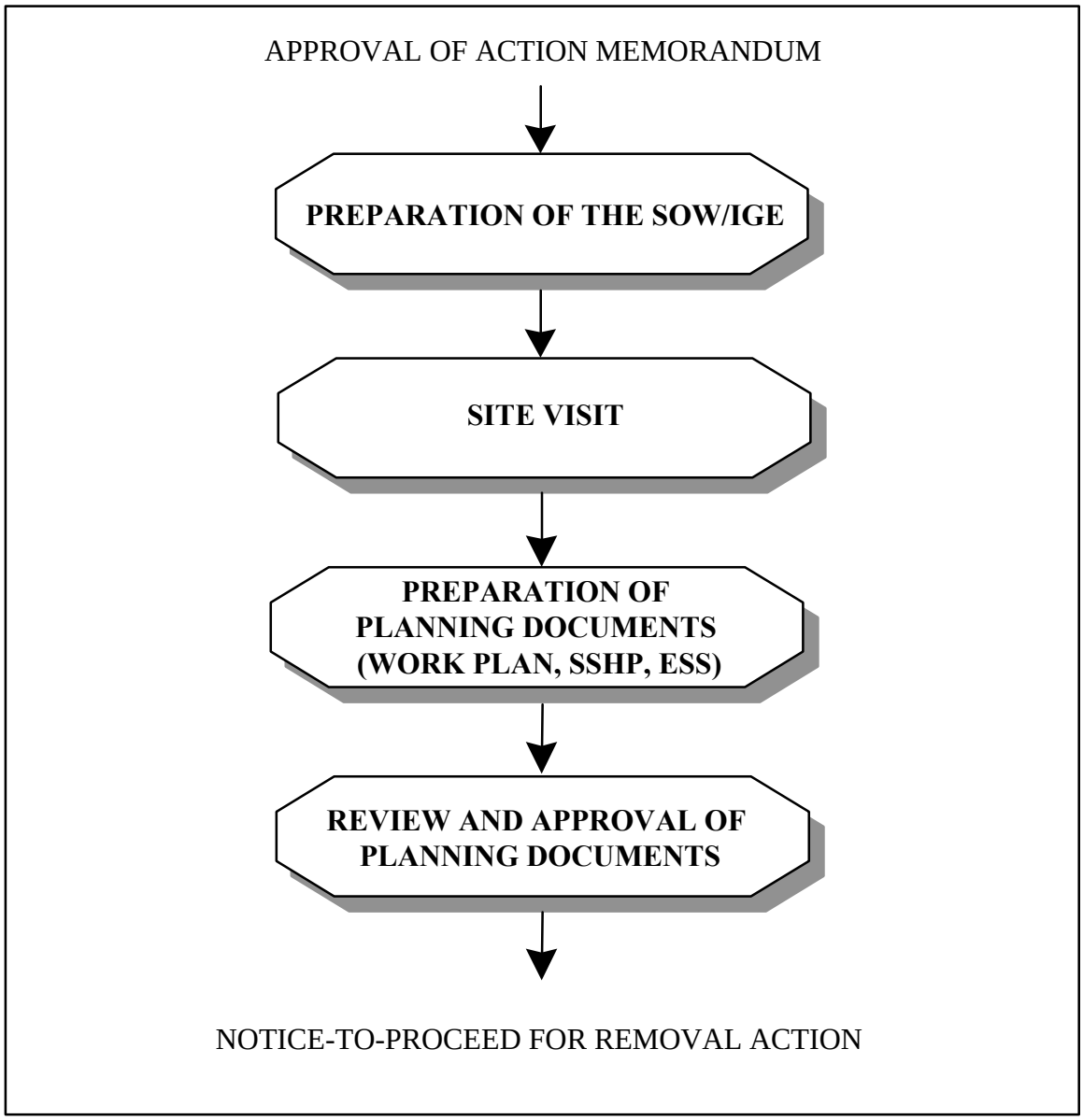



Figure 11-1. Removal Design Process

(2) An example removal action SOW is located on the OE MCX website at http://www.hnd.usace.army.mil/oew. The following tasks are typically included in the SOW:

(a) Site visit.

(b) Work Plan preparation.

(c) Location surveying and mapping.

(d) Site preparation.

(e) Geophysical investigation.

(f) OE removal.

(g) Institutional analysis.

(h) Quality control.

(i) Public affairs assistance.

(j) Final Report.

(3) The OE MCX may be consulted to provide the appropriate statements or paragraphs concerning background and authority for the task order's award.

(4) The SOW will be reviewed by the PM, OE Design Center personnel and other appropriate personnel, as required.

b. Preparation of the IGE. The IGE for an OE removal action will be prepared in accordance with the guidance provided in Chapter 3.

c. Removal Action Contract Award. Following the approval of the SOW and IGE, the removal action contract is solicited and awarded.

11-3. Site Visit.

a. The site visit is conducted to provide the UXO contractor with the opportunity to gather pertinent information for use in preparing the cost estimate and project planning documents.

b. Site Visit Task Order/Purchase Order. The site visit may be awarded as a task in the removal action task order or as a stand-alone task order/purchase order. Sample SOWs for awarding the site visit as either a task in the overall removal action task order or as a stand alone task/purchase order are located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

c. The information collected from the site visit allows the UXO contractor to gain a better understanding of the nature and extent of OE contamination, verify the locations of the proposed areas of interest, and better define the locations for the removal action. Examples of site-specific information important to removal design include:

(1) UXO type, composition and quantity.

(2) Anticipated depth of UXO.

(3) Site topography and vegetation.

(4) Available environmental resource data.

(5) Past, current, and future land use.

(6) Geologic conditions.

(7) Clear distances to inhabited buildings.

(8) Man-made features potentially affected by removal actions.

d. Site Visit Requirements. The site visit requirements for an EE/CA are applicable to the removal action phase. Site visit requirements are discussed in Chapter 9, paragraph 9-3c(2).

11-4. Preparation, Review and Approval of Contractor Planning Documents. The removal action contractor's initial planning tasks include preparation of the Work Plan, SSHP, and ESS. Once these documents have been approved, the Notice-to-Proceed for the field components of the removal action will be issued.

a. Work Plan.

(1) Contents.

(a) A site-specific Work Plan is required for all OE removal projects. Following the site visit, the UXO contractor will prepare a Work Plan and related sub-plans that describe the proposed methodology for accomplishing the removal action. The Work Plan and sub-plans will be prepared in accordance with contract requirements. The following documents describing the removal action methodology may be included in the Work Plan:

- Technical Management Plan.
- Explosives Management Plan.
- Explosives Siting Plan.

- Geophysical Plan.
- Site Safety and Health Plan.
- Location Surveys and Mapping Plan.
- Work, Data, and Cost Management Plan.
- Property Management Plan.
- Sampling and Analysis Plan.
- Quality Control Plan.
- Environmental Protection Plan.
- Investigative Derived Waste Plan.

(b) The Work Plan will be prepared in accordance with contract requirements. Additional information on Work Plan requirements is provided in the OE MCX DID OE-005-01, "Work Plan", which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

(2) Review and Approval.

(a) The OE Design Center is responsible for executing the Work Plan. The district will review the Work Plan and provide comments or written concurrence or non-concurrence. The OE MCX will monitor the Work Plan.

(b) When review of the draft document is completed, the government will provide comments to the contractor for incorporation into the final document. A minimum turnaround is expected, and the final document will be back-checked for adequate revisions. Once the draft comments are incorporated, the document may be sent to regulators or other stakeholders for review and comment. The OE Design Center will approve the Work Plan.

(3) Changes to the Work Plan.

(a) Changes are often required to the Work Plan during execution of removal projects. The OE Design Center and CO will approve any changes to the Work Plan in coordination with the PM. The approved changes should be made to the Work Plan within 21 days.

(b) A Work Plan change that affects any operational and/or safety procedures may also require a revision to and a re-submittal of the ESS. The OE MCX must approve any changes to the ESS.

(4) The Work Plan will be included in the Administrative Record for the project. The PM, project personnel, and on-site safety specialists should also maintain a current copy of the Work Plan.

b. SSHP. The SSHP should be prepared in accordance with the guidance provided in Chapter 20.

c. Explosives Safety Submission.

(1) The purpose of the ESS is to ensure that all applicable DOD and Army regulations regarding safe and secure handling of ordnance are followed. The OE project team will ensure that the ESS and the Work Plan are consistent with each other and the approved Action Memorandum.

(2) Intrusive operations may not begin on OE projects until the USATCES and DDESB approve the ESS and the contractor has been directed to incorporate the approved ESS changes into the Work Plan. A copy of the approved ESS will be maintained at the project site. All operations will be executed in accordance with the approved ESS.

(3) Content Requirements.

(a) The ESS will contain the plans for OE removal and methods proposed to protect the public and site workers during the project.

(b) The format for the ESS is described in the DDESB Memorandum for the USATCES Guidance for Clearance Plans, dated January 1998. This memorandum may be found on the DDESB website at http://www.acq.osd.mil/ens/esb/esbhompb.html. Additional information on the ESS is provided in the OE MCX DID OE-060, “Conventional Explosives Safety Submission”, which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

(4) ESS Routing and Approval for FUDS Projects. The following process will be used in the preparation and review of the ESS for FUDS projects:

(a) The OE Design Center is responsible for executing the ESS.

(b) The OE Design Center forwards four copies of the ESS to the district and OE MCX for review.

(c) The OE MCX reviews the ESS and forwards three copies to HQUSACE Safety and Occupational Health Office (CESO).

(d) CESO reviews and endorses the ESS, then forwards two copies to USATCES for approval.

(e) USATCES forwards one copy to DDESB for coordination/concurrence.

(f) A period of 60-90 days should be provided for the review and approval of the ESS by USATCES and DDESB.

(5) ESS Routing and Approval for IRP and BRAC Projects. The following process will be used in the preparation and review of the ESS for IRP and BRAC projects:

(a) The installation is responsible for preparing the ESS.

(b) The installation forwards three copies of the ESS to its Major Command (MACOM) safety office for endorsement.

(c) The installation provides two copies to the district and one copy to the OE MCX for review.

(d) The district and OE MCX provide comments to the MACOM safety office.

(e) The MACOM safety office reviews the ESS, incorporates comments, and forwards two copies to USATCES with MACOM recommendations.

(f) USATCES reviews the ESS and forwards one copy to DDESB for final approval.

(g) DDESB reviews and gives final approval.

(6) ESS Modification. When an element of the approved ESS changes, the ESS must be amended. The contractor will prepare the proposed change and forward it to the PM who will forward it to the OE MCX for review. The OE MCX will forward the proposed changes to the appropriate agency for approval. For a change that specifies less restrictive requirements (e.g., reduction in exclusion zone), the contractor will comply with the approved ESS until the change is approved. When changes would be more restrictive (e.g., increase in exclusion zone), the contractor will apply the more restrictive measures until the ESS change is approved.

11-5. Notice-to-Proceed. Once the ESS and all other prerequisite planning documents have been approved, a Notice-to-Proceed with the removal action will be issued.

# CHAPTER 12
# OE DETECTION AND REMOVAL

12-1. Introduction.

a. This chapter discusses the OE removal action tasks that occur following the receipt of the Notice-to-Proceed.

b. The removal action is intended to permanently and comprehensively address both short and long-term health and safety hazards at OE contaminated sites. The removal action may be implemented using active duty military personnel, DOD civilian personnel, private contractors, or a combination of the three. The implementing agency will be responsible for full coordination of all activities, including procurement, funding, scheduling, and authorizations.

c. The removal action phase is composed of the following tasks, which are illustrated in Figure 12-1 and discussed below.

(1) Location surveys and mapping.

(2) Area preparation.

(3) OE surface removal.

(4) Geophysical investigation.

(5) OE subsurface removal.

(6) OE destruction.

(7) OE scrap disposition.

(8) Demobilization.

12-2. Location Surveys and Mapping. Location surveys and mapping will be performed by the UXO contractor to establish boundaries of the areas under investigation. The procedures for the execution of location surveys and mapping are discussed in Chapter 21.

12-3. Area Preparation.

a. Prior to the initiation of an OE removal action, brush clearance may be required. The purpose of brush clearance is to reduce or remove the vegetative growth from the work areas in order to effectively locate, investigate, and remove surface and subsurface OE.

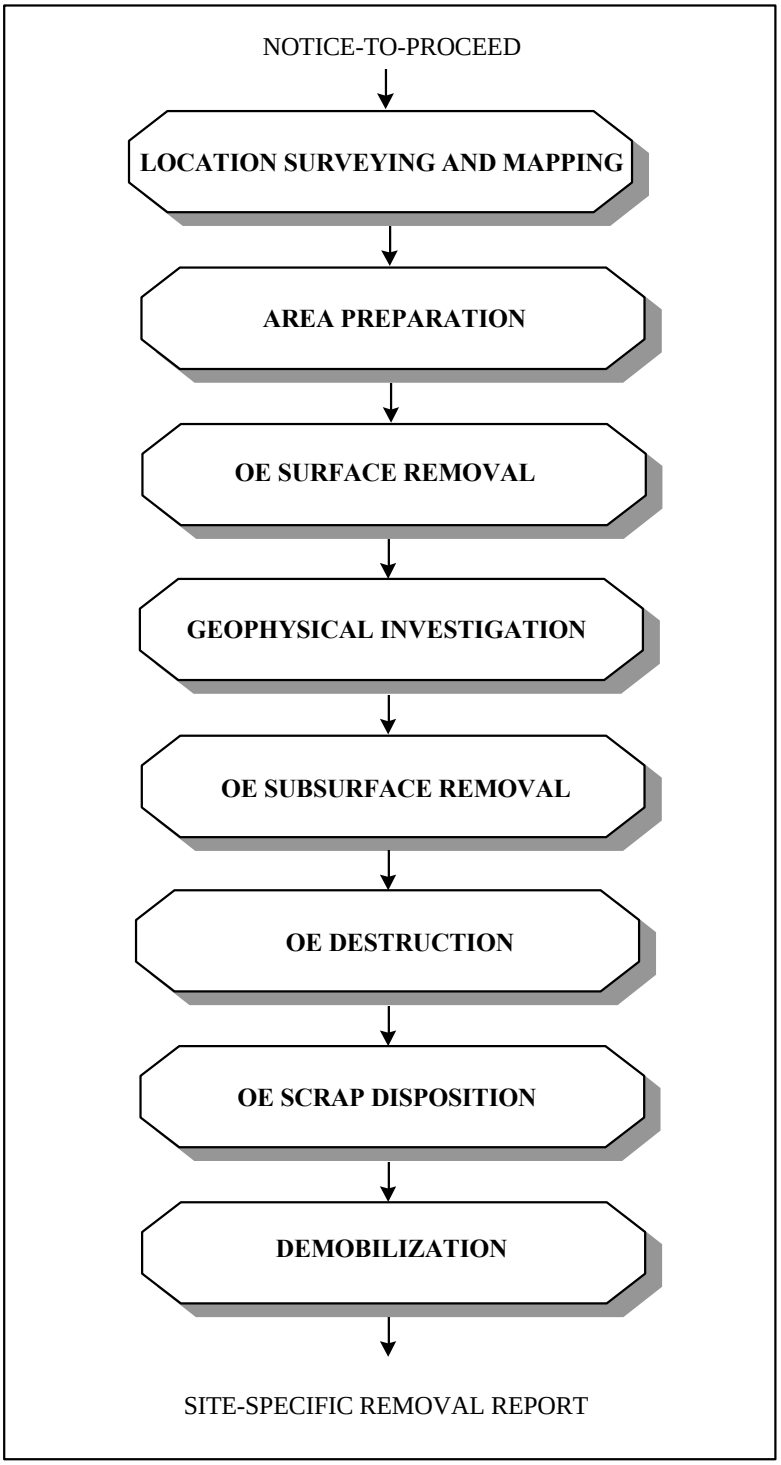



Figure 12-1. Removal Action Process

b. The areas cleared and techniques used must be coordinated with the district environmental staff and documented in the Work Plan. A UXO Technician II must always escort the brush clearing crew in areas not previously cleared of OE. The safety requirements in EM 385-1-1 must be followed. PPE will be provided to the brush clearance crew and used as required for protection. All brush clearance personnel must be trained in the safe operation of the equipment and must have obtained site-specific safety training in accordance with Chapter 24.

12-4. OE Surface Removal. OE surface removals are conducted to remove all OE from the surface of the work area. UXO qualified personnel will flag, identify, and record the approximate location of all discovered OE for subsequent destruction. In addition, all OE scrap and non-OE related materials that may interfere with the geophysical investigation should be collected and stored for later disposition.

12-5. Geophysical Investigation. The purpose of the geophysical investigation is to acquire geophysical data and identify all anomalies which resemble UXO/OE. Geophysical investigations may be completed using detection equipment with real time or post-processing discrimination techniques. The latter requires the collection and recording of geophysical data which is subsequently processed by commercial software to identify electronic signals representative of anomalies. All anomalies selected for excavation will be mapped, documented on dig-sheets, physically re-established by precise survey methods, and marked for investigation. Information on the elements which must be considered when planning and executing a geophysical investigation is provided in Chapter 21.

12-6. OE Subsurface Removal.

a. Intrusive activities are conducted to investigate and identify the source of each subsurface anomaly. Anomalies deeper than 12 inches may be excavated using mechanical or manual methods. Only approved UXO personnel will perform excavations. All excavations will be performed in accordance with the provisions of 29 CFR 1926, subpart P.

b. After the probable source of the subsurface anomaly is removed, the excavation will be rechecked with a magnetometer or other ordnance detector prior to backfilling. If the location does not produce another anomaly upon the recheck, then the excavated area will be backfilled and restored in accordance with contract requirements. If a UXO item is recovered, the location will be marked and the item disposed of in accordance with project approved procedures.

c. Evacuations. Evacuations are sometimes necessary when conducting intrusive investigations in order to minimize the risk of the operation. An exclusion zone distance is calculated to ensure that all non-essential personnel are outside of that distance during the conduct of the excavation. The exclusion zone distance can be reduced by implementing engineering controls. The use of engineering controls is presented in Chapter 21.

d. Other considerations. There are several other considerations which must be accounted for during the intrusive investigation, including: explosives storage, engineering controls, exclusion zone management, disposal and transportation of OE, and quality assurance. These topics are discussed in detail in later chapters of this document.

12-7. OE Destruction.

a. Destruction of recovered OE can take one of three forms: in-place; on-site; and off-site. The decision regarding which technique to use is based on the risk involved in employing the disposal operation as determined by site-specific characteristics and the nature of the OE recovered. Additional information on OE disposal operations can be found in TM60A-1-1-31, Explosive Ordnance Disposal Procedures.

(1) In-Place Destruction. In-place destruction (blow-in-place) is a technique used when an OE item cannot be safely moved to an alternate location for destruction. All in-place destructions will be conducted in a manner that assures maximum control of the site. When this technique is employed, engineering controls are often used to minimize the blast effects. Information on the use of engineering controls is presented in Chapter 21.

(2) On-Site Destruction.

(a) If OE is recovered in close proximity to occupied buildings, it may not be possible to safely destroy the OE item in place. In this instance, the OE item may be moved to a remote part of the project site where destruction and disposal can safely take place. When an OE item is destroyed on-site, engineering controls are often used to minimize the blast effect. Information of the use of engineering controls is presented in Chapter 21.

(b) Guidance for the on-site destruction of OE is published in EP 1110-1-17, Establishing a Temporary Open Burn/Open Detonation Site for Conventional OE.

(3) Off-Site Destruction.

(a) If transported off-site for destruction, the OE will be transported by either military vehicles or by a qualified UXO contractor. The OE is typically transported to an active military installation where it can be safely destroyed.

(b) The transportation of OE will be performed in accordance with the provisions of 49 CFR Part 172, applicable state and local laws, and Chapter 15 of this pamphlet. A Transportation Plan detailing the route and procedures to be used during the transportation of OE will be prepared and approved prior to engaging in any off-site OE transport to ensure all safety aspects of the movement have been addressed.

12-8. OE Scrap Disposal. The fragments and components from the on-site or in-place destruction of OE items will be gathered, inspected, and turned-in as OE scrap. Contact the OE MCX for additional information on the disposal of OE scrap.

12-9. Demobilization.

a. Demobilization may occur for a variety of reasons, including:

(1) The project may be completed with all work accomplished.

(2) The project may be incomplete, but the contractor has expended most of the contract funds.

(3) Adverse weather conditions.

(4) Determination that continuing in the present course of action is not in the best interest of the government.

b. A demobilization plan will be developed, as a part of the Work Plan, by the contractor in close coordination with the PM, OE Design Center, OE Safety Specialists, and the customer. Authorization to demobilize from a site must be issued in writing to the contractor from the CO.

# CHAPTER 13
# SITE-SPECIFIC REMOVAL REPORT

13-1. Introduction.

a. At the completion or termination of an OE removal action, the UXO contractor will prepare and submit a Site-Specific Removal Report. This chapter discusses the required content and submittal procedures for the Site-Specific Removal Report.

b. The Site-Specific Removal Report documents all activities and operations which occurred and lists the ordnance found during the removal action. This report is used as the basis for the USACE's recommendations for future land use and for any proposed restrictions on the cleared area.

13-2. Content.

a. The Site-Specific Removal Report should identify and document the following:

(1) The boundary of actual removal activities and any areas that were avoided (e.g., lakes, rivers, streams, cemeteries, wetlands). Monuments and boundaries for these areas will be determined by a land surveyor.

(2) Any archaeological sites and environmentally sensitive areas that were encountered and a description of any corrective or protective procedures that were taken.

(3) Any damage to trees, utilities, or facilities and a description of any corrective actions that were taken to repair these damages.

(4) The number of acres on which re-vegetation or re-seeding was conducted.

b. The Site-Specific Removal Report should also include the following information:

(1) A tabulation of all UXO, ordnance scrap, and other material recovered during the removal action. The report will list UXO (including number, type, and condition), ordnance-related scrap in pounds (including fragmented pieces not included in the list of UXO), and pounds of other recovered material. Other material is defined as non-munitions material found at the ordnance site. This tabulation should be provided for each grid, and a summary table shown for the entire project. The depth of each UXO item recovered at the nose and tail (if applicable) will be reported on the individual grid tables.

(2) A compilation of dig sheets for all excavations on projects where geophysical mapping and investigation occur. The dig sheet capture minimum data to allow the OE project team and stakeholders to easily understand what was found at the site.

c. Additional information on Site-Specific Removal Report requirements can be found in the OE MCX DID OE-030, which is available on the OE MCX website at http://www.hnd.usace.army. mil/oew.

13-3. Submittal.

a. The contractor will be required to submit the draft Site-Specific Removal Report in accordance with the SOW. Normally, the SOW requires the report to be submitted in draft form within 21 days of the completion of all field work.

b. The Site-Specific Removal Report should be submitted in digital format, including all text, drawings, maps, forms, tables, field notes, and other data gathered during the removal action. The format requirements should be coordinated among OE project team members at the time the contract or task order is prepared. Specifications for the digital format should be developed with the objectives of user compatibility and posting the report on the Internet.

13-4. Review and Approval.

a. The Site-Specific Removal Report is reviewed by the district and the OE MCX. It is critical that the USACE review this report for completeness, accuracy, and compliance with the contract/task order terms. The contractor will make all necessary corrections as directed by the CO prior to publishing the report as a final document.

b. The OE Design Center will provide approval of the Site-Specific Removal Report. A copy of the final report will be placed on file in the Administrative Record.

# CHAPTER 14
# EXPLOSIVES STORAGE

14-1. Introduction.

a. This chapter discusses the requirements for a temporary explosives storage facility for FUDS and BRAC/IRP sites.

(1) FUDS. Since FUDS normally do not have existing OE storage facilities, the UXO contractor will, when required by the government, establish a temporary OE magazine storage area. The magazine will be used to store OE awaiting destruction and/or explosive materials for use in destroying OE. If a storage facility exists at a FUDS, the contractor may use it for explosives storage, provided the owner agrees and the facility meets the minimum requirements set forth in this chapter.

(2) BRAC and IRP sites. Storage facilities normally exist at IRP sites, but do not always exist on BRAC sites. The contractor may use existing facilities on these sites if the MACOM approves a waiver to allow the storage of commercial explosives. To obtain this waiver, the contractor will provide a list of explosives to be used, including the DOT EX number, to the USAESCH OE Safety Group. The DOT EX number is issued by the DOT to identify that an explosive has been tested and assigned an accurate hazard classification in accordance with Title 49 CFR. This information will be relayed to USATCES so that a DOD Hazard Classification can be assigned in accordance with Chapter 16 of DA Pam 385-64, Ammunition and Explosives Safety Standards. The USAESCH OE Safety Group will use the DOD Hazard Classification to formally request a waiver from the MACOM. The contractor will be notified when the waiver is approved.

(3) Table 14.1 contains a listing of commercial explosive items that have been hazard classified by the United States Army Technical Center for Explosive Safety.

b. When government storage facilities are not available, they will be constructed or installed by the contractor using this chapter as guidance.

14-2. Temporary Storage Facility. Temporary storage facilities will meet the following requirements:

a. Magazines. When the contractor must establish temporary facilities, Type 2 magazines conforming to the standards set forth in Section 55.206 of ATFP 5400.7, Alcohol, Tobacco, and Firearms (ATF) Explosives Law and Regulations will be used.

Table 14.1
Department of Defense Hazard Classifications for Commercial Explosives*

| DOT EX # | Name | DOD Hazard Classification | Date Class. |
|---|---|---|---|
| 9806054 | Cord, detonating | 1.1D | 2 Dec 98 |
| 9803207 | Detonator with fuse assembly | 1.1B | 12 Jan 99 |
| 9709010 | Cap, blasting, electric instant | 1.4B only when in DOT packaging | 27 Jan 99 |
| 9707051 | Cap, blasting, non-electric | 1.4B only when in DOT packaging | 2 Dec 98 |
| 9608028 | Shaped charge, commercial | 1.4D | 19 Sep 97 |
| 9608031 | 1 lb booster | 1.1D | 14 Jan 98 |
| 9508033 | Fuse lighter, commercial | 1.4S | 27 Oct 97 |
| 9404156 | Shock Star MS (shock tube) | 1.4S | 14 Jan 98 |
| 9405290 | Shaped charge, commercial | 1.4S | 10 Mar 99 |
| 9409002 | Shaped charge, commercial | 1.4D | 27 Oct 97 |
| 9308432 | Pentolite booster | 1.1D | 14 Jan 98 |
| 9303285 | Austin cast booster | 1.1D | 14 Jan 98 |
| 9303282 | Cord detonating, commercial | 1.1D | 14 Jan 98 |
| 9303278 | Cap, NE, commercial | 1.1B | 14 Jan 98 |
| 9202035 | Cord, detonating, commercial | 1.1D | 19 Sep 97 |
| 9201092 | Fuse, time safety | 1.4S | 2 Dec 98 |
| 9104118 | Cap, blasting electric, commercial | 1.4B | 19 Sep 97 |
| 9106259 | Exel MS (shock tube) | 1.4S | 14 Jan 98 |
| 8912113 | Demo charge, C-4, commercial | 1.1D | 27 Jan 99 |

Table 14.1 (continued)
Department of Defense Hazard Classifications for Commercial Explosives*

| DOT EX # | Name | DOD Hazard Classification | Date Class. |
|---|---|---|---|
| 8601111 | Shaped charge, commercial | 1.4S | 10 Mar 99 |
| 8611125 | Pentex booster | 1.1D | 14 Jan 98 |
| 8511062 | Cap, blasting, NE, commercial | 1.4B | 27 Oct 97 |
| 8311105 | Safety fuse, commercial | 1.4S | 27 Oct 97 |
| 8210044 | Cord, detonating | 1.1D | 12 Jan 99 |

*The supporting information for this table may be obtained from the USAESCH Safety Group.

b. Placards. Each magazine will display the placards required by DOT regulations in accordance with DOD 6055.9-STD and DA Pam 385-64 for the hazard division of OE stored in the magazine.

c. Quantity Distances (Q-D). A Net Explosive Weight (NEW) will be established for each magazine. The Q-D, based on the NEW, will comply with Table 5-1, DA Pam 385-64. The location of the magazine storage area and the Q-D arcs will be shown on a Q-D map attached to the Work Plan or ESS.

d. Storage Compatibility Groups. OE stored in each magazine will be segregated into the appropriate hazard division. Each OE item will be stored in accordance with its hazard division and the storage compatibility group criteria listed in Chapter 3, DOD 6055.9-STD.

e. Physical Security.

(1) A documented physical security survey will be conducted to determine if fencing or guards are required when temporary facilities must be established. The contractor is responsible for determining the degree of protection required to prevent the theft of OE stored in the magazines.

(2) Locks used on OE storage magazines at a FUDS will meet the standards listed in Section 55.208 (a) (4), ATFP 5400.7.

(3) The requirements for locks used on OE storage magazines at BRAC and IR sites will be determined using the installation's service criteria. A key control system will be documented in the Work Plan.

f. Lightning Protection.

(1) FUDS. Lightning protection is not required on FUDS if the following criteria are met:

(a) The magazine is constructed of metal that is 3/16 inch steel or larger in accordance with National Fire Protection Association (NFPA) 780.

(b) The magazine is grounded in accordance with NFPA.

(c) The magazine is located at least 6.5 feet from the nearest fence.

(2) BRAC and Active Installations. Lightning protection for BRAC or IRP sites will meet the provisions of DOD 6055.9-STD. Army installations will also meet the provisions of DA Pamphlet 385-64.

g. Fire Protection. Extinguishers of appropriate size and type will be located in all explosives storage facilities.

# CHAPTER 15
# TRANSPORTATION OF OE

15-1. Introduction. This chapter documents the procedures applicable to all government and contractor personnel responsible for the transportation of OE from a FUDS.

15-2. Hazardous Waste Manifest. A hazardous waste manifest (EPA Form 8700-22) is required when transporting OE over public roads. Informational guidance on the hazardous waste manifest is provided in 49 CFR 172.205 and 40 CFR 262.20.

15-3. Memorandum of Agreement. Prior to transporting any potentially hazardous OE items to another facility for destruction, a Memorandum of Agreement (MOA) must be prepared between the district and the supporting agency. The MOA must include specific requirements for the transportation, acceptance, and disposal of the OE items that will be transported to the agency.

15-4. Hazard Classification of OE. For the purposes of transportation and storage, OE will be hazard classified in accordance with TB 700-2, DOD Ammunition and Explosives Hazard Classification Procedures.

15-5. Training for Transporting OE.

a. Government Personnel. Government personnel who are tasked to sign shipping papers (including the hazardous waste manifest, if required), will be trained in accordance with the requirements of DOD 4500.9-R, Defense Transportation Regulation, Part II, Cargo Movement.

b. Contractor Personnel. Contractor personnel who, by contract requirement, are tasked with the responsibility of transporting or preparing shipments of OE over public roads, will meet all training requirements of 49 CFR, Part 172 and applicable state requirements.

15-6. Organizational Responsibilities for Transportation of OE. This section discusses district, USAESCH, and contractor responsibilities for the transportation of OE.

a. Districts.

(1) Meet DOD training requirements for the transportation of OE when providing personnel to certify and sign shipping papers.

(2) Coordinate with the OE MCX for support, if needed, when transporting OE over public roads.

b. USAESCH.

(1) Maintain a core of trained and certified personnel meeting DOD standards for the purpose of certifying shipments of OE over public roads.

(2) Provide certified personnel to sign shipping papers, as needed, on a project by project basis.

(3) Maintain training records for all trained and certified personnel within USAESCH.

c. Contractors.

(1) Provide personnel trained and certified in accordance with 49 CFR, Part 172, for the transportation of OE over public roads.

(2) Coordinate with the receiving installation for special requirements, including packaging, marking, blocking and bracing, delivery schedule, etc.

(3) Prepare, sign, and certify shipping papers, when required by the contract.

(4) Prepare a Transportation Plan for each project explaining how OE will be transported over public roads, if needed, including individual responsibilities and certification that those individuals meet 49 CFR, Part 172, and applicable state training requirements. The Transportation Plan is a subpart of the Work Plan for the removal action.

# CHAPTER 16
# OPERATIONS AND MAINTENANCE

16-1. Introduction.

a. This chapter discusses operations and maintenance (O&M) issues at sites where an OE response action has occurred. The district is responsible for ensuring that appropriate O&M activities are in place.

b. A response action may be completed that addresses only part of the OE risk at a site, leaving known or suspected OE at the site. The purpose of O&M activities is to ensure that appropriate site safety and security measures remain in place and to maintain the integrity of any site controls, such as fences and signs. The determination of appropriate safety and security measures and site controls must be made on a case-by-case basis.

16-2. Recurring Reviews.

a. Any recurring reviews necessary following the completion of the response action will be addressed and approved in the Action Memorandum. The recurring reviews may be necessary to ensure that the remedy is effective. The district executes recurring reviews.

b. Recurring reviews for FUDS will be funded by the Defense Environment Restoration Account. Funding for recurring reviews is subject to Work Plan approval. The 10-year funding limitation on recurring reviews is applicable only to the active site program, but not to the FUDS program.

16-3. Recordkeeping.

a. FUDS. For FUDS, USACE will maintain permanent records for OE response actions.

b. Active Installations. For active installations, permanent records, including master planning installation maps, are required to clearly identify all areas contaminated with OE. These records will be maintained by each DOD installation. These records will indicate, to the extent possible, positive identification of the ammunition and explosives contamination by nomenclature, hazard, quantity, and exact locations.

c. Inactive Installations. If the installation is inactivated, the records are required to be transferred to the office designated by the DOD component concerned to ensure permanent retention.

16-4. Warning Signs. Contaminated locations are required to be placarded appropriately with permanent signs warning of the presence of OE and prohibiting the entrance of unauthorized personnel. The DOD Component concerned is required to periodically ensure that such signs are maintained in a legible condition.

16-5. Access Restrictions. Access to areas containing OE will be restricted based on the type, amount and depth of OE present and the activities for which entry personnel will be authorized. Restrictions must be negotiated with the private landowners and must comply with all applicable state and local regulations.

# CHAPTER 17
# PROJECT COMPLETION

17-1. Introduction. This chapter provides guidance on the requirements to complete an OE removal action project.

17-2. Requirements for Completion of OE Removal Action Projects Executed at Formerly Used Defense Sites by the OE Design Center.

a. Once the OE removal action has been completed and the final removal report has been approved, the OE Design Center will execute the preparation of a project completion memorandum, which summarizes the OE removal action activities and states that the OE removal action is completed. The project completion memorandum will be reviewed by the district and the OE MCX. The OE Design Center will provide final approval of the project completion memorandum. A sample project completion memorandum is provided in Figure 17-1.

b. The memorandum will be forwarded to the PM for subsequent property/project completion of the entire FUDS.

c. A copy of the memorandum will be included in the Administrative Record for the project and will be forwarded by the district by cover letter to all affected property owners.

17-3. Requirements for Completion of OE Removal Action Projects Executed at Formerly Used Defense Sites by the District. When a district executes a removal action, guidance in the DERP-FUDS manual for project completion will be followed.

17-4. Requirements for Completion of OE Removal Actions at Base Realignment and Closure/Installation Restoration Program Sites.

a. The USACE element responsible for executing the OE removal action will prepare a Statement of Clearance and the FOST.

b. The Statement of Clearance and FOST will be coordinated with the OE MCX for review. The Commander of the executing OE Design Center or district will sign the Statement of Clearance. The Installation Commander will sign the FOST. The Statement of Clearance will be provided to the installation representative as a supporting document to the FOST. The FOST will be submitted to the installation representative for approval and submission to DDESB in accordance with AR 405-90, Disposal of Real Estate.

c. A copy of the Statement of Clearance and FOST will be included in the Administrative Record for the project. Figure 17-2 presents the format for a Statement of Clearance.

USAESCH-DC (200-1c) Date

MEMORANDUM FOR Commander, U.S. Army Engineer District, _____,
ATTN: Office Symbol (Project Manager), Address

SUBJECT: Completion of Ordnance and Explosives (OE) Removal Action at the Former _____, City, State

1. All OE removal actions associated with the OE project at the Former _____ have been completed. The Huntsville Center received and reviewed the Final Removal Report dated _____ for the OE removal action performed by (contractor), at Area(s) __, ___, and ___ at the Former _____, City, State. A copy is provided at Enclosure 1.

2. During the removal action, OE was cleared to a depth of ____ feet in Area ___, a depth of ___ feet in Area ___,(etc.) in accordance with the approved Action Memorandum dated _____. A list of explosive ordnance that was found and destroyed during the removal action is included in the Final Removal Report dated _____.

3. If there are any changes in the land use that differ from those discussed in the Action Memorandum, the OE MCX should be contacted to determine if the proposed uses are consistent with the actions taken at the site. Since there will always be some risk of residual OE, this is a safety precaution.

4. The spreadsheet provided at Enclosure 2 summarizes the project expenditures. The contractor has not submitted his final invoice, but based on expenditures to date, we expect the total costs will closely approach the task order ceiling. Also, the funds remaining for in-house use are very minimal and will be used for labor to close out the task order. In the event that there are unused funds remaining after the task order is closed, they will be returned to you.

5. We encourage you to contact us if you have questions relating to the Former _____ project. Point of contact is (name) at (telephone).

FOR THE DIRECTOR OF ORDNANCE
AND EXPLOSIVES TEAM:

Encls (as) Name
Chief, Design Center
for Ordnance and Explosives Team

Figure 17-1. Sample Project Completion Memorandum

STATEMENT OF CLEARANCE

All lands within the *(installation)*, located approximately *(miles) (direction)* of *(town)* have been given a careful search *(or other method)* and have been cleared of all dangerous and/or explosive material reasonably possible to detect. The following contamination is suspected to be present:…It is recommended that tracts *(designated)* and, as shown on the enclosed real estate map, be restricted to *(surface use only or maximum safe depth of soil disturbance)*. All other tracts are recommended for any use for which the land is suited. This action has been conducted in accordance with AR…

Approved:_____ Signed:_____
*(Installation Commander or MACOM designee)* *(Commander of Performing Unit)*

Figure 17-2. Format for a Statement of Clearance

# CHAPTER 18
# CHEMICAL WARFARE MATERIEL

18-1. Introduction.

a. This chapter discusses non-stockpile chemical warfare materiel (CWM) as it relates to OE response actions. The OE response process at sites containing non-stockpile CWM typically follows the same procedures as those followed for conventional OE. The following paragraphs highlight areas of the response action process where a different approach is required for non-stockpile CWM sites as compared to conventional OE sites.

b. CWM is defined as an item configured as a munition containing a chemical substance that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. The term CWM includes V- and G- series nerve agent, H- and HN- series blister agent, and lewisite in other-than-munition configurations. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets are also considered CWM. CWM does not include: riot control agents; chemical herbicides; smoke and flame producing items; or soil, water, debris or other media contaminated with chemical agent.

18-2. Responsibilities. OE response actions at non-stockpile CWM sites will be performed in accordance with ER 1110-1-8153. The USACE is responsible for the overall project management and on-site management for non-stockpile CWM projects. Execution of all phases of a non-stockpile CWM project within the USACE is the responsibility of the USAESCH OE Design Center. The specific responsibilities of the HQUSACE, district, MSC, USAESCH OE Design Center, and OE MCX for non-stockpile CWM response actions are presented in ER 1110-1-8153.

18-3. Regulatory Authority.

a. In addition to the regulatory authorities previously cited for conventional OE, there are specific regulations related to non-stockpile CWM. These include:

(1) AR 385-61, The Army Toxic Chemical Agent Safety Program.

(2) DA Pam 385-61, Toxic Chemical Agent Safety Hazards.

(3) AR 50-6, Chemical Surety.

(4) DA Pam 50-6, Chemical Accident or Incident Response and Assistance Operations.

(5) DA Pam 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, and HT.

(6) DA Pam 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX.

b. The probability of encountering CWM during proposed CWM response activities will be ranked in accordance with AR 385-10 into one of five categories prior to initiating on-site activities: frequent, probable, occasional, remote, or improbable.

(1) If the probability is categorized as improbable or remote, the district Commander or designated representative may assume the risk of conducting site activities as a non-CWM site.

(2) If the probability is categorized as occasional, probable, or frequent, the response action must be conducted. Contact the OE MCX for the procedures to be used.

18-4. Coordination. If the presence of CWM is suspected at a site, the district must coordinate with USAESCH prior to beginning any on-site activities.

18-5. Risk Assessment. Any activity on a non-stockpile CWM response project will require determination of risk to the public and site workers. Risks to human health and the environment as a result of an explosion or release of chemical agent are the primary factors in determining the effectiveness of risk management decisions concerning non-stockpile CWM. A site-specific maximum credible event (MCE) will be developed to form a basis to generate hazard zones. Contact the OE MCX for procedures for calculating the MCE. Hazard zones will be computed using the MCE and Army approved atmospheric dispersion modeling. Quantitative RACs will also be developed to assess response hazards (e.g., dispersion of agent-contaminated soil, and explosive hazards). Public risk information and controls will be addressed in safety planning documents.

18-6. Non-stockpile Chemical Warfare Materiel Planned Response Activities.

a. Non-stockpile CWM planned response activities will be conducted to protect public and worker health and the environment in accordance with applicable statutes and implementing regulations. Safety planning and coordination with EPA, state and civil authorities, as appropriate, will be priorities.

b. Prior to initiation of any planned response activities, including site investigation, approved SSHPs and procedures are required. The need for an ARB should also be considered in accordance with the guidance provided in Appendix E.

c. For investigative and assessment activities (e.g., soil and water sampling, geophysical analysis, installation of monitoring wells when anomaly avoidance techniques are used, etc.), SSHPs approved by USAESCH are required. For removal activities (e.g., surface removal of non-stockpile CWM or excavations when the intent is to uncover, characterize, and remove geophysical anomalies), safety submissions must be prepared by the agency with overall project

responsibility and approved by the Office of the Deputy Assistant to the Secretary of the Air Force (ODASAF). Safety submissions will serve as the specifications for conducting work activities at a project. Deviation from the responsibilities, procedures, and controls outlined in a safety submission is not permitted unless approved by the ODASAF.

d. If non-stockpile CWM is encountered during site activities, all other site activities will be stopped and a CWM response action will be initiated. USAESCH is the only USACE command authorized to execute CWM projects, as defined in the glossary and described in ER 1110-1-8153.

# CHAPTER 19
# QUALITY ASSURANCE

19-1. Introduction.

a. This chapter discusses quality assurance (QA) and quality control (QC) requirements for OE response actions.

b. QA, for the purposes of OE response, is broken down into two levels to bridge the requirements of ER 1110-1-12 and ER 1110-1-8158.

(1) Project QA consists of those actions taken to ensure that the contractor is fulfilling contractual obligations (e.g., project planning, government QA, and contractor QC).

(2) Programmatic QA consists of those efforts of the OE MCX, as an extension of HQUSACE, to assist all USACE elements by supporting their quality efforts, reviewing designated project documents, and by conducting OE Assistance Visits to various project sites.

c. All USACE MSCs, districts, and OE Design Centers involved in OE response activities are required to develop a Quality Management System consistent with the principals outlined in ER 1110-1-12. Policies and procedures will be identified and documented showing the flow of information and approval controls for all processes affecting quality.

19-2. Quality Planning. Every OE response project will be managed in accordance with a PMP developed by the PM. The PMP will be developed with the customer, the OE Design Center and other appropriate team members. The PMP will define specific responsibilities of team members with regard to quality.

19-3. Government Quality Assurance.

a. Project QA.

(1) OE response activities present unique and extraordinary QA considerations. Normally, an OE project site is divided into two areas for QA purposes: within the exclusion zone or outside of the exclusion zone.

(2) It is essential to the overall safety and quality of the contractor's performance within the exclusion zone that a qualified OE Safety Specialist be on-site to evaluate and oversee the contractor's efforts. This OE Safety Specialist is specifically trained in recognizing and evaluating UXO, its various conditions in a field environment (safe, unsafe, armed, or unarmed), and the safety procedures required to reduce or eliminate the hazard. Normally, this OE Safety

Specialist will be the only USACE representative allowed within the exclusion zone during the execution of UXO procedures by the UXO contractor.

(3) The PM is generally responsible for QA of activities outside of the exclusion zone unless otherwise defined in the PMP.

b. Programmatic QA.

(1) When requested, the OE MCX will provide a member to participate on HQUSACE teams conducting Quality Reviews and Evaluations of MSC Quality Assurance Roles. These reviews will be conducted on a biennial basis in accordance with ER 1110-1-12.

(2) The OE MCX is also available upon request to assist MSCs in conducting their annual reviews of districts.

(3) The OE MCX performs technical reviews of designated project documents for conformance to applicable laws, regulations, policies, and guidance.

(4) The OE MCX will perform OE Assistance Visits to selected project sites. These visits will be conducted to develop lessons learned, identify areas for improvement, and identify gaps in current policy and guidance. OE Assistance Visits will generally consist of a review of the contractor QC process, the government field safety/QA process, and the administrative record process. One OE Assistance Visit per quarter will be planned; others may be conducted upon request.

19-4. Contractor Quality Control.

a. The contractor is solely responsible for the control of the process and product quality and for offering to submit for acceptance only products and services determined to conform to contractual requirements. Each contract will require the contractor to establish a QC plan, which includes procedures, processes, and specified end products to include QC audits for each quality affecting process or procedure. The specifications for the QC plan should be identified in the basic contractual document.

b. The contractor's QC program will also provide for an equipment maintenance program addressing preventive maintenance, routine repair; and emergency repair.

# CHAPTER 20
# SAFETY CONSIDERATIONS

20-1. Introduction.

a. This chapter describes the safety considerations for personnel during OE response projects. This chapter also discusses health and safety documents that will be submitted prior to executing an OE response project.

b. Detailed safety and health practices and procedures must be developed and implemented at each site to provide proper control of and protection against the unique safety hazards associated with specific on-site activities. All OE response activities will be planned and conducted in accordance with the requirements of this section, will be thoroughly coordinated with the OE MCX, and will include participation of explosives safety technical personnel.

20-2. Policy. All USACE and contractor elements will conduct OE response projects in compliance with regulations and guidance publications referenced below. Additionally, safety and occupational health documentation will comply with all other applicable Federal, state, and local safety and occupational health requirements.

a. EM 385-1-1, USACE Safety and Health Requirements Manual. This document, which is the primary safety reference, prescribes the safety and health standards for OE activities, and provides guidance on the roles, responsibilities, and documents required for OE response activities.

b. ER 385-1-92, Safety and Occupational Health Requirements for HTRW and OE Activities. This regulation identifies the safety and health documents and procedures required to be implemented by USACE elements and their contractors responsible for executing HTRW and OE activities. This document also discusses the execution, review, and approval responsibilities within USACE for the required safety and health documents.

c. OSHA Standards - 29 CFR 1910.120 and 29 CFR 1926. These standards identify OSHA's hazardous operations and emergency response procedures.

20-3. Personnel Safety Considerations. The most important consideration throughout all aspects of OE response activities performed by USACE and its contractors is the safety and health of on-site personnel.

a. Safety of Government Personnel. All government personnel assigned as OE Safety Specialists will meet the prerequisites identified in ER 385-1-92 as well as OSHA requirements.

b. Safety of Contractor Personnel. All contractor personnel will be trained and skilled in their assigned positions in accordance with the guidance provided in paragraph 20-4b of this chapter. The contractor will ensure that their work force complies with OSHA requirements and will assign a UXO Safety Officer for each project. The UXO Safety Officer will be corporately responsible for the health and safety environment of the contractor's work force. The government's safety specialist will provide safety oversight to ensure the contractor's compliance with established policies and procedures. The contractor will be required to prepare a SSHP and present site-specific training to the work force prior to work beginning; attendance at the training will be documented.

20-4. Personnel Standards. The OE MCX has set forth personnel standards applicable to all USACE OE safety specialists and UXO contractor personnel working for the USACE. The following personnel standards detail the prerequisites for education and experience required for UXO personnel. The standards are minimums only and may be exceeded at any time; however, they will not be relaxed without the approval of the OE MCX.

a. OE Safety Specialists.

(1) Prerequisite Experience. Any USACE employee involved in the execution, supervision, or oversight of ordnance related activities inside the exclusion zone, will be a graduate of the U.S. Naval Explosives Ordnance Disposal School, Indian Head, MD. This experience must be demonstrated by the following abilities:

(a) The ability to identify fuzing, precautions that must be taken, fuze condition (e.g., armed, functioned, or armed and functioning), and how this condition can or will affect the munition payload should other external forces be applied.

(b) The ability to recognize munition/ordnance types and determine hazards and make risk assessments. This includes identifying potential fillers including those in extremely deteriorated condition (e.g., high explosives , fragmentation, white phosphorus, and chemical warfare materiel). Must also be able to determine if munitions can be moved before destroying, or if the munition must be blown-in-place; the fragmentation radius, or in the case of chemical warfare materiel, the potential down-wind hazard along with the engineering controls to mitigate both.

(2) On-Site Responsibilities. An OE Safety Specialist will be on-site each day during intrusive and OE destruction activities. This on-site requirement may only be reduced after a written request is reviewed and approved by the OE MCX.

(a) The OE Safety Specialist is on-site to ensure that the contractor establishes the appropriate daily safety routines at the beginning of UXO field operations, to perform quality assurance oversight, to verify contractor employee UXO qualifications, to advise the contractor on UXO procedures, to coordinate with the PM, and to facilitate EOD response when needed.

These are the minimum responsibilities. Additional responsibilities may include Contracting Officer's Representative duties, contract surveillance responsibilities, and other non-safety related responsibilities.

(b) OE Safety Specialists not permanently stationed at the project site will normally be rotated to the home office after two weeks at a site, and should spend at least one week in the home office before returning to the field. When replacing an OE Safety Specialist at an on-going OE project site, the new OE Safety Specialist will, as a minimum, review the SOW, ESS, Work Plan, and SSHP and be briefed on the project by the departing OE Safety Specialist.

(c) Hazardous Duty Pay. An individual's mere presence on a site containing ordnance or explosives does not necessarily qualify as hazardous duty. A claim for hazardous duty pay can be made if an employee is accomplishing or observing the accomplishment of UXO tasks within the work exclusion zone. The individual requesting hazardous duty pay may be required to furnish his/her supervisor an explanation of the tasks and hazards involved.

b. Contractor UXO Personnel Qualifications. All contactor UXO personnel will be graduates of one of the following schools or courses: The U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD; U.S. Naval Explosive Ordnance Disposal School, Indian Head, MD; The EOD Assistant's Course, Redstone Arsenal, AL; the EOD Assistant's Course at Eglin Air Force Base, FL; or a DOD certified equivalent course. USNAVEOD also requires that EOD personnel be U.S. citizens due to the need for access to the TM-60 series publications, some of which are marked NOFORN (No Foreign Nationals). UXO contractors cannot employ active military or Federal civilian employees except for members of the military who are on terminal leave. Credit for EOD experience in National Guard or Reserve units will be based on the documented actual time spent on active duty, not on the total time of service. Additional information on the qualification requirements for UXO personnel is located at the OE MCX website at http:\\www.hnd.usace.army.mil\oew.

(1) Senior UXO Supervisor (SUXOS).

(a) This individual will be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Grounds, MD or U.S. Naval EOD School, Indian Head, MD. This individual will have UXO experience, which may be a combination of active duty military EOD and contractor UXO experience, and will include experience in supervisory positions. A SUXOS must be able to fully perform all of the functions enumerated for UXO Sweep Personnel and UXO Technicians I, II, and III.

(b) The SUXOS is required to perform the following functions: Planning, coordinating, and supervising all contractor on-site UXO activities; preparation of standing operating procedures (SOPs) for UXO operations ensuring compliance with DOD directives as well as local, state, and federal statues and codes; and certification of Ammunition, Explosives, and

Dangerous Articles (AEDA) and/or range scrap as ready for turn-in or disposal in accordance with current policies. The SUXOS must also be fully capable of supervising multiple project teams which may be performing UXO and UXO related activities (e.g., vegetation clearance; land surveying; reconnaissance and classification of UXO, pyrotechnic items, and military explosives and demolition materials; locating surface and subsurface UXO; destroying UXO and OE by burning or detonation; and/or transporting and storing UXO and explosives material).

(2) UXO Technician III.

(a) This individual will be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Grounds, MD or U.S. Naval EOD School, Indian Head, MD. This individual will have experience in OE clearance operations and supervising personnel, and will have combined active duty military EOD and contractor UXO experience. The UXO Technician III must be able to fully perform all functions enumerated for UXO Sweep Personnel, UXO Technicians I and II.

(b) The UXO Technician III is required to perform the following functions: Supervising and performing on-site disposal of OE; preparing explosives storage plans in accordance with all applicable guidance; preparing required OE administrative reports; preparing SOPs for on-site OE operations; performing risk hazard analyses; conducting daily site safety briefings; and supervising the conduct of all on-site evolutions directly related to OE operations.

(3) UXO Technician II.

(a) This individual will be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Grounds, MD or U.S. Naval EOD School, Indian Head, MD. As an exception, a UXO Technician II may be a UXO Technician I with combined military EOD and contractor UXO experience. This individual must be able to fully perform all functions enumerated for UXO Sweep Personnel and UXO Technician I.

(b) The UXO Technician II is required to perform the following functions: Properly storing OE material in accordance with applicable guidance; identifying fuzes and determining fuze condition; determining a magnetic azimuth using current navigational/locating equipment; performing field expedient identification procedures to identify explosives contaminated soil; preparing an on-site holding area for OE material; and operating modes of transportation for transporting OE material, when appropriate.

(4) UXO Technician I.

(a) This individual will be a graduate of the EOD Assistant's Course, Redstone Arsenal, AL; the EOD Assistant's Course, Eglin Air Force Base, FL; or a DOD equivalent certified course. A UXO Technician I can advance to the UXO Technician II category after combined active duty military and contractor UXO experience.

(b) The UXO Technician I assists fully qualified personnel (UXO Technician II and above) in the following functions: Conducting reconnaissance and classification of UXO and other OE materials; identifying all munitions including bombs and bomb fuzes, guided missiles, projectiles and projectile fuzes, rockets and rocket fuzes, land mines and associated components, pyrotechnics items, military explosives and demolition materials, grenades and grenade fuzes, and submunitions; locating subsurface UXO using military and civilian magnetometers and related equipment; performing excavation procedures on subsurface UXO; locating surface UXO by visual means; transporting UXO and demolition materials; preparing firing systems, both electric and non-electric, for destruction operations; operating Personnel Decontamination Stations; inspecting salvaged OE related material and erection of UXO related protective works; and donning and doffing personal protective equipment.

(5) UXO Sweep Personnel. Sweep personnel assist UXO technicians and supervisory personnel in the clearance of UXO, operating only under the direct supervision of qualified UXO technicians and/or UXO supervisors. This position requires site and job specific contractor training (which may include ordnance recognition, safety precautions, donning and doffing personnel protective equipment, etc.) but does not require UXO technician qualifications. UXO Sweep Personnel conduct visual and /or instrumented UXO search activities in the field; perform field maintenance on military and civilian magnetometers; operate ordnance detection instruments and other similar equipment to include digital geophysical mapping instruments; and remove OE scrap after such items have been certified/verified safe for handling by a qualified UXO technician. UXO Sweep Personnel are not involved in the execution of explosives operations.

(6) UXO Quality Control Specialist (UXOQCS). This individual will have the same minimum qualifications as a UXO Technician III. In addition, this individual will have documented Quality Control Training. This individual must be able to fully perform all functions enumerated for UXO Sweep Personnel and UXO Technicians I, II, and III. This individual must have the specific training, knowledge, and experience necessary to implement the contractor's QC plans. In addition, the UXOQCS must have the ability to implement the UXO specific sections of the Quality Control Program for all OE related evolutions; conduct quality control inspections of all UXO and explosives operations for compliance with established procedures; and direct and approve all corrective actions to ensure all OE related work complies with contractual requirements.

(7) UXO Safety Officer (UXOSO).

(a) This individual will have the same minimum qualifications as a UXO Technician III. In addition, this individual will have the specific training, knowledge, and experience necessary to implement the SSHP and verify compliance with applicable safety and health requirements. This individual must be able to perform all functions enumerated for UXO Sweep Personnel and UXO Technicians I, II, and III.

(b) The UXOSO must have the ability to implement the approved explosives and UXO safety program in compliance with all DOD, Federal, state, and local statutes and codes; analyze UXO and explosives operational risks, hazards, and safety requirements; establish and ensure compliance with all site specific safety requirements for UXO and explosives operations; enforce personnel limits and safety exclusion zones for UXO clearance operations, UXO and explosives transportation, storage, and destruction; conduct safety inspections to ensure compliance with UXO and explosives safety codes; and operate and maintain air monitoring equipment required at site for airborne contaminates.

20-5. Work Standards. The following are minimum work standards for ordnance response actions. Prior approval of the Contracting Officer will be obtained to relax these standards.

a. Work Week: UXO personnel involved in performing UXO field operations will be limited to a 40 hour week, either four 10-hour days or five eight-hour days. Two consecutive work weeks will be separated by 48 hours of rest.

b. UXO Team Composition and Roles.

(1) Conventional OE Investigations or Removal Actions.

(a) Each UXO team will consist of one UXO Technician III and six or less team members. Teams will have a minimum of two UXO qualified personnel, one of which will be the UXO Technician III.

(b) A UXO Technician III will supervise all UXO operations and all teams operating within the exclusion zone. These may include brush clearing teams, geophysical teams, UXO Sweep Personnel teams, and laborer teams.

(c) The SUXOS will supervise no more than ten UXO Technicians III. There will be no more than one SUXOS on an OE project without prior approval of the Contracting Officer.

(d) A separate UXOSO is not required when there are less than 15 personnel on site. The UXOSO may be dual-hatted with the UXOQCS to perform this function. The UXOSO will not be involved in any OE removal or investigation tasks. The UXOSO will be directly hired and work for the prime contractor and must report directly to the contractor's project manager or someone higher in the contractor's organization.

(e) A UXOQCS may not be required full time on site. However, QC functions will be performed for all field activities. The UXOQCS will ensure a quality product in the field without compromising safety. The UXOQCS will not be involved in any OE removal or investigation tasks. The UXOQCS will be directly hired and work for the prime contractor and must report directly to the contractor’s project manager or someone higher in the contractor s organization.

(f) The UXO Technician I is authorized to perform the functions listed above. The UXO Technician I will not determine whether or not a UXO is safe to move.

(g) UXO sweep personnel will not excavate anomalies or handle UXO. They are limited to the functions listed in paragraph 20-4b(5). If these personnel are performing required work, they may remain in the exclusion zone during anomaly investigation.

(2) CWM Investigations and Removal Actions.

(a) A full time UXOSO will be present during all field operations on a CWM project site due to the complex hazards posed by CWM. UXO qualifications for the safety officer are not required for sites where CWM is in Chemical Agent Identification Sets, shipping containers, or other non-munition type containers.

(b) A full time UXOQCS will be used for all CWM field operations. This requirement may be relaxed if a written request, citing actual site conditions, is submitted to the Contracting Officer for approval.

20-6. Explosives Safety. The contractor will be required to comply with DOD 6055.9-STD; AR 385-64; U.S. Army TM 60 series publications on EOD procedures; ER 385-1-92; and ATF P 5400.7 for all matters/operations involving OE. The contractor will be required to design and implement a site-specific Explosives Management Plan in accordance with OE MCX DID OE-005-03, which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew. This requirement should be identified in the basic contract.

20-7. Exclusion Zone Safety.

a. General. When OE operations are being conducted, only personnel essential for the operation will be allowed in the exclusion zone. The number of people in the exclusion zone must be restricted to the minimum number consistent with safe and efficient operations and include only those personnel directly engaged in the tasks being performed.

b. Establishing Exclusion Zones. An exclusion zone is a safety zone around an OE work area. Each UXO contractor will establish an exclusion zone to protect the public and non-essential personnel from unintentional detonations and all personnel from intentional detonations of ordnance.

(1) To the maximum extent practical, OE projects will be executed based on minimum separation distances specified in DOD 6055.9-STD. Contact the OE MCX for the criteria to be used in calculating minimum separation distances for OE operations.

(2) Where minimum separation distances are not practical, only engineering controls that have been approved by DDESB will be used.

c. Restriction of Personnel from Exclusion Zone. Access to the exclusion zone will be controlled during all UXO operations. UXO operations will cease prior to non-essential personnel entering the exclusion zone.

d. Visits by Non-essential Personnel. When a non-essential person requests entrance to the exclusion zone, he must receive a safety briefing before entry is allowed. Generally, UXOSO or SUXOS will brief the visitor and have them sign the visitors log. Site visitors must be escorted at all times. In addition to the visitor briefing requirements of 29 CFR 1910.120, the following topics will be included during the briefing:

(1) The measures to be taken in the event of an accident and the location and route to the nearest hospital.

(2) The hazards associated with the site (e.g., UXO, safety, health, etc.).

(3) Authorized areas to eat, drink, or smoke.

e. OE Removal Operations within the Exclusion Zone. It is imperative that UXO operations be conducted in accordance with safe, standard EOD practices as taught by one of the following schools or courses: The U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD; U.S. Naval Explosive Ordnance Disposal School, Indian Head, MD; The EOD Assistant's Course, Redstone Arsenal, AL; or the EOD Assistant's Course, at Eglin Air Force Base, FL.

f. Safety Violations. If a contractor violates the recommended practices of any safety provision required by the removal contract, a notice of violation will be issued by the OE Safety Specialist. An example format of a notice of violation is available on the OE MCX website at http://www.hnd.usace.army.mil/oew. Districts may modify this format as appropriate. Districts should ensure appropriate distribution of the notice of violation to include: the Contracting Officer; Resident Engineer; and OE Safety Manager located at the OE Design Center. The nature and severity of the violations will be reviewed during the contractor selection process for new contracts.

g. Safety Alerts. The USAESCH OE Safety Group will provide "Safety Alerts" on OE issues notifying UXO Contractors and USACE OE Safety Specialists of problems or potential problems concerning OE operations. These "Safety Alerts" require immediate attention and will be distributed to all personnel involved in OE operations.

20-8. Emergency Response.

a. Before the start of OE response operations, an Emergency Response Plan which complies with 29 CFR 1910.120(1) and 1926.65(1) will be developed and implemented. The Emergency Response Plan is a component of the SSHP.

b. Local fire, police and rescue authorities having jurisdiction and nearby medical facilities that would be utilized for emergency treatment of injured personnel will be contacted before the start of OE response operations in order to notify them of upcoming site activities and potential emergency situations, to ascertain their response capabilities, and to obtain a response commitment.

c. The following items, as appropriate, will be immediately available for on-site use during the conduct of OE response operations: first aid equipment and supplies approved by the consulting physician; fire extinguishers; and emergency eyewashes/showers (as necessary).

20-9. Health and Safety Submittals. The following required health and safety documents will be submitted in accordance with ER 385-1-92 for all OE response activities.

a. Site Safety and Health Plan. Prior to performing on-site work, USACE personnel and contractors are required to complete a SSHP in accordance with the requirements of 29 CFR 1910.120(b)(4), 29 CFR 1926.65(b)(4), and ER 385-1-92.

(1) Contents. The SSHP will be based on limiting the exposure to a minimum amount of UXO and a minimum number of personnel for the minimum time consistent with safe and efficient operations. A description of the elements required in the SSHP is found in the OE MCX DID OE-005-06, “Site Safety and Health Plan”, which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

(2) Review and Approval. The OE Design Center executes the SSHP. The SSHP will be forwarded to the district for review as well as the MSC and OE MCX for monitoring. The OE Design Center provides final approval for the SSHP.

b. Abbreviated Site Safety and Health Plan. When preliminary project activities of a non-intrusive nature are conducted on potential OE sites prior to work plans and SSHPs being approved (e.g., site visits, pre-work plan visits, and public affairs visits), an ASSHP will be prepared. If a contractor will be involved in the site visit, the UXOSO will prepare the ASSHP. If only government personnel take part in the site visit, the OE Safety Specialist will prepare the ASSHP. All site visit participants will read, sign and comply with the ASSHP and attend all safety briefings held by the UXOSO or OE Safety Specialist (as applicable). On FUDS projects, the property owner may accompany the site visit team and should be invited to attend safety briefings even though they cannot be expected to comply with the ASSHP. If the site is operating under an existing SSHP that adequately addresses the appropriate OE safety issues, an ASSHP is not required.

(1) Contents. Appendix H includes an example format for developing an ASSHP. While the ASSHP may be presented in a format other than depicted, all of the information listed in Appendix H and additional information required due to site-specific conditions must be included.

The ASSHP will require that the site visit be conducted by at least two individuals who maintain constant communication and line-of-sight with each other. Provisions must be made for off-site communications for emergencies, especially for remote sites.

(2) Review and Approval. The review process for the ASSHP is determined by whether the document is prepared to support the PAE, SI or EE/CA phase of an OE response action. If the ASSHP is prepared for the PAE, the district is responsible for executing and approving the ASSHP. If the ASSHP is prepared for the SI or EE/CA phases, the OE Design Center is responsible for executing and approving the ASSHP. During the SI and EE/CA phases, the district will review the SSHP and provide comments or written concurrence or non-concurrence. The ASSHP must be approved prior to departure for the site.

(3) Modification. When new information becomes available, the ASSHP should be revised in coordination with the OE Safety Manager.

c. Health and Safety Design Analysis. The applicability of a Health and Safety Design Analysis (HSDA) for OE design will depend on the complexity of the removal operations and the type of work. If an HSDA is applicable, it will be prepared in accordance with the requirements of ER 385-1-92. If it is not applicable, the contractor will provide a negative declaration and justification for exclusion.

d. Safety, Health, and Emergency Response Specifications. The applicability of a Safety, Health and Emergency Response Specification for OE design will depend on the complexity of the removal operations and the type of work. If a Safety, Health, and Emergency Response Specification is applicable, it will be prepared in accordance with the requirements in ER 385-1-92. If it is not applicable, the contractor will provide a negative declaration and justification for exclusion.

20-10. Accident and Incident Reporting.

a. All accidents will be reported and investigated to determine the cause of the accident and develop controls to prevent recurrence. Notification and reporting will be in accordance with AR 385-40, Accident Reporting and Records, and USACE Suppl 1 to AR 385-40.

b. The UXOSO is responsible for accident reporting. For contracts under the supervision of the district, accidents will be reported to the district safety office with an informational copy to be forwarded to the OE MCX. USACE district personnel will report through the OE MCX and Command channels to CESO.

c. If CWM is encountered during site activities, all work will cease, workers will evacuate upwind, the site will be secured, and the proper authorities will be notified. Chemical event reporting will begin based on the time of release confirmation and must not wait until location and isolation of the leaking munition is accomplished.

(1) On FUDS, the notification will be made to the local law enforcement agency, who in turn will notify the appropriate military EOD. Site workers will also notify the USAESCH OE Safety Manager.

(2) On active installations, the military police will be notified and the USAESCH OE Safety Manager will be contacted.

(3) A Chemical Event Report will be completed. The format for a Chemical Event Report is available from the OE MCX. Additional information on chemical event reporting is found in AR 50-6.

20-11. Other Constituents.

a. The OE Design Center will notify the PM when other constituents are suspected to be present at a project site. The OE Design Center will follow applicable safety precautions when conducting OE activities and other constituents are suspected.

b. Under normal circumstances, OE constituents are not expected to be a concern at project sites. However, in some cases, regulators may be concerned about the potential for OE constituents at a site. In these cases, it is appropriate to conduct limited sampling to provide additional information on the OE constituents. Prior to initiating any activity, an exit strategy will be developed with the regulators. The PM is responsible for determining if such a condition exists. The PM will follow the HTRW close-out procedures after completion of the response activities precipitated by the safety hazard presented by OE.

# CHAPTER 21
# ENGINEERING CONSIDERATIONS

21-1. Introduction. This chapter provides guidance on three important engineering considerations for OE response actions: the use of engineering controls, the selection and application of geophysical instrumentation, and location surveying and mapping.

21-2. Engineering Controls. Engineering controls can be used to mitigate the effects of accidental or intentional explosions if the calculated exclusion zone for the OE items to be destroyed cannot be met. Engineering controls are used to improve personnel safety and/or to reduce the exclusion zone during removal operations. The types of engineering controls include those used for unintentional explosions and those used for intentional explosions.

a. Engineering Controls for Unintentional Detonation.

(1) An unintentional detonation occurs when the location of the detonation cannot be planned in advance. An unintentional detonation includes a detonation during excavation of a suspected OE item or a detonation in the interim holding area or collection point. An example of an engineering control commonly used for unintentional detonations is the barricade.

(2) The project team should design barricades in accordance with approved DOD standards. To implement a barricade that has previous approval by DDESB, the project team should contact USAESCH's Engineering Directorate, Structural Branch. If a barricade has not been previously approved, a complete structural design package should be submitted to USAESCH's Engineering Directorate, Structural Branch as part of the ESS. The structural design package should include design drawings, design details, calculations, drawings, and relevant testing details. The design must show how fragmentation is captured and overpressure is reduced. The design package, as part of the ESS, is forwarded to DDESB for approval.

b. Engineering Controls for Intentional Detonations. An intentional detonation is a planned, controlled detonation. Intentional detonations include blow-in-place, consolidated shots (detonation of multiple items), and open detonation/open burn areas. Engineering controls used for intentional detonations include soil cover, sandbags, and the On-Site Demolition Container.

(1) Soil Cover. If soil is proposed to be used over a to-be-detonated OE, the project team may use one of several computerized models to determine the required thickness of soil cover necessary for the intentional detonation of OE items. The Buried Explosion Module is one such computerized model. The methodology used in this software is documented in HNC-ED-CS-S-97-7-Revision 1. The use of soil as an engineering control reduces the fragment and soil ejecta distances.

(2) Sandbags. Sandbags may be used for an OE item no larger than 155-mm. If sandbags are proposed to be used as an engineering control to mitigate the fragmentation and overpressures generated during an intentional OE detonation, the project team should refer to HNC-ED-CS-S-98-7, Use of Sandbags for Mitigation of Fragmentation and Explosion effects Due to Intentional Detonation of Munitions.

(3) On-Site Ordnance Demolition Container (ODC). Another engineering control that may be proposed for the intentional detonation of OE items is the ODC. The ODC has been approved by DDESB for the intentional detonation of OE items. The ODC is designed to contain all significant explosion pressures for a total NEW of up to 6 pounds of TNT or its equivalent. The ODC is designed to capture all fragmentation from OE items with fragmentation characteristics up to those from an 81-mm mortar. When using the ODC, the required withdrawal distance is 75 feet. Detailed design drawings for the ODC and the supporting technical report, CEHNC-ED-CS-S-97-3, Safety Submission for On-Site Demolition Container for Unexploded Ordnance are available.

c. If engineering controls are required for intentional detonations, the OE Design Center should be contacted to arrange for the preparation of a design with USAESCH's Engineering Directorate, Structural Branch.

21-3. Geophysical Considerations. This section presents an overview of geophysical considerations for OE response projects. Detailed requirements for geophysical investigations during OE response projects are available from the OE MCX.

a. Types of OE Detectors. The most successful geophysical systems used as OE detectors rely on one of two technologies: magnetometry or electromagnetics. Magnetometers are limited to detecting ferrous items. Electromagnetic detectors can detect any conductive metal. Another method used for subsurface detection of munitions is ground penetrating radar. Other systems may be used as they are advanced.

b. Instrument Selection. To select the most appropriate OE detection instrument for a geophysical investigation, the following factors should be considered: site characteristics; ordnance penetration; instrument detection rates; and instrument performance during testing on a sample grid.

(1) Site Characteristics. Prior to selecting an OE detection instrument, the unique characteristics of the site should be evaluated. Features of the site which may impact an OE detection instrument include:

(a) Terrain and vegetation.

(b) Geologic conditions.

(c) Man-made features, such as utilities.

(d) Past, current and future land use.

(2) Ordnance Penetration. When planning geophysical investigations for buried UXO, it is necessary to consider possible depth of UXO. If UXO is intentionally buried, factors affecting burial depth may include type of soil, mechanical versus hand-excavation, depth of water table, etc. If the munition was fired or dropped, then the depth of penetration can be estimated by considering soil type, munition type and weight, and impact velocity. Penetration depths may be estimated using a Maximum Ordnance Penetration source document such as the nomograph found in Figure 4-8 of TM 5-855-1, Fundamentals of Design for Conventional Weapons. There are many cases where UXO can penetrate deeper than geophysical instruments can reliably detect. On such sites, it is possible that undetected UXO remains deeper than it can be detected.

(3) OE Instrument Detection Rates. Detection rates are always site-specific and are highly dependent upon the type of ordnance at the site, how the ordnance was used, how deeply it may be buried, environmental conditions, and cultural influences. Previous test results have shown that, regardless of the particular detector system tested, the best detection systems utilize computer-based post processing to assist data evaluation and target selection.

(4) OE Detection Instrument Performance.

(a) The performance of OE detection instruments varies as a result of different characteristics such as soil type, moisture content, depth to groundwater, vegetation, and type of OE. The number of environmental and OE factors affecting the performance of OE detection instruments are so numerous that a test of various potential OE detection instruments should be performed on the site to determine which instrument performs the best.

(b) The purpose of OE instrument testing is to:

- Document the consideration given to various OE detection instruments for use at a project site, the criteria used to identify geophysical instruments for consideration, and the causes for their respective selection or rejection.

- Document the capabilities and limitation of each OE detection instrument selected for consideration at the site-specific geophysical prove-out.

- Observe each OE detection instrument operating in the contractor’s configuration, using the contractor’s personnel and methodologies at the project site operating as a unit.

- Evaluate the contractor’s data collection, data transfer quality, data quality control method(s), and data transfer rates.

- Evaluate the contractor's method(s) of data analysis and evaluation.

- Evaluate estimated field production rates and estimated false positive rations, as related to project cost.

- Evaluate proposed changes to OE detection methodologies.

(c) OE detection instrumentation will be tested prior to and upon the completion of the geophysical survey of each grid to characterize system operation.

(d) A specific standardization test grid will be constructed at the project site. The location of the standardization test grid will be selected by the OE project team based upon the technical and site-specific considerations identified by the SUXOS and the project geophysicist.

(e) The standardization test grid will be seeded with inert OE items which are representative of the items expected to be recovered from the site. The number, orientation, and depths of the seeded OE items will be sufficient to characterize the limitations of the proposed OE detection equipment and to evaluate the ability of the proposed OE detection equipment to located each type of OE at the anticipated depths.

(f) Normally, the grid will be seeded by someone other than the contractor. The grid typically will contain a known portion and an unknown portion. The contractor will be provided the test grid location and the location of all seeded items on the known portion. The contractor will use the known portion of the grid to optimize the proposed methodologies. The contractor will be evaluated by the OE Design Center on the ability to characterize the unknown portion of the test grid.

(g) The results of this site-specific OE detection instrument test should be documented and included in the SOW for the removal action.

c. Geophysical Investigation Plan.

(1) The contractor must prepare a Geophysical Investigation Plan, which is a component of the project Work Plan. The purpose of the Geophysical Investigation Plan is to document the methodology for completing the geophysical investigation. The required contents for the Geophysical Investigation Plan are discussed in the OE MCX DID OE-005-05, "Geophysical Investigation Plan", which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

d. Personnel Requirements.

(1) OE detection instrument testing will be managed by a qualified geophysicist. The requirements for the geophysicist are presented in the OE MCX DID OE-025, "Personnel/Work Standards", which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

(2) Training and medical surveillance requirements for the on-site geophysical mapping crews will be in accordance with Chapter 24 of this document.

(3) During all field investigation activities, the crew must be accompanied by UXO personnel who will ensure that the site is safe before the team begins work. Based on-site conditions, it is possible that a UXO escort will not be required in all areas at all times after the initial site visit. However, such a decision will be made jointly by the OE Safety Specialist and UXOSO who may rescind or modify it at any time.

21-4. Location Surveying and Mapping.

a. General. This section provides an overview of location survey and mapping considerations for OE response projects. Detailed survey, mapping, and GIS requirements may be found in OE MCX DID OE-005-07, "Location Surveys and Mapping Plan", which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

b. Location surveys and mapping will be performed by the contractor to establish primary and secondary project control; collect and compile topographic, planimetric, and/or orthometric mapping; monument and record the perimeter boundaries of an OE removal action and interior boundaries designating various depths of OE removal, if applicable; delineate the sampling areas within defined areas of concern for site characterization during an EE/CA; re-establish and mark OE-related anomalies identified during OE detection surveys and analyses; and record the geographic location of recovered OE. Project areas may be subdivided into subareas (grids) to enhance command and control within the work area.

c. Personnel. All of the location survey and mapping will be conducted and/or supervised by a professional land surveyor licensed by the appropriate Board of Registration for the applicable state. The boundary survey and metes and bounds description of each OE removal area will be stamped and sealed by the professional land surveyor in charge of the survey and mapping activities.

d. Safety Requirements. During all initial field work and all intrusive activities, the survey crew shall be accompanied by UXO personnel. The UXO personnel will conduct visual surveys for surface OE prior to the survey crew entering a suspect area. The UXO personnel will also confirm that the desired location for setting a survey reference monument, project control point, grid stake, or any other marker is free of any surface OE and subsurface anomalies. If the

location is not clear of OE or potential OE, the UXO personnel will check an alternate offset location for the marker as established by the survey crew.

e. Training and Medical Surveillance. Training and medical surveillance requirements for on-site surveying crews will be in accordance with Chapter 24 of this document.

21-5. Geographic Information Systems. The GIS assembles all the data required to associate the non-intrusive subsurface geophysics investigative data to its correct geographical location, the relational database, mapping, and remote sensing data. It provides a standard methodology to assist in the assembly of all past, current, and proposed OE project information into a common reference for analysis, management and storage in a digital for the project's administrative record. GIS requirements are detailed in OE MCX DID OE-005-07, "Location Surveys and Mapping Plan", which is located on the OE MCX website at http://www.hnd.usace.army.mil/oew.

# CHAPTER 22
# INNOVATIVE TECHNOLOGIES

22-1. Introduction. This chapter discusses the use of innovative technologies in OE response actions. Topics discussed include the innovative technology program and the technology advocate.

22-2. Innovative Technologies in OE Response Actions.

a. Innovative technologies, like any other engineering tool, must be applied appropriately to an OE response project. The best available technology for each OE response project may vary due to different and unpredictable, site conditions.

b. The OE MCX reviews, evaluates, and approves the implementation of the best available OE detection and removal technologies for OE response projects. The OE MCX ensures that the implementation of innovative technologies is efficient and effective. The OE MCX defines current technology and functional requirements, provides consulting services to projects, identifies technology gaps, provides seed money to field improved technologies, and supports other technology programs. To assist with these functions, the OE MCX maintains an OE Innovative Technology Program.

22-3. Innovative Technology Program.

a. The purpose of the OE MCX Innovative Technology Program is to assess and apply innovative applications of existing technology to OE response projects. The PM should contact the OE MCX to discuss the applicability of innovative technologies to an OE response project.

b. The Innovative Technology Program is focused on three phases: assessment, removal, and treatment. Efforts are tailored to address the tasks required in each phase to produce logical, efficient, and safe site-specific cleanup activities. The current OE technology or “baseline” is used to evaluate and develop improvements to the state-of-the-art.

c. The Innovative Technology Program utilizes a team approach, involving multiple disciplines and techniques, to adapt safe and efficient techniques and technologies to project-specific assessments, OE removals, and disposal or treatment activities.

22-4. Technology Advocate.

a. In order to ensure that the most appropriate technologies are implemented during project design and execution, each organization performing OE work must have an OE Technology Advocate. The USACE Technology Advocate at the OE MCX serves as the user-

needs interface between the Design and Execution Districts and USACE, the US Army Environmental Center and DOD Executive Agent for UXO Technology Programs.

b. The OE Innovative Technology Advocate also coordinates and implements technology transfer activities with other federal agencies and public and private sector stakeholders. The Technology Advocate is responsible for:

(1) Coordinating with the OE MCX on regulatory, policy, and procedural issues relating to OE technology on behalf of his or her organization.

(2) Maintaining a current working knowledge of conventional and emerging technologies having application to OE design or response execution.

(3) Serving as an organizational resource for technologies that may contribute to project effectiveness (enhanced risk reduction per cost).

(4) Communicating technology information, opportunities, requirements, lessons learned, or other feedback among design or execution personnel and the OE MCX.

# CHAPTER 23
# UXO SUPPORT FOR CONSTRUCTION ACTIVITIES

23-1. Introduction. This chapter discusses explosive soils, anomaly avoidance, and UXO support during construction as part of OE response actions on FUDS.

23-2. Explosive Soils.

a. General. Explosive soil, primary explosives, and secondary explosives are defined in the glossary.

b. Soil Contaminated with Primary Explosives and Propellants. For soils known or suspected to be contaminated with any concentration of primary explosives or propellants, the following will apply:

(1) The OE MCX will be contacted for sampling and cleanup procedures prior to initiating any work.

(2) Responsibilities for sampling and cleanup of soils contaminated with any concentration of primary explosives or propellants will be determined on a case-by-case basis.

c. Soil Contaminated with Secondary Explosives. For soils known or suspected to be contaminated with secondary explosives, the following will apply:

(1) The HTRW Design District is responsible for the design and removal or remedial action to cleanup soils contaminated with secondary explosives. However, where military munitions (excluding bulk explosives) are suspected or known to exist, the OE Design Center is responsible for the design and the OE Design Center or the district approved to execute OE removal actions is responsible for the cleanup.

(2) The HTRW Design District will sample and analyze site soil samples to determine by compositional analysis whether areas exist where soils are in excess of ten percent secondary explosives. Sampling and analysis procedures can be obtained from the HTRW MCX. Project documents to include a sampling and analysis plan will be prepared and submitted to the HTRW MCX in accordance with the current approved HTRW responsibilities matrix (the matrix is available on the Internet at http://www.usace.army.mil/inet/centers/mcx/htrw/htrw.htm under the "List of Mandatory Services"). The Work Plan and SSHP will be submitted to the OE MCX for review prior to beginning any sampling. UXO support is required during sampling.

(3) When the concentration of secondary explosives is determined to be ten percent or greater, the HTRW Design District will prepare an ESS for cleanup in addition to the project documents required by existing HTRW guidance. Project documents will be submitted to the

HTRW MCX in accordance with the current approved HTRW responsibilities matrix. The Work Plan and design documents (HSDA and SSHP) will be submitted to the OE MCX for review. The ESS will be submitted to the OE MCX for comments and written concurrence or nonconcurrence. The OE MCX will forward the ESS to CESO for monitoring, concurrence, and forwarding to higher headquarters for approval. The cleanup will not begin until the DDESB or their designee approves the ESS. The OE MCX should be contacted for further information on ESS requirements.

(4) When the concentration of secondary explosives is determined to be less than ten percent, the HTRW Design District will prepare and submit documents for review and approval in accordance with the current approved HTRW responsibilities matrix and ER 385-1-92.

d. Unexpected Ordnance Finds. If military munitions (excluding bulk explosives) are discovered during any phase of the explosive soils remediation, field work will cease and the OE MCX will be contacted. The OE MCX will assess the situation and consult with the HTRW MCX and the OE project team to determine the appropriate course of action to take in completing the project.

23-3. Anomaly Avoidance/UXO Support During Construction Activities.

a. General.

(1) Anomaly Avoidance. Anomaly avoidance refers to techniques employed by EOD or UXO personnel at sites with known or suspected OE to avoid any potential surface UXO and any subsurface anomalies. This usually occurs at mixed hazard sites when HTRW investigations must occur prior to execution of an OE removal action. All surface UXO and subsurface anomalies will be avoided during investigation activities. Intrusive anomaly investigation is not authorized during anomaly avoidance operations, but any surface ordnance discovered will be noted so that later operations can readily find them. Contact the OE MCX for additional information on team composition, activity specific procedures, and quality management requirements for anomaly avoidance.

(2) Construction Activities. Construction projects on known or suspected OE sites may require UXO support. When a determination is made that the probability of encountering UXO is low (e.g., current or previous land use leads to an initial determination that OE may be present), a two person UXO team will stand by in case the construction contractor encounters a suspected UXO. When a determination is made that the probability of encountering a UXO is moderate to high (current or previous land use leads to a determination that OE was employed or disposed of in the parcel of concern, e.g., open burn and open detonation areas, impact areas, maneuver areas, etc.), UXO teams are required to conduct subsurface UXO clearance for the known construction footprint in conjunction with the construction contractor prior to construction intrusive activities. The level of effort for construction support will be determined

on a case-by-case basis in coordination with the OE MCX. Additional information on the specific procedures, team composition, and quality management requirements for UXO support for construction activities is available from the OE MCX.

b. Responsibilities.

(1) Districts preparing to work on a project site with known or suspected OE (including Civil Works) will coordinate the project the OE MCX.

(2) If a UXO Support action is deemed insufficient to address OE concerns, then an OE response action must be initiated. The appropriate OE Design Center will be notified and a response plan will be developed.

(3) The district is responsible for supervising the field work. The OE MCX will spot check the field work to ensure conformance with the approved work plan and SSHP. Upon completion of the field work, the district will prepare a draft report that will be sent to the OE MCX for review.

(4) HTRW Design Districts should include anomaly avoidance capability in all applicable indefinite delivery order contracts for HTRW reports, designs, or remedial actions on FUDS or active military sites. Contact the OE MCX for applicable contract DIDs.

c. Documentation.

(1) The district is responsible for executing the preparation of SOWs and Work Plans for anomaly avoidance and UXO support during construction activities. These documents will be reviewed by the OE MCX.

(2) When an ESS is required for UXO Support activities, the OE Design Center is responsible for executing the ESS. The ESS will be reviewed by the district, OE MCX and HQUSACE. The ESS will be monitored by the MSC. Final approval of the ESS will be provided by HQUSACE.

# CHAPTER 24
# TRAINING AND MEDICAL SURVEILLANCE

24-1. Introduction.

a. This chapter summarizes the training requirements which must be completed by USACE and contractor personnel prior to conducting OE response activities. The training will be conducted by instructors who meet the trainer qualifications identified in 29 CFR 1910.120(e)(5).

b. All USACE and contractor personnel working on-site who are exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the site, will receive training meeting the requirements of 29 CFR 1910.120(e). These personnel will receive training before being permitted to engage in operations that would expose them to hazardous substances, safety, or health hazards. They will receive updated training on an annual basis.

24-2. Subject Matter Requirements.

a. Employees will be trained in the following items at the beginning of each project:

(1) Names of persons and alternates responsible for site safety.

(2) Safety, health, and other hazards known to be on the site.

(3) Use of personal protective equipment.

(4) Work practices to minimize hazards.

(5) Safe use of equipment and other controls on site.

(6) Medical surveillance requirements.

(7) Decontamination procedures (if necessary).

(8) An emergency response plan.

(9) Confined space entry procedures (if applicable).

(10) A spill containment program (if applicable).

b. Additional site-specific training covering site hazards, procedures, and all contents of the approved SSHP will be conducted by the UXOSO. This training will be provided for all on-site employees, including those assigned only to the Support Zone, prior to the commencement of

work; for visitors prior to entering the site; and on a continual basis. Completion of specialized, site-specific training will be documented by the UXOSO.

24-3. Mandatory Training. This section discusses the initial, Cardiopulmonary Resuscitation (CPR)/First Aid, and refresher training requirements for personnel engaged in OE response actions. This section also addresses training certification and documentation.

a. Initial Training.

(1) 40-Hour Training. All workers engaged in hazardous substance removal or other activities on an OE site which expose or may expose them to hazardous substances and health hazards will receive a minimum of 40 hours of instruction off-site and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(2) 24-Hour Training. On OE sites, workers and supervisors only occasionally on-site or those who are assigned to a single project only, and who are unlikely to be exposed over OSHA Permissible Exposure Limits or other exposure limits of a national consensus standard, will receive a minimum of 24 hours of instruction off-site, and a minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor. These workers may be engaged in clearing brush, land surveying, geophysical surveying, etc.

(3) On-site Management and Supervisor Training. On-site management and supervisors directly responsible for or who supervise workers engaged in activities which may potentially expose them to hazardous substances and health hazards at OE sites will receive an additional 8 hours of supervisory training. It is the responsibility of the UXOSO to maintain current records and verify the training status of all on-site personnel.

(4) Workers Outside of Controlled Area Training. Workers regularly on-site who work in areas outside the exclusion zone will receive a minimum of 24 hours of instruction off-site and a minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(5) Noise Training. Workers exposed to high noise levels at the OE site must be provided training on the physical and psychological effects of high noise levels; noise exposure limits; and the selection, use, and limitations of hearing protection devices.

(6) Site Visitor Training. Visitors to an OE site prior to cleanup work beginning for the purpose of viewing the site for contractor bids, determining terrain conditions, size of area, etc., are not be required to have HAZWOPER training. All site visitors must be informed of physical hazards of the site and methods to control those hazards.

(7) Office and Administrative Worker Training. Project personnel whose jobs should never require them to enter the exclusion zone will be provided a site-specific safety briefing. These personnel may include clerical workers and office geophysicists.

b. Refresher Training. All employees requiring 40-hour or 24-hour training, as well as managers and supervisors, will receive eight hours of refresher training annually on the items specified in paragraph 24-2. Employees will also critique any incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

c. First Aid and CPR Training.

(1) When a medical facility or physician is not accessible within five minutes to a group of two or more employees for the treatment of injuries, at least two employees on each shift will be qualified to administer first aid and CPR.

(2) Employees designated as responsible for rendering first aid or medical assistance will be:

(a) Included in their employer's blood-borne pathogen program in accordance with 29 CFR 1910.1030.

(b) Instructed in the sources, hazards, and avoidance of blood-borne pathogens.

(c) Provided with, use, and maintain personal protective equipment when appropriate for rendering first aid or other medical assistance to prevent contact with blood or other potentially infectious materials.

d. Training Certification. Each employee successfully completing the training and field experience requirements specified above will be certified as having successfully completed the necessary training. A written certificate will be given to each person certified. The certificate or a copy of the certificate will be maintained at the project site as proof of the completion of the training. Any person not certified is prohibited from engaging in on-site OE response operations. The only exception is individuals who can show by past experience and/or training that they have had the equivalent to the above initial training.

e. Documentation. All health and safety training, including the names of employees trained, the duration of the training, the contents of the training courses, and the dates of training will be documented and appended to the SSHP. Records must be kept to ensure identified personnel receive appropriate initial health and safety training and annual refresher courses. Response action contractors and visitors must provide evidence of health and safety training before site entry is authorized.

24-4. Medical Surveillance. This section discusses the following aspects of the medical surveillance program: participation requirements, medical examinations, certification and recordkeeping.

a. Participation Requirements.

(1) All personnel performing on-site activities that meet or exceed the requirements and inclusion criteria in 29 CFR 1910.120/29CFR 1926.65(f), and EM 385-1-1 (or other applicable military requirements) will participate in an ongoing medical surveillance program.

(2) In consultation with the Occupational Physician, the minimum content and frequencies of necessary medical examinations will be determined. This determination will be based upon probable site conditions, potential occupational exposures, and required PPE.

b. Medical Examinations.

(1) Examinations will be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine. Examination and/or test results will be reviewed by the Occupational Physician.

(2) The written opinion from the attending physician required by 29 CFR 1910.120/ 29 CFR 1926.65(f)(7) will be made available upon request to the CO or approving authority for any site employee.

c. Certification. Certification of employee participation in the medical surveillance program will be appended to the SSHP. This certification will include the employee's name, the date of last examination, and name of reviewing occupational physician.

d. Recordkeeping. All personnel medical monitoring records will be maintained in accordance with 29 CFR 1910.120.

# APPENDIX A
# REFERENCES

## A-1. Section I
## Required Publications

Base Realignment and Closure Act of 1988, Public Law (PL) 100-526, 102 Stat. 2632.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, PL 96-510, 94 Stat 2767, 42 USC 9601

Defense Base Realignment and Closure Act of 1990, PL 101-510, 104 Stat. 1808.

Defense Environmental Restoration Program, PL 99-499, Section 211, 100 Stat 1719, 10 USC 2701 et seq.

Resource Conservation and Recovery Act (RCRA) of 1976, PL 94-580, 90 Stat 2796, 42 USC 6901, et seq., as amended

Superfund Amendment and Reauthorization Act (SARA) of 1986, PL 99-499, 100 Stat 1613, amending CERCLA, 42 USC 9601 et seq., and miscellaneous other sections

29 CFR 1910.120/1926.65
OSHA Hazardous Waste Operations and Emergency Response

32 CFR Part 203
Technical Assistance for Public Participation (TAPP) in Defense Environmental Restoration Activities

40 CFR Part 260, et al
U.S. Environmental Protection Agency (EPA) Military Munitions Rule

40 CFR Part 300
EPA National Oil and Hazardous Substance Pollution Contingency Plan

49 CFR Part 172
Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information and Training Requirements

Federal Acquisition Regulation as of January 1, 1999

Defense Federal Acquisition Regulation Supplement

Army Federal Acquisition Regulation Supplement

Engineer Federal Acquisition Regulation Supplement

DOD 6055.9-STD
Ammunition and Explosives Safety Standards

AR 50-6
Chemical Surety

AR 200-1
Environmental Protection and Enhancement

AR 385-10
The Army Safety Program

AR 385-61
Army Toxic Chemical Agent Safety Program

AR 385-64
Ammunition and Explosives Safety Standards

AR 405-90
Disposal of Real Estate

DA Pam 385-61
Toxic Chemical Agent Safety Standards

DA Pam 385-64
Ammunition and Explosives Safety Standards

TM 5-855-1
Fundamentals of Design for Conventional Weapons

TM 9-1300-214
Military Explosives

ER 5-1-11
Program and Project Management

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

ER 1110-1-12
Quality Management

ER 1110-1-8153
OE Response

ER 1110-1-8158
Corps-Wide Centers of Expertise Program

EP 1110-1-17
Establishing a Temporary Open Burn/Open Detonation Site for Conventional Ordnance and Explosives

EP 1110-3-8
Public Participation in the Defense Environmental Restoration Program

EM 385-1-1
U.S. Army Corps of Engineers Safety and Health Requirements Manual

HQDA 385-98-1, DACS-SF
Explosives Safety Policy for Real Property Containing Conventional Ordnance and Explosives

HQDA Policy Memorandum
Interim Guidance for Biological Warfare Materiel and Non-Stockpile Chemical Warfare Materiel Response Activities
(Use until final guidance is issued.)

HQUSACE, CEMP-R
Environmental Cleanup and Protection Management Plan for Military Programs

HQUSACE, CEMP-RF
Program Manual for DERP-FUDS

HQUSACE, CEMP-RF
DERP-FUDS INPR Review Procedures

HQUSACE, CEMP-RF
Delegation of Presidential Authorities under the CERCLA and DERP for Execution of FUDS

HQUSACE, CEMP-RF
USACE Policy on Determination of Project Eligibility for Properties

Circ No. 385-1-216
Safety Briefings for Official Visitors to USACE Project Sites

EPA/540-P-90-004
EPA Superfund Removal Procedures Action Memorandum Guidance

EPA/540-R-93-057
EPA Guidance for Conducting Non-Time Critical Removal Actions under CERCLA

A-2. Section II
Related Publications

A related publication is merely a source of additional information. The user does not have to read it to understand this pamphlet.

Interim Policy for DOD Implementation of the EPA Military Munitions Rule

DOD 4500.9-R
Defense Transportation Regulation, Part II, Cargo Movement

AR 25-30
The Army Integrated Publishing and Printing Program

AR 75-15
Responsibilities and Procedures for Explosive Ordnance Disposal

AR 385-40
Accident Reporting and Records

DA Pam 40-8
Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX

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

DA Pam 50-6
Chemical Accident or Incident Response and Assistance (CAIRA) Operations

DA Pam 385-64
Ammunition and Explosives Safety Standards

TB 700-2
DOD Ammunition and Explosives Hazard Classification Procedures

TM 60A-1-1-31
Explosive Ordnance Disposal Procedures

USACE Supplement 1 to AR 385-40
U.S. Army Engineering and Support Center, Huntsville Safety Concepts and Basic Considerations for Unexploded Ordnance (UXO) Operations

USAESCH-ED-CS-S-96-8-Revision 1
Guide for Selection and Siting of Barricades for Selected Unexploded Ordnance, September 1997

HNC-ED-CS-S-97-3
Safety Submission for On-Site Demolition Container for Unexploded Ordnance

HNC-ED-CS-S-97-7-Revision 1
Buried Explosion Module (BEM): A Method for Determining the Effects of Detonation of a Buried Munition

HNC-ED-CS-S-98-7
Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions

ATFP 5400.7
Explosives Laws and Regulations

EPA/625/R-93/013
Approaches for the Remediation of Federal Facility Sites Contaminated with Explosive or Radioactive Wastes

National Fire Protection Association (NFPA) 780

# APPENDIX B
# RISK ASSESSMENT PROCEDURES FOR ORDNANCE AND EXPLOSIVES (OE) SITES

Site Name _____ Rater's Name_____
Site Location _____ Phone Number_____
DERP Project # _____ Organization_____
Date Completed _____ Score_____

OE RISK ASSESSMENT**:**

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The Risk Assessment Code (RAC) score will be used by the U.S. Army Engineering and Support Center, Huntsville (USAESCH), Ordnance and Explosives Team (USAESCH-OE) to prioritize the response action(s) at Formerly Used Defense Sites (FUDS). The risk assessment should be based on the best available information resulting from record searches, reports of Explosive Ordnance Disposal (EOD) Detachments actions, field observations, interviews, and measurements. This information is used to assess the risk involved based on the potential OE hazards identified at the site. The risk assessment is composed of two factors, hazard severity and hazard probability. Personnel involved in visits to potential OE sites should view the USAESCH-OE videotape entitled "A Life Threatening Encounter: OEW".

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible event resulting from personnel exposure to various types and quantities of unexploded ordnance.

| TYPE OF ORDNANCE: (Circle all that apply) | VALUE |
|---|---|
| A. Conventional ordnance and ammunition: | |
| Medium/large caliber (20mm and larger) | 10 |
| Bombs, explosive | 10 |
| Grenades, hand or rifle, explosive | 10 |
| Landmine, explosive | 10 |
| Rockets, guided missile, explosive | 10 |
| Detonators, blasting caps, fuzes, boosters, bursters | 6 |
| Bombs, practice (w/spotting charges) | 6 |
| Grenades, practice (w/spotting charges) | 4 |
| Landmine, practice (w/spotting charges) | 4 |
| Small arms, complete round (.22 cal -.50 cal) | 1 |
| Small arms, expended | 0 |
| Practice ordnance (w/o spotting charges) | 0 |

Conventional ordnance and ammunition (largest single value) _____

What evidence do you have regarding conventional unexploded ordnance?_____

_____

| B. Pyrotechnics (for munitions not described above): | VALUE |
|---|---|
| Munition (containers) containing White Phosphorus (WP) or other pyrophoric material (i.e., spontaneously flammable) | 10 |
| Munition containing a flame or incendiary material (i.e., Napalm, Triethylaluminum metal incendiaries) | 6 |
| Flares, signals, simulators, screening smokes (other than WP) | 4 |
| Pyrotechnics (select the single largest value) | _____ |

What evidence do you have regarding pyrotechnics?_____

_____

| C. Bulk High Explosives (HE) (not an integral part of conventional ordnance; uncontainerized): | VALUE |
|---|---|
| Primary or initiating explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.) | 10 |
| Demolition charges | 10 |
| Secondary explosives (PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.) | 8 |
| Military dynamite | 6 |
| Less sensitive explosives (Ammonium Nitrate, Explosive D, etc.) | 3 |
| High explosives (select the single largest value) | _____ |

What evidence do you have regarding bulk explosives?_____

D. Bulk propellants (not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized):

| | VALUE |
|---|---|
| Solid or liquid propellants | 6 |
| Propellants | _____ |

What evidence do you have regarding bulk propellants?_____

_____

| E. Chemical Warfare Materiel (CWM) and Radiological Weapons: | VALUE |
|---|---|
| Toxic chemical agents (choking, nerve, blood, blister) | 25 |
| War Gas Identification Sets | 20 |
| Radiological | 15 |
| Riot Control Agents (vomiting, tear) | 5 |
| Chemical and Radiological (select the single largest value) | ____ |

What evidence do you have regarding chemical or radiological?_____

TOTAL HAZARD SEVERITY VALUE (Sum of value A through E (maximum of 61) ____

Apply this value to Table 1 to determine Hazard Severity Category

TABLE 1
HAZARD SEVERITY*

| DESCRIPTION | CATEGORY | HAZARD SEVERITY VALUE |
|---|---|---|
| CATASTROPHIC | I | 21 and/or greater |
| CRITICAL | II | 10 to 20 |
| MARGINAL | III | 5 to 9 |
| NEGLIGIBLE | IV | 1 to 4 |
| **NONE | V | 0 |

*Apply Hazard Severity Category to Table 3

**If hazard severity value is 0, you do not need to complete Part II of this form. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

PART II. Hazard Probability. The probability that a hazard has been, or will be, created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used Department of Defense (DOD) site.

AREA, EXTENT, ACCESSIBILITY OF OE HAZARD (Circle all that apply)

| A. Locations of OE hazards: | VALUE |
|---|---|
| On the surface | 5 |
| Within tanks, pipes, vessels, or other confined areas | 4 |
| Inside walls, ceilings, or other building/structure | 3 |
| Subsurface | 2 |

Location (select the single largest value) _____

What evidence do you have regarding the location of OE?_____

| B. Distance to nearest inhabited location/structure likely to be at risk from OE hazard (road, park, playground, building, etc.) | VALUE |
|---|---|
| Less than 1,250 feet | 5 |
| 1,250 feet to 0.5 mile | 4 |
| 0.5 mile to 1.0 mile | 3 |
| 1.0 mile to 2.0 Miles | 2 |
| Over 2 miles | 1 |

Distance (select the single largest value) ___

What are the nearest inhabited structures/buildings? _____

_____

| C. Number(s) of building(s) within a 2-mile radius measured from the OE hazard area, not the installation boundary. | VALUE |
|---|---|
| 26 and over | 5 |
| 16 to 25 | 4 |
| 11 to 15 | 3 |
| 6 to 10 | 2 |
| 1 to 5 | 1 |
| 0 | 0 |

Number of buildings (select the single largest value) ___

Narrative: _____

_____

_____

| D. Types of Buildings (within a 2 mile radius) | VALUE |
|---|---|
| Educational, child care, residential, hospitals hotels, commercial, shopping centers | 5 |
| Industrial, warehouse, etc. | 4 |

| | |
|---|---|
| Agricultural, forestry, etc. | 3 |
| Detention, correctional | 2 |
| No buildings | 0 |
| Types of buildings (select the single largest value) | ____ |

Describe the types of buildings:_____

_____

| E. Accessibility to site refers to access by humans to ordnance and explosives. Use the following guidance: | VALUE |
|---|---|
| No barrier nor security system | 5 |
| Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing. | 4 |
| A barrier (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site. | 3 |
| Security Guard, but no barrier | 2 |
| Isolated site | 1 |
| A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel continuously monitors and controls entry; or, an artificial or natural barrier (e.g., fence combined with a cliff) which completely surrounds the area; and, a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the area). | 0 |
| Accessibility (select the single largest value) | ____ |

Describe the site accessibility:_____

_____

F. Site Dynamics. This deals with site conditions are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion on beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility. VALUE

| | |
|---|---|
| Expected | 5 |
| None anticipated | 0 |

Site Dynamics (select the single largest value) ____

Describe the site dynamics;_____

_____

TOTAL HAZARD PROBABILITY VALUE (sum of largest values for A through F (maximum of 30) ____

Apply this value to Hazard Probability Table 2 to determine the Hazard Probability Level.

TABLE 2
HAZARD
PROBABILITY

| DESCRIPTION VALUE | LEVEL | HAZARD PROBABILITY |
|---|---|---|
| FREQUENT | A | 27 or greater |
| PROBABLE | B | 21 to 26 |
| OCCASIONAL | C | 15 to 20 |
| REMOTE | D | 8 to 14 |
| IMPROBABLE | E | less than 8 |

*Apply Hazard Probability Level to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table. Enter the results of the Hazard Probability and Hazard Severity values.

TABLE 3

| PROBABILITY LEVEL | FREQUENT A | PROBABLE B | OCCASIONAL C | REMOTE D | IMPROBABLE E |
|---|---|---|---|---|---|
| SEVERITY CATEGORY: | | | | | |
| CATASTROPHIC I | 1 | 1 | 2 | 3 | 4 |
| CRITICAL II | 1 | 2 | 3 | 4 | 5 |
| MARGINABLE III | 2 | 3 | 4 | 4 | 5 |
| NEGLIGIBLE IV | 3 | 4 | 4 | 5 | 5 |

RISK ASSESSMENT CODE
(RAC)

RAC 1 Expedite INPR, recommending further action by USAESCH-Immediately call USAESCH-OE-S (comm 256-895-1582/1598).

RAC 2 High priority on completion of INPR-Recommend further action by USAESCH.

RAC 3 Complete INPR-Recommend further action by USAESCH.

RAC 4 Complete INPR-Recommend further action by USAESCH.

RAC 5 Usually indicates that No DOD Action Indicated (NDAI) is necessary, Submit NDAI and RAC to USAESCH.

PART IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

# APPENDIX C
# ARCHIVES SEARCH REPORT FORMAT

| VOLUME I - FINDINGS | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| ACKNOWLEDGMENTS | • Presents individual responsible for ASR | • Provides Acknowledgments |
| INTRODUCTION | • Presents the Subject, Purpose, and Scope | • Provides introduction |
| 1. PREVIOUS INVESTIGATIONS | • Presents prior DERP-FUDS actions | • Ensures all appropriate DERP-FUDS data and actions are incorporated |
| 2. SITE DESCRIPTION | | |
| a. Existing Land Usage | • Identifies current land owners<br>• Delineates acreages and current land usage<br>• Equates OE subsites to current usage and ownership | • Used to identify owners for present and future OE activities<br>• Provides ownership needed in determining strategy of response action<br>• Needed to determine RAC |
| b. Climatic data | • Presents normal/average weather of area and seasonal changes<br>• Presents weather extremes<br>• Presents unique weather conditions | • Used to determine timeframe for investigations and response actions |
| c. Topography | • Describes general topography of the sites, including slopes and specific terrain features | • Needed for response considerations |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| d. Geology and Soils | • Presents regional/site geological information<br>• Presents and describes soil types, locations onsite, and depths<br>• Provides soil boring log references<br>• Provides general information on site terrain and identifiable land forms | • Needed for investigations/sampling/ response actions<br>• Used to determine possible depth of OE contamination<br>• Needed for competitive contractor bidding<br>• Needed to assess OE contamination and response strategy |
| e. Hydrology | • Provides surface water patterns<br>• Provides ground water patterns/flow | • Used for assessing surface water for OE contamination<br>• Used to assess OE/HTRW contamination<br>• Natural Resources |
| f. Natural Resources | • Provides status on fish, wildlife, and vegetation, including threatened or endangered species | • Used in assessing EE/CA alternatives |
| g. Historical/ Cultural Resources | • Provides historical/cultural site information | • Used in assessing EE/CA and RA alternatives |
| 4. HISTORICAL ORDNANCE USAGE | | |
| a. Chronological Site Summary | • Provides chronological usage/ownership of site | • Used to assess contamination |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| b. Review of Ordnance-related records | • Presents historical records | • Used to make conclusions and recommendations on actual and potential OE contamination<br>• Establishes actual ordnance items/ contamination present<br>• Establishes areas/subsites of actual, potential, or uncontaminated OE<br>• Provides information for RAC |
| c. Interviews with site-related personnel | • Presents information obtained on current or prior site usage<br>• Includes historians, current land owners, former employees, police, ordnance disposal teams and others | • Further establishes site usage<br>• Used to evaluate historical documents<br>• Provides information for RAC |
| 5. SITE ELIGIBILITY | | |
| a. Confirmed FUDS | • Presents correctness of acreage and land ownership on existing FDE | • Confirms FDE |
| b. Potential FUDS | • Presents areas/subsites not included on existing FDE | • Provides recommendations on new OE areas of investigation for OE contamination |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| 6. VISUAL SITE INSPECTION | | |
| a. General Procedures and Safety | • Presents basic concept/approach to site visit<br>• Addresses site safety | • Provides site inspection<br>• Provides awareness briefing of safety requirements |
| b. Site Specific Areas | • Presents each specific area or subsite within main site<br>• Presents description of site features | • Confirms OE presence or non-presence<br>• Provides input on current land usage for RAC, EE/CA, RD, and RA actions |
| 7. EVALUATION OF ORDNANCE PRESENCE | | |
| a. General Procedures | • Describes process of ASR OE evaluation | • Provides clear understanding of intent of ASR |
| b. Site Specific Area | • Presents confirmed, potential and uncontaminated areas/subsites<br>• Evaluates historical records, interviews, and site inspection<br>• Combines site inspection information and documented information for evaluation/interpretation<br>• Provides description of manufacturing and process control | • Evaluates actual areas of OE contamination<br>• Use to form/provide conclusions/ recommendations |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| 8. SITE ORDNANCE TECHNICAL DATA | | |
| a. End Item Data | • Lists all ordnance items that could exist on site<br>• Provides filler type of each item<br>• Provides drawings of ammunition | • Used to assist EE/CA and RA strategy and safety<br>• Used to assist EE/CA and RA positive item identification and component function |
| b. Chemical Data of Ordnance Fillers | • Presents chemical breakdown for ordnance fillers of end items | • Used to assist EE/CA and RA strategy and safety regarding handling, storage, and transportation<br>• Provides potential HTRW sampling requirements and safety considerations |
| 9. EVALUATION OF OTHER SITE ENVIRONMENTAL HAZARDS | • Presents documented information or observed conditions that indicate potential HTRW or BD/BR problems | • Provides other DERP-FUDS potential projects |
| APPENDICES | | |
| A. Reference Sources | • Presents persons/organizations contacted and credits | • Provides contacts and their contributions |
| B. References and Abstracts | • Provides bibliography of references | • Provided resources used |
| C. Glossary | • Defines acronyms | • Defines acronyms |
| D. Texts/Manuals | • Presents excerpts from texts/manuals<br>• Presents drawings/data of ordnance | • Provides clarification of information<br>• Provides visual identification of ordnance |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| E. Reports/Studies | • Presents excerpts form reports or studies | • Provides supporting information |
| F. Letters/ Memorandums/ Miscellaneous Items | • Presents historical an current correspondence documents | • Provides current and historical supporting information |
| G. Real Estate Documents | • Provides deed or lease documents | • Provides verifying information of DERP-FUDS eligibility |
| H. Newspapers/ Journals | • Provides newspaper articles and excerpts from journals | • Supports/verifies information |
| I. Interviews | • Presents conversation records | • Provides information used in assessing site |
| J. Present Site Photographs | • Presents photographs of site taken during site visit | • Provides visual verification of current site usage |
| K. Historical Photographs | • Presents historical photographs of the site | • Provides visual verification of historical site usage<br>• Provides visual verification of prior projects/response action |
| L. Reference Maps/Drawings | • Presents historical site/location maps/drawings | • Provides verification of site layout<br>• Used to evaluate/ascertain areas of potential OE contamination |
| M. ASR Correspondence | • Presents any ASR related correspondence | |
| N. Report Distribution | • Presents organizations receiving Draft/Final copies of ASR | • Used to verify receipt by all pertinent organizations |

| VOLUME I - FINDINGS (continued) | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| REPORT PLATES | • Presents site map and boundaries abstracted from historical drawings/documents<br>• Presents drawings of subsites<br>• Presents aerial photographs<br>• Presents drawings showing former usage<br>• Presents drawings defining current land usage/ownership<br>• Presents drawings showing current photo locations<br>• Presents drawings defining firing fans<br>• Presents drawings defining specific information presented in ASR<br>• Presents drawings defining soil types<br>• Presents boring logs as needed | • Provides visual clarification of site location/information<br>• Used for site EE/CA and RA strategy |

| VOLUME II - CONCLUSIONS AND RECOMMENDATIONS | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| PROJECT FACT SHEET | • Provides summary of ASR and recommended OE actions | • Provides project summary |
| 1. INTRODUCTION | • Presents subject purpose and scope | • Provides introduction |
| 2. CONCLUSIONS | | |
| a. Summary of Conclusions | • Presents summary (table) of conclusions | • Provides summary of OE presence/contamination<br>• Provides summary of DERP-FUDS site eligibility |
| b. Historical site Summary | • Provides chronological usage ownership of site | • Used to assess OE contamination and verify DERP-FUDS eligibility |
| c. Site Eligibility | • Presents correctness of acreage on existing FDE<br>• Presents areas/subsites not included on existing FDE | • Confirms FDE<br>• Used to recommend new areas of investigation for OE contamination |
| d. Visual Site Inspection | • Presents OE observations | • Confirms OE presence or non-presence |
| e. Confirmed ordnance subsites | • Presents specific areas/subsites of confirmed OE contamination | • Used to develop RA strategies |
| f. Potential Ordnance Subsites | • Presents specific areas/subsites of potential OE contamination | • Used to determine EE/CA strategies |

| VOLUME II - CONCLUSIONS AND RECOMMENDATIONS | | |
|---|---|---|
| SECTION | DESCRIPTION | PURPOSE |
| g. Uncontaminated Ordnance Subsites | • Presents areas/subsite where no confirmed or potential OE contamination exists | • Used to site areas requiring no further OE action |
| h. Other Environmental Hazards | • Summarizes/evaluates/interprets all OE related information | • Provides basis for all recommendations presented throughout ASR |
| RECOMMENDATIONS | | |
| a. Summary of Recommendation | • Presents summary (table)of recommendations for PAE,ASR,EE/CA and SI actions | • To provide concise overview of all actions required - OE, HTRW, and BD/DR |
| b. Ordnance and Explosive Waste | • Presents specific areas/subsites requiring OE actions | • Provides recommendation for each OE action<br>• Used to determine EE/CA and RA costs/strategies |
| c. Other Environmental Remediation Actions | • Presents areas of potential HTRW and BD/BR contamination/projects | • Used to initiate investigation of other site hazards |
| ATTACHMENT A | • Presents RAC | • Used to prioritize OE response actions |
| REPORT PLATS | • Same as Findings | • Same as Findings |

# APPENDIX D
# SAMPLE ARCHIVES SEARCH REPORT FACT SHEET

D-1. Site Name. Hammer Army Airfield

Site number: J09CA082300

Location:
City: Fresno
County: Fresno
State: California

Project Number: J09CA082300

Category: Non-stockpile CWM and OE

D-2. Points of Contact (POC).

District Project Manager:
Name:
Office:
Phone:

OE Design Center POC:
Name:
Office:
Phone:

MSC POC:
Name:
Office:
Phone:

Headquarters POC:
Name:
Office:
Phone:

Project Engineer:
Name:
Office:
Phone:

D-3. Site Description. The Former Hammer Army Airfield consisted of 1617 acres. Most of the Former Airfield site is now the Fresno Air Terminal. Other portions of the site are used for commercial and industrial development and for municipal parks. A portion of the site remains undeveloped.

D-4. Site History. The site was acquired between 1941-1945 for use as a sub-base for Camp Pinedale. Hammer Army Airfield was an integral part of the aerial defense of the west coast during World War II. The site was excessed beginning in 1946 by the war assets administration.

D-5. Project Description. Records indicate storage and training facilities for non-stockpile CWM and storage facilities for conventional ordnance. Interviews with local individuals revealed two suspected non-stockpile CWM burial sites and four remote training areas. None of the original ordnance storage and training facilities remains on the site. Two of the remote training sites were skip bombing ranges. No evidence of non-stockpile CWM or OE contamination was found at these sites. One of the remote training sites is a rifle range. No evidence of non-stockpile CWM or OE contamination was found at this site. The two burial sites and a remote training site used as a gunnery range are described in detail as follows:

Area 1

Size: 2 acres
Use: Suspected burial site
Ordnance found: None
Suspected contamination: Non-stockpile CWM

Area 2

Size: 2 acres
Use: Suspected burial site
Ordnance found: None
Suspected contamination: Non-stockpile CWM

Area 4

Size: 10 acres
Use: Gunnery range
Ordnance found: Practice rockets, one rocket suspected of containing white phosphorus
Suspected contamination: Additional practice ordnance items (exact type unknown)

D-6. Current status. The Archives Search Report was completed in _____.

D-7. Strategy. An Engineering Evaluation/Cost Analysis (EE/CA) to determine the type and extent of contamination of the three contaminated areas is scheduled to begin in the ___ qtr of FY _____. Cleanup of the gunnery range is schedule to begin _____.

D-8. Issues and concerns.

D-9. Schedule Summary.

| Phase | Stat | Original Start | Schedule Start | Actual Start | Original Complete | Schedule Complete | Actual Complete |
|---|---|---|---|---|---|---|---|
| EE/CA | | | | | | | |

D-10. Funding/Budget Summary.

| Year | Phase | Exec FOA | In-House Required | Contract Required | Funded | Obligated |
|---|---|---|---|---|---|---|
| | EE/CA | | | | | |

D-11. Immediate Concerns, Public Risk/Exposure.
There is no immediate concern regarding the non-stockpile CWM burial sites. All evidence indicates the non-stockpile CWM items were buried deep and therefore surface risk to the public should not be a concern. The potential for groundwater contamination is unknown.

There is immediate concern regarding the anti-tank rockets found on Campbell Mountain. Although the area is not a highly developed residential area, there is a significant amount of unauthorized recreational use during spring and summer. The warhead from one of the rockets was found intact and may contain white phosphorus.

# APPENDIX E
# ANOMALY REVIEW BOARD PROCEDURES

E-1. Purpose. An Anomaly Review Board (ARB) may be established to review decisions and recommendations made by the OE project team regarding the detection and evaluation of subsurface anomalies. ARBs should be used only in exceptional circumstances, such as at CWM sites or highly contaminated sites in heavily urbanized areas.

E-2. Scope of an ARB. The ARB will review all evaluations of the OE project team based on screening criteria developed by the ARB for the site. The screening criteria will be approved by the OE MCX.

E-3. Composition of the ARB. The ARB will generally consist of four to six members with technical expertise in ordnance detection and safety, geophysics, and geotechnical and environmental engineering. One or more board members may be appointed from the district for the project site. A Chairperson and an alternate Chairperson will be appointed. All board members will be independent from the project site personnel.

E-4. Procedures for Establishing an ARB.

a. It is the responsibility of the OE Design Center Point of Contact (POC), in coordination with the project engineer and OE Safety Manager for the OE project team, to put forth a recommendation to the OE MCX POC as to whether or not an ARB should be established for a site. This recommendation will be documented and will include the rationale for the recommendation. The recommendation for or against the establishment of the ARB should be made prior to intrusive investigations of anomalies.

b. The OE MCX will concur/nonconcur in the recommendation. If concurred, the OE MCX will designate an ARB Chairman. If the OE Design Center's recommendation for establishment of an ARB is nonconcurred by the OE MCX, full rationale supporting the nonconcurrence will be documented and forwarded to the Director of Engineering and OE project team for a decision. The final decision will be forwarded to the OE MCX.

c. The ARB Chairman must have previously served on an ARB as either a chairman or a member. The ARB Chairman will be responsible for locating and appointing qualified ARB members to serve on the committee.

E-5. Procedures for Operating an ARB.

a. Upon appointment of the board members, the ARB Chairman will coordinate with the PM and request a work directive be issued for the preparation of a site-specific Management Plan to identify the responsibilities of the ARB and how it will operate. The OE MCX will assist in

the development of the Management Plan and provide information needed by the PM to carry out these procedures. The final Management Plan for the ARB will be approved by the OE MCX and the OE Design Center. Once approved, the ARB Chairman will be responsible for ensuring that the Management Plan is implemented.

b. The ARB Chairman will be responsible for timely notification to the PM of all required site visits, fund requirements, reproduction services or other elements requiring PM support. The ARB Chairman is also responsible to assure that all actions of the ARB are fully and timely documented. The ARB Chairman will ensure that the OE MCX, the OE Design Center, and the PM are fully aware of the ARB's progress and performance on an on-going basis throughout the life of the ARB.

E-6. Conclusion of the ARB. The ARB will be disbanded upon completion of all work elements described in the Management Plan.

# APPENDIX F
# EXPLOSIVES SAFETY SUBMISSION FOR NO DOD ACTION INDICATED (EXAMPLE FORMAT)

F-1. Reason for Ordnance and Explosives

Provide a brief description of why Ordnance and Explosives (OE) contamination exists in the specific area(s) of the site covered in the Explosives Safety Submission (ESS). This information may be derived from the following project documents: Inventory Project Report; Preliminary Assessment of Eligibility; Historical Records Searches; Archives Search Report; and/or Engineering Evaluation/Cost Analysis (EE/CA).

Provide a brief explanation that the site is under the Formerly Used Defense Site (FUDS) or Base Realignment and Closure (BRAC) program.

Provide a brief explanation that following an EE/CA or a risk assessment, the response action alternative of "No DOD Action Indicated" has been recommended.

F-2. Maps.

a. Regional Map.

Provide a map showing the regional location of the site. For example, provide a state map with the site identified on it.

b. Site Map.

Provide a site map which illustrates the OE area(s) addressed in the ESS. Show the current use of each area (for FUDS) or the expected reuse of each area (for BRAC). The specific boundaries of the area(s) should be clearly noted. If other areas of the site are not covered by the ESS, the reasoning for their exclusion should be explained. For example, these areas may be covered in a future ESS or were addressed by a previous ESS.

c. Soil Sampling Map.

If sampling of explosive soils occurred during the site investigation, provide a map outlining the area(s) sampled and the location and depth of sampling points. Identify the field screening methods used and the concentrations of explosives for each sampling point. Identify any environmental or legal considerations which are important to the implementation of institutional controls.

F-3. Justification.

Provide justification for No DOD Action Indicated at the area(s) addressed in the ESS. This justification should include the following:

a. The amounts and types of OE found during the site investigation. Present a brief synopsis of the results of the surface and intrusive investigations. This discussion should be supported by a table that shows: the amount of OE, type of OE, and the depths of OE found in each area investigated.

b. A summary of the risk analysis performed on the area(s) addressed in the ESS.

c. A summary of the cost-benefit analysis, if performed.

d. Provide a summary for the rationale for the selection of No DOD Action Indicated as the most appropriate action, based on the amount, type and depth of OE found, the risk analysis, and (if available) the cost-benefit analysis.

F-4. Start Date.

Not applicable.

F-5. Migration of OE.

If the existing amounts, types and depths of OE is expected to increase due to migration, describe what impact this will have on the level of risk at the site in the future. If the level of risk is expected to increase to the unacceptable level, describe what the plans are to address this escalation. Principal migration mechanisms are discussed below:

a. Frostline. State the depth of the frostline at the site. Where OE is above the frostline but is currently deep enough to be an acceptable risk, but may migrate upward and cause trouble in the future, describe what provisions will be made for continued surveillance of the area.

b. If the area(s) encompass water bodies, then provide a discussion on the impact of wave action, tides, currents, storms, etc, on any potential OE migration.

c. If the area lies in a watershed such that runoff and erosion can carry OE from upstream into the area, address this concern.

F-6. Clearance Techniques.

Not applicable.

F-7. Alternate Techniques.

Not applicable.

F-8. Quantity-Distance.

Not applicable.

F-9. Off-site Disposal.

Not applicable.

F-10. Technical Support.

Not applicable.

F-11. Public Involvement.

Discuss the public participation activities which occurred as part of the EE/CA process, including:

- public meeting(s);
- Restoration Advisory Board, if applicable;
- 30-day public comment period;
- press conference(s);
- media day(s); and
- location of the Administrative Record.

F-12. After Action Report.

An After Action Report will not be produced. An Action Memorandum will be executed to conclude this project.

F-13. Summary.

Present a summation of the project that mirrors the language in the conclusion of the EE/CA. (This language will also be included in the Action Memorandum.)

State that "Following the approval of the ESS, an Action Memorandum presenting the recommendations outlined in the EE/CA and ESS will be submitted to the District Commander. Following the approval of the Action Memorandum, it will be submitted to the Administrative Record."

# APPENDIX G
# EXPLOSIVES SAFETY SUBMISSION FOR INSTITUTIONAL OR ENGINEERING CONTROLS (EXAMPLE FORMAT)

G-1. Reason for Ordnance and Explosives.

Provide a brief description of why Ordnance and Explosives (OE) contamination exists in the specific area(s) of the site covered in the Explosives Safety Submission (ESS). This information may be derived from the following project documents: Inventory Project Report; Preliminary Assessment of Eligibility; Historical Records Searches; Archives Search Report; and/or Engineering Evaluation/Cost Analysis (EE/CA).

Provide a brief explanation that the site is under the Formerly Used Defense Site (FUDS) or Base Realignment and Closure (BRAC) program.

Provide a brief explanation that following an EE/CA or a risk assessment, the response action alternative of "Institutional Controls" or "Engineering Controls" has been recommended.

G-2. Maps.

a. Regional Map.

Provide a map showing the regional location of the site. For example, provide a state map with the site identified on it.

b. Site Map.

Provide a site map which illustrates the OE area(s) addressed in the ESS. Show the current use of each area (for FUDS) or the expected reuse of each area (for BRAC). The specific boundaries of the area(s) should be clearly noted. If other areas of the site are not covered by the ESS, the reasoning for their exclusion should be explained. For example, these areas may be covered in a future ESS or were addressed by a previous ESS.

Show the location of any areas which will be addressed by institutional or engineering controls. For example, if deed restrictions are to be imposed, show the area affected. As another example, if an area will be fenced off, show the fence line.

c. Soil Sampling Map.

If sampling of explosive soils occurred during the site investigation, provide a map outlining the area(s) sampled and the location and depth of sampling points. Identify the field screening methods used and the concentrations of explosives for each sampling point.

Identify any environmental or legal considerations that are important to the implementation of institutional controls.

G-3. Justification.

Provide justification for institutional or engineering controls at the area(s) addressed in the ESS. This justification should include the following:

a. The amounts and types of OE found during the site investigation. Present a brief synopsis of the results of the surface and intrusive investigations. This discussion should be supported by a table which shows: the amount of OE; type of OE; and the depths of OE found in each area investigated.

b. A summary of the risk analysis performed on the area(s) addressed in the ESS.

c. A summary of the cost- benefit analysis, if performed.

d. Provide a summary for the rationale for the selection of institutional or engineering controls as the most appropriate action, based on the amount, type and depth of OE found, the risk analysis, and (if available) the cost-benefit analysis.

G-4. Start Date.

Not applicable.

G-5. Migration of OE.

If the existing amounts, types and depths of OE is expected to increase due to migration, describe what impact this will have on the level of risk at the site in the future. If the level of risk is expected to escalate back to the unacceptable level, describe what the plans are to address this escalation. Principle migration mechanisms are discussed below:

a. Frostline. State the depth of the frostline at the site. Where OE is above the frostline but is currently deep enough to be an acceptable risk with the chosen controls, but may migrate upward and cause trouble in the future, describe what provisions will be made for continued surveillance of the area.

b. If the area(s) encompass water bodies, then provide a discussion on the impact of wave action, tides, currents, storms, etc, on any potential OE migration.

c. If the area lies in a watershed such that runoff and erosion can carry OE from upstream into the area, address this concern.

G-6. Clearance Techniques.

Not applicable.

G-7. Alternate Techniques.

Not applicable.

G-8. Quantity-Distance.

Not applicable.

G-9. Off-site Disposal.

Not applicable.

G-10. Technical Support.

Not applicable.

G-11. Public Involvement.

Discuss the public participation activities which occurred as part of the EE/CA process, including:

- public meeting(s);
- Restoration Advisory Board, if applicable;
- 30-day public comment period;
- press conference(s);
- media day(s); and
- location of the Administrative Record.

G-12. After Action Report.

An After Action Report will not be produced. An Action Memorandum will be executed to conclude this project.

G-13. Summary.

Present a summation of the project which mirrors the language in the conclusion of the EE/CA. (This language will also be included in the Action Memorandum.)

State that "Following the approval of the ESS, an Action Memorandum presenting the recommendations outlined in the EE/CA and ESS will be submitted to the District Commander. Following the approval of the Action Memorandum, it will be submitted to the Administrative Record."

# APPENDIX H
# ABBREVIATED SITE SAFETY AND HEALTH PLAN FORMAT
# (NON-INTRUSIVE ACTIVITIES)

Site Name: _____

Version: [ ] Original [ ] Revision/Date: _____

Prepared by: _____

Affiliation: _____

Address/Phone: _____

Signature/Date: _____

Reviewer Signature/Date: _____

Title/Affiliation: _____

Reviewer Signature/Date: _____

Title/Affiliation: _____

Team Leader/UXOSO: _____

Title/Affiliation: _____

Signature/Date: _____

H-1. Site Description and Contamination Characterization.

a. Site Description

| SITE LOCATION | APPROXIMATE SIZE |
|---|---|
| | |
| **TOPOGRAPHY** | **SITE USES** |
| ( )Forested ( )Open Terrain<br>( )Lake, Pond ( )Wetland<br>( )Grassland ( ) Arid<br>( )Hilly ( )Tillage<br>( )Other_____ | ( )Rural ( )Urban<br>( )Ag Business ( )Commercial<br>( )Farming ( )Industrial<br>( )Ranching ( )Mining<br>( )Military ( )Residential<br>( )Government ( )Recreational<br>( )Other_____ |

b. Contamination Characterization

| CHEMICAL CONTAMINANT LISTING | | | | |
|---|---|---|---|---|
| Chemical Name | Conc. Range | Media: Air Water, Soil | Location | Quantity Expected |
| | | | | |
| | | | | |
| | | | | |

| ORDNANCE/EXPLOSIVES CONTAMINATION | | | |
|---|---|---|---|
| Type | Amount | Location | Surface/ Subsurface |
| | | | |
| | | | |

H-2. Hazard/Risk Analysis.

a. Tasks to be performed:
Task #: _____
Task #: _____
Task #: _____

| Task # | HAZARDS: Safety, Chemical, Physical, Radiological, Biological, OE (*See Below) | ACTION LEVELS: (**See Below) |
|---|---|---|
| | | |
| | | |
| | | |

Notes to Hazard/Risk Analysis:

***HAZARDS:**

**Safety:**

Structural: (e.g. sagging roof or floor, broken or missing stairs, railings, floor boards, leaning or deteriorated load bearing walls/support beams, etc.)

Falling: (e.g. open pits; manholes; silos; wells; shafts; rocks; steep inclines; wet surfaces; etc.)

Climbing: (e.g. falls from structures > 4 feet; deteriorated ladders or missing rungs; etc.)

Walking or Debris: (e.g. Uneven terrain; animal burrows; surface indentations; exposed nails; broken timbers; sharp protruding objects; broken glass; etc.)

Confined Space (e.g. excavations > 4 feet deep; surface/underground utility vaults; vats/silos/grain bins; open surface tanks/cisterns/septic tanks; cellars/crawl spaces; tunnels; wells; boilers; underground/above ground storage tanks; etc.)(NO ENTRY)

Eye Hazards: (e.g. Thicket branches; airborne dust/windy conditions; contaminated liquid splashes; etc.)

OE/Other: (e.g. explosives; combustible or flammable materials; oxygen deficiency; etc.)

**Chemical**:

Evaluate the chemical hazards that may be encountered during site activities for each task. For activities utilizing this plan, encounters with chemicals above the PEL, TLV or the IDLH are not expected. THIS PLAN SHALL NOT BE USED IF OVEREXPOSURES OR IDLH CONDITIONS ARE EXPECTED. (List the chemical TLV/PEL/REL; OSHA/NIOSH IDLH; odor threshold/warning levels; warning signs/symptoms of overexposure; concentrations expected on site.)

**Physical:**

Evaluate the potential for injury from physical agents such as noise, electricity, moving parts/machinery, heat and cold stress that may be present (e.g. loud machinery; overhead or underground power lines; personal protective clothing, etc.)

Notes to Hazard/Risk Analysis (continued)

**Radiological:**

Evaluate the risk to human health caused by radioactive materials or ionizing radiation fields in the area where work is to be performed. Do not use this Generic SSHP if a qualified health physicist determines that worker exposure is likely to exceed exposure levels considered acceptable for the general public.

**Biological:**

Evaluate the potential for illness of injury due to biological agents (e.g. poisonous plants, animals, insects, microorganisms, medical waste, etc.)

**OE:**

Evaluate exposure; minimize people, time, and amount of hazardous material. Age or condition of ordnance DOES NOT decrease hazard. Presence of GREEN MARKINGS indicates chemical filler: EVACUATE IMMEDIATELY. Ordnance exposed to fire EXTREMELY hazardous: EVACUATE IMMEDIATELY.

****ACTION LEVELS:**

Action Levels shall typically be defined as requiring site evacuation only, if significant hazards are encountered. Note: The non-intrusive activities for which this abbreviated SSHP is designed, will not typically encounter ordnance, chemical contaminant or radioactive exposures above background. In the event that chemical or radioactive exposures which are judged to be significant are encountered (reasonable potential to exceed permissible exposure limits or encounter IDLH conditions, or where OE is expected) this plan requires evacuation of the site, reevaluation, and development of a SSHP by the Qualified Industrial Hygienist/Safety Personnel which addresses the potential overexposures.

H-3. Staff Organization, Qualifications, and Responsibilities.

| TITLE | NAME | RESPONSIBILITY | PHONE NO. |
|---|---|---|---|
| Qualified IH/SP | | Plan Approval | |
| Proj. Manager | | | |
| Team Lead/UXOSO | | On-site SOH Authority | |
| CPR/First Aid | | | |
| CPR/First Aid | | | |
| Physician | | | |

H-4. Training.

| NAME | TYPE: 40-Hr/Rfshr/Suprv | PPE | SITE HAZARD |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

H-5. Personal Protective Equipment.

a. Personal Protective Equipment (PPE) Program:

- PPE Selection: Level D
- PPE Use and Equipment Limitations: No known atmospheric hazard; work tasks preclude splashes, immersion and potential for unexpected inhalation/contact with chemical hazards.
- Work Mission Duration: Team Leader/UXOSO Instructions
- PPE Maintenance and Storage: Team Leader/UXOSO Instructions
- PPE Decontamination and Disposal: Team Leader/UXOSO Instructions
- PPE Training/Fitting: Team Leader/UXOSO Instructions
- PPE Donning and Doffing: Manufacturer=s Instructions
- PPE Inspection: Team Leader/UXOSO Instructions
- PPE Program Effectiveness: N/A; Level D only
- PPE Temperature Limitations: Impermeable work clothing may cause heat stress. See paragraph 9, this SSHP

b. Levels of Protection/Task:

Level D: A standard work uniform affording minimal protection, used for nuisance contamination only. The following constitute Level D equipment; it shall be used as specified below. (29 CFR 1910.120, appendix A.)

- Coveralls (optional)
- Gloves (optional)
- Boots/shoes, Chemical-resistant steel toe and shank
- Boots, outer, chemical-resistant (disposable)(optional)
- Safety glasses or chemical splash goggles
- Hard hat (optional)
- Escape masks (optional)
- Face shield (optional)
- Disposable Work Clothing (optional)

| TASK # | PPE |
|---|---|
| | |
| | |
| | |

H-6. Medical Surveillance.

a. Medical surveillance program employee participation certification:

| NAME | EXAM DATE |
|---|---|
| | |
| | |
| | |

H-7. Dosimetry

a. Safety and health issues involving employees working within a radiologically restricted area or activities that will generate worker exposure in excess of what is considered acceptable to the general public are beyond the scope of this SSHP.

b. Radiation dosimetry: N/A

c. Employee radiation exposure history: N/A

d. Internal radioactive contamination exposure hazards are beyond the scope of this SSHP.

e. Reports of Exposure to Ionizing Radiation: N/A

H-8. Exposure Monitoring/Air Sampling Program.

a. Air Monitoring/Air Sampling: (See preamble)

b. Real-time Screening for Ionizing Radiation: (See preamble)

c. Sampling and analytical methods: N/A

d. Sample analysis laboratories: N/A

e. Meteorological data: N/A

f. Noise monitoring: N/A

g. Monitoring/sampling results: N/A

h. Exposure monitoring records: N/A

H-9. Heat/Cold Stress Monitoring.

The buddy system or appropriate monitoring procedures shall be used to observe heat stress symptoms. Arrangements shall be made to provide access to plain cool potable water.

H-10. Standing Operating Safety Procedures, Engineering Controls and Work Practices.

a. Site rules/prohibitions: Use buddy system (exception: preliminary assessments of eligibility-but still recommended); no eating/drinking/smoking.

b. Work permit requirements: None. [e.g. No radioactive work, excavation, hot work, confined space, etc.]

c. Material handling procedures: Do not handle soils, liquids, radioactive materials.

d. Drum/container handling procedures and precautions: Do not open, sample or overpack.

e. Confined space entry procedures: Avoid/Do not enter.

f. Hot work, sources of ignition, fire protection/ prevention, and electrical safety: Avoid all electrical hazards, no smoking, avoid spark producing objects.

g. Excavation and trench safety: Avoid/Do not enter.

h. Guarding of machinery and equipment: Do not operate/avoid all physical contact.

i. Lockout/Tagout: N/A

j. Fall protection: No structural climbing, avoid potential areas where fall through could occur.

k. Hazard Communication: N/A

l. Illumination: Daylight hours only; flash light optional.

m. Sanitation: Use on-site/off-site facilities.

n. Engineering controls: N/A

o. Process Systems Safety: N/A

p. Signs and labels: N/A

q. Ordnance/Explosives Site work practices:

(1) Do not touch or move any ordnance items regardless of the marking or apparent condition.

(2) 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.

(3) Do not use radio or cellular phones in the vicinity of suspect ordnance items.

(4) Do not walk across an area where the ground cannot be seen. If dead vegetation or animals are observed, leave the area immediately due to the potential contamination of chemical agent.

(5) Do not drive vehicles into a suspected OE area; use clearly marked lanes.

(6) Do not carry matches, cigarettes, lighters or other flame producing devices into an OE site.

(7) Do not rely on color code for positive identification of ordnance items or their contents.

(8) If necessary, approach ordnance items from the side, avoid approaching the front and rear areas.

(9) Always assume ordnance items contain a live charge until it can be determined otherwise.

SPECIFIC ACTIONS TO BE TAKEN UPON LOCATING ORDNANCE

(1) Do not be misled by markings on the ordnance item stating practice bomb, a dummy or inert. Even practice bombs have explosive charges that are used to mark/spot the point of impact; or the item could be mismarked.

(2) Do not roll the item over or scrape the item to identify the markings.

(3) The location of any ordnance items found during site investigation should be clearly marked so it can be easily located and avoided.

(4) Upon locating any OE, notify USAESCH at (256) 895-1582 during office hours, (central time). If after hours, notify USAESCH at (256) 895-1180.

H-11. Site Control Measures.

a. Work zones and access points.

b. Site map delineating work zones (attached as appropriate).

c. Ionizing radiation restricted areas.

d. On-site and off-site communications:

(1) On-site Communication: Oral with a contingency for hand signals, or on-site cellular phone / FM two way radio (in the absence of suspected ordnance).

(2) Off-site Communication (Either on-site cellular phone / FM two way radio (in the absence of suspected ordnance) or specified readily accessible on/off-site public or private phone):

e. Site security (physical and procedural) description:

(1) Physical Site Security.

(2) Procedural Site Security.

f. General site access description:

H-12. Personal Hygiene and Decontamination.

a. Necessary facilities and their locations.

b. Decontamination SOPs: N/A

H-13. Equipment Decontamination.

a. Decontamination facilities/locations: N/A

b. Decontamination procedures: N/A

H-14. Emergency Equipment and First Aid Requirements.

a. First aid equipment and supplies: As specified:

b. Emergency eye washes/showers: N/A

c. Emergency-use respirators: N/A

d. Spill control materials and equipment: N/A

e. Fire extinguishers: As specified according to size, type, and location:

H-15. Emergency Response and Contingency Procedures (On-Site and Off-site).

a. Local fire/police/rescue pre-notification:

b. Emergency Response Plan:

(1) Pre-emergency planning and procedures for reporting incidents to appropriate government agencies: As specified and prearranged by the UXOSO.

(2) Personnel roles, lines of authority, communications:

(a) Personnel roles (See Paragraph 3):

(b) Lines of Authority (See Paragraph 3):

(c) Communications (See Paragraph 11.d):

(3) Posted instructions (attach route map) and list of emergency contacts:

(a) Project Manager (See Paragraph 3)

(b) Qualified Industrial Hygienist (See Paragraph 3)

(c) Qualified Safety Personnel (See Paragraph 3)

(d) Nearest Medical Facility

(e) Ambulance

(f) Police

(g) Fire

(h) Poison Control Center

(i) State/Local Emergency Response Centers

(j) National Response Center (by U.S. Coast Guard)

(4) Emergency recognition and prevention: The site shall be evacuated in the event significant unexpected hazards are encountered which cannot be safely documented from an appropriate safe distance.

(5) Site topography, layout, and prevailing weather conditions:

(a) Site Topography (See Paragraph 1.a).

(b) Layout.

(c) Prevailing Weather Conditions.

(6) Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).

(a) Emergency Alerting Procedures/Alarm System: Oral Communication for small groups; emergency signals for large groups (e.g. air horns) as specified by the UXOSO.

(b) Emergency PPE and Equipment (See Paragraph 14).

(c) Safe Distances: As specified by the UXOSO.

(d) Places of Refuge: As specified by the UXOSO.

(e) Evacuation Routes (See route map): As specified by the UXOSO.

(f) Site Security and Control(See Paragraph 11): As specified by the UXOSO.

(7) Specific procedures for decontamination and medical treatment of injured personnel.

(8) Route maps to nearest pre-notified medical facility: See attached; as specified by the UXOSO.

(9) Criteria for initiating community alert program, contacts and responsibilities: N/A.

(10) Critique of emergency responses and follow-up:

c. 29 CFR 1910.38(a) applicability: See Paragraph 15.b.

H-16. Accident Prevention.

a. Additional Accident Prevention Plan topics required by EM 385-1-1 which are not specifically covered in this appendix, shall be addressed as follows:

| |
|---|
| |
| |

H-17. Logs, Reports, and Recordkeeping.

a. The records may include the following:

(1) Daily safety inspection logs (may be part of the Daily QC Reports): N/A

(2) Equipment maintenance logs: N/A

(3) Environmental and personal exposure monitoring/ sampling results: N/A

(4) Records of radiation surveys, monitoring and disposal as per 10 CFR 20 subpart L: N/A

## SAFETY BRIEFING CHECKLIST/SSHP ACCEPTANCE FORM

SITE NAME: _____ DATE/TIME_____

### GENERAL INFORMATION

_____ Purpose of Visit
_____ Key Site Personnel/Responsibilities
_____ Training & Medical Requirements

### Site-Specific Information

_____ Site Description/Characterization/Past Uses
_____ Previous Studies/History
_____ Contaminant Characterization
_____ Potential Site Hazards/Health Effects
_____ OE Safety Procedures
_____ Site Personal Protective Equipment(PPE) Program
_____ Site SOPs
_____ Site Control Measures, Decontamination and Communications
_____ Emergency Equipment
_____ Emergency Response/Phone Numbers/Nearest Medical Facility
_____ Unanticipated hazardous conditions shall result in ceasing activities and evacuation of the site in accordance with instructions from the UXOSO.

PLAN ACCEPTANCE

I, the undersigned, have read and have been verbally briefed on the topics noted above and in the SSHP; I understand the SSHP and agree to comply with all the indicated safety and health requirements:

| PRINTED NAME | ORGANIZATION | SIGNATURE | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| Safety Briefing Presenter | | Signature | Date |
| | | | |

# GLOSSARY

## Section I
## Abbreviations

A-E.....Architect-Engineer
AEDA .....Ammunition, Explosives and Dangerous Articles
AMC .....Army Materiel Command
AR.....Army Regulation
ARAR .....Applicable or Relevant and Appropriate Requirement
ARB .....Anomaly Review Board
ASR.....Archives Search Report
ASSHP .....Abbreviated Site Safety and Health Plan
ATF .....Alcohol, Tobacco and Firearms
BRAC.....Base Realignment and Closure
CAA .....Clean Air Act
CBD .....Commerce Business Daily
CDRL.....Contract Data Requirements List
CEMP-R.....Corps of Engineers Directorate of Military Programs, Environmental Division
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
CESO .....Corps of Engineers Safety Office
CFR.....Code of Federal Regulations
CO.....Contracting Officer
COR .....Contracting Officer's Representative
CPFF .....Cost-plus-fixed-fee
CPR.....Cardiopulmonary Resuscitation
CRP.....Community Relations Plan
CWA .....Clean Water Act
CWM .....Chemical Warfare Materiel
DA.....Department of the Army
DA Pam.....Department of the Army Pamphlet
DDESB .....Department of Defense Explosives Safety Board
DERP .....Defense Environmental Restoration Program
DID.....Data Item Description
DOD.....Department of Defense
DOT .....Department of Transportation
EE/CA.....Engineering Evaluation/Cost Analysis
EM.....Engineer Manual
EOD .....Explosive Ordnance Disposal
EP.....Engineer Pamphlet

EPA.....Environmental Protection Agency
ER .....Engineer Regulation
ESS.....Explosives Safety Submission
FAR.....Federal Acquisition Regulation
FDE.....Findings and Determination of Eligibility
FOST.....Finding of Suitability to Transfer
FUDS .....Formerly Used Defense Site
GIS .....Geographic Information System
GFP .....Government Furnished Property
HAZWOPER .....Hazardous Waste Operations and Emergency Response
HQDA.....Headquarters, Department of the Army
HQUSACE.....Headquarters, United States Army Corps of Engineers
HSDA.....Health and Safety Design Analysis
HTRW.....Hazardous, Toxic, and Radioactive Waste
IDO.....Indefinite Delivery Order
IGE.....Independent Government Estimate
INPR .....Inventory Project Report
IOC.....Industrial Operations Command
IRP .....Installation Restoration Program
MACOM.....Major Command
MCE.....Maximum Credible Event
MCX .....Mandatory Center of Expertise
MIPR.....Military Interdepartmental Purchase Request
MOA .....Memorandum of Agreement
MSC.....Major Subordinate Command
NCP.....National Contingency Plan
NDAI.....No DOD Action Indicated
NEW .....Net Explosive Weight
NFPA .....National Fire Protection Association
NPL.....National Priorities List
NTCRA.....Non-Time-Critical Removal Action
OB/OD .....Open Burn/Open Detonation
OC.....Office of Counsel
ODASAF.....Office of the Deputy Assistant to the Secretary of the Air Force
OE .....Ordnance and Explosives
OE MCX .....Ordnance and Explosives Mandatory Center of Expertise
O&M.....Operations and Maintenance
OSHA.....Occupational Safety and Health Administration
PAE.....Preliminary Assessment of Eligibility
PAO.....Public Affairs Office (or Officer)
PL.....Public Law

PM.....Project Manager
PMP .....Project Management Plan
POC.....Point of Contact
PPE.....Personal Protective Equipment
QA.....Quality Assurance
QC.....Quality Control
Q-D .....Quantity Distance
RAB .....Restoration Advisory Board
RAC .....Risk Assessment Code
RACER .....Remedial Action Cost Engineering and Requirements System
RCRA.....Resource Conservation and Recovery Act
RECON.....Reconnaissance
RFP .....Request for Proposal
ROE.....Right-of-Entry
SARA.....Superfund Amendments and Reauthorization Act of 1986
SI.....Site Inspection
SOP .....Standing Operating Procedure
SOW.....Statement of Work
SSHP.....Site Safety and Health Plan
SUXOS .....Senior UXO Supervisor
TAG .....Technical Advisory Group
TAPP.....Technical Assistance for Public Participation
TB .....Technical Bulletin
TCRA.....Time Critical Removal Action
TEU.....Technical Escort Unit
T&M .....Time and Materials
TM.....Technical Manual
USACE .....United States Army Corps of Engineers
USAESCH .....U.S. Army Engineering and Support Center, Huntsville
USATCES.....U.S. Army Technical Center for Explosives Safety
USC.....United States Code
UXO.....Unexploded Ordnance
UXOSO.....UXO Safety Officer
UXOQCS .....UXO Quality Control Specialist

**Section II**
**Terms**

**Action Memorandum**
Approves time-critical removal action and also concludes the engineering evaluation/cost analysis. Provides a concise, written record of the decision to select an appropriate removal action. As the primary decision document, it substantiates the need for a removal action, identifies the proposed action, and explains the rationale for the removal action selected.

**Active Installations**
Installations under the custody and control of DOD. Includes operating installations, installations in a standby or layaway status, and installations awaiting closure under the Base Realignment and Closure (BRAC) legislation.

**Active Range**
A military range that is currently in service and is being regularly used for range activities. (40 CFR 266.201)

**Administrative Record**
The body of documents that "forms the basis" for the selection of a particular response at a site. Documents that are included are relevant documents that were relied upon in selecting the response action as well as relevant documents that were considered but were ultimately rejected. (ER 1110-1-8153)

**Anomaly**
Any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity should deviate from the expected subsurface ferrous and non-ferrous material at a site (i.e., pipes, power lines, etc.).

**Anomaly Avoidance**
Techniques employed by EOD or UXO personnel at sites with known or suspected OE to avoid any potential surface UXO and any subsurface anomalies. This usually occurs at mixed hazard sites when HTRW investigations must occur prior to execution of an OE removal action. Intrusive anomaly investigation is not authorized during ordnance avoidance operations. (ER 1110-1-8153)

**Anomaly Review Board (ARB)**
The ARB is a technical group established to review decisions and recommendations made by the OE project team on the detection and evaluation of subsurface anomalies. ARBs should be used only in exceptional circumstances, such as at CWM sites.

**Applicable or Relevant, and Appropriate Requirements (ARARs)**
Applicable requirements are cleanup standards, standards of control, and other substantive environmental protection requirements promulgated under federal or state environmental law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance found at a CERCLA site. Relevant and appropriate requirements are cleanup standards that while not "applicable", address situations sufficiently similar to those encountered at a CERCLA site that their use is well-suited to the particular site.

**Approval Memorandum**
Secures management approval to conduct the engineering evaluation/cost analysis.

**Archives Search Report (ASR)**
A detailed investigation to report on past OE activities conducted on an installation. The principal purpose of the Archives Search is to assemble historical records and available field data, assess potential ordnance presence, and recommend follow-up actions at a DERP-FUDS. There are four general steps in an Archives Search: records search phase, site safety and health plan, site survey, archives search report including risk assessment.

**Base Realignment and Closure (BRAC)**
Program governing the scheduled closing of Department of Defense sites. (Base Closure and Realignment Act of 1988, Public Law 100-526, 102 Stat. 2623, and the Defense Base Closure and Realignment Act of 1990, Public Law 101-510, 104 Stat. 1808)

**Chemical Warfare Materiel (CWM)**
An item configured as a munition containing a chemical substance that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. Also includes V- and G- series nerve agent, H- series blister agent, and lewisite in other- than-munition configurations. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. CWM does not include: riot control agents, chemical herbicides; smoke and flame producing items; or soil, water, debris, or other media contaminated with chemical agent. (HQDA Interim Guidance for Biological Warfare Materiel and Non-Stockpile Chemical Warfare Materiel Response Activities)

**Community Relations Plan (CRP)**
The Community Relations Plan (CRP) serves as the framework to establish a successful information exchange with the public for OE response actions. The CRP follows guidelines set forth under CERCLA and the SARA. Each CRP must be tailored to fit the individual site and situation and should also accommodate any site-specific agreements between the U.S. Army and the EPA or state environmental agencies. The CRP is not a static document and should be revised to reflect the project's development/progress.

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**
CERCLA authorizes federal action to respond to the release or threatened release of hazardous substances into the environment or a release or threat of release of a pollutant or contaminant into the environment that may present an imminent or substantial danger to public health or welfare.

**Construction Support**
Support provided by qualified UXO personnel during construction activities at potential OE sites to ensure the safety of construction personnel from the harmful effects of UXO. When a determination is made that the probability of encountering UXO is low (e.g., current or previous land use leads to an initial determination that OE may be present), a minimum of a two person UXO team will stand by in case the construction contractor encounters a suspected UXO. When a determination is made that the probability of encountering a UXO is moderate to high (current or previous land use leads to a determination that OE was employed or disposed of in the parcel of concern, e.g., open burn and open detonation areas, maneuver areas, etc.), UXO teams are required to conduct subsurface UXO clearance for the known construction footprint either in conjunction with the construction contractor or prior to construction intrusive activities. The level of effort will be determined on a case-by-case basis in coordination with the OE MCX. (ER 1110-1-8153)

**Conventional Ordnance and Explosives**
The term "conventional OE" refers to ordnance and explosives (see definition) other than CWM, BWM and nuclear ordnance. (ER 1110-1-8153)

**Defense Environmental Restoration Program (DERP)**
Established in 1984, DERP promotes and coordinates efforts for the evaluation and cleanup of contamination at Department of Defense installations. (10 U.S.C. 2701)

**Design Center**
A specified USACE field office assigned a singular technical mission that is permanent and USACE-wide in scope. The designated office is to be considered the "lead activity" in a specialized area where capability needs to be concentrated for maximum effectiveness, economy, and efficiency. The OE Design Center (in coordination with the PM) will execute all phases of the OE response project after the approval of the INPR unless the removal action is transferred to an approved district. Only the USAESCH OE Design Center is authorized to execute any phase of a Non-Stockpile CWM response. (ER 1110-1-8153)

**Districts Approved to Execute OE Removal Actions**
These districts are selected and approved by the MSC Commander with concurrence from the OE MCX, trained, and assigned the mission of conducting OE removal actions. The districts are responsible for final removal action execution. (ER 1110-1-8153)

**Easement**
An easement allows the holder to use the land of another or to restrict the uses of the land. An easement "appurtenant" provides a specific benefit to a particular piece of land. For example, allowing a neighbor to walk across your land to get to the beach. The neighbor's land, the holder of the easement, benefits by having beach access through your land. An easement "in gross" benefits an individual or company. For example, allowing the utility company to come on your land to lay a gas line. The utility company, the holder of the easement, benefits by having use of the land to lay the gas line. An affirmative easement allows the holder to use another person's land in a way that, without the easement, would be unlawful - for example, allowing a use that would otherwise be a trespass. A negative easement prohibits a lawful use of land - for example, creating a restriction on the type and amount of development of land.

**Emergency Removal Response Actions**
Emergency Removal Response Actions address immediate, unacceptable hazards. These actions are normally accomplished by Explosive Ordnance Disposal (EOD) units and may or may not require USACE support.

**Engineering Evaluation/Cost Analysis (EE/CA)**
An EE/CA is prepared for all non-time-critical removal actions as required by Section 300.415(b)(4)(i) of the NCP. The goals of the EE/CA are to identify the extent of a hazard, to identify the objectives of the removal action, and to analyze the various alternatives that may be used to satisfy these objectives for cost, effectiveness, and implementability.

**Exclusion Zone**
A safety zone established around an OE work area. Only project personnel and authorized, escorted visitors are allowed within the exclusion zone. Examples of exclusion zones are safety zones around OE intrusive activities and safety zones where OE is intentionally detonated. (DDESB-KO, 27 January 1990)

**Explosive Ordnance Disposal (EOD)**
The detection, identification, field evaluation, rendering safe, recovery, and final disposal of unexploded ordnance or munitions.

**Explosives Safety Submission (ESS)**
The document which serves as the specifications for conducting work activities at the project. The ESS details the scope of the project, the planned work activities, and potential hazards (including the maximum credible event) and the methods for their control.

**Explosive Soil**
Explosive soil refers to mixtures of explosives in soil, sand, clay, or other solid media at concentrations such that the mixture itself is explosive.

(a) The concentration of a particular explosive in soil necessary to present an explosion hazard depends on whether the particular explosive is classified as "primary" or "secondary." Guidance on whether an explosive is classified as "primary" or "secondary" can be obtained from the OE MCX or Chapters 7 and 8 of TM 9-1300-214, Military Explosives.

(b) Primary explosives are those extremely sensitive explosives (or mixtures thereof) that are used in primers, detonators, and blasting caps. They are easily detonated by heat, sparks, impact, or friction. Examples of primary explosives include Lead Azide, Lead Styphnate, and Mercury Fulminate.

(c) Secondary explosives are bursting and boostering explosives (i.e., they are used as the main bursting charge or as the booster that sets off the main bursting charge). Secondary explosives are much less sensitive than primary explosives. They are less likely to detonate if struck or when exposed to friction or to electrical sparks. Examples of secondary explosives include Trinitrotoluene (TNT), Composition B, and Ammonium Picrate (Explosive D).

(d) Soil containing 10 percent or more by weight of any secondary explosive or mixture of secondary explosives is considered "explosive soil." This determination was based on information provided by the USAEC as a result of studies conducted and reported in USAEC Report AMXTH-TE-CR 86096.

(e) Soil containing propellants (as opposed to primary or secondary high explosives) may also present explosion hazards. (ER 1110-1-8153)

**Formerly Used Defense Sites (FUDS)**
FUDS includes those properties previously owned, leased, or otherwise possessed by the U.S. and under the jurisdiction of the Secretary of Defense; or manufacturing facilities for which real property accountability rested with DOD but were operated by contractors (Government owned - contractor operated) and which were later legally disposed of. FUDS is a subprogram of the DERP. Restoration of military land was extended to formerly used sites in 1983 under Public Law 98-212 (DOD Appropriations Act of FY84).

**Geophysical Techniques**
Techniques utilized for the detection and measurement of buried anomalies (e.g., ferromagnetic indicators and ground penetrating radar) to investigate the presence of munitions.

**Hazardous, Toxic, and Radioactive Waste (HTRW) Activities**
HTRW activities include those activities undertaken for the Environmental Protection Agency's Superfund program, the Defense Environmental Restoration Program (DERP), including Formerly Used Defense Sites (FUDS), and Installation Restoration Program (IRP) sites at active DOD facilities, HTRW actions associated with Civil Works projects, and any other mission or non-mission work performed for others at HTRW sites.

**Information Repository**
A repository, generally located at libraries or other publicly accessible locations, which contains documents reflecting the on-going environmental restoration activities. This may include the EE/CA, CRP, RAB meeting minutes, public notices, public comments and responses to those comments, etc.

**Intrusive activity**
An activity which involves or results in the penetration of the ground surface at an area known or suspected to contain OE. Intrusive activities can be of an investigative or removal action nature.

**Inventory Project Report (INPR)**
The report resulting from the preliminary assessment of eligibility. The INPR includes data as well as a recommendation for further action and guides investigators through further site studies. Documents whether DOD is responsible for contamination at a FUDS.

**Mandatory Center of Expertise (MCX)**
An MCX is a USACE organization that has been approved by HQUSACE as having a unique or exceptional technical capability in a specialized subject area that is critical to other USACE commands. Specific mandatory services to be rendered by an MCX are identified on the MCX's homepage. These services may be reimbursable or centrally funded. The USAESCH is the OE MCX for the USACE. (ER 1110-1-8153)

**Maximum Credible Event (MCE)**
The worst single event that could occur at any time, with maximum release of a chemical agent from a munition, container, or process as a result of unintended, unplanned, or accidental occurrence. (HQDA Interim Guidance for Biological Warfare Materiel (BWM) and Non-Stockpile Chemical Warfare Materiel (CWM) Response Activities)

**Military Munitions**
All ammunition products and components produced or used by or for the U.S. DOD or the U.S. Armed Services for national defense and security, including military munitions under the control of the DOD, the US Coast Guard, the US DOE, and National Guard personnel. The term military munitions includes: confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries used by DOD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. Military munitions do not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components there-of. However, the term does include non-nuclear components of nuclear devices, managed under DOE's nuclear weapons program after all required sanitization

operations under the Atomic Energy Act of 1954, as amended, have been completed. (40 CFR 260.10)

**Most Probable Event (MPE)**
The most likely event, as a result of an accidental, unplanned, or unintended detonation of an item of ordnance, that could occur during OE activities. The event must be realistic with reasonable probability of occurrence.

**National Oil and Hazardous Substance Pollution Contingency Plan (NCP)**
Revised in 1990, the NCP provides the regulatory framework for responses under CERCLA. The NCP designates the Department of Defense as the removal response authority for ordnance and explosives hazards.

**Non-Stockpile Chemical Warfare Materiel**
CWM (see definition) that is not included in the chemical stockpile. Non-stockpile CWM is divided into five categories: buried CWM, recovered chemical weapons (items recovered during range clearing operations, from chemical burial sites, and from research and development testing), former chemical weapon production facilities, binary chemical weapons, and miscellaneous CWM (unfilled munitions and devices and equipment specially designed for use directly in connection with employment of chemical weapons). (HQDA Interim Guidance for Biological Warfare Materiel (BWM) and Non-stockpile Chemical Warfare Materiel (CWM) Response Activities)

**Non-Time Critical Removal Action (NTCRA)**
NTCRAs are actions initiated in response to a release or threat of a release that poses a risk to human health, its welfare, or the environment. Initiation of removal cleanup actions may be delayed for six months or more.

**Ordnance and Explosives (OE)**
OE consists of either (1) or (2) below:
(1) Ammunition, ammunition components, chemical or biological warfare materiel or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried, or fired. Such ammunition, ammunition components, and explosives are no longer under accountable record control of any DOD organization or activity. (HQDA Policy Memorandum "Explosives Safety Policy for Real Property Containing Conventional OE")

(2) Explosive Soil. See definition under "Explosive Soil." (ER 1110-1-8153)

**OE Project Team**
The OE Project Team consists of the customer(s), the PM, and multi-disciplined representatives from the technical/functional elements necessary to execute the project.

**OE Safety Specialist**
USACE Personnel, classified as a GS-018 Safety Specialist, and who is UXO qualified. OE Safety Specialists perform safety, quality assurance and UXO subject matter expert functions for the Government. The Safety Specialist may reside in and report to the construction field office or may reside in the engineering/construction office within the OE Design Center. (ER 1110-1-8153)

**Preliminary Assessment of Eligibility (PAE)**
The PAE is the initial phase of the non-time-critical response action process. A PAE includes a review of existing information and an off-site reconnaissance, if appropriate, to determine if a release may require additional investigation or action. A PAE may include an on-site reconnaissance, if appropriate. The findings of the PAE are reported in the INPR, along with recommendations for further action, if appropriate. This document is used to determine property and project eligibility under DERP-FUDS.

**Quantity Distance (Q-D)**
The quantity of explosives 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 provided in DOD 6055.9-STD. Separation distances are not absolute safe distances but are relative protective safe distances. Greater distances than those shown in the Q-D tables shall be used whenever possible. (DOD 6055.9-STD)

**Removal Action**
The cleanup or removal of OE from the environment to include the disposal of removed materiel. The term includes, in addition, without being limited to, security fencing or other measures to prevent, minimize, or mitigate damage to the public health or welfare or to the environment. (ER 1110-1-8153)

**Resource Conservation and Recovery Act (RCRA)**
Enacted in 1976, RCRA promotes the protection of health and the environment. It regulates waste generation, treatment, storage, transportation, and disposal for facilities currently in operation. The OE removal process is affected by RCRA if OE must be disposed off-site.

**Response Action**
Action taken instead of or in addition to a removal action to prevent or minimize the release of OE so that it does not cause substantial danger to present or future public health or welfare or the environment. (ER 1110-1-8153)

**Restoration Advisory Board (RAB)**
A forum for discussion and exchange of information between agencies and the affected communities. RABs provide an opportunity for stakeholders to have a voice and actively

participate in the review of technical documents, to review restoration progress, and to provide individual advice to decision makers regarding restoration activities. (ER 1110-1-8153)

**Risk Assessment Code (RAC)**
An expression of the risk associated with a hazard. The RAC combines the hazard severity and accident probability into a single arabic number on a scale from 1 to 5, with 1 being the greatest risk and 5 the lowest. The RAC is used to prioritize response actions.

**Senior UXO Supervisor**
Supervises all contractor on-site UXO activities. This individual will be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD or the U.S. Naval Explosive Ordnance Disposal School, Indian Head, MD. This individual will have combined active duty military EOD and contractor UXO experience, including experience in supervisory positions. Experience in active duty in military EOD units is required. This individual will have documented experience with or specialized training in the type of OE expected to be encountered on the site. (USAESCH OE MCX Personnel and Work Standards for Ordnance Response, 30 July 1996)

**Site Inspection (SI)**
Activities undertaken to determine whether there is a release or potential release and the nature associated threats. The purpose is to augment the data collected in the PAE and to generate, if necessary, sampling and other field data to determine the presence, type, distribution, density and location of OE. The results of the SI are reported in an Archives Search Report (ASR).

**Stakeholder**
Stakeholders include federal, state, and local officials, community organizations, property owners, and others having a personal interest or involvement, or having a monetary or commercial involvement in the real property which is to undergo an OE response action.

**Superfund Amendments and Reauthorization (SARA)**
Enacted in 1986, this legislation establishes standards for cleanup activities, requires federal facility compliance with CERCLA, and clarifies public involvement requirements.

**Time Critical Removal Action (TCRA)**
TCRAs respond to a release or threat of release that poses such a risk to public health (serious injury or death), or the environment, that clean up or stabilization actions must be initiated within six months.

**Technical Assistance for Public Participation (TAPP)**
Program that can provide independent assistance to Restoration Advisory Boards in interpreting scientific and engineering issues with regard to the nature of OE hazards and response activities at an OE project site. (ER 1110-1-8153)

**Technical Escort Unit (TEU)**
Military chemical agent response unit.

**Unexploded Ordnance (UXO)**
Military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material and remain unexploded either by malfunction, design, or any other cause. (40 CFR 266.201)

**UXO Personnel**
Contractor personnel who have completed specialized military training in EOD methods and have satisfactorily performed the EOD function while serving in the military. Various grades and contract positions are established based on skills and experience. Check with the OE MCX for current ratings. (ER 1110-1-8153)

**UXO Safety Officer (UXOSO)**
Contractor personnel with the responsibility of enforcing the contractor's SSHP. This individual must therefore be in the field whenever possible to observe operations. This individual will have the same minimum qualifications as the UXO Supervisor. In addition, this individual will have the specific training, knowledge, and experience necessary to implement the SSHP and verify compliance with applicable safety and health requirements.

**UXO Technician I**
This individual will be a graduate of the EOD Assistant's Course at Redstone Arsenal, AL; Eglin AFB, FL or a DOD certified equivalent course. A UXO Assistant may advance to a UXO Specialist category after obtaining active duty military EOD and contractor UXO experience. A UXO Assistant will not perform UXO procedures without the direct supervision of a UXO Specialist, UXO Supervisor, or Senior UXO Supervisor.

**UXO Technician II**
This individual shall be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD or U.S. Naval EOD School, Indian Head, MD. The UXO Specialist may be a UXO Assistant with combined military EOD and contractor UXO experience.

**UXO Technician III**
Supervises a UXO team. This individual will be a graduate of the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, MD or the U.S. Naval Explosive Ordnance Disposal School, Indian Head, MD. This individual will have combined active duty military EOD and contractor UXO experience. This individual will have experience in OE clearance operations and supervising personnel.