

Appendix C

Executing the Program

Understanding the Environmental Restoration Process

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) are the primary Federal laws governing the investigation and cleanup of contaminated sites. DoD installations typically have multiple contaminated sites regulated by either CERCLA or RCRA, or by both CERCLA and RCRA. State and local environmental laws and regulations also apply to the investigation and cleanup of DoD sites.

The environmental restoration program carries out the investigation and cleanup or control of past contamination, pursuant to these statutory and regulatory authorities, at operational and closing installations, and Formerly Used Defense Sites (FUDS). The following sections provide a brief summary of these primary statutory and regulatory authorities and the

Base Realignment and Closure (BRAC) environmental program.

CERCLA — CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, establishes a comprehensive framework within which to identify, investigate, and clean up releases of hazardous substances to the environment. CERCLA authorizes the President to take response actions when a release or the threat of a release is discovered. Through Executive Order 12580, signed in January 1987, the President directed the Secretary of Defense to implement investigation and cleanup measures in consultation with EPA for releases of hazardous substances from facilities under the jurisdiction of the Secretary. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes EPA's response policy and lays out the key response steps for implementing CERCLA.

DoD refers to the program for meeting its responsibilities under CERCLA as the Installation Restoration Program, or IRP. The IRP is the major element of DoD's environmental restoration program. All DoD installations are included in this program, whether or not they are on the National Priorities List (NPL).

Cleanup of contaminated sites may be governed by both CERCLA and RCRA statutory and regulatory authorities. Circumstances depend on many factors, including the source and cause of the contamination, the status of the installation as either an NPL or non-NPL site, and whether the installation has or is seeking a RCRA permit to manage hazardous wastes. Conflicts are not uncommon as different regulatory agencies exercise their respective authorities under these statutes. However, partnering efforts are allowing DoD, EPA, and the states to work through regulatory overlaps and inconsistencies to ensure the most effective and timely cleanup of DoD installations.



RCRA Corrective Action — RCRA, as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984, establishes a comprehensive program for the management of hazardous wastes. HSWA provides authority for the investigation and cleanup of past waste sites, creating a corrective action program substantially equivalent to that under CERCLA, although differing requirements exist. For those DoD installations requiring a

RCRA permit to manage hazardous wastes, EPA or authorized states may impose corrective action requirements for all known or suspected releases of hazardous wastes or hazardous constituents from Solid Waste Management Units (SWMU) or other areas of concern at the Installation. Investigation and cleanup of past contamination at SWMUs are eligible for funding under the environmental restoration program.

Underground Storage Tanks — The Underground Storage Tank (UST) program was created by HSWA to regulate tanks that store both petroleum products and hazardous substances. RCRA Subtitle I establishes requirements concerning the management of USTs that contain petroleum products and any substance defined as hazardous under CERCLA. Subtitle I does not, however, regulate tanks that store RCRA hazardous wastes. Responses to releases of petroleum products are conducted in accordance with the UST regulations under RCRA Subtitle I or state laws that apply to petroleum releases. Investigation and cleanup of past contamination at UST sites are eligible for funding under the environmental restoration program.

The CERCLA, RCRA Corrective Action, and UST regulatory frameworks, although differing in many ways, generally parallel one another in terms of process. All require assessments and investigations to determine the need for cleanup and the selection, design, and implementation of appropriate remedies to ensure protection of human health and the environment. However, each program has its own nomenclature for the various phases of investigation, design, and cleanup. The table on the following pages defines the terminology and compares activities under each program.

For purposes of general discussion and to better understand the measures of progress presented in this report, activities conducted under the environmental restoration program are referred to by the terms investigation, interim action, design, and cleanup. These terms are defined as follows:

- **Investigation** — analysis to characterize the nature, extent, and risk of releases of hazardous substances to the environment and to develop and select a cleanup remedy
- **Interim Action** — early measure to reduce the risk of releases of hazardous substances before the initiation of more complicated, comprehensive, and long-term cleanup remedies—for example, placing fences around contaminated areas or removing and treating or disposing of contaminated soil
- **Design** - performance specifications or detailed engineering plans and specifications to construct and implement a final cleanup remedy
- **Cleanup** - action to construct and implement a final cleanup remedy

National Priorities List (NPL)

Using the Hazard Ranking System (HRS), EPA evaluates contaminated sites for their potential to affect human health and the environment. The HRS is a numerical scoring system which provides a means of applying uniform technical judgment regarding the potential hazards posed by a site relative to other sites. The HRS does not address the feasibility, desirability, timing, or degree of cleanup required. Sites that score 28.5 or greater are considered for placement on the NPL. For DoD, NPL status generally refers to the entire installation, not to any individual site on the installation.

Activity	CERCLA	RCRA Corrective Action	Underground Storage Tanks (UST) ²
i n v e s t i g a t i o n	<p>Preliminary Assessment (PA) — The PA is a limited scope investigation designed to distinguish between sites that pose little or no threat to human health and the environment and sites that require further investigation. The PA typically is based on installation records searches, visual site inspections, and interviews of site personnel. (The PA formerly was referred to as an Initial Assessment Study, or IAS.)</p>	<p>RCRA Facility Assessment (RFA) — An RFA is the first step in the RCRA corrective action process. The RFA acts as a screen, first identifying and then eliminating Solid Waste Management Units (SWMU), environmental media, or entire facilities from further consideration for corrective action. RFAs are performed as part of the RCRA permitting process.</p>	<p>Initial Site Characterization — This study requires an installation to submit information regarding local communities, subsurface soil conditions, climate, and land use to the appropriate state or Federal regulatory agency. The data may be compiled from readily available sources or generated by site investigations.</p>
	<p>Site Inspection (SI) — If the PA recommends further investigation, an SI is performed. SIs typically involve the collection of waste and environmental samples to determine the hazardous substances present at a site and whether they are being released to the environment. Screening Site Inspections (SSI) and Expanded Site Inspections (ESI) may be conducted to refine or obtain additional site characterization data to support Hazard Ranking System (HRS) scoring. (The SI formerly was referred to as a Confirmation Study, or CS.)</p>	<p>RCRA Facility Investigation (RFI) — An RFI characterizes the nature, extent, and migration of, and risk posed by, releases of hazardous substances into the environment.</p>	<p>Investigation for Soil and Groundwater Cleanup — This investigation requires an installation to determine the extent of soil and groundwater contamination at an UST site when an Initial Site Characterization shows evidence of a release.</p>
	<p>Remedial Investigation (RI) — An RI is a field investigation that is more extensive than an SI. Its purpose is to characterize the nature and extent of contamination at a site. The RI also assesses the risks posed by on-site contamination to human health and the environment.</p>	<p>Corrective Measures Study (CMS) — The CMS identifies and evaluates potential cleanup measures for releases that have been investigated by an RFI.</p>	<p>Corrective Action Plan (CAP) — The CAP is a site-specific plan to address releases from USTs. At a minimum, CAPs include requirements for long-term monitoring, continued control of the groundwater flow at the site, and placement of a notice of continuing hazard in the property deed. However, CAPs may involve more detailed studies that establish the design and implementation of a cleanup.</p>
	<p>Feasibility Study (FS) — Based on data collected during the RI, options for final cleanup actions are developed and evaluated in the FS. The FS is divided into two phases of evaluating</p>		

remedial alternatives. The first phase is an initial screening of alternatives, which is followed by the detailed analysis of alternatives. The detailed analysis, among other things, considers cost-effectiveness, short- and long-term effectiveness, and overall protection of human health and the environment.

Engineering Evaluation/Cost Analysis (EE/CA) — An EE/CA is a study that documents the selection of a non-time-critical Removal Action. An EE/CA includes site characterization data, response objectives, identification and analysis of Removal Action alternatives, and recommendation of a specific Removal Action alternative.

¹ The process descriptions provided in this table are not intended to be all-encompassing or exact regulatory definitions. They provide a general description and comparison of the primary milestones under each regulatory program.

² The UST program generally is regulated under state, county, or other local agency authorities. Consequently, the UST cleanup process and terminology may vary from state-to-state or installation-to-installation.

Comparison of CERCLA, RCRA Corrective Action, and UST Cleanup Process Terminology ¹

Activity	CERCLA	RCRA Corrective Action	Underground Storage Tanks (UST) ²
Interim Action	Removal Action — A Removal Action is taken to respond to a release, or threat of a release, of hazardous substances, pollutants, or contaminants to prevent, minimize, or mitigate harm to human health or the environment. Such actions may be taken during any phase of the study, design or cleanup.	Interim Measures — These actions accelerate the cleanup process. Interim Measures generally are initiated to mitigate actual threats to human health and the environment from a release while comprehensive cleanup measures are being developed.	Initial Abatement Measures — These activities specify requirements for the management of contaminated soils and procedures to mitigate fire and safety hazards. Free Product Removal — This type of action requires

Interim Remedial Action (IRA)

— An IRA is an early response action that is identified and implemented at any time during the study or design phase. IRAs are limited in scope and address only areas or media for which a final remedy will be developed by the RI/FS process.

Design Remedial Design (RD) — An RD involves the development of the actual design of the selected cleanup remedy. It includes preparation of all technical drawings and specifications needed to implement the cleanup action.

Cleanup Remedial Action (RA) — An RA involves the construction, operation, and implementation of the final cleanup remedy. Long-term RAs require continued monitoring, operation, and maintenance for a number of years.

Operation and Maintenance (O&M) — O&M measures, required to maintain the effectiveness of the cleanup, are initiated after the remedy has been constructed or implemented.

Long-Term Monitoring (LTM) — LTM is undertaken when conditions require extensive remediation or O&M activities. Examples include most groundwater remediation and large-scale soil remediation efforts.

Corrective Measures Design (Remedy Design) — Activities conducted in this phase involve the preparation of plans and specifications for implementing the final cleanup.

Corrective Measures Implementation (CMI) — A CMI involves the construction, operation, and implementation of the final cleanup remedy. Long-term CMIs require continued monitoring, operation, and maintenance for a number of years.

Operation and Maintenance (O&M) — O&M measures, required to maintain the effectiveness of the cleanup, are initiated after the remedy has been constructed or implemented.

Long-Term Monitoring (LTM) — LTM is undertaken when conditions require extensive remediation or O&M activities. Examples include most groundwater remediation and large-scale soil remediation efforts.

that free or liquid product released from USTs be removed to the maximum extent possible by available and appropriate methods.

Design³ — A Remedial Action Plan (RAP) may be conducted that involves the preparation of plans and specifications for implementing the cleanup of the UST site.

Corrective Action³ — This process involves the construction, operation, and implementation of the final cleanup process. Long-term implementation requires continued monitoring, operation, and maintenance for a number of years.

Operation and Maintenance (O&M) — O&M measures, required to maintain the effectiveness of the cleanup, are initiated after the remedy has been constructed or implemented.

Long-Term Monitoring (LTM) — LTM is undertaken when conditions require extensive remediation or O&M activities. Examples include most groundwater remediation and large-scale soil remediation efforts.

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² The UST program is generally regulated under state, county, or other local agency authorities. Consequently, the UST cleanup process and terminology may vary from state-to-state or installation-to-installation.

³ No specific term is specified by UST regulations. However, upon approval of the Corrective Action Plan, each DoD installation is responsible for designing and implementing the selected corrective measure to address the leaking UST.

Environmental Restoration at BRAC Installations

Restoration efforts at BRAC installations are conducted in a manner similar to that at operational installations. However, the restoration process also is governed by economic considerations related to reuse and transfer of property.

BRAC — The BRAC program utilizes several processes and planning documents that focus cleanup efforts on promptly making property available for transfer. These include the BRAC Cleanup Plan (BCP), the Environmental Baseline Survey (EBS), the Finding of Suitability to Transfer (FOST), the Finding of Suitability to Lease (FOSL), the Restoration Advisory Board (RAB), the community redevelopment plan, and National Environmental Policy Act (NEPA) analyses.

- **BCP** — The BCP, developed by the installation's cleanup team, provides a roadmap of the restoration work necessary to make property available for transfer. The BCP develops schedules and estimated costs of environmental restoration to be implemented in support of the transfer and reuse of property at an installation.
- **EBS** — An EBS is prepared at each closing and realigning installation where excess property is available for reuse by the community. The EBS documents and identifies real property that can be considered uncontaminated as defined by the Community Environmental Response Facilitation Act (CERFA) as it amends CERCLA § 120(h). In addition to documenting uncontaminated property, the EBS describes the environmental condition of the remaining property according to its relative status in the restoration process. The environmental condition of property categories are described numerically as category 1 (uncontaminated); categories 2_4 (contaminated at varying levels below action levels or having undergone approved remedial actions); and categories 5_7 (areas requiring further remediation or evaluation). The EBS is used to identify property available for transfer to the community. According to DoD policy and applicable regulations, property identified by categories 1_4 is available for transfer for community reuse.
- **FOST** — The FOST is the process that documents the conclusion that property is environmentally suitable for transfer by deed for an intended use. The FOST also identifies any applicable restrictions on future use, and provides a statement of the notice, covenant, and access requirements under CERCLA, as appropriate.
- **FOSL** — The FOSL is the process that documents the conclusion that property can be leased, even while cleanup is still under way. The FOSL also identifies any applicable restrictions to accompany the lease, and provides a statement of notice and access requirements under CERCLA and other lease restrictions, as appropriate.
- **RAB** — The RAB provides a forum for the discussion and exchange of information regarding environmental activities among the installation, regulatory agencies, and the community. The RAB provides an opportunity for stakeholders to participate in the restoration process and provide input to decision makers. RABs benefit both DoD and the community by facilitating open and honest communication.
- **Community Redevelopment Plans** — Communities are cooperating in the restoration process by preparing community redevelopment plans that identify the desired and anticipated reuse of excess installation property. Community redevelopment plans can help direct environmental restoration priorities to areas with the greatest reuse potential and economic benefit to the community.
- **NEPA Analysis** — A NEPA analysis is conducted to evaluate disposal decisions made by the installation with regard to environmental impacts. The NEPA analysis is useful to the community's ongoing planning efforts as well as the installation's property disposal decisions. NEPA analysis also is used to support DoD

decisions concerning the interim outleasing of property for early reuse and other actions supporting transfer of property for community reuse.

Contracting Strategies

Contracting policies and strategies have evolved significantly over the last several years as the scope and magnitude of environmental restoration work began to unfold. Traditional contract vehicles, while effective for executing standard design and construction projects, are not always the best approach for carrying out cleanup investigations and remedial actions.

Clearly, there is much greater uncertainty involved in environmental restoration than in standard planning, design, and construction work. Early phases of an investigation are dominated by uncertainty because little is known about the hazards that may exist, or that might be encountered or created during intrusive activities such as drilling, sampling, and excavation. Uncertainties often continue to exist even after the investigation and design phases have been completed because variations in contamination sources, soil conditions, hydrogeology, and transport mechanisms make it difficult to characterize and understand actual site conditions completely. The full extent of the cleanup effort may not be known entirely until the remedial action has been at least partially completed. In some cases, the effectiveness of the cleanup can be measured only after long-term monitoring is completed.

Because of these uncertainties, and the associated complexities of environmental work, investigation and cleanup of a contaminated site typically involve multimillion dollar costs spread out over a number of years. Therefore, continuity of the work and continuity of experience and knowledge about a site are critical.

In light of these challenges, contract type, length, and capacity are important considerations for ensuring the success of the restoration program. Traditional site-specific, firm-fixed-price contracts do not provide the responsiveness and flexibility necessary to handle the majority of investigation and cleanup work. Therefore, DoD agencies have turned to large, long-term, multiphase, cost-reimbursement contracts to execute much of the restoration program. These contract vehicles are proving more responsive, effective, and efficient in meeting the challenges of environmental work, and thereby accelerating the restoration process.