
Navy/Marine Corps Installation Restoration Manual



Developed By:

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PREFACE

Since the Navy/Marine Corps published the second Installation Restoration (IR) Manual in February 1992, many changes have occurred in our IR Program. Congress has passed new laws. Numerous Department of the Navy (DON) installations are in the process of closing as a result of Base Realignment and Closure legislation and these installations need to be cleaned up before transferring the property. Additionally, the funding for the program has been devolved to the Services, and we have had to adapt our program to meet ever changing and increasing requirements.

This manual is a revision and update incorporating the many changes which have occurred in the IR Program since 1992. It represents a compilation of Defense Environmental Restoration Program requirements, policy, and guidance for both the United States Navy and the United States Marine Corps. It synthesizes the laws and regulations which define and affect the IR Program. The manual summarizes the organization and responsibilities of the Department of Defense and DON offices, commands, and installations as they pertain to this Program. The manual provides detailed discussions of terminology and procedures to be used in the implementation of the program. It discusses funding eligibility, priority setting, reporting and information management systems. The manual provides information on research, development, test and evaluation as they relate to IR Program. This information should allow the Navy and Marine Corps to identify, investigate, and clean up their hazardous waste sites while ensuring appropriate coordination both within DON and externally.

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Executive Summary

INTRODUCTION

This *Navy/Marine Corps Installation Restoration Manual* supersedes the February 1992 manual. The purpose of this update is to provide the most current Installation Restoration (IR) Program policy, guidance, and information to Remedial Project Managers who have primary responsibility to ensure proper, timely, and cost effective IR Program implementation. This manual describes the management framework used to meet the requirements of an increasing number of applicable environmental statutes and regulations. It also describes the organization and management responsibilities within the Department of the Navy (Navy/Marine Corps) including the responsibilities of the Assistant Secretary of the Navy (Installations and Environment), the Chief of Naval Operations (CNO), the Commandant of the Marine Corps (CMC), the Major Claimants, the Naval Facilities Engineering Command, and the installations.

The manual represents a compilation of Defense Environmental Restoration Program (DERP) requirements, policy, and guidance, and focuses on moving an IR Program site through Identification, Investigation, and, if necessary, Cleanup and Closure. The manual provides information to be used to ensure appropriate coordination of the IR Program within the Navy/Marine Corps and with other supporting Federal, state, and local government agencies. The guidance herein is intended to be consistent with the guidelines, rules, and criteria set forth in the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, the Resource Conservation and Recovery Act, and other applicable environmental laws and implementing regulations. The manual is also

in compliance with the Navy Environmental and Natural Resources Program Manual, OPNAVINST 5090.1B and the Marine Corps Environmental Compliance and Protection Manual, MCO P5090.2. In the event of a conflict with statutory or regulatory requirements, this guidance should not be interpreted as superseding such statutory or regulatory requirements.

PROGRAM GOAL

The goal of the Navy/Marine Corps IR Program is to reduce, in a cost-effective manner, the risk to human health and the environment from hazardous substance contamination resulting from past Department of Defense (DoD) activities in the U. S. and its territories. The Navy/Marine Corps IR Program uses Risk Management as the primary philosophy in programming, budgeting, and executing the program.

ENVIRONMENTAL RESTORATION PROGRAM CHANGES IN THIS REVISED MANUAL

Funding

In 1984 Congress established the DERP and funded it with the Defense Environmental Restoration Account (DERA). Annually, the Services and defense agencies submitted their environmental restoration requirements to the Secretary of Defense where the requirements were combined into a single line-item request in the President's Budget. When Congress appropriated DERA for the fiscal year, the Secretary of Defense divided the account and provided each military Department with its share. As the DERA funding requirements grew, it became more difficult for DoD to add funding to the account and DoD, at the last

minute, would require the military Departments to add funding to the account. Because of the last minute funding requirement and the delays the military Departments encountered in receiving the funds in-hand for program execution, Congress devolved DERA to the Departments in FY-97. It is now each Department's responsibility to budget for environmental restoration within their total obligation authority. The devolved Navy/Marine Corps account is the Environmental Restoration, Navy (ER, N) account. While devolvement, means that funds are more readily available for execution at the beginning of the fiscal year, it also means that environmental restoration requirements now compete in the budget process with all other Department of Navy (DON) needs.

The restoration account will remain centrally managed through CNO (N45) down to the Naval Facilities Engineering Command and the Engineering Field Divisions/Engineering Field Activities (EFDs/EFAs). EFDs/EFAs will continue to program and manage ER, N funds.

The Deputy Secretary of Defense also endorsed stabilized funding and the use of Relative Risk to determine program priorities.

Risk Based Prioritization

In accordance with DoD policy, DON programs, budgets, and executes the environmental restoration program using the tools of risk management. Relative risk, as described in the *DoD Relative Risk Primer*, is an important factor in risk management and the DoD standards are followed for evaluating and assigning relative risk. Other risk management factors that the Navy/Marine Corps considers include legal agreements, military readiness, stakeholder concerns,

packaging sites for cost-effective contracting, regional distribution of workload, and use of innovative cleanup technologies. Navy/Marine Corps activities are responsible to educate stakeholders about the relative risk evaluation and risk management. Stakeholders and regulators participate in the relative risk categorizing of sites and the considering of other risk management factors to determine the order and timing of project execution.

SUMMARY

The Navy/Marine Corps gives careful consideration to the formulation of its cleanup program budget and executes that budget consistent with Congressional policies.

Community stakeholders must be made aware of fiscal realities, and as partners, should be involved early in the program development process.

Applicable environmental legal requirements change at a rapid and ever-increasing pace. The Navy/Marine Corps IR Program must change to meet these new mandates. This manual provides a "user-friendly" tool to better understand and apply the information presented to assist in program management, training of personnel, and as a reference for IR Program implementation and execution.

The guidance presented in the *Navy/Marine Corps Installation Restoration Manual* should not be taken as a replacement for well-informed judgment or innovative solutions and approaches to novel site characteristics and problems.

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Chapter One

1. Background: Legal and Historical Context of the Installation Restoration Program

The Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6 of 24 June 1980 - **note: see Appendix A for a listing of acronyms and their meaning** - required Department of Defense (DoD) components to identify their abandoned hazardous waste disposal sites and establish a prioritized program to conduct record searches at their installations. DEQPPM 81-5 of 11 December 1981 superseded DEQPPM 80-6 and defined the DoD Installation Restoration (IR) Program - **note: see Appendix B for a listing of Program definitions** - as a four-phased program to include:

- Phase I - Problem Identification
- Phase II - Confirmation and Quantification
- Phase III - Technology Development
- Phase IV - Planning and Implementation of Appropriate Remedial Actions

In response to DEQPPM 80-6, the Department of the Navy (DON) developed the Navy Assessment and Control of Installation Pollutants (NACIP) Program. The Navy and Marine Corps instituted the NACIP Program by OPNAVNOTE 6240 and Marine Corps Order (MCO) 6280.1 of 30 January 1981, respectively. NACIP has changed into the Navy/Marine Corps's IR Program. *The Navy Environmental and Natural Resources Program Manual* (OPNAVINST 5090.1B), Chapter 15, and the *Marine Corps Environmental Compliance and Protection Manual* (MCO P5090.2), Chapter 14, contain current policy and requirements for this program.

The purpose of the Navy/Marine Corps IR Program is to identify, investigate, assess, characterize, and clean up or control releases of hazardous substances; and to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills at Navy/Marine Corps activities in a cost-effective manner. The goal of the IR Program is to move all sites in the IR Program to the 'No Further Action' category.

The Defense Environmental Restoration Program (DERP), codified in 10 U.S.C. 2701-2709 and 2810, gave the DoD IR Program a statutory basis. The Navy/Marine Corps implements the DERP subject to and in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and its implementing regulation, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), codified in 40 CFR 300. Significant changes to the DERP including transition to a risk management concept, performance measures, and additional community involvement procedures will be discussed further in Chapter 8 of this manual.

Environmental laws and regulations impact virtually every activity undertaken in the IR Program. A comprehensive treatment of all environmental laws that control IR Program actions is beyond the scope of this guidance; however, the following laws and regulations, have significant influence on the Navy/Marine Corps IR Program and its policy guidance.

1.1 Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. 9601 et seq.

CERCLA (commonly referred to as Superfund) authorized Federal intervention in events where hazardous substances were released into the environment or a substantial threat of a release exists and may present an imminent danger to public health or welfare. Originally CERCLA did not include provisions for cleaning up DoD sites; however, the Defense Appropriations Act of 1984 established special funding for DoD cleanups, and in 1987 Congress established the Defense Environmental Restoration Account (DERA), codified in 10 U.S.C. 2703. In a 3 May 1995 memorandum, the Deputy Secretary of Defense devolved DERA to the military Departments beginning in FY 97. DON's portion of the devolvement is referred to as the Environmental Restoration, Navy (ER, N) account.

CERCLA's scope covers all media including air, surface water, groundwater, and soil. Its emphasis is on the cleanup of past/inactive hazardous waste sites and does not include cleanup of spills of petroleum, oil, or lubricants. The Navy/Marine Corps IR Program does include cleanup of these contaminants.

CERCLA has no cleanup standards of its own. Instead, it borrows cleanup standards from other federal and state laws and regulations, through a process called selection of ARARs. "ARAR" stands for "applicable *or* relevant and appropriate requirement". A law or regulation is "applicable" if the legal standard would apply independently of the CERCLA clean-up. A law or regulation is "relevant and appropriate" if it makes sense to apply it at the site even though it is not otherwise legally required.

CERCLA requires that other Federal laws and more stringent issued state laws and regulations be considered when conducting response actions.

1.1.1 Superfund Amendments and Reauthorization Act of 1986 (SARA)

Congress enacted SARA on 17 October 1986 to amend the authorities and requirements of CERCLA and other associated laws. SARA contains five major titles. The two titles that mandate action for DoD and other Federal cleanup efforts are described below:

- Title I - Provisions Relating Primarily to Response and Liability

Adds Section 120 to CERCLA addressing response actions at Federal facilities

Requires that the DERP be consistent with Section 120, and

Provides that all Federal facilities "shall be subject to, and comply with, this act in the same manner and to the same extent, both procedurally and substantively, as any non-government entity

- Title II - Miscellaneous Provisions

Codifies DERP into law as Section 211, and

Amends DERP as Chapter 160 of Title 10 U.S.C. DERP is not a component of CERCLA, although it is subject to and must be consistent with CERCLA.

SARA established that the DERP has as its goals the identification, investigation, research and development, and cleanup of contamination. SARA mandated that DoD establish DERP and continue to fund the IR Program and other DERP activities through DERA.

Key differences between the Superfund and DERP that should be considered when applying the NCP or EPA guidelines to IR Program activities include:

- Congress intended the Superfund to be used to clean up non-Federal sites included on the National Priorities List (NPL). However, sites do not have to be on the NPL to be cleaned up through the IR Program activities. DERP and Navy/Marine Corps IR Program activities apply to all Navy/Marine Corps sites which pose a threat to public health, welfare, or the environment.
- Navy/Marine Corps activities do not receive Superfund funding whether listed on the NPL or not, but must use ER, N or Base Realignment and Closure funds to implement the IR Program.
- DERP and CERCLA, Section 120, instituted administrative requirements for Federal NPL sites which do not apply to non-Federal NPL sites. Examples are schedule requirements, Interagency Agreements, Annual Report to Congress, and Technical Review Committees /Restoration Advisory Boards.
- Section 120 also requires that terminology used to describe or otherwise identify actions carried out under the IR Program shall be consistent with the terminology used by EPA under CERCLA authority.

1.1.2 Community Environmental Response Facilitation Act (CERFA)

Congress enacted the Community Environmental Response Facilitation Act (CERFA) on 19 October 1992. CERFA amends CERCLA to facilitate the rapid identification and return to local communities of clean properties identified in the Base Realignment and Closure process. CERFA requirements affect DoD's Cleanup Program by requiring DoD to identify clean properties at all Base Realignment and Closure installations within 18 months after the installation formally has been identified for realignment or closure. Guidance in CERFA applies to identification and documentation of "uncontaminated" property defined as "property on which no hazardous substances or petroleum products or derivatives were stored for one year or more, known to have been released, or disposed of." CERFA objectives include:

- Ensuring protection of human health and the environment
- Developing a DoD-wide process to identify and document properties (parcels) which can be considered "uncontaminated" as defined in CERFA, and
- Ensuring appropriate consultation with the public and coordinating and concurring with regulatory agencies without unduly encumbering the Department's authority and mandate to make property available for reuse in a timely manner.

1.1.3 National Oil and Hazardous Substances Pollution Contingency Plan (NCP): 40 CFR 300; CERCLA, Section 105

The NCP is the basic regulation that implements the statutory requirements of CERCLA and Section 311 of the Clean Water Act (CWA). The NCP guides the CERCLA program and, as a regulation, has the full force of law. Navy/Marine Corps policy is to comply with the NCP for all sites cleaned up under CERCLA authority.

The NCP provides the organizational structure and procedures to prepare for and respond to discharges of oil and the release or threatened release of hazardous substances, pollutants, and contaminants. The NCP also outlines actions required upon discovery and following notification of a release of a hazardous substance in a reportable quantity. The NCP provides procedures for removal and remedial response actions to hazardous substance releases or threatened releases. Removal and remedial actions are described as follows:

- Removal Actions - Removal actions are responses to immediate and significant dangers to the public or the environment. They are not necessarily a final solution.
- Remedial Actions - Remedial actions are final measures taken to provide a permanent remedy. Remedial actions may take an extended period of time and may include allowing a certain level of contamination to remain on the site.

All Navy/Marine Corps response actions must comply with the nine criteria required by the NCP for a remedy. The nine criteria which the remedy must satisfy (see **Table 5-3** for additional information) are:

- Overall protection of human health and the environment;
- Compliance with Applicable or Relevant and Appropriate Requirements;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and
- Community acceptance.

1.1.4 National Priorities List (NPL)

CERCLA and its implementing regulation, the NCP, require that EPA develop a prioritized list of the nation's worst hazardous waste sites. This list known as the National Priorities List or "NPL", has the primary purposes of identifying releases of hazardous substances, pollutants, and

contaminants and informing the public about sites that pose the most significant risk to public health, welfare, and the environment and warrant further investigation.

The NPL includes both Federal and non-Federal sites. EPA uses rule making to place sites on the NPL. Sites are first proposed for inclusion on the NPL in the *Federal Register*. EPA then accepts public comments on the sites (typically for 60 days), responds to the comments, and finally places those sites that continue to meet the requirements for listing on the NPL. Sites may be placed on the NPL by using any one of three mechanisms: 1) the EPA determines the site poses a significant threat to public health through the Hazard Ranking System; 2) the Agency for Toxic Substances and Disease Registry issues a “Public Health Advisory” for the site; or 3) by designation of a governor as the state’s highest priority release with the greatest danger to public health, welfare, or the environment regardless of the Hazard Ranking System score.

1.1.4.1 NPL Sites

The Hazard Ranking System uses the amount and toxicity of contaminants, their potential mobility and pathway to humans, and the proximity of population centers to evaluate the relative potential hazard to health and the environment of a contaminated site.

EPA policy is to place sites, including Federal facilities, on the NPL if they have a Hazard Ranking System score of 28.50 or greater even if the Federal facility also is subject to the corrective action authorities of RCRA, Subtitle C. In that way, the sites could be cleaned up under CERCLA, if appropriate. CERCLA and the NCP generally require the following for NPL sites:

- Identification of all sources of contamination at an installation through a Preliminary Assessment/Site Inspection;
- Characterization of all sources and associated contaminant migration pathways through the Remedial Investigation and identification of those areas that exceed health-based regulatory criteria and require remediation;
- Evaluation of remedial alternatives using the screening criteria and explicit remedy selection criteria in a site- or operable unit-specific Feasibility Study;
- Development of an Administrative Record, Proposed Plan of action, and a Record of Decision in coordination with regulators and the public; and
- Development of a remedial management strategy followed by execution of a Remedial Design/Remedial Action for each site or operable unit.

CERCLA contains Administrative requirements that apply to Federal NPL sites, but not to Non-Federal NPL sites. These requirements include an Interagency Agreement with EPA after signature of the Record of Decision (ROD) - the culmination of the Remedial Investigation/Feasibility Study - for a site. The Agreement establishes the legal and administrative framework for environmental response actions. Other such requirements include the preparing of a Health

Assessment by the Agency for Toxic Substances Disease Registry and the documenting of schedule requirements beyond the Preliminary Assessment/Site Inspection phase.

Since the NPL is a list of locations where hazardous substance releases have occurred in the past, when EPA adds a site to the NPL, it is necessary for EPA to define the release (or releases) encompassed within the listing. EPA has sometimes described Federal facility sites in the rule making process with reference to a geographical area, e.g., Indian Head Naval Surface Warfare Center, Indian Head, Maryland. This type of listing is referred to as “fence line to fence line”; however, the boundaries of the installation are not necessarily the boundaries of the NPL site. Rather, the NPL site consists of only the contaminated areas within the area used to define the site and any other location to or from which contamination from that area has come to be located. Therefore, areas on an installation where releases and accompanying contamination have not occurred are not part of the NPL site even if the site name implies that the entire facility is listed.

EPA has amended all proposed and final NPL docket listing packages to include a clear statement that the sites are not to be based on the property boundaries but rather on the area of contamination.

Liability under CERCLA is determined under Section 107 which makes no reference to NPL listing. Placing a site on the NPL does not create CERCLA liability.

1.1.4.2 Non-NPL Sites

If sites do not meet the criteria to be included on the NPL, they are still subject to corrective action requirements of other laws protecting human health and the environment. An Interagency Agreement is not required for a Non-NPL site. All sites, whether on the NPL or not, require notification, public participation, and implementation of state and Federally defined ARARs. While it is required for NPL sites, regulatory concurrence is not required but it is highly recommended for cleanup actions to be accomplished at Non-NPL sites.

1.1.5 Lead Agency Authority

CERCLA authorizes the President to act, in a manner consistent with the National Contingency Plan (NCP), whenever any hazardous substance is released or there is a substantial threat of such a release into the environment. The President, by Executive Order 12580, delegated most of his CERCLA authority to the U.S. EPA; however, in the case of releases and threatened releases on or from DoD properties, the President delegated his authority to DoD. Accordingly, DoD, not the U.S. EPA, has lead agency authority to respond at DoD installations. DoD has re-delegated its lead agency authority to the individual Departments. Within the DON, NAVFACENGCOM has been delegated program responsibility to plan and implement response actions at all Navy and Marine Corps installations.

1.2 Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq.

The Resource Conservation and Recovery Act (RCRA), Subtitles C and D, establish the national strategy for the management of “on-going” hazardous and solid waste operations, respectively.

RCRA seeks to encourage alternatives to land disposal of hazardous wastes through recovery of useful material in order to reduce waste volume. RCRA provides cradle-to-grave tracking of hazardous material and includes record keeping on the generation, transportation, storage, and disposal of hazardous materials. States and territories administer RCRA after EPA has approved their Hazardous Waste Management Programs.

1.2.1 Hazardous and Solid Waste Amendments of 1984 (HSWA); Public Law 98-616

The Hazardous and Solid Waste Amendments of 1984 greatly expanded EPA's authority to require corrective action for releases of hazardous waste and hazardous constituents at Federal facilities. The corrective action authority issued under RCRA provides EPA, or the state which has primacy via an approved hazardous waste management plan, the ability to better control water and soil contaminants and air pollutants such as volatile organic compounds and particulate matter.

The EPA or state may require the cleanup of RCRA hazardous waste sites in accordance with Section 3004(u) or 3008(h) of RCRA if an installation is applying for, or has been issued, a Part B permit to store, treat, or dispose of hazardous wastes.

Specifically, Section 3004(u) addresses standards that require corrective actions for all releases of hazardous waste or constituents from any solid waste management unit (SWMU) at a treatment, storage, or disposal facility seeking a permit under Subtitle B. The waiver of sovereign immunity subjects the Federal government to the permitting requirements.

Section 3004(v) authorizes corrective action to be taken for releases of hazardous waste that have migrated beyond the facility's boundary. Section 3004(v) requires corrective action to be taken unless the owner/operator of the facility can demonstrate permission cannot be obtained from the adjacent property owner/operator to undertake such action.

Section 3008(h) applies to existing facilities that should have, but failed to obtain, interim status. Section 3008(h) resulted from legislative history and common sense that a facility that is not in compliance with interim status requirements should not be treated better than a facility that has met all of its compliance requirements. This corrective action authority potentially applies to treatment, storage, or disposal facilities regardless of their operational status.

Section 8.5.1 discusses RCRA corrective actions eligible for ER, N funding.

1.2.2 Federal Facilities Compliance Act of 1992 (FFCA), 42 U.S.C. 6901 Note, 6908

The Federal Facilities Compliance Act (FFCA) amended RCRA to expand the enforcement authority of Federal and state regulators with respect to solid and hazardous waste management at Federal facilities. The FFCA makes Federal facilities fully responsible for RCRA violations resulting from their management of hazardous wastes. The Act also provides Federal facilities with incentives to minimize hazardous wastes regulated under RCRA. The FFCA waives Federal immunity from fines and penalties imposed as a result of failing to comply with Federal, state, and local procedural and substantive requirements relating to RCRA. The FFCA also relieves Federal employees of personal liability for civil penalties for acts or omissions within the

scope of their official duties, but it does not waive criminal liability under any Federal or state hazardous waste law. The FFCRA also provides for annual inspections of Federal facilities by EPA or any state with an authorized hazardous waste program.

1.2.3 Corrective Action at Non-NPL Sites

A consensus of opinion must be developed between the Navy/ Marine Corps, EPA, state and local authorities, and the interested public when planning, selecting, and implementing corrective actions at a Non-NPL site. Corrective action at Non-NPL sites must conform to the more stringent of Federal and state laws.

1.3 National Historic Preservation Act (NHPA), 16 U.S.C. 470 et seq.

Congress passed the National Historic Preservation Act (NHPA) to help prevent the loss of irreplaceable historic properties. The Act established the Advisory Council on Historic Preservation (ACHP) and authorized the Secretary of the Interior to maintain a *National Register of Historic Places*. The *National Register* lists sites, districts, buildings, structures, and objects of significance in American History.

Section 106 of the NHPA requires each Federal agency to establish a program to locate, inventory, nominate, and protect all properties which appear to meet *National Register* criteria of significance. Agencies must ensure that such properties are not inadvertently transferred, sold, demolished, substantially altered, or allowed to significantly deteriorate. Historic and archaeological resource protection requirements apply to all properties located in the U. S. which are under the control of the Navy/Marine Corps by ownership, lease, or similar instrument. The NHPA requirements apply equally to land and water areas under direct control of Navy/Marine Corps.

Section 106 requires that, before a Federal agency can begin a project, the agency must make a determination of the effect that such an “undertaking” may have on historic properties. This “undertaking” may take into account a broad range of activities including construction, rehabilitation and repair projects, demolition, licenses, permits, grants, Federal property transfers, and any type of activity with Federal involvement. The NHPA requires that CERCLA remedial actions consider the effects of these activities on historic properties or their potential effect on properties listed on the *National Register of Historic Places*. Where applicable, the NHPA may be an ARAR.

1.4 American Indian Religious Freedom Act (AIRFA), 42 U.S.C. 1996, and the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013

Legislative guidance pertaining to Tribal governments is addressed in two significant acts: the American Indian Religious Freedom Act (AIRFA); and the Native American Graves Protection and Repatriation Act (NAGPRA). The AIRFA requires Federal agencies to consult with native traditional religious leaders and to consider, but not necessarily defer to, Indian religious values. Agencies should also permit access to religious sites, when possible.

The NAGPRA sets forth a process for the return to American Indians, Native Hawaiians, and Native Alaskans, upon request, of certain human remains and other cultural items presently held by Federal agencies or Federally-assisted museums or other institutions. The NAGPRA defines “cultural items” as human remains, funerary objects, sacred religious objects, and cultural patrimony, defined as material remains of historical, traditional, or cultural importance to the Native American group or culture.

1.5 Archaeological Resources Protection Act of 1979 (ARPA), 16 U.S.C 470 et seq.

The Archaeological Resources Protection Act (ARPA) requires issuance of permits for authorized professional excavation or removal of archaeological resources. An archaeological resource is any material remains of human life or activities which are at least 100 years old and which are of archaeological interest as determined by 32 CFR 229. The ARPA imposes civil and criminal penalties for unauthorized excavation, removal, damage, alteration or defacement of archaeological resources, or attempts to perform such unauthorized acts. Archaeological sites may be placed on the *National Register of Historic Places* if listing criteria are met.

As indicated in the NHPA, archaeological resource protection requirements apply to all properties under the control of the Navy/Marine Corps and apply equally to land and water areas. All such areas must be surveyed by cultural resource professionals to locate National Register resources. Repairs, alterations, new construction, and other projects likely to affect historic or archaeological resources must always include consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation.

1.6 Clean Air Act, as amended, 42 U.S.C. §§7401 - 7671q.

The Clean Air Act is a massive regulatory scheme designed to protect and enhance the quality of the nation’s ambient (i.e., outdoor) air. The Act and the implementing EPA regulations regulate pollutants such as ozone, carbon monoxide and small particulate matter, that are common and widespread throughout the country by: dividing the country into Air Quality Control Regions; establishing National Ambient Air Quality Standards; and requiring the states to develop implementation plans to attain, maintain and enforce the National Ambient Air Quality Standards. The Act also regulates “hazardous air pollutants. “ Hazardous Air Pollutants are toxic pollutants emitted by industrial sources. Any pollutant identified as a Hazardous Air Pollutant by the Clean Air Act is a CERCLA hazardous substance. The Clean Air Act contains civil and criminal provisions and waives sovereign immunity. Federal facilities must comply with state and local requirements pertaining to the control and abatement or ambient air pollution. Substantive local requirements will be ARARs at a CERCLA cleanup site.

1.7 Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1544

The Endangered Species Act (ESA) protects endangered and threatened species of flora and fauna (E/TS) by prohibiting “takings” and by protecting “critical habitat”. The term “take” is defined to include every conceivable way in which a person can “take” or attempt to “take” an E/TS. It includes acts that harm or harass an E/TS. Section 7 of the Endangered Species Act imposes a duty on the federal agency to conserve E/TS and requires the agency to consult with the Fish and Wildlife Service or the National Marine Fisheries Service to determine whether a

proposed action might jeopardize the continued existence of an E/TS or result in the destruction or adverse modification of habitat of such E/TS. The statute contains criminal and civil penalty provisions. The ESA does not contain a waiver of sovereign immunity. It is Navy/Marine Corps policy however to encourage cooperation with the states and territories to protect species identified as endangered, rare or threatened under local law, see OPNAVINST 5090.1B, paragraphs. 22-5.2a and 22-6.4m. A state “mini-ESA” law can be an ARAR at a clean-up site.

1.8 Executive Order Authority

An Executive Order (E.O.) is a Presidential Decree that establishes Presidential policy and assigns responsibilities among the executive agencies.

1.8.1 Executive Order 12088 (Federal Compliance With Pollution Control Standards)

E.O. 12088 of 1978 requires that Federal agencies cooperate with EPA, states, and local authorities to prevent, control, and abate environmental pollution and provides that the head of each Federal agency is responsible for compliance with “applicable and substantive control standards.” It also provides that any dispute between the EPA and a Federal agency regarding environmental violations shall be turned over to the Office of Management and Budget for resolution.

1.8.2 Executive Order 12580 (Superfund Implementation)

See **section 1.1.5** for a discussion of this Executive Order.

1.8.3 Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)

E.O. 12898 requires Federal agencies to identify and address the potential for their programs, policies, and actions to have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

The DoD Strategy on Environmental Justice, dated 24 March 1995, states that Restoration Advisory Boards and Community Relation Plans are ideal vehicles for implementation of environmental justice principles. RPMs should document efforts made to address environmental justice issues, including encouraging participation of citizens who may be considered to be interested in environmental justice issues on Restoration Advisory Boards and as part of the Community Relations Plan process. The RPM should maintain records of such efforts in the information repository.

1.9 Federal Water Pollution Control Act as amended by the Clean Water Act (CWA), 33 U.S.C. §§1251-1387

The Clean Water Act (CWA), also known as the Federal Water Pollution Control Act, seeks to “restore and maintain the quality of the nation’s waters” by: 1) prohibiting unpermitted

discharges of pollutants into navigable waters from point sources [section 402]; 2) requiring the pre-treatment of discharges of pollutants into sewage systems that feed into publicly-owned waste treatment works from industrial sources [section 307(b)]; 3) prohibiting the placement of dredged or fill materials into navigable waters [section 404]; and 4) prohibiting discharges of oil and hazardous substances in harmful quantities from vessels and facilities into or upon the navigable waters, shorelines or contiguous zone [section 311; the original statutory authority for the NCP]. The CWA definition of “navigable waters” is extremely broad and includes most surface waters and wetlands. The CWA and the implementing EPA regulations regulate discharges of “conventional” and “toxic” pollutants and “hazardous substances”. All CWA toxic pollutants and hazardous substances are CERCLA hazardous substances. The CWA includes both civil and criminal penalties and waives sovereign immunity.

1.10 Fish and Wildlife Conservation Act, 16 U.S.C. 661 et seq.

The purpose of the Fish and Wildlife Conservation Act is to assure that wildlife conservation will receive equal consideration and be coordinated with other features of water-resource development, maintenance, and overall coordination of wildlife conservation and rehabilitation. The Act also provides for the integration of wildlife species and/or habitat improvement or protection within project development or operation plans. Federal agencies must consider the effects of water-related projects on fish and wildlife and act to prevent these resources from being lost or damaged.

1.11 National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et seq.

The National Environment Policy Act (NEPA) is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides a means for carrying out environmental policy. NEPA is a procedural statute with twin objectives that require a Federal decision-maker to consider and document the environmental impacts of a proposed action while also ensuring that the public is fully informed of the proposal and its impacts and given adequate opportunity to comment. Compliance is required whenever a “major Federal action” is proposed. **NEPA’s procedural requirements do not apply to CERCLA cleanup actions.** CERCLA’s substantive and procedural provisions are the “functional equivalent” of NEPA. (See OPNAVINST 5090.1B, Section 15-5.27).

1.12 Safe Drinking Water Act, 42 U.S.C. 300f et seq.

The Safe Drinking Water Act authorized the formulation and implementation of potable water supply, treatment, and distribution system permitting and monitoring programs. The Act also authorized the establishment of allowable “ceiling concentrations” of specified pollutants in drinking water. The National Primary Drinking Water Regulations, 40 CFR 141-149, and the National Secondary Drinking Water Regulations, 40 CFR 143, are of particular interest to Navy/Marine Corps activities. 40 CFR 141 lists maximum contaminant levels in drinking water and details sampling, monitoring, reporting, and record keeping requirements for public water systems. 40 CFR 143 promulgates secondary standards, which are guidelines but not enforceable, for chloride, fluoride, sulfate, copper, iron, manganese, color, corrosivity, foaming agents, odor, pH, and total dissolved solids. EPA issued, as a general rule, the Maximum Contamination Level Goals and proposed that the maximum contaminant levels be evaluated for

appropriateness as an ARAR during the Remedial Action Process for contaminated groundwater cleanups. The Act also has a “Right to Know” provision that states that the public must be informed of any contamination to the drinking water supply above the maximum contaminant levels.

The Safe Drinking Water Act waives sovereign immunity and permits program delegation to the state if state standards are no less stringent than Federal standards. OPNAVINST 5090.1B, Chapter 8; MCO P5090.2, Chapter 8; and NAVMED P-5010.5, Manual of Naval Preventive Medicine, Water Supply Ashore, promulgate further guidance of Navy/Marine Corps drinking water policy.

1.13 State Mini-Superfund Laws

Section 120(a)(4) of CERCLA provides that state laws concerning removal, remedial action, and enforcement apply to removal and remedial actions at Federal facilities not included on the NPL. State laws must be consistent with CERCLA in order to apply to Federal facilities. To be consistent, state laws must:

- Set up a comprehensive scheme for remedial enforcement
- Establish health-based standards through an objective process such as ARARs
- Include cost-effectiveness as an element
- Be free of discriminatory application to Federal facilities, and
- Be consistent with EPA’s NCP.

States have a role in defining ARARs for both NPL and Non-NPL sites. CERCLA, Section 121(d), requires that, with some exceptions, Federal facility remedial actions must comply with these ARARs.

1.14 Navy Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B) and the Marine Corps Environmental Compliance and Protection Manual (MCO P5090.2)

OPNAVINST 5090.1B and MCO P5090.2 establish policy, discuss requirements, and assign responsibilities for the management of the environment and natural resources for Navy and Marine Corps activities, respectively. They also describe command responsibilities for environmental management and describe updated funding procedures. These documents contain IR Program guidance.

1.15 Guidance Documents

It is Navy/Marine Corps policy, in accordance with CERCLA, Section 120(a)(2), that all actions carried out under the IR Program will be accomplished in compliance with all applicable requirements of CERCLA and the terminology used by the IR Program will be consistent with that used in CERCLA and the NCP.

Although EPA policy and guidance documents are not mandatory, it is Navy/Marine Corps policy that IR response actions reasonably interpret and apply EPA policy and guidance when making cleanup decisions. In addition, CERCLA, Section 120(a)(2), prohibits the Navy/ Marine Corps from adopting any guidelines, rules, etc. that are inconsistent with EPA's guidelines and rules.

Appendix B, References, contains current EPA, DoD, and Navy/ Marine Corps guidance and policy documentation. Information on how to obtain EPA documents should be available from the EPA Remedial Project Manager for those installations that have them.

Also, EPA maintains a RCRA/Superfund Hotline to assist in finding documentation at 800 424-9346, or 800 535-0202, or (703) 412-9810.

- **Note:** see **Appendix C for an extensive list of references used in this *Manual*.**

Chapter Two

2. Organization and Responsibilities

The three major governmental entities involved in the cleanup of past hazardous waste sites on DoD installations are the U.S. Environmental Protection Agency, the state

and the DoD and its components. This chapter summarizes the organizational responsibilities of participants in the Installation Restoration (IR) Program.

The following paragraphs describe the responsibilities of the Federal offices involved in the Navy/ Marine Corps IR Program:

2.1 U. S. Environmental Protection Agency

The primary mission of the U. S. Environmental Protection Agency (EPA) is to protect and enhance the environment. Under CERCLA and other related laws, EPA is responsible for guidance concerning hazardous waste site operations and EPA Superfund site cleanup activities. EPA implements the environmental laws by issuing regulations published in the *Federal Register*. EPA's goals for the Superfund Program are to:

- Ensure that polluters pay to clean up the problems they create; and
- Work first on the worst problems at the worst sites including:

Make sites safe by controlling acute threats to people and the environment;

Make sites clean by achieving long-term cleanup goals; and

Use innovative and the most current technology to remove contamination from the environment .

EPA also conducts technical and environmental training programs related to hazardous materials.

2.2 States

The states serving in their regulatory role of protecting and enhancing the environment are participants in the cleanup of Navy/Marine Corps installations. CERCLA, Section 120, and 10 U.S.C. 2705 require that all response

activities at Federal facilities be coordinated with Federal, state, and local authorities to implement CERCLA and NCP requirements for NPL and Non-NPL sites.

2.2.1 Defense and State Memorandum of Agreement

DoD developed the Defense and State Memorandum of Agreement (DSMOA) Program to enhance the involvement of states and territories in the cleanup of DoD installations through the DERP in compliance with CERCLA, Sections 120 and 121. CERCLA, Section 211(d), allows the SECDEF to enter into agreements with the states, on a reimbursable basis, to support the cleanup effort. A state's role in the IR Program will be facilitated and clarified by the development of a DSMOA. DSMOAs specify the conditions under which DoD will reimburse a state for costs of providing services in direct support of ER, N or Base Realignment and Closure (BRAC) funded activities. The following state services qualify for reimbursement:

- Technical review, comments, and recommendations on all documents or data submitted to the state for projects using ER, N or BRAC funding including actions accomplished under the Federal Facility Agreement (FFA) or Interagency Agreement (IAG);
- DSMOA preparation / administration / amendments;
- Identification/review/ determination/regulation of applicable or relevant and appropriate requirements (ARARs);
- Site visits to review DoD response actions;

- Site visits to obtain and analyze split samples;
- Support and assistance in conducting public participation requirements;
- Participation in the Restoration Advisory Board (RAB);
- Preparation and administration of a Cooperative Agreement (CA) to implement the DSMOA;
- Independent Quality Assurance/ Quality Control (QA/QC); and
- Any additional services that may be set forth in the DSMOA on a state-by-state basis.

A signed DSMOA represents a commitment between DoD and a state to cooperate in the cleanup program for specified installations and establishes the procedural framework for payment. A signed DSMOA, although a prerequisite for reimbursement, is not a funding instrument.

The Services review draft CA applications provided to them by the U.S. Army Corps of Engineers (USACE) for consistency with cost estimates and review of the work plan for state technical services. The USACE provides the Services a copy of all signed DSMOAs and CAs.

2.3 Department of Defense/Secretary of Defense

The Department of Defense's (DoD) IR Program to identify and remediate past hazardous waste sites on DoD installations closely parallels the Environmental Protection Agency's (EPA) Superfund Program with the principal difference being the funding mechanism. The Environmental Restoration, Navy (ER, N), which is the counterpart to the EPA Superfund, provides the funding for the

IR Program activities. As delegated by Executive Order 12580, DoD is the Lead Agency Authority for actions taken under the authority of CERCLA at DoD installations. Executive Order 12580 delegated authority for response action decisions to the Secretary of Defense (SECDEF) "...with respect to release or threatened releases where either the release is on or the sole source of the release is from any facility or vessel under the jurisdiction, custody, or control of DoD."

SECDEF also has other responsibilities under CERCLA, Sections 105, 109, 111, 116, and 122. The Defense Environmental Restoration Program (DERP) implements the SECDEF's authorities and responsibilities. CERCLA requires that the SECDEF identify an office within the Office of the Secretary to carry out the IR Program. The Secretary assigned this responsibility to the Deputy Under Secretary of Defense, Environmental Security [DUSD(ES)].

Figure 2-1 shows the DoD/DON Chain of Command for the IR Program.

2.3.1 Department of Defense Explosive Safety Board

Under 40 CFR 186.5, The Department of Defense Explosive Safety Board (DDESB) is assigned the role of reviewing and approving all plans for the leasing, transferring, or disposing of DoD real property where ammunition and explosive contamination exists or is suspected to exist. DoD 6055.9-STD, DoD Ammunition and Explosive Safety Standards, and NAVSEA OP 5, *Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*, outline the specific procedures that must be followed in these cases.

2.4 Deputy Under Secretary of Defense, Environmental Security

SECDEF designated the DUSD(ES) to serve as the focal point for DoD-wide environmental policy and planning. DUSD(ES) represents DoD before Congress, Federal and state agencies, news media, and the public in environmental matters. DUSD(ES) is responsible for policy, management, and oversight of the DERP. Figure 2-2 outlines the responsibilities mandated by Executive Order 12580. DUSD(ES) responsibilities include:

- Maintaining close interaction with the EPA Headquarters, national news media, and coordinating broad interface issues with states and the public to implement the requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP);
- Providing special notification of hazardous wastes that are specific to DoD installations to the Department of Health and Human Services and EPA;
- Providing integration of public review and comment in activities associated with implementing the NCP;
- Submitting an annual report to Congress describing DERP activities under CERCLA, Section 211;

- Providing oversight to the DERP including consistent program implementation across DoD components and establishing a DoD-wide restoration management information system containing site-specific data; and
- Negotiating Defense and State Memoranda of Agreement.

2.5 Secretary of the Navy

OPNAVINST 5090.1B and MCO P5090.2 describe responsibilities for personnel and organizations involved in the IR Program.

2.5.1 Assistant Secretary of the Navy (Installations and Environment)

The Assistant Secretary of the Navy (Installations and Environment) [(ASN(I&E)] is the Secretary of the Navy's (SECNAV) designated focal point for the DoD IR Program. ASN(I&E) duties include coordination with the DUSD(ES) on policy issues and ultimate responsibility for the Navy/Marine Corps' IR Program. Responsibilities of the ASN(I&E) include:

- General policy oversight for Navy/Marine Corps IR Program activities;

Chain of Command for the Navy Installation Restoration Program

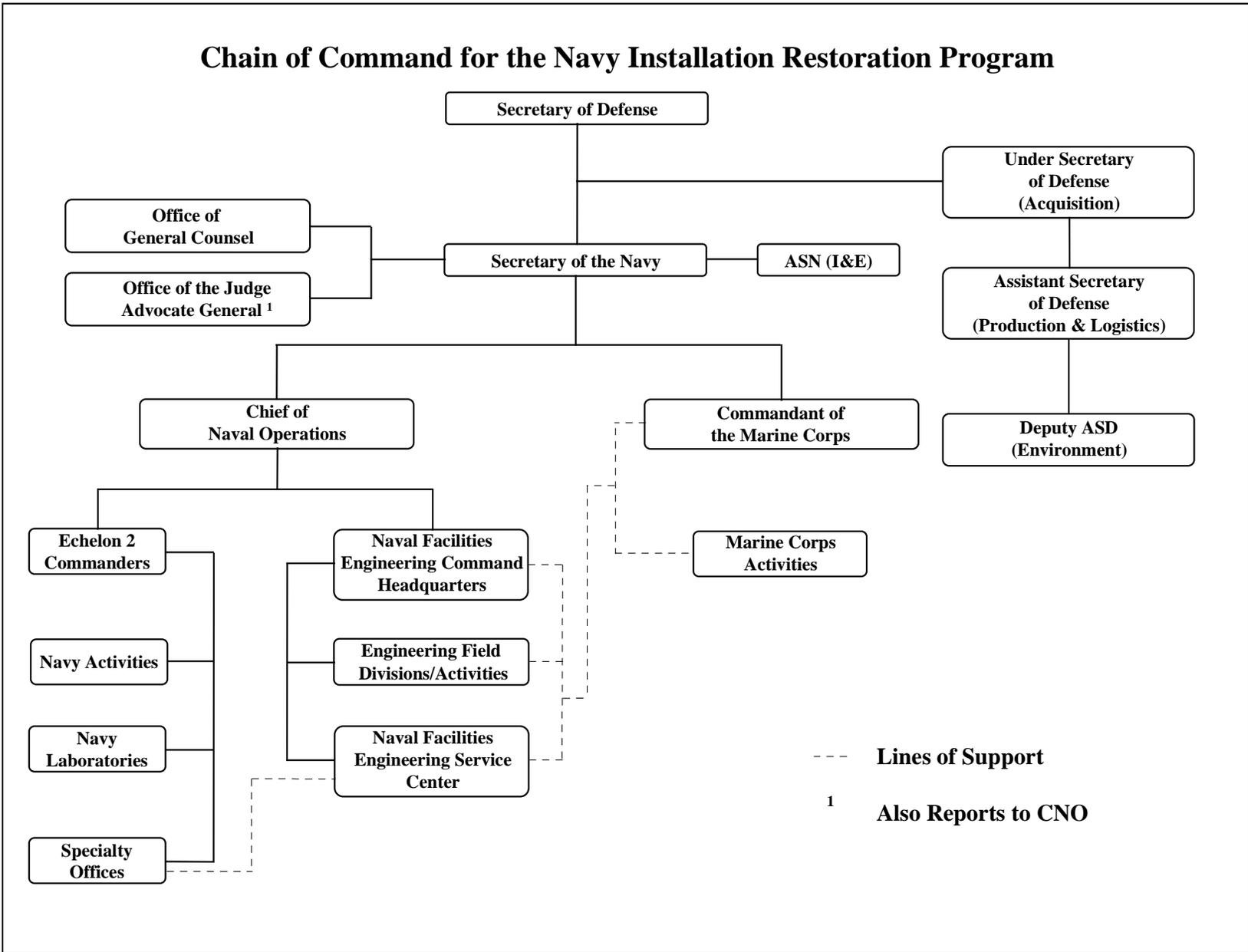


Figure 2-1: Chain of Command for the Navy Installation Restoration Program

Outline of DoD Responsibilities in Implementing CERCLA and NCP Requirements under Executive Order 12580

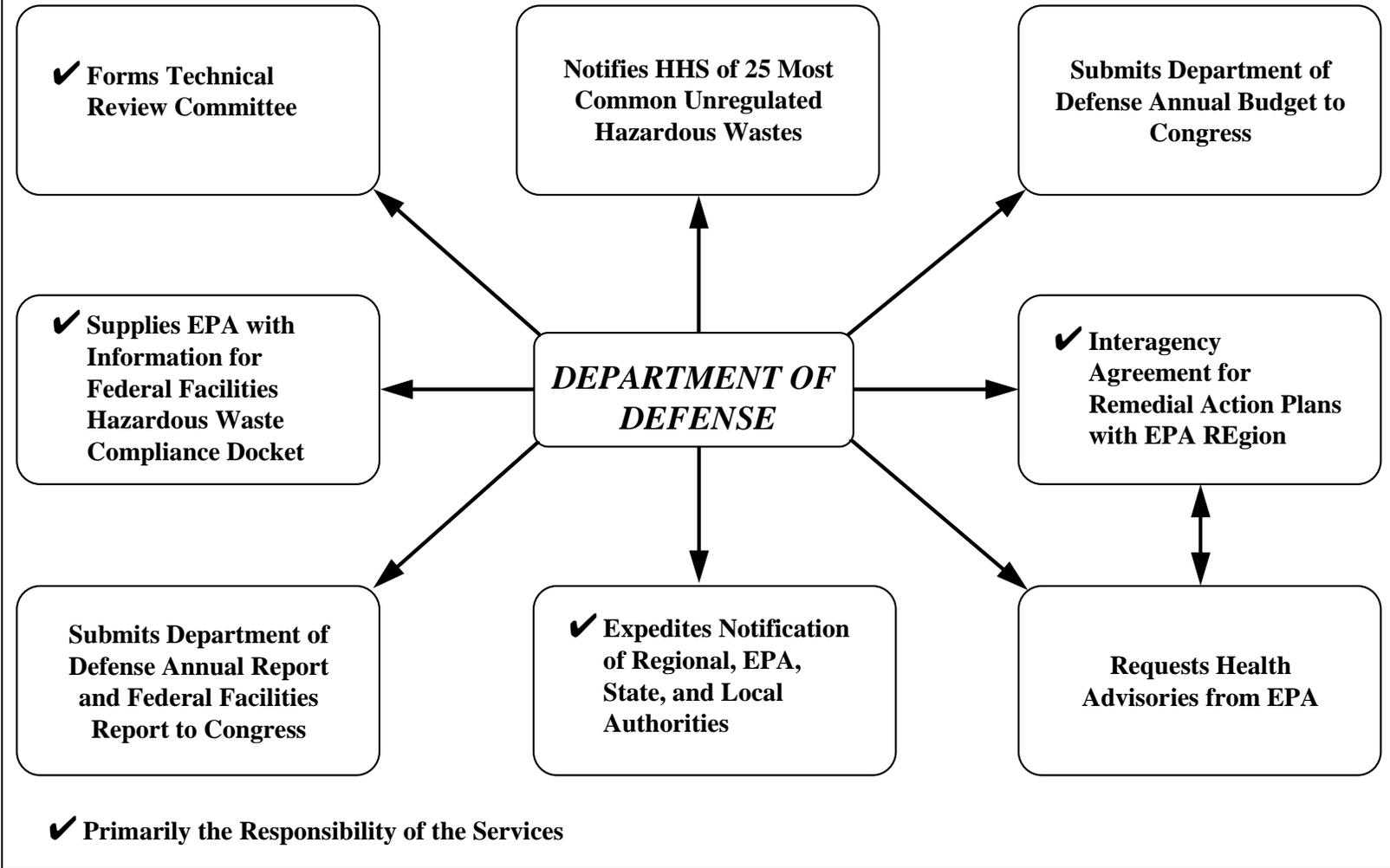


Figure 2-2: Outline of DoD Responsibilities in Implementing CERCLA and NCP Requirements under Executive Order 12580

- Representing the Navy/Marine Corps with environmental agencies on IR Program matters;
- Representing the Navy/Marine Corps with senior level DoD officials and committees; and
- Signing the FFA and IAG after appropriate endorsement via the Chain of Command including CNO (N45) for Navy installations and CMC (LFL) for Marine Corps installations.

2.5.2 General Counsel

The General Counsel is the principal legal advisor to SECNAV and has primary responsibility within the Navy/Marine Corps for providing advice and counsel on environmental matters. Within the Office of the General Counsel (OGC), the Office of the Assistant General Counsel (Installations and Environment) has primary responsibility for advising the ASN(I&E). The Associate General Counsel (Litigation) has primary responsibility for all environmental litigation. OGC attorneys are also assigned to the Offices of Counsel for the Commandant of the Marine Corps, the Navy Comptroller, the Naval Facilities Engineering Command (NAVFACENGCOR), and the other Major Claimants.

2.5.2.1 Counsel, NAVFACENGCOR

Within the Navy/Marine Corps, the NAVFACENGCOR Office of Counsel has the largest cadre of environmentally trained attorneys, with environmental law attorneys at the headquarters, EFD/EFAs, and at some of the public works centers. These attorneys serve as legal advisors to NAVFACENGCOR program managers responsible for the various environmental programs, including the IR Program.

NAVFACENGCOR attorneys, working with their engineering and technical counterparts and in close coordination with the installation, negotiate all FFAs and Federal Facility State Remediation Agreements on behalf of Navy/Marine Corps and negotiate all Potentially Responsible Party (PRP) agreements pertaining to off-station CERCLA sites.

2.5.2.2 Counsel for the Commandant of the Marine Corps

Counsel for the Commandant of the Marine Corps, a member of the OGC, is the principal legal advisor to the Commandant on environmental matters. The Office of Counsel consists of both Marine Corps judge advocates and civilian OGC attorneys. Two regional offices, the Eastern Area Counsel Office and the Western Area Counsel Office are staffed with environmentally trained attorneys, civilian and military, who provide advice and counsel on environmental matters to Marine Corps commands and installations within their respective geographic areas.

2.5.3 Judge Advocate General

The Judge Advocate General is the senior military lawyer in the Navy/ Marine Corps. The Deputy Assistant Judge Advocate General (Environmental Law) also serves as the Deputy Assistant General Counsel (Environment and Safety) in the Office of the Assistant General Counsel (Installations and Environment). The Office of Legislative Affairs monitors the congressional legislative process, advises Navy and Marine Corps commands and installations on pending legislation and develops Navy/Marine Corps positions for transmission to DoD and Congress. Environmentally trained judge advocates are assigned as environmental counsel to the Area Environmental

Coordinators (AECs) and Regional Environmental Coordinators (RECs) that do not have OGC counsel. Judge Advocates assigned as fleet or staff judge advocates provide legal advice and counsel on all matters, including environmental matters, to installation commanding officers.

2.6 Chief of Naval Operations

The Chief of Naval Operations (CNO), Environmental Protection, Safety, and Occupational Health Division (N45) responsibilities include:

- Establishing policy;
- Directing, coordinating, and monitoring the IR Program within the Navy;
- Coordinating with ODUSD(ES), OASN(I&E), CMC, and non-DoD agencies involved in environmental restoration matters; and
- Submitting program and budget requests, forwarding funds for execution, and providing program oversight.

2.7 Commandant of the Marine Corps

The Commandant of the Marine Corps (CMC), Land Use and Military Construction Branch (LFL), responsibilities include:

- Coordinating with OASN(I&E), CNO (N45), and NAVFACENGCOM to ensure equitable and timely allocation of funding from the ER, N to support remediation of releases of hazardous substances at Marine Corps installations; and
- Providing oversight for the implementation of the IR Program for the remediation of past hazardous waste disposal sites at Marine Corps installations.

2.8 Major Claimant/Echelon II Commands

Major Claimant/Echelon II Commands responsibilities include:

- Ensuring that subordinate installations identify IR Program requirements to NAVFACENGCOM;
- Ensuring that subordinate installations receive IR Program information and guidance;
- Ensuring that subordinate installations fulfill their responsibilities under the Navy/Marine Corps IR Program;
- Ensuring that public participation and other legal requirements are met at installations with IR sites; and
- Ensuring that installation budgets reflect resource requirements to support the Navy/Marine Corps IR Program.

2.9 Naval Facilities Engineering Command

The Naval Facilities Engineering Command (NAVFACENGCOM) provides expertise in environmental engineering, technical, contracting and legal support and coordinates all Navy/Marine Corps IR actions. Specific NAVFACENGCOM responsibilities include:

- Executing the IR Program;
- Providing program and technical support as directed by CNO or CMC;
- Developing and supporting ER, N resource requests and managing funds allocated for program execution;
- Providing IR-related training to EFDs/EFAs; and
- Providing quarterly briefings to Major Claimants/Echelon II Commands.

2.9.1 Engineering Field Divisions/ Engineering Field Activities

The Naval Facilities Engineering Command's Engineering Field Divisions /Engineering Field Activities (EFDs/EFAs) are subordinate offices under NAVFACENGCOCM. The EFDs/EFAs provide environmental engineering, technical, legal, and contracting assistance to Major Claimants and installations. NAVFACENGCOCM's EFDs/EFAs are as follows:

- Atlantic Division (LANTDIV), Norfolk, Virginia
- Pacific Division (PACDIV), Pearl Harbor, Hawaii
- Southern Division (SOUTHDIV), Charleston, South Carolina
- Southwestern Division (SWDIV), San Diego, California
- Northern Division (NORTHDIV), Philadelphia, Pennsylvania
- EFA Northwest (EFA NW), Poulsbo, Washington
- EFA, West (EFA WEST), San Bruno, California
- EFA Chesapeake (EFA CHES), Washington, D. C.
- EFA Midwest (EFA MW), Great Lakes, Illinois

Each EFD/EFA is responsible for the Navy/Marine Corps IR Program within its geographical area, as shown in Figure 2-3, except for SOUTHDIV which has direct responsibility for installations located within EFA Midwest's area.

EFD/EFA responsibilities include:

- Executing the IR Program at the field level;
- Maintaining administrative record files and distributing copies as required;
- Providing information and reviewing the DERP, Annual Report to Congress.
- Developing and revising installation specific Community Relations Plans (CRP);
- Managing and administering contracts supporting the IRP;
- Negotiating FFAs and state remediation agreements on behalf of and in close coordination with the installation;
- Ensuring that IR Program requirements are charged to ER, N, and those chargeable to the installation's operations and maintenance (O & M) are identified to Commanding Officers/Commanding Generals well in advance of the requirement, i.e., RAB expenses;
- Preparing No Further Action documentation;
- Participating in remediation planning meetings with other PRPs and serving as the Navy/ Marine Corps representative for PRP negotiations with EPA;

Engineering Field Divisions/Engineering Field Activities of the Naval Facilities Engineering Command

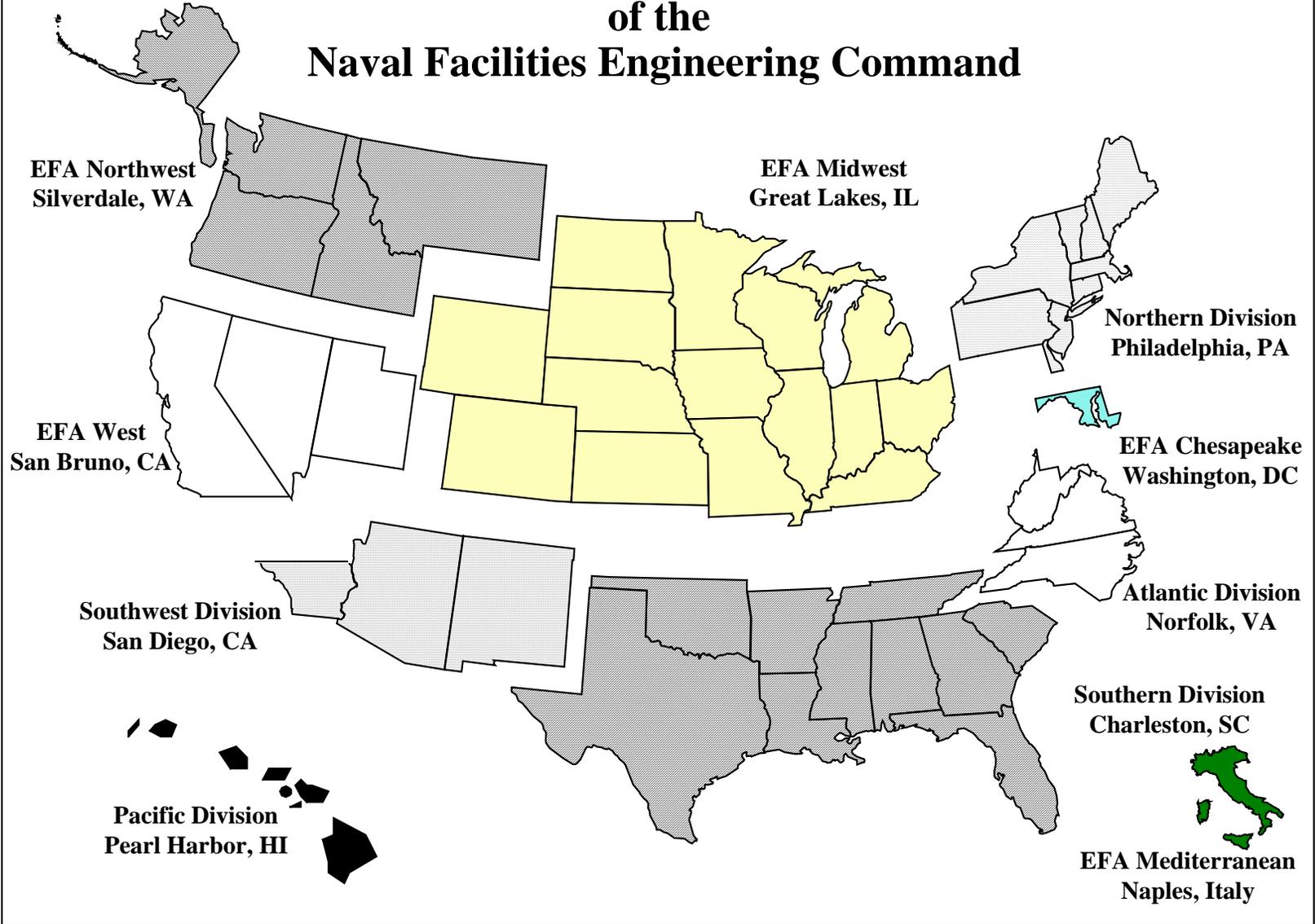


Figure 2-3: Engineering Field Divisions/Engineering Field Activities (EFDs/EFAs) of the Naval Facilities Engineering Command

- Providing semi-annual updates of the Navy's environmental restoration database (DSERTS);
- Providing quarterly briefings to the Major Claimants/Echelon II Commands on the status of the IRP, as requested by NAVFACHQ;
- Assigning a Remedial Project Manager (RPM) to manage remedial or other response actions in the IR Program;
- Coordinating with the installation and regulatory agencies prior to initiating projects and during all phases through to project completion;
- Developing and performing site-specific projects in coordination with installations to assess and control contamination; preparing project plans, reports, and contract documents; coordinating review and comments; and distributing final documents to the appropriate installation and Major Claimant;
- Providing IR study results to planning and real estate personnel and providing support to acquisition project managers to ensure that hazardous waste site conditions are taken into account by other Navy programs and projects before land use decisions are made;
- Providing technical and financial oversight during project performance;
- Tracking project progress to meet schedule requirements;
- Negotiating, in close coordination with the installation, and forwarding proposed remediation agreements (RCRA Corrective Action permits/orders, UST consent orders, and any regulatory

documents that involve commitment of ER, N funds) to CNO/CMC via the chain of command;

- Preparing, coordinating and forwarding the Record of Decision (ROD) to the installation Commanding Officer/Commanding General for signature; and
- Providing support to installations with member representation at Technical Review Committees (TRCs)/RABs.

2.9.1.1 Remedial Project Manager Responsibilities

The Remedial Project Manager (RPM) is the prime contact for remedial or other response actions undertaken or needed at sites in the IR Program. In that the Naval Facilities Engineering Command has been assigned the responsibility of implementing the IR Program, the RPM is a Naval Facilities Engineering Command employee (except in rare instances) whose responsibility is to manage the IRP at an installation while closely coordinating with the installation.

The RPM's responsibilities include identifying the resources needed to effectively implement the Remedial Action Process including CERCLA response actions and ER, N eligible RCRA Corrective Actions. The RPM coordinates the work of Navy technical support agencies and contractors to accomplish IR Program goals and policies. RPM responsibilities include overall management of all phases of the project including problem definition through project design, remedial action, and close-out. The RPM is also the single individual involved in all aspects of the project including interagency relationships, funding, scheduling, design, and remedial action. The RPM's responsibilities include:

- Coordinating, directing, and reviewing the IR Program site work;
- Maintaining a close relationship with the installation to facilitate communication and recognize the installation's responsibilities for installation property, personnel, and mission;
- Assuring compliance with the NCP;
- Forwarding IR Program studies to the EPA and state regulatory agencies for review and upon study completion;
- Identifying ER, N funding needs for response actions at the installation;
- Maintaining relationships with representatives of regulatory agencies and natural resource stakeholders/trustees to facilitate communications concerning their environmental and public health interests;
- Understanding the DSMOA;
- Managing the IR Program work effort to comply with milestones and commitments in the ROD and FFA;
- In cases where IR Program Remedial Action Contractors are being used, working with the Contracting Officer to ensure that the work is properly executed;
- Ensuring that the scope and level of effort of response actions are appropriate for the nature of the environmental and public health threats being remedied;
- Coordinating with the installation to ensure that all long term monitoring is accomplished (possibly by contracting);
- Serving on or as a technical advisor to the RAB/TRC;
- Understanding and fulfilling the RPM role as the principle representative of the lead agency, under CERCLA, for remediation of past releases; and
- Evaluating site screening tools and innovative technology for possible use.

In addition to the previously described duties, the RPM for a BRAC installation is a member of the BRAC Cleanup Team (BCT). The RPM's involvement with ongoing and planned restoration program activities is important to the BCT and the RPM needs to keep the BCT informed of planned and ongoing environmental restoration program activities. Knowing the scope of planned and ongoing program activities and the contracts driving them, will facilitate the project team's understanding of the mechanisms and resources available to implement environmental restoration at the installation.

2.9.2 Naval Facilities Engineering Service Center

The Naval Facilities Engineering Service Center (NFESC), located at Construction Battalion Center, Port Hueneme, California, reports to the NAVFACENGCOM. NFESC's IR Program responsibilities include:

- Providing IR Program technical analyses as requested by NAVFACENGCOM HQ, and EFDs/EFAs;
- Developing and maintaining a computerized database of IR Program

- information, and preparing program management reports;
- Managing the QA/QC review of environmental laboratories involved in the IR Program;
- Maintaining a library of program documents;
- Developing and performing site-specific projects (with the concurrence of the EFD/EFA and installation) to assess and control contamination at installations;
- Providing administrative support to the specialty offices addressing unique IR problems related to marine and ordnance operations;
- Providing technical input to the IR Program through participation in Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program reviews;
- Providing EFDs/EFAs with recommendations and technical assistance to conduct RI/FS, remedial actions (RA), long-term monitoring, and site close out;
- Providing technical studies, specialized field teams (including technology transfer teams), and field support guidance, i.e., manuals, guides, and standard procedures, to assist installations and EFDs/EFAs in complying with IR Program requirements including written program quality assurance strategy;
- Providing IR-related training such as Health and Safety Training and Resident Officer in Charge of Construction (ROICC) training;

- Evaluating unsolicited proposals for Research, Development, Test and Evaluation (RDT & E) for environmental cleanup; and
- Maintaining Appendix E, Innovative Technologies.

2.9.3 Specialty Offices

The Specialty Offices listed below provide technical support to the IR Program. Specialty Offices include:

- The Ordnance Environmental Support Office, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland, provides Navy-wide support relative to specialty chemical, ordnance, munitions, and ordnance activity environmental protection;
- The Marine Environmental Support Office, Naval Command, Control and Ocean Surveillance Center Research, RDT&E Division, San Diego, California, provides Navy-wide support relative to aquatic environmental protection;
- The Aircraft Environmental Support Office, Naval Aviation Depot, North Island, California, provides Navy-wide support relative to aircraft and aircraft facility environmental protection; and
- The Ships Environmental Support Office, Naval Surface Warfare Center, Carderock Division, Carderock, Maryland, provides Navy-wide support relative to ship environmental protection.

2.10 Other Supporting Navy Organizations

2.10.1 Bureau of Medicine and Surgery

The Bureau of Medicine and Surgery (BUMED), acting through the Navy Environmental Health Center (NAENVIRHLTHCEN), located in Norfolk, VA, is responsible for providing IR Program support including:

- Providing support for health assessments, toxicological profiles, health/safety training, review of human health evaluations, and risk assessments;
- Interfacing and serving as the Navy coordinator with the Agency for Toxic Substances and Disease Registry (ATSDR) concerning ATSDR's legally mandated public health assessment responsibilities; and
- Assisting NAVFACENGCOM and installations during public meetings and providing responses to community concerns regarding program health and safety.

NAENVIRHLTHCEN is responsible for providing medical consultation in all health-related actions within the IR and the BRAC Programs. Services available through NAVENVIRHLTHCEN are consultation, quick response risk assessments, document reviews, public health support, environmental risk communication and public dialogue support, and training. A description of these services is as follows:

- Consultation - a special study which evaluates risks associated with a particular site or project. This may require in-depth review of available data or the acquisition of supplemental data;
- Quick response risk assessment - a limited evaluation of a site or project. A quick response risk assessment is appropriate when the Navy/Marine Corps quickly needs a human health risk determination.

It evaluates the site or project under its current or future use scenarios;

- Document review - a multi-disciplinary environmental health review of site or project documents including human health risk assessment documents. These documents result from execution of CERCLA RIs or RCRA Corrective Actions. They include planning, scoping, and draft and final documents for all phases of the remediation process including work plans, QA/QC plans, RI/FS, risk assessments, and health/safety plans;
- ATSDR program coordination - serve as the Navy/Marine Corps' liaison for ATSDR issues. Provide pre-ATSDR site visit briefings to appropriate facility personnel; accompany ATSDR on site visits; review public health assessment documents; coordinate health education, health consultations, and health studies; review draft toxicological profiles; provide and review medical effects data; and consult on health effects data;
- Public health support - provide technical assistance on public health issues and conduct a public health baseline survey for BRAC or other emergent situations not receiving ATSDR involvement;
- Environmental risk communication and public dialogue - provide support including workshops and other assistance to identify and effectively communicate environmental risk issues with the public. Other assistance includes training on selected issues; correspondence preparation; presenter practice/ evaluation; poster/exhibit preparation for public meetings; RAB assistance; and assistance in profiling the community; and

- Training - RPM training in environmental risk communication, public health assessment, human health risk assessment, and health and safety planning. Specialized workshops are available upon request.

Figure 2-4 details the relationship of BUMED and NAVENVIRHLTHCEN in providing support to NAVFACENGCOM and the EFDs/EFAs for the IR Program.

2.10.2 Naval Sea Systems Command

The Naval Nuclear Propulsion Program (NNPP) in the Office of the Chief of Naval Operations (OPNAV N00N, which is also part of NAVSEA 08, Nuclear Propulsion Directorate) is responsible for all matters pertaining to naval nuclear propulsion, including the control of radioactivity associated with the operation and servicing of naval nuclear propulsion plants. This radioactivity is regulated by the NNPP pursuant to the Atomic Energy Act of 1954, Executive Order 12344 and Public Law 98-525 (42 U.S.C. 7158). Because of this statutory authority as a regulator, the NNPP must be involved in the remedial action process (under CERCLA, RCRA, or BRAC) at Navy bases and shipyards frequented by nuclear powered warships.

NAVSEA 07R is responsible for the non-NNPP radiological matters within the remediation processes of the IR and BRAC Programs. NAVSEA 07R has designated Naval Sea Systems Command Detachment, Radiological Affairs Support Office (NAVSEADET RASO) as their technical support center within the remediation process. Services available through NAVSEADET RASO include consultation, assessment of remediation plans, document review,

environmental risk communication, and public dialogue support.

Further guidance on radiological issues in the IR and BRAC Programs is provided in **section 7.16**.

2.11 Area Environmental Coordinator

CNO assigns Area Environmental Coordinators (AECs) who are responsible for coordination of environmental issues within their designated EPA region. AECs appoint Regional Environmental Coordinators. Navy AECs are:

CINCLANTFLT: EPA Regions I, II, III, and IV

CNET: EPA Regions V and VI

COMNAVRESFOR: EPA Regions VII and VIII

CINCPACFLT: EPA Regions IX and X

2.12 Regional Environmental Coordinator

The AEC assigns the Regional Environmental Coordinator (REC) to serve as the senior Navy officer in a local region to coordinate environmental matters and public affairs.

2.13 Installation Commanding Officer/Commanding General

Installations are responsible for all activities regarding properties under their command. The IR Program may affect the mission of an installation, the health and welfare of the people who work and live on or near the

Navy Environmental Health Center Corporate Relationships

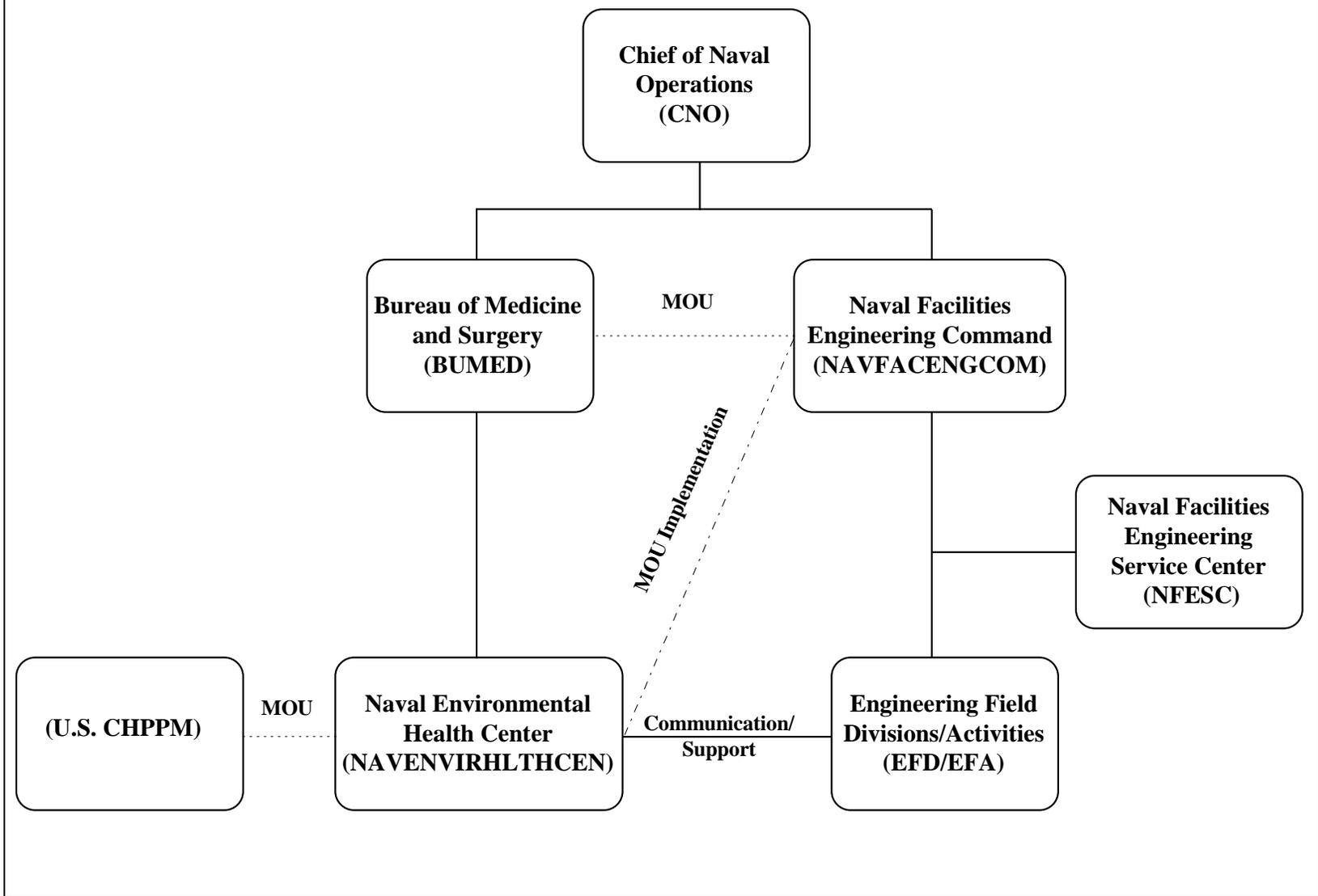


Figure 2-4: Navy Environmental Health Center Corporate Relationships

installation, and the public's attitude in neighboring communities toward an installation. Commanding Officers/Commanding Generals of Navy and Marine Corps installations must be involved in IR Program decisions and actions affecting their installations. Their knowledge of the status of the IR Program will assist them in making property management decisions for all tenant and tenant activities.

The RPM will coordinate with the installation regarding IR Program implementation decisions. These decisions are driven by resource availability, funding priority, and the inherent technical and regulatory complexity of site remediation. Installation responsibilities include:

- Closely coordinating with the cognizant EFD/EFA concerning all IR or BRAC cleanup matters;
- Assisting the servicing EFDs/EFAs in negotiating FFAs, state agreements, and other agreements;
- Ensuring that appropriate information is placed in the local information repository;
- Ensuring that IR Program site conditions are considered prior to making land use planning, development, or operation decisions, especially in regard to Military Construction and special projects development. IR Program review must be incorporated into the shore facilities planning process;
- Cooperating with the on-site EFD/EFA representative (generally the Officer in Charge of Construction/ROICC) to resolve installation issues that effect IR contractor operations;
- Ensuring that installation O&M funding is not used to fund ER, N IR efforts;
- Providing an installation contact and logistic support to the EFD/EFA and their contractors performing investigations and cleanup of IR projects;
- Participating in negotiations and remediation planning meetings with state and EPA regulatory personnel;
- Notifying servicing EFD/EFA, REC, and the chain of command of any EPA or state notification of PRP action;
- Preparing and implementing a public participation program to include a CRP for IR Program sites and keeping RECs and EFDs/EFAs informed of all public affairs actions;
- Assisting in selecting the remedy and then signing the ROD for applicable IR Program sites. (EPA will review and concur on the final decision concerning sites on the NPL.);
- Ensuring that all applicable statutory and regulatory requirements concerning safety and health training for installation personnel are met for personnel accessing IR site;
- Notifying Federal, state, and local officials when a release is discovered;
- Participating in scoping meetings for contract negotiations between the EFD/EFA and the IR or BRAC contractor;
- Identifying funding needs to the respective chain of command; and
- Establishing and conducting periodic meetings of the TRC/RAB.

2.14 RCRA Corrective Action/ CERCLA Interface

Multiple Federal, state, and local regulatory agencies regulate and enforce legal requirements on hazardous waste sites. The regulators generally have the prerogative, within the scope of their authority, to determine which enforcement mechanism applies to each IR Program effort. This means that facilities in different geographic locations may have different legal requirements placed upon them for responses to releases and threats of release at hazardous waste sites. Within these prerogatives, regulators have certain requirements that do not differ from location to location. For example, regulators cannot direct a response action at an IR Program site that would require the violation of another legal or regulatory requirement. Apparent contradictions may result from a lack of understanding of the scope of legal requirements. These contradictions commonly occur because parties prefer one law or regulation over another for meeting compliance requirements at a given site or within a given geographic area.

Under CERCLA and the NCP, the DoD has the Lead Agency Authority to respond to hazardous waste releases at sites. However, EPA and the states also have extensive authority under CERCLA, RCRA, and other state laws to ensure that adequate responses are taken. Ideally, the delineation between contaminated areas requiring RCRA corrective action and those requiring CERCLA remediation should be relatively clear--CERCLA applies to closed sites, while RCRA applies to sites still in operation. However, scenarios do develop where it is possible that both RCRA and CERCLA regulations would apply. These dual

responsibilities can result in conflicts when different agencies exercise their respective authority.

Although the two processes of RCRA and CERCLA have different terminology and acronyms, the two processes move through the same basic steps: 1) site identification, 2) site prioritization and delineation, 3) site investigation, 4) implementation, and 5) post-closure activities.

A CERCLA “facility” is any site where a hazardous substance has been stored, placed, disposed, or deposited whether or not the site is regulated under RCRA. CERCLA actions can be initiated at a broader range of sites than RCRA corrective actions. FFAs usually delineate that cleanups are to be accomplished under CERCLA with RCRA as an ARAR.

RCRA normally applies to currently active practices involving solid and hazardous waste management. However, RCRA may also be applied by regulatory agencies to required remediation for past improper hazardous waste disposal practices and spills that resulted in a threat to the environment or human health.

The RPM is responsible to attempt to keep any contaminated area under a single program to eliminate regulatory overlap and avoid having to satisfy two regulatory groups. The RPM must keep in mind that there is a distinct possibility that regulations governing cleanup of a contaminated area may change, based on the results of site evaluation and characterization. The most important function is to address the contaminated area using the most pertinent regulations applicable to that contaminated area. If, based on the results of characterization, the contaminated area would be more appropriately addressed as strictly RCRA, the contaminated area should not

continue under the CERCLA hierarchy. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* contains criteria for evaluating RCRA/CERCLA eligibility.

Navy/Marine Corps facilities are subject to RCRA, if they generate, transport, store, treat, or have disposed of hazardous waste. Installations with active RCRA facilities (or even an interim Part B permit) are likely to be required by the regulator to identify and list all Solid Waste Management Units (SWMUs) on the installation. The RPM's responsibility is to work very closely with the regulators to minimize the number of CERCLA cleanup areas that become listed corrective action units under the RCRA Program. The IR Program must be consistent with the purposes of RCRA "corrective actions." RPMs who undertake IR Program activities must determine whether a state agency intends to exercise RCRA authority and, if needed, adjust their program accordingly.

When the Navy/Marine Corps discovers a site and determines that it should be included in the IR Program, it exercises its authority under Executive Order 12580 to conduct a response under CERCLA. As the Navy/Marine Corps progresses with that response, EPA and state agencies may subsequently include that site within its RFA. Once a site is identified in an RFA, the "process" of the response which is conducted at that site may change to RCRA. Information gathered under the IR Program should be evaluated to determine how best to meet the requirements of the RFA, the RFI, Corrective Measures Study, or Corrective Measures Implementation. RCRA corrective action sites may also be proposed for and subsequently included on the NPL. The value of information gathered under the IR Program should be applied to whichever response process is required. The RPM's activities, in

coordination with the installation, may also include:

- Accounting for all waste sites under RCRA as a result of an installation-wide RFA;
- Integrating RCRA Corrective Action requirements with CERCLA under an FFA. Applying ARARs, including RCRA cleanup standards, to the IR Program site;
- Determining which waste sites will be addressed under the state Underground Storage Tank Program;
- Keeping the regulator regularly informed of remedial action progress under the IR Program; and
- Determining the eligibility of RCRA SWMUs and USTs for inclusion in the IR Program.

It is important to understand the relationship between program requirements given the potential for CERCLA and RCRA overlap.

Figure 2-5 shows the RCRA/CERCLA Interface for corrective and response actions. Table 2-1 shows the differences between CERCLA remedial actions and RCRA corrective actions at Federal facilities.

2.15 Projects in Foreign Countries

The IR Program is limited to the U.S., its territories, and possessions and does not apply to foreign countries. However, past DoD activities have caused the need for environmental cleanup and restoration. DoD uses international agreements to decide responsibility for cleanup action. Therefore, this manual will not address IR activities in

CERCLA Response Action vs. RCRA Subtitle C Corrective Action

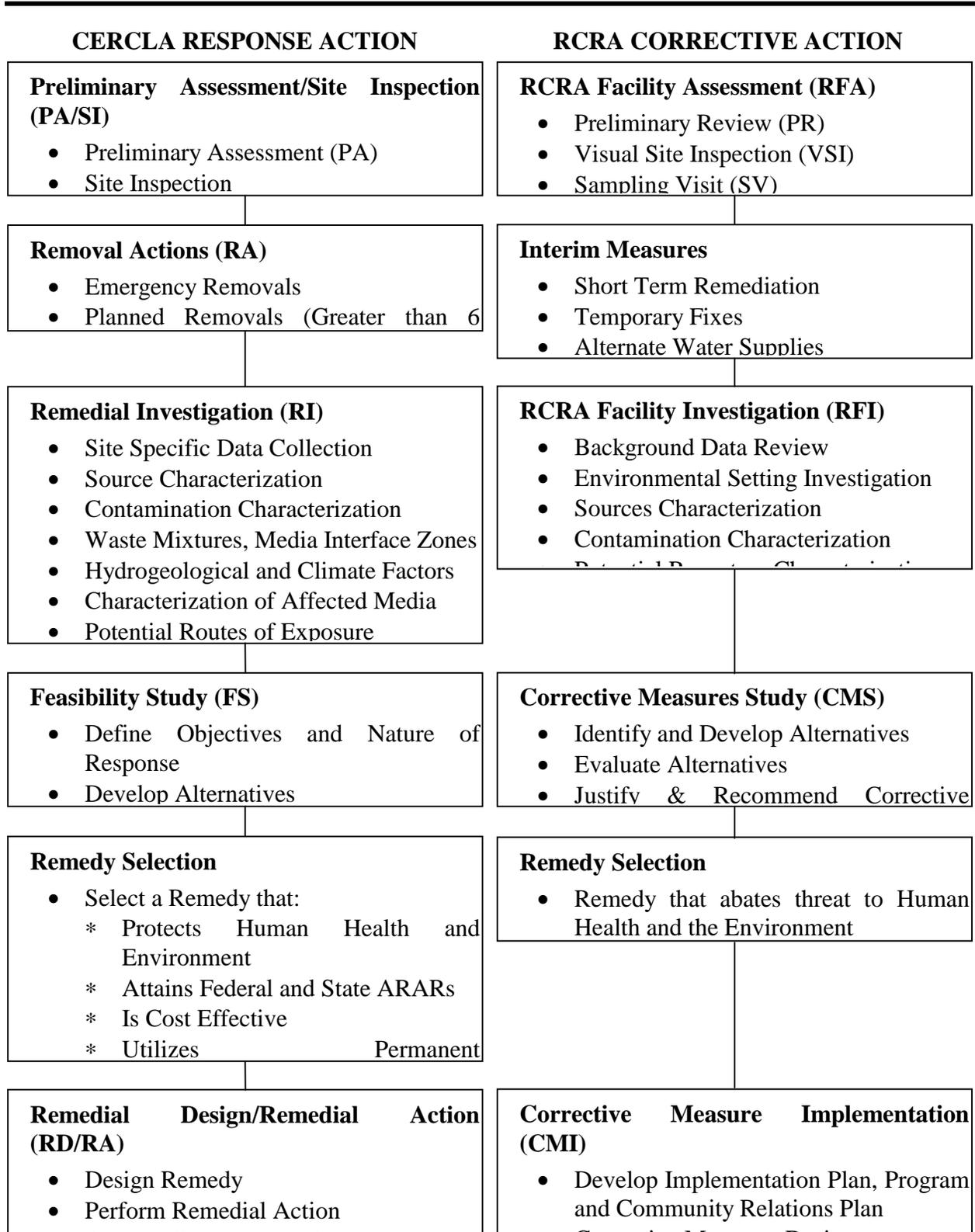


Figure 2-5: CERCLA Response Action vs. RCRA Subtitle C Corrective Action

Differences Between CERCLA Remedial Actions and RCRA Corrective Actions at Federal Facilities

Remediation Step/ Activity or Requirement	CERCLA Remediation Program	RCRA Corrective Action Program
<i>Identification</i>		
Regulated Facilities	<ul style="list-style-type: none"> Any site where a haz. substance has been stored, placed, disposed, or deposited, whether or not it is subject to RCRA 	<ul style="list-style-type: none"> All contiguous property controlled by an owner/operator seeking a RCRA permit
Regulatory Triggers	<ul style="list-style-type: none"> Release of a “reportable quantity” of a hazardous substance 	<ul style="list-style-type: none"> Treatment, storage, or disposal of hazardous waste at a facility that existed as of Nov. 19, 1980, and did not obtain RCRA closure by Jan. 26, 1983
Regulatory Materials	<ul style="list-style-type: none"> Any hazardous substance, pollutant, or contaminant (with certain exceptions) 	<ul style="list-style-type: none"> Any haz. waste or haz. waste constituent listed in Part 261, Appendix VIII or Part 264, Appendix IX
Lead Agency	<ul style="list-style-type: none"> EPA or the Federal agency controlling the facility 	<ul style="list-style-type: none"> EPA, RCRA-authorized state agency, or the Fed. agency controlling the facility
<i>Prioritization and Delineation</i>		
Site Prioritization	<ul style="list-style-type: none"> Hazard ranking system score 	<ul style="list-style-type: none"> “Action level” of hazardous constituents
Management Unit Delineation	<ul style="list-style-type: none"> Area of contamination (AOC) 	<ul style="list-style-type: none"> Corrective action management unit (CAMU)
Land Disposal Restriction Applicability	<ul style="list-style-type: none"> Applicable when remedial wastes are “placed” (e.g. moved from one area of contamination [AOC] to another). At CERCLA AOCs, investigative derived waste can be moved within the AOC without triggering land disposal restrictions. 	<ul style="list-style-type: none"> Not applicable to CAMUs
Off-site Access	<ul style="list-style-type: none"> Acquisition is authorized 	<ul style="list-style-type: none"> Permission must be obtained

Remediation Step/ Activity or Requirement	CERCLA Remediation Program	RCRA Corrective Action Program
<i>Investigation and Planning</i>		
Remedy Selection Goals	<ul style="list-style-type: none"> To protect human health and environment, maintain protection over time, and minimize untreated waste 	<ul style="list-style-type: none"> To protect human health and environmental, attain cleanup levels, comply with waste management standards, and control release sources
Public Participation	<ul style="list-style-type: none"> Program is specified in regulations 	<ul style="list-style-type: none"> Occurs as part of permitting process
Early Response	<ul style="list-style-type: none"> Through removal action provisions 	<ul style="list-style-type: none"> Through interim measures
Incremental Response	<ul style="list-style-type: none"> Through operable units 	<ul style="list-style-type: none"> Through phased remediation
<i>Implementation</i>		
Standards Governing Remediation	<ul style="list-style-type: none"> Through “applicable or relevant and appropriate requirements” (ARARs) 	<ul style="list-style-type: none"> Incorporated into facility’s permit
Cleanup Levels	<ul style="list-style-type: none"> Negotiation based on risk and ARARs 	<ul style="list-style-type: none"> Negotiation based on action levels
<i>Post-Closure</i>		
Post-Closure Requirements	<ul style="list-style-type: none"> Review every 5 years 	<ul style="list-style-type: none"> Established in permit
<i>Costs</i>		
Penalties	<ul style="list-style-type: none"> Stipulated in interagency agreement 	<ul style="list-style-type: none"> Specified in RCRA and state laws
Cost Recovery	<ul style="list-style-type: none"> Clearly defined 	<ul style="list-style-type: none"> May be possible through RCRA Secs. 7002 and 7003
Natural Resource Damage	<ul style="list-style-type: none"> Trustees appointed to recover cost for damages 	<ul style="list-style-type: none"> Facility owner/operator liable under RCRA Sec. 7003

Table 2-1: Differences Between CERCLA Remedial Actions and RCRA Corrective Actions at Federal Facilities

foreign countries. Readers are referred to the DUSD Overseas Cleanup Policy of 18 October 1995.

Chapter Three

3. Installation Restoration Program Response Actions

This chapter provides detailed discussion of the primary response actions associated with the Installation Restoration (IR) Program that are not specifically included in the standard Preliminary Assessment/Site Inspection (PA/SI), Remedial Investigation/Feasibility Study (RI/FS), or Remedial Design/ Remedial Action (RD/RA) phases. This chapter specifically addresses the conduct of IR Program response actions taken by the Navy/Marine Corps under the CERCLA at Navy/Marine Corps installations.

The actual sequence and scope of IR Program actions must be tailored to site conditions and Environmental Restoration, Navy (ER, N) funding priorities. Some guidelines include:

- A site will consist of a single unit where hazardous substances have been deposited, stored, disposed of, or placed. A site is the basic unit for planning and implementing “response actions”;
- Multiple sites grouped according to type, potential for a common remedy, proximity, contamination of a common resource, or funding priority should be evaluated or remedied together as an operable unit (OU); and
- Environmental Restoration, Navy funding priorities, and the respective sites’ relative risk rankings will influence how many sites can be addressed together and in what time frame.

The definition of “response” encompasses any investigation, evaluation, decision-making, or

implementation step. An activity typically performed to implement a response or response action can entail:

- Remedial Action;
- Removal Action; or
- No Further Action (NFA)

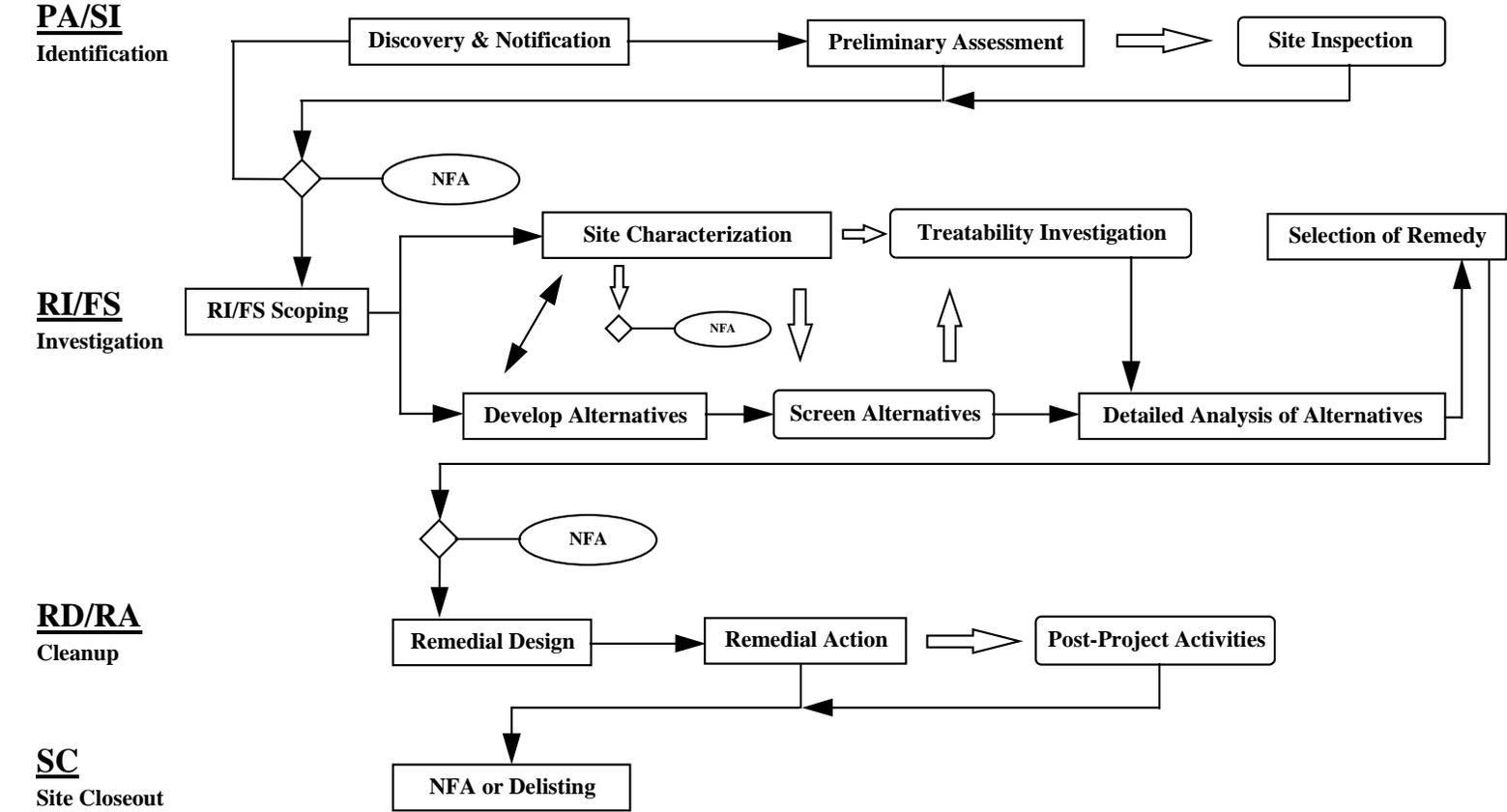
3.1 Remedial Action Process

The steps that make up the Remedial Action Process and the sequence in which they are normally undertaken are illustrated in Figure 3-1. The purpose, possible subsequent steps, tasks, documentation, and coordination requirements for each step in the process are illustrated in the accompanying figures. Figure 3-2 provides a graphic representation of how other actions, including Removals, No Further Action, Site Monitoring, and Operable Units, relate to the Remedial Action Process. These actions are more fully addressed later in this chapter.

The Remedial Action Process is the primary alternative for most IR Program sites. It provides a full, careful progression through the four phases of identification, investigation, cleanup, and close-out. A brief description of the four phases is:

- Identification or PA/SI - Includes the steps in discovering, assessing, and reporting on a potential new IR Program site;

Remedial Action Process



Note:
 (1) If situation warrants, removals or long-term monitoring may be implemented at most of the steps shown.
 (2) This process can be modified to meet site-specific needs.

Non-Optional Steps
Optional Actions

NFA NFA decision may be made here

Figure 3-1: Remedial Action Process

Removals, No Further Action, Operable Units and Continued Site Monitoring in Relation to the Remedial Action Process

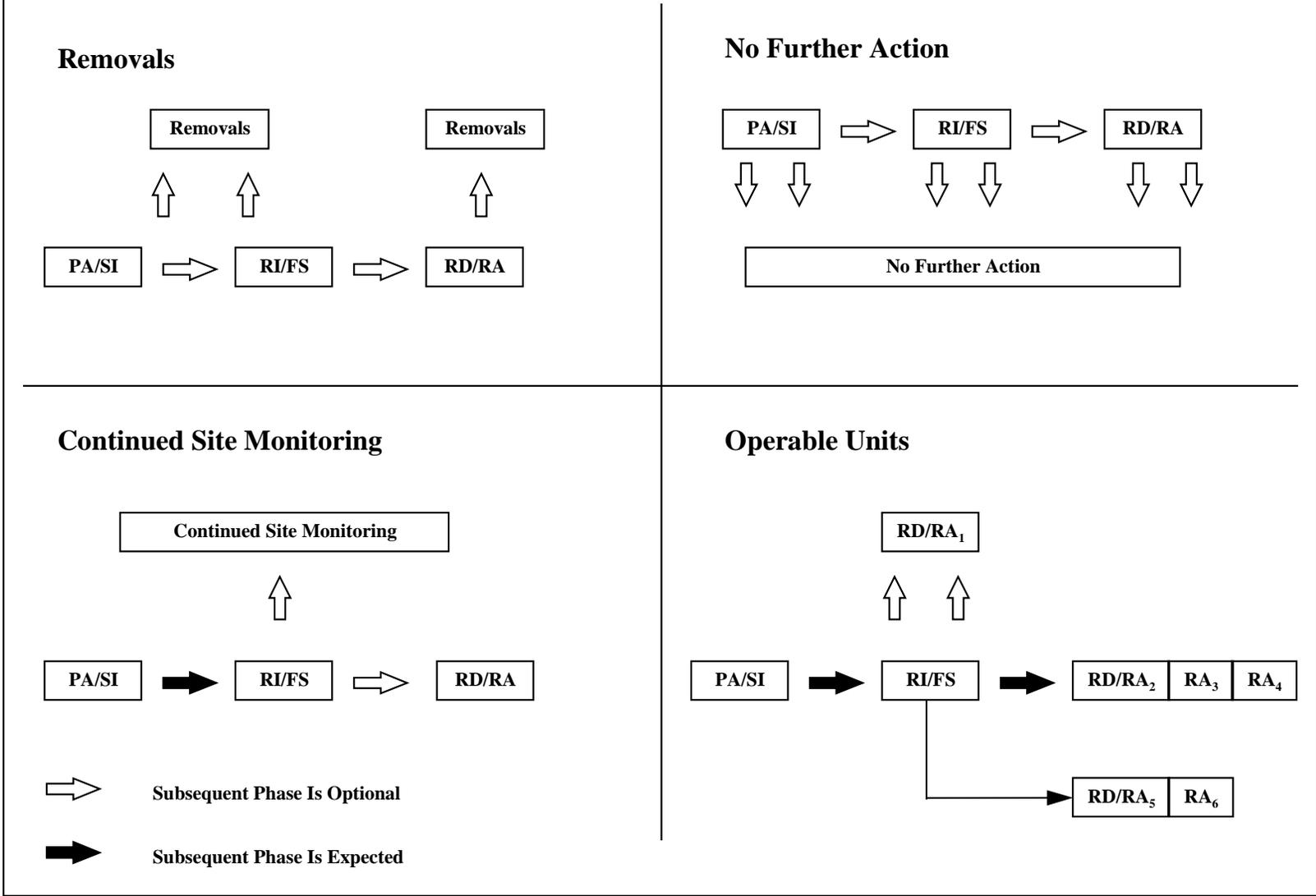


Figure 3-2: Removals, No Further Action, Operable Units and Continued Site Monitoring in Relation to the Remedial Action Process

- Investigation or RI/FS - Includes the steps for analyzing in detail the nature of the site, contaminants, and potential receptors, determining the regulatory requirements and cleanup objectives to be applied to the site, and identifying, analyzing, and selecting the remedial action approach for cleaning up the site;
- Cleanup or RD/RA - Includes the detailed engineering design step for a selected remedial action, the implementation of that remedial action, and any ongoing post-construction activities necessary to fully meet the cleanup objectives; and
- Close-out - Can be accomplished at any time during the process when the Navy/Marine Corps determines that No Further Action (NFA) is needed at the site. The Navy/Marine Corps formally requests regulatory concurrence concerning the NFA determination.

3.2 Removal Action

CERCLA, Section 104 (42 U.S.C. 9604), provides that removal actions are part of the response process and are often the first response to a release or threatened release. Removals can be undertaken at any time during the remedial process. The Navy/Marine Corps has authority under CERCLA, Section 104, to carry out removal actions when the release causing site contamination is on a Navy/Marine Corps installation or for contamination outside of the installation boundaries and the sole source of the release causing contamination is from the Navy/Marine Corps installation.

The Navy/Marine Corps will take an appropriate removal action to abate, minimize, stabilize, mitigate, or eliminate the release or threat of release if there is a threat to public health or welfare or the environment.

Removals may occur if any of the following criteria are met:

- An imminent threat to human health or the environment exists (when contaminant concentrations concerning human health standards are exceeded, the threat is imminent);
- The source of the contamination can be removed quickly and effectively;
- Access to contamination can be limited (human exposure is substantially reduced); or
- A removal action is the most expeditious manner of remediating the site.

The removal action should be compatible with future remedial actions and achieve applicable or relevant and appropriate (ARARs) cleanup requirements. ARAR compliance is dependent upon:

- the urgency of the situation, and
- the scope of the removal action to be conducted (see NCP section 300.415).

The following factors need to be considered to determine the appropriateness of a removal action:

- Actual or potential exposure of nearby human populations, animals, or food chains to hazardous substances, pollutants, or contaminants;
- Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Hazardous substances, pollutants, or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release;
- High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface, that may migrate;
- Weather conditions that may cause hazardous substances, pollutants, or contaminants to be released or to migrate;
- Threat of fire or explosion;
- Availability of other appropriate Federal/state response mechanisms to respond to a release; or
- Other situations or factors which may pose threats to public health, welfare, or the environment.

The following examples of removal actions provide representative responses to removal requirements:

- Fences, warning signs, or other security or site control precautions should be put in place if humans or animals have access to the release;
- Run-off or run-on diversion controls should be used to further prevent the spread of contamination where precipitation or run-off from other sources may enter the release area;
- Berm, dike, or impoundment stabilization should be considered where there is a need to maintain structural integrity;
- Capping of contaminated soils or sludges should be employed where needed to reduce migration of hazardous substances into soil, groundwater, and air;
- Chemicals, absorbents, and other materials should be used to retard the spread of the release or mitigate its effects;
- Highly contaminated soils should be removed from a drainage area to prevent the further spread of contamination;
- Consideration of an alternative water supply to provide an uncontaminated source of drinking water.

Alternatives to be considered in selecting a removal action include Federal public health and environmental ARARs, Federal criteria, advisories and guidance, and state standards. Removal actions that are final actions must meet ARARs unless the ARARs have been waived.

Removals implemented in response to an imminent threat need not be compatible with future remedial actions, need not be shown to be cost-effective, and need not achieve ARARs if the

urgency of the situation precludes fulfilling these goals. These goals should be considered prior to implementation of a removal, however. To justify a removal, the Remedial Project Manager (RPM) should also consider taking action as an OU duly identified during the Scoping, Site Characterization, or Development of Alternatives steps of an RI/FS.

When the Navy/Marine Corps is notified of a release or threat of release which may require a remedial action, the PA should be done as soon as possible. A new PA does not have to be done if one has already been performed. A PA is required if the site is new and previously has not been screened.

If the Navy/Marine Corps determines that the removal action will not fully address the threat or potential threat posed by the release, the Navy/Marine Corps will ensure an orderly transition from removal to remedial response activities. All decisions to implement removals under CERCLA authority must be documented. Documentation may follow the decision to implement or even the action itself, depending on the exigency of the situation.

A removal may or may not be the final action for a site. This situation is dependent on whether any hazardous substances, pollutants, or contaminants remain after the removal. All removal actions should include verification sampling.

EPA, through guidance and policy, has defined three types of removal action described below: time critical, emergency and non-time critical removals.

3.2.1 Emergency Removals

Emergency removal actions are a type of time critical removal action that must be conducted immediately.

Emergency removal actions can be initiated using verbal authorization. For Federal facilities, removal actions that must occur within two weeks may be considered an emergency removal action. The following procedures are required of responders:

Installation Requirements

- Notify its Navy On-Scene Coordinator /Marine Corps On-Scene Coordinator of any emergency situation involving a hazardous substance removal situation;
- Notify the chain-of-command and cognizant EFD/EFA of any emergency removal situation. The EFD/EFA will notify NAVFACENGCOCOM HQ who in turn will notify CNO (N45) and/or CMC (LFL);
- Notify the EPA, state, and local officials as soon as practicable; and

EFD/EFA Requirements

- If there is sufficient time, prepare documentation briefly summarizing the conditions at the site and identifying the selected removal action and the rationale for the response action;

- For situations where there is insufficient time to prepare documentation prior to initiating removal action, obtain verbal approval from the installation Commanding Officer/Commanding General or their designee. For such a situation, prepare documentation following the removal action;
- Start on-site removal action;
- Following initiation of the removal action and preparation of documentation, prepare and publish a notice of availability of the administrative record in a local newspaper within 60 days of initiation of removal action;
- Provide for a 30 day comment period;
- Include written responses to significant comments in the administrative record file; and
- Ensure that a formal Community Relations Plan is in effect if the emergency removal action is expected to extend beyond 120 days from the initiation of the on-site removal action.

3.2.2 Time Critical Removal Actions (Removal within a Six Month Planning Period)

Time critical removal actions are those actions that must be conducted within six months. No detailed study is required to plan and implement an action to mitigate the threat. Time critical removal actions historically have been small scale and interim actions but can be large scale and final actions. EFD/EFA responsibilities for time critical removal actions include:

- Coordinating actions to be taken with the affected installation;
- Ensuring that an administrative record has been established for the action to be taken at the site and the public has been informed of its existence by publishing notice of the proposed action in a major local newspaper within 60 days of the initiation of the on-site removal activity;
- Providing for a 30 day comment period following publication;
- Preparing written responses to significant comments for inclusion in the administrative record file;
- Ensuring that information relating to the removal is added to the record and that the public is informed of this addition;
- Commencing the on-site removal action.

For removal actions where on-site action is expected to extend beyond 120 days from initiation of on-site activities, the RPM will assist the installation in establishing a formal Community Relations Plan including designation of a spokesperson to inform the community of actions taken, respond to inquiries, solicit community concerns about the IR Program through interviews, and establish a local information repository at or near the site.

3.2.3 Non-Time Critical Removal Actions

A non-time critical removal action is a removal action which has a planning period of at least six months before on-site activities must be initiated. Non-Time Critical Removal Actions require preparation of Engineering Evaluations/Cost Analyses (EE/CA) or its equivalent. EFD/EFA responsibilities for non-time critical removal actions include those actions required for a time-critical removal action and the following:

- Prepare an EE/CA providing a brief analysis of the removal alternatives for the site. Recommended criteria for evaluating potential removal alternatives include effectiveness of the action to minimize or stabilize the threat to public health, consistency with anticipated final remedial action, consistency with ARARs, cost-effectiveness and implementability. Provide the EE/CA to the respective installation Commanding Officer/Commanding General for review;
- Develop a Sampling and Analysis Plan with both field sampling and quality assurance/quality control (QA/QC) components and forward the plan to EPA for NPL sites or the state for non-NPL sites for review and comment. Develop a Health and Safety Plan and forward to the regulators if requested or required by negotiated agreements. Continue with the removal program activities if the regulator does not provide timely review, noting in the administrative record that the Navy/Marine Corps formally provided the regulator the opportunity to review the plans;
- Prepare a notice of availability and brief description of the EE/CA for publication in a major local newspaper and provide at least a 30 day comment period. The installation has the responsibility to publish the notice of availability and a brief description of the EE/CA.

3.2.4 Interim Removal Actions vs. Final Removal Actions

Response actions are characterized by the extent to which the threats are mitigated by the action, either interim or final. A removal action can be used for fast and significant reductions in risk and to mitigate long-term threats. Economics play a very important role in determining whether to take an interim or final response action, and it also plays a role in determining whether to conduct a removal action or collect additional data. Economic considerations may also impact the extent of the action that is taken. The following items should be considered when deciding upon whether to take an interim or final action: 1) the cost of remobilizing to conduct the final action, 2) the uncertainty associated with acceptance of cleanup levels as final, and 3) the availability of funds to conduct the action.

For Emergency, Time Critical and Non-Time Critical removals, the EFD/EFA prepares an Action Memorandum (which is supported with an Engineering Evaluation/Cost Analysis for Non-Time Critical removals). The Action Memorandum for an interim action specifies what threat is being addressed and how long the action will remain effective. The documentation should state what type of final action may be conducted and how the removal action contributes to the implementation of the final action. The Action Memorandum for final actions specify the performance standards or cleanup levels to be reached by the actions. Both time critical and non-time critical removal actions can be final in nature. Emergency actions are hardly ever final actions.

For additional information on Action Memorandums, see **section 5.14.1**.

3.3 No Further Action

No Further Action (NFA) sites are sites at which the Navy/Marine Corps determined that all needed investigation or remediation has occurred and that no additional action is necessary. The Navy/Marine Corps documents this decision. The Navy/Marine Corps decides that NFA is necessary at a site if reasonable investigation efforts indicate that no significant release of hazardous substances, pollutants, or contaminants have occurred or may occur or all remedial action has been accomplished.

A NFA decision can be made at any point within the remedial process, but this decision must be defensible and properly documented. The NFA decision can be reached at the end of a PA, SI, or RI (including when a Baseline Risk Assessment has been completed as part of the RI and it supports the NFA decision). If it can be shown that the site no longer poses a threat to the public health, welfare, or the environment, the RPM should prepare NFA documentation.

The NFA procedure may be applied at both NPL and Non-NPL sites based upon appropriate investigation. For NPL or proposed NPL sites, EPA concurrence is required; for Non-NPL sites, EPA and state concurrence is recommended. The investigative reports documenting the decision should be forwarded to EPA and state regulators for concurrence. Decisions to cease evaluating the site may be made if:

- On the basis of a PA, all available data indicate that no hazardous substances, pollutants, or contaminants were released or are likely to be released; or
- On the basis of an SI, results of a sampling program or other information indicate that there has not been, nor is there likely to be, a release; or
- On the basis of a Baseline Risk Assessment, it is shown that the release poses no significant threat; or
- On the basis of a complete RI/FS, the NFA alternative is the preferred alternative considering all the criteria applicable to remedy selection.

RPMs should be alert to document opportunities for an NFA decision to include situations where an SI indicates that there is justification to proceed with some sites while recommending NFA at others. The NFA category should also be used to describe those sites at NPL installations where the results of site screening, conducted at the initiation of the RI/FS and under the Federal Facility Agreement, demonstrate that NFA is warranted.

The NFA alternative should be substantiated with an assessment of risk to human health and the environment taking into consideration health and environmental impacts if NFA is taken. The assessment, though usually more qualitative than quantitative, should be based on known characteristics of the contaminants (toxicity, persistence, mobility), potential pathways of contact/transport (direct contact, air, groundwater, or surface water routes, fire or explosion), types and number of targets, and maximum concentration levels of exposure (as contained in

ARARs). This assessment is not a health assessment, which is part of the overall risk assessment process, nor does it have to involve highly analytical procedures such as modeling.

Documents (i.e., PA, SI or RI reports) created during the investigation or cleanup of the site along with EPA concurrence at NPL sites and state concurrence (or a copy of the letter to the regulator which requested concurrence) are to be included in the administrative record to document decisions and actions taken to substantiate the NFA decision.

3.3.1 Site Close-out

Site Close-out can equate to NFA and can occur during any stage of the IR Program except design, depending on the particular site and its characteristics. The close-out involves procedures necessary to complete actions at a site once investigation and cleanup are complete. Site close-outs are initiated when the Navy/Marine Corps determines that NFA is appropriate at a site. The site is considered “closed out” when regulatory agency concurrences are gained or when the Navy/Marine documents formal requests for regulatory comment and no response has been received within a reasonable time, all reporting and document handling requirements are met, and NPL delisting (when applicable) has occurred.

A site close-out decision can be made at any point in the IR Program process. The RPM will be responsible for preparing and submitting the site close-out documentation. Site close-out, as well as being a consideration at each phase of the remedial action process, is also the final step in the Remedial Action Process after RD/RA or cleanup.

The RPM needs to include in the Administrative Record, EPA or state concurrence in the decision that the site status is NFA and thus the status of the site becomes “Site Closed Out.” If the RPM has requested EPA and/or state concurrence in the NFA decision and the regulator has not provided comment after a reasonable period of time, the site may be considered to be “Closed Out.”

3.4 Spill Response vs. IR Actions

The IR Program responds to situations resulting from past practices and operations. It does not provide a framework for planning or responding to oil discharges and hazardous substance releases from current operations. (The NCP establishes the national framework for planning and responding to oil discharges and hazardous substances releases.) Contingency planning and spill responses are not part of the IR Program but are included in ongoing installation operations.

Some sites which have been included in the IR Program are locations where spills occurred in the past and contaminants remained after spill response actions were completed. Those contaminants may be present at concentrations high enough to pose a threat to human health or the environment and, therefore, have been included as IR sites.

When IR Program investigations or cleanups are being conducted, appropriate spill prevention and response plans should be developed for possible IR Program project impacts. For example, if contaminated materials from an old site are being containerized for transport off-base,

provisions for containment and cleanup of spillage or residues from that operation should be part of the IR Program project.

3.5 Cleanup Standards for Removals

Several considerations are very important to establish cleanup levels for removal actions. These considerations represent a spectrum of technical, legal, economic, and public involvement issues.

Future Land Use

Future land use assumptions play an important role in establishing removal action cleanup levels. The following items affect future land use cleanup assumptions:

- Stringent Cleanup - The future land use assumed is directly linked to the stringency of cleanup levels; and
- *Land Use Assumptions Guidance* - In May 1995, EPA issued a guidance document on determining future land use assumptions for CERCLA response actions. The policy provides information sources and guidance on developing reasonable land use assumptions for use in the Baseline Risk Assessment and to establish cleanup levels.

Risk Screening

Risk screening is used to determine if the contamination is a threat. Risk screening compares site data to screening levels or criteria to determine if a potential problem may exist. Preliminary remediation goals can be used for risk screening.

Risk Evaluation

Risk evaluation in the removal program is analogous to the Baseline Risk Assessment in the remedial program. Risk evaluations vary in scope and detail from simple comparisons of site contamination to full-blown risk assessments addressing all contaminants and all pathways. The risk evaluation conducted as part of the EE/CA is called a streamlined risk evaluation.

Cleanup Standards

Removal actions with readily available cleanup standards are much easier to conduct than actions with no cleanup standards. Several sources of cleanup levels are:

- Regulatory levels of ARARs - Other environmental statutes and regulations provide significant cleanup levels for removal actions through the ARAR identification process. For example, the Resource Conservation and Recovery Act, the Clean Water Act, and the Safe Drinking Water Act provide cleanup levels for various situations.
- Levels calculated using the Risk Assessment Process - The standard Risk Assessment Process can be used to calculate cleanup levels for those contaminants that do not have regulatory cleanup levels.

- Cleanup levels used in other CERCLA Decision Documents - Other CERCLA removal and remedial action decision documents can be used to select cleanup levels for similar situations and similar contaminants.

Compatibility with Remedial Action

Removals implemented just for source control or for limiting exposure should be compatible with any remedial action that may be selected or be inexpensive enough to be considered expendable. Removals implemented in response to an imminent threat need not be compatible with future remedial actions, be cost-effective, or achieve ARARs if the urgency of the situation precludes fulfilling these goals. However, if the situation allows, these goals should be considered prior to implementation of a removal. Although this guidance allows considerable flexibility to determine how imminent a threat may be to justify a removal, the RPM should consider taking action as an operable unit duly identified during the Scoping, Site Characterization, or Development of Alternatives steps of the RI/FS. All decisions to implement removals under CERCLA authority must be documented.

3.6 Monitoring

Monitoring is used to track the presence, migration, or threat posed by contaminants at a site. Monitoring may be used at a site between response actions or when no other response action is appropriate until information or site status changes. The two types of monitoring (short-term, or interim, and long-term) are distinguished primarily by when they occur within the IR Program. The monitoring process can be expensive depending on the number of samples taken and analyses performed. Monitoring should be conducted for predetermined fixed intervals and, at the end of each interval, a decision should be made to either continue the monitoring, modify it, implement another response action, or implement a Site Close-out decision which would require documentation.

All IR monitoring programs require a sampling and analysis plan which details the location, frequency, and type of samples to be collected and describes analytical techniques, QA/QC requirements, and reporting protocol. This documentation should be provided to local, state, EPA regulatory authorities, and the Restoration Advisory Board for review and comment 30 days in advance of implementation. The decision to implement should be the result of consensus among all parties to the greatest extent possible.

Short-Term (Interim) Monitoring:

Site characterization or field investigation conducted during an RI/FS may detect the migration of hazardous substances at rates or magnitudes that warrant ongoing surveillance. Data from the RI/FS may indicate variability in chemical concentrations which should be verified or explained. Some sites may require more data collection than is ordinarily afforded in an RI/FS in order to adequately characterize the release for planning and design decisions. Such surveillance, performed outside the scope of the RI/FS and prior to implementation of a removal or remedial action, is called “short-term or interim monitoring.”

Interim monitoring should not be conducted at sites for which no migration of hazardous substances has been detected or where releases are suspected of being stable or migrating so slowly that they will not pose a threat to people or the environment prior to implementation of the remedial action. The objective and scope of short-term monitoring must be specified on a case-by-case basis.

Long-Term Monitoring:

Long-term monitoring is conducted after Response Complete and may be necessary in two specific instances: first, as a demonstration that a remedial action has not only cleaned up the site, but that the site continues to be clean; second, an RI/FS may show a low level of contamination that does not require remedial action. The Navy/Marine Corps, in the latter case, may need to monitor the contamination to ensure that it does not rise above trigger levels. Navy/Marine Corps installations should perform long-term monitoring when appropriate and in accordance with applicable laws. Long-term monitoring records must be included in the administrative record.

Each installation must decide if the work can be accomplished using in-house resources or contracted to outside sources. Long-term monitoring has many similarities to short-term monitoring efforts in an RI/FS, and contracts for long-term monitoring should resemble RI/FS contracts for short-term monitoring. Also, if an installation decides to obtain contractor support, it may want to use an existing EFD/EFA contract to expedite the process.

Although sampling points (normally wells) may be in place, the installation will need to maintain and protect them from accidental contamination and vandalism. Monitoring not only includes sample collection and laboratory analysis but also sample preservation, chain of custody procedures, laboratory QA/QC, and analysis of laboratory data results. Each installation must assess its capabilities as to whether it has the people to collect samples, a qualified in-house laboratory, and a long-term monitoring plan that adequately identifies the trigger concentrations.

Long-term monitoring does not necessarily mean monitoring forever. If the low levels of contamination continue so will the monitoring. However, if contaminant levels rise, the RPM may need to put the site back into the IR Program for further remedial action. It is also possible that regulatory agencies that initially agreed to the long-term monitoring may require further remedial action due to tightening standards even if there is no increase in contamination. There may be new scientific data supporting more stringent cleanup standards or new remedial technologies may more effectively cleanup a site or lower the cost to make cleanup cost-effective.

Long-Term Monitoring Plan:

The decision to conduct long-term monitoring should be outlined in a ROD and list the locations of the monitoring points, sampling frequency, parameters for laboratory analysis, and data analysis techniques. The plan should also outline the action if certain “triggers” are reached such as an increased or decreased level of contamination. The long-term monitoring plan will also address:

- Low contaminant concentrations;
- How long-term monitoring will substantiate the lower levels;
- If any approval is needed to confirm the decision to cease long-term monitoring;
- Persons to notify; and
- Actions to be taken.

The plan also needs to describe coordination that will occur with the EFD/EFA before an installation stops long-term monitoring.

3.7 Operable Unit

An Operable Unit (OU) as defined in the NCP, Section 300.5, is a discrete portion of a remedial response that manages migration or eliminates or mitigates a release or pathway of exposure. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site. The OU is a part of a remedial action that can be implemented by itself, e.g., groundwater cleanup. The OU represents one strategy for driving the administrative process of installation-wide environmental restoration. For both NPL and Non-NPL sites, the number, composition, sequencing, and individual timeline structure of OUs must be optimized so that remedial actions are selected and taken in the most timely manner possible. OUs may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

Examples of OUs include:

- Areas with similarly contaminated waste materials or media;
- Areas in a similar geographic location;
- Areas that may be remediated using similar techniques or within a similar time frame; and
- Areas amenable to being managed in a single RI/FS.

Because the number and composition of OUs at an installation will need to be adjusted as investigations proceed, it is critical that an installation-wide approach be developed to define, sequence, and schedule OUs. Whether OUs are implemented before or after selection of the final remedial action, they should be consistent with the final action and not preclude its implementation.

Establishing priorities and scheduling of OUs will also assist greatly in the remedial action. After the number and composition of OUs has been identified, the next step is to determine the sequence of administrative activities associated with each OU. OUs are subject to requirements for decision documentation, administrative records, information repositories, and public participation.

Chapter Four

4. Preliminary Assessment/Site Inspection (PA/SI) and Site Closeout

The Preliminary Assessment/Site Inspection (PA/SI) phase of the Remedial Action Process discussed in this chapter evaluates all potential IR Program sites at an installation. PA/SI steps include: site discovery and notification, assessment and report preparation for all sites identified at the installation, and risk management analysis.

The PA/SI phase is initiated by the Navy/Marine Corps conducting a PA/SI as a result of EPA listing the installation on the Federal Agency Waste Compliance Docket, the Navy/Marine Corps discovering a site, or petition from an affected person. EPA adds installations to the Docket by periodically searching for previously unlisted installations in four EPA and U.S. Coast Guard databases of hazardous substance (HS) releases and hazardous waste (HW) activities. Any person potentially affected by a release can petition the President for a PA under CERCLA, Section 105(d).

The PA/SI phase for efforts under CERCLA is comparable in scope and effort to the RCRA Facility Assessment comprised of Preliminary Review, Visual Site Inspection, and a Sampling Visit.

4.1 Discovery and Notification

The Discovery and Notification step initiates the IR Program's processing of a newly discovered HS release or HW site at an installation.

Figure 4-1 summarizes elements of the Discovery and Notification step.

Discovery

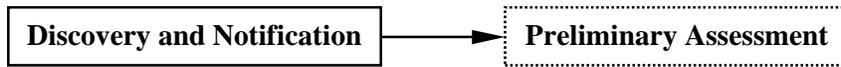
Discovery occurs when a release is noticed (e.g., spill, leaking drum) or when the Navy/Marine Corps or a regulator locates a previously unknown HW site (e.g., during unrelated field work or record searches).

Notification

It is the responsibility of the installation Commanding Officer/General to report releases of HSs. Any release must be reported to EPA, the state, and relevant local authorities, per 10 U.S.C. 2705. In addition, if the release exceeds a Reportable Quantity, listed in 40 CFR 302.4, per CERCLA, the installation must notify the National Response Center and state emergency response organizations.

As part of planning and preparation for response to releases or spills on Navy/Marine Corps installations, a Navy On Scene Coordinator (NOSC) or the installation's Commanding General has been designated to coordinate pollution contingency planning and direct Navy/Marine Corps oil and HS pollution efforts in predesignated areas. Shoreside NOSCs are normally regional environmental coordinators predesignated by the area coordinators or they are the installation's Commanding General (see OPNAVINST 5090.1B, Chapter 1 and 10 or MCO P5090.2, Chapter 11). The NOSC/Commanding General is the Federal OSC for Navy/Marine Corps HS releases.

Elements of the Discovery and Notification Step



- | | | |
|---|-------------------|---|
| Purpose | | <ul style="list-style-type: none"> • Fulfill Navy/Marine Corps, Federal, state and local release notification requirements. • Initiate IR Program for site. |
| Potential Actions | Subsequent | <ul style="list-style-type: none"> • Preliminary Assessment. • Removal Action (if necessary). |
| Tasks | | <ul style="list-style-type: none"> • Notify National Response Center. • Notify Navy On-Scene Coordinator or Marine Corps Commanding General. • Notify state and local response organizations if off-installation is possible. • Assign RPM to site. |
| Documentation | | <ul style="list-style-type: none"> • Entry in installation spill log. • Installation spill report form. • Spill Report teletype message. • Phone log with National Response Center confirmation number. • Correspondence. |
| Additional Management Activities | Site | <ul style="list-style-type: none"> • Prevent recurrence. |
| EPA/State Activities | | <ul style="list-style-type: none"> • EPA lists installation on Federal Agency Hazardous Waste Compliance Docket. |

Figure 4-1: Elements of the Discovery and Notification Step

RPM Assignment

The cognizant EFD/EFA will assign a Remedial Project Manager (RPM) for a newly discovered site. The RPM will handle remediation, ensuring that action is taken to fulfill regulatory requirements.

4.2 Preliminary Assessment (PA)

A PA is required for an installation not already on the Federal Facilities Docket if:

- a HS release site is discovered;
- a HW site is discovered; or
- a person successfully petitions EPA for a PA.

Navy/Marine Corps policy requires that PAs be completed within twelve months of either listing on the Docket or successful petitioning. For additional information, see OPNAVINST 5090.1B section 15-4.4, and MCO 5090.2 section 14304.

The purpose of a PA is to identify all sites on a contiguous property that need further action under the IR Program. A SI will be needed if the PA finds that human health or the environment are threatened.

A PA is intended to be a relatively quick, low cost compilation of existing information about an installation. It assesses potential contaminant migration via four pathways (surface water, ground water, air or soil) and identifies potential targets (humans and resources that could be affected by such migration).

Sampling is generally not conducted during a PA. However, sampling may be suggested when it could avoid the need for a SI (i.e.,

when a SI is justified, but would probably find little threat).

Figure 4-2 summarizes the elements of the PA step.

Information Included in a PA

The types of installation information presented in a PA are dictated by the EPA data requirements. EPA uses the information in the PA to determine if the site should be listed on EPA's National Priorities List (NPL). The following are key types of information and resources for preparing the PA:

- installation description (physical inspection, interview, maps);
- evidence of releases (physical inspection, interviews, record searches);
- site description and characterization (physical inspection, record searches, photo analysis, previous sampling or studies);
- potential targets, e.g., drinking water wells & intakes, sensitive environments, populations;
- HW generation, storage, and disposal, both past and present (interviews and record searches);
- hydrology (literature searches, previous studies, Federal Emergency Management Agency flood maps);
- hydrogeology (literature searches, previous studies);

Elements of the Preliminary Assessment Step

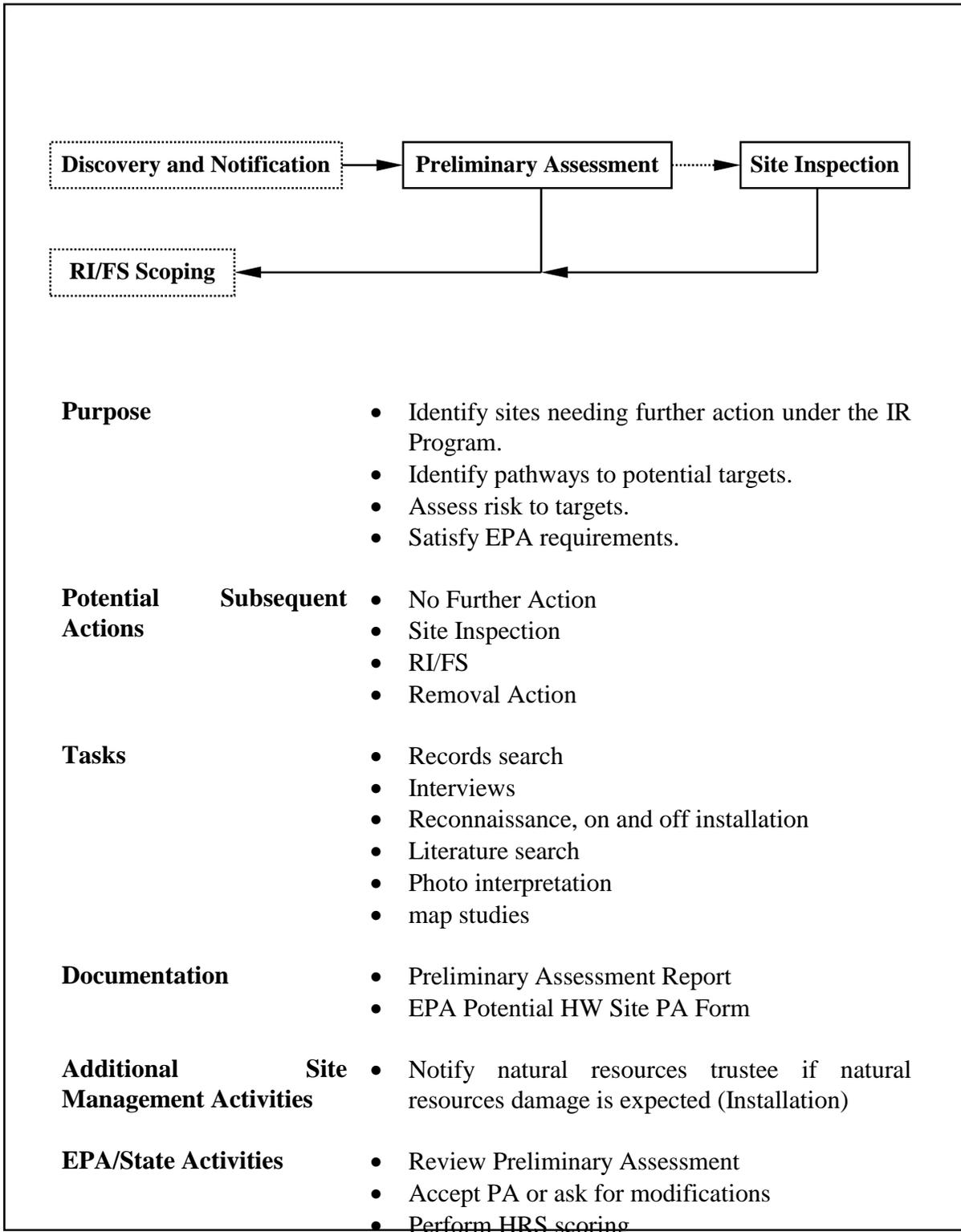


Figure 4-2: Elements of the Preliminary Assessment Step

- soil (USDA soil survey, previous boring records);
- regulatory actions, e.g., permits, inspections, violations, removals (interviews, record searches); and
- history of land use/ownership (interviews, record and literature searches).

An annotated bibliography should be provided in a PA to allow information to be easily located for review.

Assessment Included In a PA

Assessment of the collected information is presented in a PA to make a determination of whether further action is justified under the IR Program (e.g., Removal Action or SI). Factors include:

- probability of release to a pathway;
- probability that targets will be exposed; and
- probable health risk due to exposure.

Performing PAs

EPA guidance on PAs is found in *Guidance for Performing Preliminary Assessments Under CERCLA*, (EPA/540/G-91/013, September 1991). This guidance is intended for purely industrial facilities, and interpretations must be made when applying it to Navy/Marine Corps installations.

NFESC normally performs the Docket PAs (those initiated as a result of EPA listing a installation on the Docket).

NAVFAC HQ has tasked NFESC with monitoring the Docket. NFESC tracks all

installations with a PA and must be informed of all new Navy/Marine Corps PAs.

PA Disposition

NFESC or the EFD/EFA will provide a draft of the PA to the installation Commanding Officer/ Commanding General for review. Following completion of the PA, the installation will send a copy of the PA to the Docket Coordinator at the EPA Regional Office.

EPA may request modifications or additional information or completion of a SI following review of the PA.

Newly discovered sites at installations with on-going IR Program work will either be considered new sites or be remediated as part of existing sites. Factors the installation and the RPM will consider are:

- whether the origin and type of contaminant are similar;
- how compatible investigation techniques are;
- how integration would affect the cost, scheduling, and management of on-going activities;
- how human health and environment would be impacted; and
- how regulators might react.

The PA may result in one of the following outcomes. The RPM makes the decision in coordination with the installation.

- No Further Action (NFA) - If no significant threats are identified, NFA would be taken unless the regulators

present compelling reasons to continue actions at the site.

- SI - If the Navy/Marine Corps identifies sites that need further investigation, a SI is normally the next step.
- RI/FS - If the Navy/Marine Corps determines that a site needs to be remediated, the SI can be skipped and the site can go directly to RI/FS.
- Removal Action - If the threat is imminent and in-place control is impractical, the contamination may have to be physically removed immediately.

4.3 Site Inspection (SI)

The NCP defines a SI as “...an on-site investigation to determine whether there is a release or potential release and the nature of the associated threats.” The EFDs/EFAs will conduct the SI when the PA recommends further investigation. The SI may be considered as an optional step dependent upon the PA recommendations.

The objective of the SI is to augment the data collected in the PA to generate sampling and other field data to determine if further action or investigation is appropriate and identify which sites have a high probability of qualifying for EPA's NPL. Prior to conducting field sampling as a part of the SI, a Sampling and Analysis Plan (SAP) should be developed. A second objective of the SI is to identify sites posing immediate health or environmental threats which require emergency responses.

The SI can be conducted in one or two phases. Often the SI can be structured to test the critical PA conclusions that resulted in the recommendation for a SI; the information

developed may be sufficient for the Navy/Marine Corps to determine either that NFA is necessary or that it is likely to score high enough on the EPA's Hazard Ranking System (HRS) to be considered for NPL listing.

Two Phases of the SI

The first phase conducted in the SI process is the Screening Site Inspection (SSI). The screening exercise can determine whether an expanded effort is cost-effective and warranted. The overall objective of the SSI is to provide information to support a recommendation that a site should either go on to Listing Site Inspection (LSI) or be considered for a NFA decision. At Navy/Marine Corps installations where contamination has not been confirmed or the extent of contamination characterized, the two-phased SI may be prudent. The data collected during the SSI is used to verify and substantiate data collected during the PA, provide additional data to characterize the site and its environment, and provide physical environmental samples for analysis. The SSI report will be a less detailed report than that developed from the second stage SI process--the LSI.

The LSI is the second phase of the SI. It is a more comprehensive field sampling, analysis, and data gathering exercise. The LSI uses the results of the SSI as a basis to determine if more detailed delineation of the amounts and potential migration of the hazardous waste is warranted.

The preparation of the SI report requires that sufficient information be collected to define present and past site waste operations and site conditions resulting from waste operations. The results documented in the report should at a minimum:

- Define the source and nature of the release; and
- Provide conclusions whether NFA, removal, or an RI/FS is warranted.

The documents used and reviewed in carrying out the SI should be referenced or enclosed as a part of the SI report. Documentation of the background information is critical for a NFA decision or to substantiate the recommended action to be followed after the SI.

The elements of the SI step are summarized in Figure 4-3. Also, for clarification, the LSI will be hereinafter referred to as the SI.

4.4 Risk Management Process

Risk management involves establishing an acceptable range of risk concerning the level of remedial action required at a site and weighing the feasibility and cost of achieving various levels of risk. The SI report bases conclusions and recommendations for further action on an assessment of risk posed by contaminants on the site.

“Environmental risk” can be defined as the potential or likelihood of injury, disease, or death resulting from human exposure to an actual or potential environmental threat. In conjunction with regulatory guidance, risk assessment results can be used to define the appropriate risk management techniques. However, it should be noted that risk assessment is a concept grounded in probability, not certainty. A preliminary assessment of risk at the SI step of the remedial process provides a consistent means to evaluate and document threats to human health and the environment.

The assessment performed as part of the SI will be more qualitative than quantitative since a thorough analysis involving fate and transport modeling is not within the scope of the SI. The SI should be designed to collect enough samples to perform a qualitative risk assessment.

The quality of the assessment and confidence level will depend upon the breadth and depth of the data, e.g., number of samples analyzed, how much is known about the contaminants present, their toxicity, persistence, and mobility, and potential human and environmental receptors. The SI report should contain such an assessment with appropriate qualifiers and confidence levels stated.

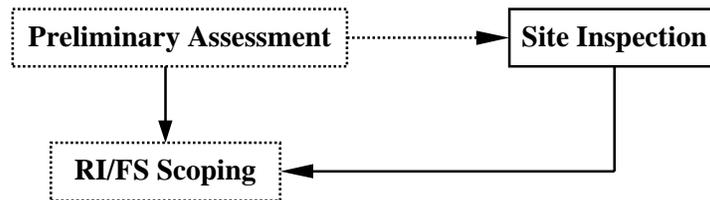
Methods of risk management such as engineering judgment and non-DoD models are valid tools and should be used, as appropriate, to evaluate risk and set priorities. Risk management factors that must be considered include the site’s relative risk, legal agreements, military readiness, stakeholder’s concerns, packaging sites for cost-effective contracting, regional distribution of work load, and use of innovative cleanup technologies.

Stakeholders and regulators will be participants in discussions concerning risk management factors used to determine the order and timing of project execution.

4.4.1 Relative Risk Site Evaluation

DoD has developed a Relative Risk Site Evaluation framework as a means of categorizing sites in the IR Program. Relative risk results in the grouping of sites or areas of

Elements of the Site Inspection Step



Purpose		<ul style="list-style-type: none"> • Eliminate from further consideration those releases that pose neither threat nor potential threat to public health, welfare, or the environment • Collect data to characterize the release for effective rapid initiation of RI/FS
Potential Actions	Subsequent	<ul style="list-style-type: none"> • Determine need for removal and/or remedial action • No Further Action • RI/FS • Removal • Monitoring
Tasks		<ul style="list-style-type: none"> • Prepare Work Plan, Sampling and Analysis Plan, and Worker Health and Safety Plan • Sample soils, sediments, groundwater, surface water as appropriate
Documentation		<ul style="list-style-type: none"> • Work Plan, Sampling and Analysis Plan, and Worker Health and Safety Plan • Site Inspection Report • HRS Scoring Package
Additional Management Activities	Site	<ul style="list-style-type: none"> • Installation submits SI Report and HRS Scoring Package to EPA and the State within 30 days of receipt from EFD/EFA
EPA/State Activities		<ul style="list-style-type: none"> • Comment on EPA proposal to include site on NPL • HRS Scoring • HRS Quality Assurance/Quality Control • NPL Proposal • NPL Listing

Figure 4-3: Elements of the Site Inspection Step

concern (AOCs) into High, Medium, and Low categories based on three key factors affecting groundwater, surface water and sediment, and surface soils:

- Contaminant Hazard Factor - a measure of contaminant concentrations in a given environmental medium;
- Migration Pathway Factor - a measure of the movement or potential movement of contamination away from the original source; and
- Receptor Factor - an indication of the potential for human or ecological contact with site contaminants.

At present, the Relative Risk Site Evaluation does not consider air media because the risk via the air pathway from DoD sites without soil contamination is minimal, and the Preliminary Remediation Goals used to determine the Contaminant Hazard Factor for contaminated soils consider inhalation of volatiles and contaminated particles.

The Relative Risk Site Evaluation is to be implemented in accordance with the latest edition of DUSD(ES)'s Relative Risk Site Evaluation Primer at all IR Program sites and AOCs. EFDs/EFAs and the installation will work closely together with their regulatory and community counterparts including Restoration Advisory Boards when conducting Relative Risk Site Evaluations by obtaining regulatory and community input and addressing their concerns.

The Relative Risk Site Evaluation will assist in sequencing future work within the IR Program. It is a conceptual tool whose goal is to ensure that the Navy/Marine Corps generally first considers sites with higher relative risk in the priority setting process. A

Relative Risk Site Evaluation for a site is not a substitute for either a Baseline Risk Assessment or health assessment, nor is it a means of placing sites into a NFA category.

The Navy/Marine Corps Cleanup Program uses risk management as the primary philosophy in programming, budgeting, and executing the program. DoD policy now stipulates that work sequencing should be reviewed on an annual basis using risk as a key factor. The Relative Risk Site Evaluation framework provides a means of accomplishing this objective.

When is a Relative Risk Site Evaluation Required?

The Navy/Marine Corps requires Relative Risk Site Evaluations for hazardous and petroleum waste sites and AOCs in the IR Program. The evaluation at a site should be based on currently available information on contaminants, migration pathways, and receptors. Sites or AOCs lacking sufficient information for the conduct of the evaluation should be given a "Not Evaluated" designation and should then be programmed to have sampling accomplished, as soon as possible, to complete the Relative Risk Site Evaluation. Site assessment work required to determine the relative risk of hazardous/petroleum waste sites should be programmed as a Program Management and Support expense in the IR Program (**see section 8.4.1**).

The Navy/Marine Corps evaluates sites and AOCs with ordnance in the IR Program using a separate risk procedure. They are not subject to the Relative Risk Site Evaluation.

4.5 Site Sampling

The SI phase provides the first opportunity to generate detailed site characterization data by collecting and analyzing samples. The SI consists of a visual inspection of the site and usually includes sample collection and analysis. The information may come from both on-site and off-site samples to determine the presence and nature of potential contamination in the soil, groundwater, surface water, and air. The objective of the SI sampling effort is to verify the presence of contamination, not to determine the extent of contamination. However, during any phase of the program, a sampling strategy should be developed after project objectives have been defined and before issuing the Statement of Work or contract. This strategy will ensure that the appropriate data will be collected to make decisions supporting project objectives. Additional sampling objectives include:

- Determining regulatory compliance;
- Obtaining data for risk assessment;
- Providing design information for remediation; or
- Proving the effectiveness of remediation.

Evaluation of existing data and information enables the RPM to define the sampling strategy. The results of initial sampling, such as those developed by the SI, should provide information to decide whether additional characterization of the site is necessary or whether a NFA decision is appropriate.

On-Site Sampling

On-site sampling should determine the nature of any disposed or stored wastes (source identification). Additionally, appropriate soil, air, groundwater, surface water, and sediment samples should be collected in the vicinity of any suspected source and along expected

migration pathways to determine the existence of contamination.

Off-Site Sampling

Off-site sampling should be carried out to determine the possible contamination of any off-site receptors due to waste disposed or stored on the site. Off-site sampling may consist of air, soil, groundwater, surface water, sediment samples, vegetation, and food chain organism samples.

Off-Site Surveys

Off-site surveys, which may include off-base areas, should be conducted to assess the population, land use, and operation that may be affected by site operations and conditions. These surveys should identify adjacent land ownership, land use, water supplies, waste disposal practices, and potential receptors of any wastes that may migrate off the site.

4.5.1 Sampling and Analysis Plan (SAP)

A SAP will be developed during the SI phase. It contains the Field Sampling Plan and the Quality Assurance Project Plan as described below:

Field Sampling Plan (FSP)

The FSP describes the number, type, and location of samples, the types of analyses, and decontamination procedures. It also identifies the personnel to perform each task. The plan should be based on the types of hazardous materials expected and their potential off-site migration routes. Suggested elements to be included in an FSP are given in Table 4-1.

Suggested Format For Field Sampling Plan

<ol style="list-style-type: none">1. Site Background2. Sampling Objectives<ul style="list-style-type: none">• Sample location• Sample purpose/data quality objectives (DQO)3. Location, Designation, and Frequency of Samples<ul style="list-style-type: none">• Project• Quality Assurance/Quality Control (QA/QC)4. Sampling Equipment and Procedures<ul style="list-style-type: none">• Equipment• Decontamination• Sample Taking• Waste Handling5. Sample Handling and Analysis
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Table 4-1: Suggested Format For Field Sampling Plan

Quality Assurance Project Plan (QAPP)

The QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities to ensure the validity of analytical data generated during project execution. For additional information concerning QAPPs, see **section 5.4.1**.

4.6 Site Closeout

The goal for all sites in the IR Program is completion of all necessary remedial action and site closeout. The Navy/Marine Corps considers the status of a site to be “Response Complete” when all needed cleanup actions have been completed. When the Navy/Marine Corps considers remedial action to be complete and the site to be “Response Complete”, the Remedial Project Manager forwards the appropriate information supporting Site Closeout to the regulators. Site Closeout occurs when the Navy/ Marine Corps and regulators, if necessary, agreed that NFA is appropriate at that site. Site Closeout is a single step whose key objectives are to ensure that the Navy/Marine Corps:

- Formally makes the Site Closeout decision;
- Documents the Site Closeout decision;
- Notifies regulatory authorities and the public of the Site Closeout decision;
- Receives concurrence on the Site Closeout, if necessary, from EPA and the state; and
- Initiates EPA delisting if the site is on the NPL.

The decision to cease evaluating an IR site on the basis of data on hand and to proceed with a Site Closeout decision can be made at any time during the Remedial Action Process and can be justified by any of the following findings:

- No evidence is collected in a PA that indicates use of the site for HW handling, storage, or disposal;
- Samples taken during SI or Site Characterization indicate that no HSs are migrating or likely to migrate from the site;
- A public health evaluation or Baseline Risk Assessment indicates there is no significant threat to public health or the environment;
- Site Closeout is the selected alternative in the Selection of Remedy step; or
- Following the completion of monitoring, removal, or remedial action.

The RPM and installation must be aware of the importance of maintaining pertinent information and documentation collected during the Remedial Action Process to support the site closeout decision. Files must be established, maintained, and safeguarded to provide a complete and accurate history of the process and information used to select the remedy.

4.6.1 National Priorities List (NPL) Delisting

EPA's National Contingency Plan, Section 300.425(e), identifies actions that must be completed and procedures to be followed in delisting a site from the NPL. Sites may be deleted from the NPL when no further response is appropriate. Response actions and procedures as they relate to the delisting of Navy/Marine Corps sites include:

- The cognizant EFD/EFA will notify the EPA regional office that appropriate response actions have been taken/ completed and request that the site be deleted from the NPL;
- EPA will consult with the state prior to developing the notice of intent to delete. EPA will consider, in consultation with the state, whether any of the following criteria have been met:

The Navy/Marine Corps or any other responsible party has implemented all appropriate, required response actions;

No further response action by the Navy/Marine Corps or other responsible party is appropriate; or

The Remedial Investigation has shown that the release poses no significant threat to public health or the environment and no further remedial action is appropriate.

- The state in which the release was located must concur with the proposed deletion before the site will be deleted from the NPL. EPA provides the state 30 working days for review of the deletion notice prior to its publication in the *Federal Register*;
- The site will be restored to the NPL without application of the HRS whenever there is a significant release from the deleted site;
- EPA, to ensure public involvement during the proposal to delete, will:

Publish a notice of intent to delete the site from the NPL in the *Federal Register* and solicit comment through a 30 day public comment period;

Publish a notice of intent to delete in a major local newspaper of general circulation at or near the proposed site to be deleted;

Provide the Navy/Marine Corps with copies of information supporting the proposed site deletion for placement in the information repository at or near the proposed site to be deleted; and

Coordinate with the Navy/Marine Corps and respond to each significant comment and any significant new data submitted during the comment period and include those responses and documents in the final deletion package.

- EPA will provide the Navy/ Marine Corps with the final deletion package for placement in the local information repository once the notice of final deletion has been published in the *Federal Register*.

The Navy/Marine Corps designates sites that EPA has delisted as response complete, site closed out and as a NFA site. The site may again become an active site in the IR Program if future conditions determine that contaminants still exist at the site.

4.6.2 Non-NPL Sites

Site Closeout at Non-NPL sites requires the following actions by the EFD/EFA or the installation:

EFD/EFA:

- Prepare documentation which shows that the Navy/Marine Corps has implemented all appropriate, required response actions and NFA by the Navy/Marine Corps is appropriate;
- Designate the site or group of sites for which response actions have been taken/completed as NFA; and
- Notify the EPA regional office and the state that appropriate response actions have been taken/ completed.

Installation:

Ensure public notification by:

- Placing the documentation to support the NFA status in the information repository at or near the site; and
- Publishing a notice in a major local newspaper of general circulation to inform the public that documentation to support the NFA status is available in the information repository.

4.7 Data Quality Objectives (DQO)

DQOs are an important aspect of quality assurance for the IR Program process from collecting and analyzing samples to data processing and reporting. DQOs are statements that provide critical definitions of the confidence required in drawing conclusions from the project data. These objectives will determine the degree of total variability (uncertainty or error) that can be tolerated in the data. Limits of variability must be incorporated into the SAP and are achieved by using a detailed sampling and analysis protocol. Desired DQOs must be balanced against the cost of sampling and analysis, and realistic objectives must be established with the concurrence of the data users. Three factors that most influence the cost of sampling are site location and accessibility to sampling points; the number, kind, complexity, and size of samples to be collected; and the frequency of sampling. The extent to which these factors will influence cost depends on the particular aspects of each sampling project.

DQOs are the full set of constraints needed to design a study including a specification of the level of uncertainty that a data user is willing to accept in the decision. The DQO process includes specifying the limits on decision errors thus defining the data quality. The Navy/Marine Corps develops DQOs using a process that encourages the sequential consideration of relevant issues. The principal stages in the DQO process result in an important criterion or product for the study that describes the following:

- The problem to be resolved at the site;
- The decision needed to resolve the problem;
- The inputs to the decision;
- The boundaries of the study;
- The decision rule; and
- The uncertainty constraints.

Data quality management ensures that usable data is developed to provide a basis for evaluating the performance of remedial actions. It should be effective in determining how much and what quality of data are needed and to identify the intended uses of historical sampling data, e.g., site characterization, risk assessment, engineering design, so the data can be used to support subsequent remediation phase operations. Such data reviews should be in concurrence with EPA guidance documents, *Data Quality Objectives for Remedial Response Actions, Volume; Guidance for the Data Quality Objectives Process*, EPA QA/G-4; and *Guidance for Data Quality Assessment*, EPA QA/G-9.

RPMs should ensure that contractors follow EPA's DQO Process. This will provide focused, cost-effective investigations - **DQOs should be implemented prior to commencing SI activities** - and remedial designs geared toward the particular features and requirements of the specific site and yield scientifically defensible data.

DQOs on the Internet

For additional DQO information, see the Uniform Resource Locator for the Department of Energy DQO Home Page at: **<http://terrassa.pnl.gov:2080/DQO/home.html>**

Chapter Five

5. Remedial Investigation/Feasibility Study (RI/FS)

The purpose of the Remedial Investigation/Feasibility Study (RI/FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is to determine the nature and extent of the threat presented by a release of a hazardous substance and, if sufficient need is documented by site sampling and a Baseline Risk Assessment, to evaluate proposed remedies. The end product of an RI/FS is the selection of a remedial action that:

- Is supported by valid site data and a Baseline Risk Assessment;
- Is judged to be the best means of meeting the need for remedial action in light of nine criteria including:
 - Overall protection of human health and the environment
 - Compliance with applicable or relevant and appropriate requirements (ARARs)
 - Long-term effectiveness and permanence
 - Reduction of toxicity, mobility, or volume through treatment
 - Short-term effectiveness
 - Implementability
 - Cost
 - State acceptance, and
 - Community acceptance (40 CFR 300.430(f)(1)).

The Engineering Field Division/Engineering Field Activity (EFD/EFA) is responsible for conducting the RI/FS on behalf of the installation Commanding Officer/Commanding General. In the past the Navy/Marine Corps generally performed the RI/FS as one phase; however, EPA has shown through its Superfund Accelerated Cleanup Model initiative that a phased RI is more cost-effective, and yields a better definition of sites being studied. For RI/FSs, the EFD/EFAs should, as far as possible:

- place emphasis on conducting timely, cost-effective studies
- use appropriate models, such as EPA's Superfund Accelerated Cleanup Model
- use non-invasive techniques for characterization where appropriate, and
- use field measurement methods that can substitute for fixed laboratory analyses where appropriate.

The Navy/Marine Corps generally performs the RI phase concurrently but independently of the FS as shown in Figure 5-1. The phased RI/FS process includes the following: 1) project scoping, 2) data collection or site characterization, 3) risk assessment, 4) treatability studies, and 5) analysis of alternatives. The steps, as illustrated in Figure 5-1, may be implemented in an iterative manner depending on the complexity of the site. The steps most likely to require repetition or reconsideration are Scoping, Site

Phased RI/FS Process

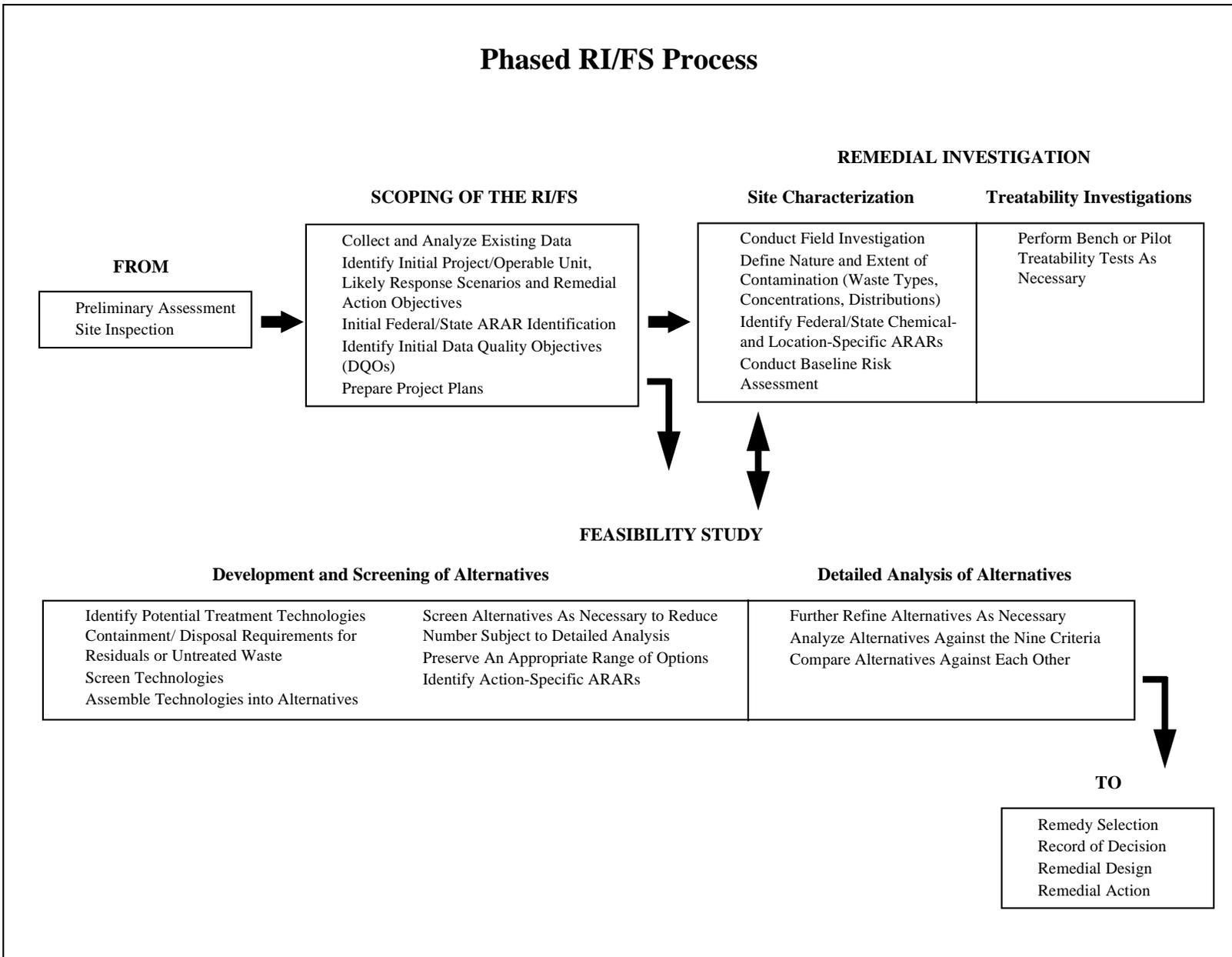


Figure 5-1: Phased RI/FS Process

Characterization, and the evaluation of Detailed Alternatives.

Selection of the remedy after consideration of public and regulatory agency comments concludes an RI/FS. The Record of Decision (ROD) for sites listed on EPA's National Priorities List (NPL) and a decision document (DD) for Non-NPL sites documents the selection. The overall process and requirements for selecting a remedy and remedial action will be described in this chapter. Additional information for conducting a RI/FS can be found in *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*, (EPA, October 1988).

5.1 Remedial Investigation (RI)

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) sets out the general purpose of the RI phase as the collection of data necessary to adequately characterize the site to develop and evaluate effective remedial alternatives. The Navy/Marine Corps will characterize the site by conducting field investigations including treatability studies and Baseline Risk Assessments. The RI provides information to assess the risks to human health and the environment and to support the development, evaluation, and selection of appropriate response alternatives. The RI is the investigative phase of the Remedial Action Process and is designed to:

- Determine the nature and extent of contamination;
- Determine the nature and extent of the threat to human health and the environment; and
- Provide a basis to determine the types of response actions to be considered.

Bench- or pilot-scale treatability studies will be conducted, when appropriate, to provide additional data for the detailed analysis and to support engineering design of remedial alternatives.

5.2 Site Evaluation

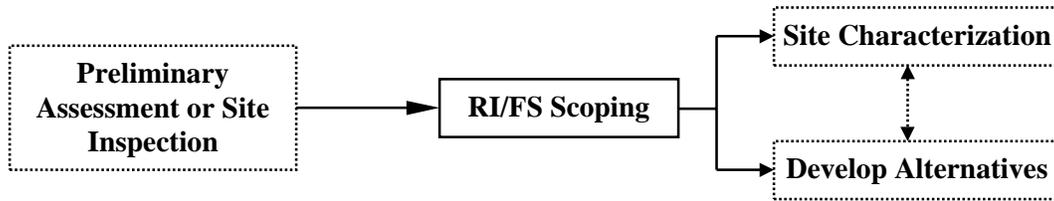
In order justify the effort and expense of performing a RI/FS for a site, the Navy/Marine Corps usually will have performed a PA/SI which evaluated the site. For such a case, the PA/SI would document that a RI/FS is needed. If site conditions have changed since completion of the PA/SI, the Navy/Marine Corps will conduct a search for other relevant data. If the Navy/Marine Corps discovers a new site, a site evaluation similar to that which occurs for a PA/SI should be accomplished before instituting a RI/FS.

5.3 RI/FS Scoping

Scoping is the first step to be implemented to successfully complete the RI/FS phase. Figure 5-2 shows the elements of the RI/FS Scoping step and Figure 5-3 shows in a flow diagram how these key elements are related. The RI/FS Scoping process normally includes the following activities:

- Identification of the RI/FS study area. The specific IR Program sites to be evaluated should be designated. The media that may be contaminated and the populations and resources that may be exposed to the contamination should be delineated on a conservative basis from available information.

Elements of the RI/FS Scoping Step



- | | | | |
|---|---|-------------------|---|
| Purpose | <ul style="list-style-type: none"> • Describe type and content of studies needed to initiate response actions • Determine need for removal actions • Determine appropriate response mechanisms and authorities • Identify preliminary RI/FS and environmental assessment study areas • Set priorities for implementation of removal actions, operable units, and RI/FS phases | | |
| Potential Actions | <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; padding-right: 10px;">Subsequent</td> <td> <ul style="list-style-type: none"> • Site Characterization • Development of Alternatives • Removal Actions • Operable Units </td> </tr> </table> | Subsequent | <ul style="list-style-type: none"> • Site Characterization • Development of Alternatives • Removal Actions • Operable Units |
| Subsequent | <ul style="list-style-type: none"> • Site Characterization • Development of Alternatives • Removal Actions • Operable Units | | |
| Tasks | <ul style="list-style-type: none"> • Prepare Work Plan (Installation and EFD/EFA) • Determine prel. ARARs (EFD/EFA and installation) • Begin to formulate likely remedial alternatives (EFD/EFA) • Develop Sampling and Analysis Plan and Worker Health and Safety Plan (Installation and EFD/EFA) | | |
| Documentation | <ul style="list-style-type: none"> • Sampling and Analysis Plan (QAPP & FSP) • Worker Health and Safety Plan • RI/FS Work Plan | | |
| Additional Management Activities | <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; padding-right: 10px;">Site</td> <td> <ul style="list-style-type: none"> • Establish local information repository (Installation) and administrative record (EFD/EFA) • Request preliminary State ARARs (EFD/EFA) • Establish Technical Review Committee/Restoration Advisory Board (Installation and </td> </tr> </table> | Site | <ul style="list-style-type: none"> • Establish local information repository (Installation) and administrative record (EFD/EFA) • Request preliminary State ARARs (EFD/EFA) • Establish Technical Review Committee/Restoration Advisory Board (Installation and |
| Site | <ul style="list-style-type: none"> • Establish local information repository (Installation) and administrative record (EFD/EFA) • Request preliminary State ARARs (EFD/EFA) • Establish Technical Review Committee/Restoration Advisory Board (Installation and | | |

EFD/EFA)

- For sites proposed or listed on NPL, begin FFA negotiation (Installation and EFD/EFA)
- Prepare Community Relations Plan (Installation and EFD/EFA)

EPA/State Activities

- Review Federal ARARs and provide State ARARs (State)
- Negotiate FFA for NPL Sites (EPA and State)

Figure 5-2: Elements of the RI/FS Scoping Step

Flow Diagram for RI/FS Scoping

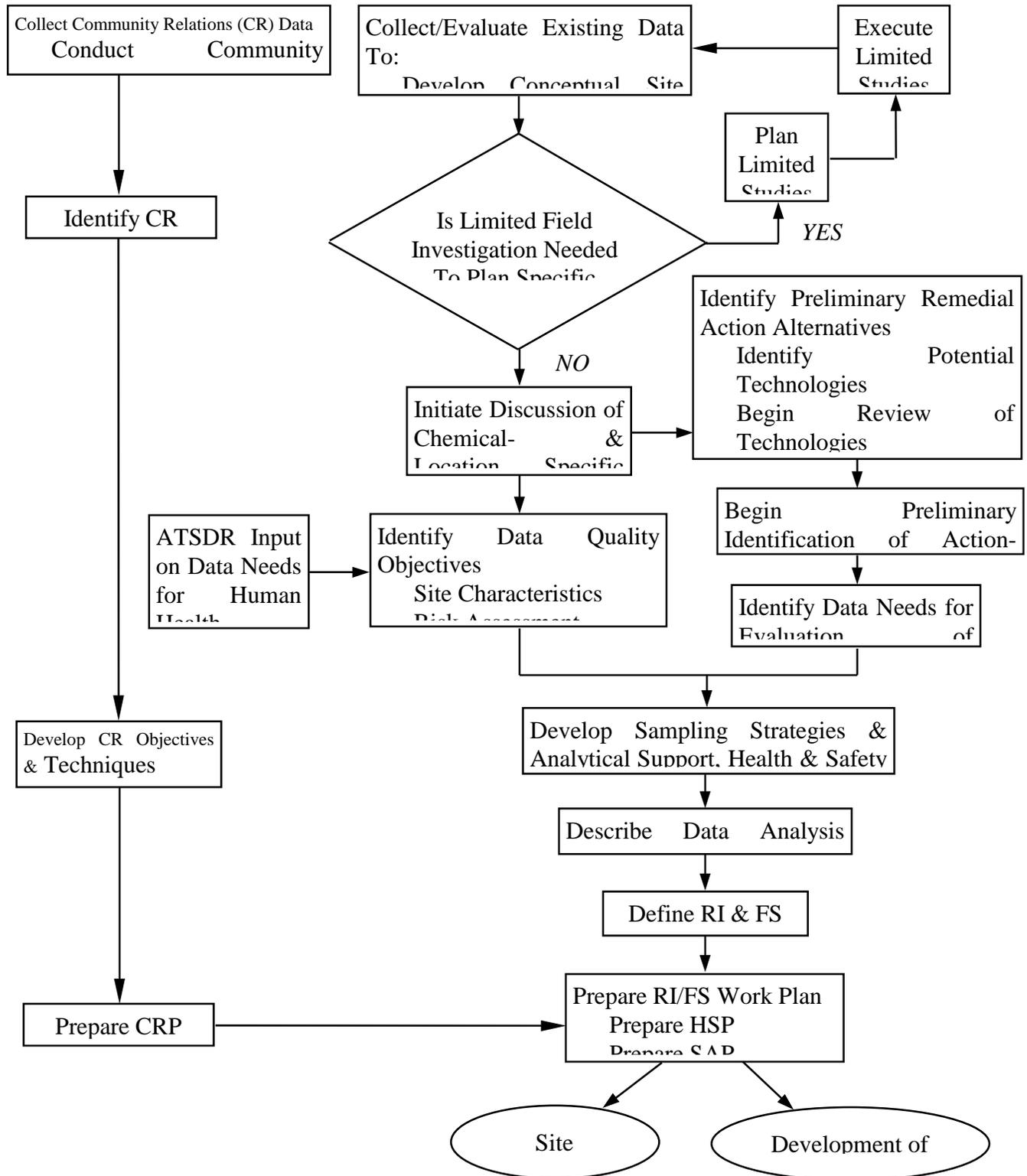


Figure 5-3: Flow Diagram for RI/FS Scoping

Properties, transportation routes, treatment and disposal facilities, and any environmental resources that may be used for or are directly impacted by potential remedial actions should be identified as the basis for evaluating location-specific ARARs and the environmental impacts of alternatives.

- Determination of appropriate response mechanisms - EFDs/EFAs and installations should use the following criteria to assess whether, and what types of, remedial actions will be considered:

Population, environmental, and public welfare concerns;

Rates of exposure;

Amount, concentration, hazardous properties, environmental fate and transport, e.g., ability and opportunities for bioaccumulation, persistence, mobility, etc., and chemical composition of substances present;

Hydrogeological factors, e.g., soil permeability, depth to saturated zone, hydrogeological gradients, proximity to a drinking water aquifer, and flood plains and wetlands proximity;

Current and potential groundwater use, e.g., the appropriate groundwater classes under the system established in the EPA groundwater protection strategy;

Climate;

The extent to which the source can be adequately identified and characterized;

Whether substances at the site can be reused or recycled;

The likelihood of future releases if the substances remain on the site;

The extent to which natural or man-made barriers currently contain the substances and the adequacy of the barriers;

The extent to which the substances have migrated or are expected to migrate from the area of the original location or new location, if relocated, and whether future migration may pose a threat to public health, welfare, or the environment;

The extent to which the Federal environmental and public health requirements are applicable or relevant and appropriate to the specific site and the extent to which other Federal criteria, advisories and guidance, and state standards are to be considered in developing the remedy;

The extent to which contamination levels exceed Federal ARARs or other Federal criteria, advisories, and state standards;

Impact of the contamination on air, land, water, and/or the food chain; and

The ability to implement and maintain the remedy until the threat is permanently abated.

- Determination of appropriate authorities/responsibilities - the EFD/EFA, in coordination with the installation, will:

Identify the appropriate state regulatory agency and EPA regional office involved in the project;

Identify which state and Federal laws are applicable; and

Establish decision-making roles.

- Identify likely response scenarios, potentially applicable technologies, and operable units that may correct site problems;
- Identify the quantity and types of data which will be required to support response;
- Develop a set of work plans which includes a Sampling and Analysis Plan (SAP) consisting of a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP), and a Health and Safety Plan. These work plans developed during the scoping process, should adhere to the seven step Data Quality Objective (DQO) process. Site-specific data needs, the evaluation of alternatives, and documentation of the selected remedy should reflect the scope and complexity of the site problems being addressed;
- Identify the need and set priorities for removals, operable units, and continuing monitoring requirements while the RI/FS is being conducted; and
- Identify preliminary Federal contaminant- and location-specific ARARs based on available and confirmatory data, if collected. As the lead agency, the Navy/Marine Corps is to identify ARARs in a timely manner to supporting agencies. Supporting agencies such as state regulatory agencies are to identify their ARARs in a timely

manner to the lead agency [see 40 CFR 300.400(g)].

A RI/FS seldom is so predictable that all activities can be accurately forecast during initial Scoping. The Remedial Project Manager (RPM) should be prepared to adjust the scope of activities as new information is developed. Decision points, where ongoing and future activities will be reexamined, should be established to assist in more effectively managing contracts and providing accurate project status. These decision points may be:

- At the conclusion of each round of site sampling during Site Characterization;
- During Baseline Risk Assessment preparation;
- During or after bench- or pilot-scale testing of technologies; or
- After implementation of removals or operable units.

5.4 Quality Assurance/Quality Control (QA/QC)

5.4.1 Quality Assurance Project Plan (QAPP)

The QAPP describes the policy, organization, functional activities, quality assurance and quality control protocols necessary to achieve DQOs. The QAPP provides guidance for field analyses and sampling interpretation and ensures that laboratory methods and results are properly processed and validated. The QAPP used during the RI/FS activities can be modified for the verification of materials sampling during remediation. Only site-specific aspects of a QAPP need to be explicitly described. If another document already contains the information, it need only be referenced in the QAPP. The QAPP along

with the SAP compares the project's requirements to the laboratory's capabilities.

QA consists of an overview check to certify that QC procedures have been properly implemented to produce accurate data. QA is generally a supervisory and peer review oversight function. QC consists of a system of checks on field sampling and laboratory analysis using field blanks, duplicates, documentation of all sample movement, and chain of custody records to provide supporting information to ensure quality analytical data.

The purpose of the QAPP is to ensure that all technical data generated are accurate, representative, and will be able to withstand judicial scrutiny should such a need arise, and that the methods employed to generate the data are reliable and scientifically valid. All QA/QC procedures should be in accordance with applicable professional technical standards, EPA and state requirements, government regulations and guidelines, and specific project goals and requirements.

A QAPP incorporates the following elements:

- Project Management - including project history and objectives, role and responsibilities of participants, ensuring that the project has a defined goal and that the participants understand the goal, and the approach to be used, and that the outputs needed for planning have been documented;
- Measurement/Data Acquisition - covers all aspects of measurement system design and implementation, ensuring that appropriate methods for sampling, analysis, data handling and QC are employed and documented;
- Assessment/Oversight - addresses the activities for assessing the effectiveness

of the implementation of the project and associated QA/QC, and ensures that the QAPP is implemented as prescribed; and

- Data Validation and Usability - covers the QA activities that occur after the data collection phase of the project is completed, and determines whether or not the data conform to the specified criteria, which satisfies the project objectives.

The QAPP must provide sufficient detail that:

- the project technical and quality objectives (DQOs) are identified and agreed upon;
- the intended measurements or data acquisition methods are appropriate for achieving project objectives;
- assessment procedures are sufficient for confirming that data of the type and quality needed and expected are obtained; and
- any limitations on the use of the data can be identified and documented.

If the original work plans need to be modified to address new features requiring characterization, addenda to each component of the work plans is acceptable. If the additional work is outside of the original boundaries set during the initial set of work plans, a new set of work plans to address these issues must be written to properly define the work being proposed. For additional information see, *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, and EPA's *Guidance for the Data Quality Objectives Process*.

The QAPP should include criteria for reviewing the adequacy of laboratory (Navy/Marine Corps and contractor) QC procedures and implementation.

5.4.2 Fixed Laboratory Quality Assurance/Quality Control

In September 1984, NAVFAC established a process whereby the NFESC (or their contractor) would audit the QA/QC procedures (planned and implemented) used by laboratories (Navy/Marine Corps and contractor) performing sample analysis for the IR Program. The purpose of the review was to ensure that the analytical data provided by the laboratories consistently would be of high quality. The laboratory QA/QC review achieved this goal primarily through evaluating the analytical laboratory's capabilities before they analyzed Navy samples. Occasionally, when situations warranted, an in-depth audit was performed on the data after it had been provided to the Navy/Marine Corps.

The process for reviewing laboratory QA/QC procedures and their implementation has recently been modified to a new system in which EFD/EFAs (or their contractors) perform laboratory QA/QC audits, and NFESC assists the EFD/EFAs in their QA/QC process. The Navy has transitioned from the old system, in which NFESC (or their contractor) performed the laboratory QA/QC audits, to the new system in which EFD/A's (or their contractors) perform laboratory QA/QC audits, and NFESC audits the EFD/A process.

Beginning in FY-97, the QA review of laboratories performing sample analysis for the IR Program will function as follows:

- NFESC will serve as the central manager for an auditing contractor, with EFD/EFAs responsible for implementing their own QA/QC protocol and analytical review;
- EFD/A's are responsible for notifying NFESC to perform a lab audit. EFD/EFAs may at their discretion, perform the audit themselves, have the CLEAN/RAC contractors perform the audit (with EFD/EFA oversight), hire an independent contractor to conduct the audit, or reimburse NFESC to perform the audit;
- EFD/EFAs will submit a list of laboratories they plan to review to NFESC. NFESC will compile this information into a master list which will then be provided to the EFD/EFAs to minimize duplication of effort;
- EFD/EFAs will provide a copy of an audit report containing all the deficiencies, recommended corrective actions and other pertinent information to NFESC for each laboratory audited;
- NFESC will perform, for informational purposes only, an annual review of each EFD/EFAs laboratory QA audit system;
- NFESC will serve as the central repository of information on audits performed at the EFD/EFAs and by the other Services and provide technical assistance to the EFD/EFAs; and
- EFD/EFAs will fund their laboratory audits.

The *Navy QA/QC Laboratory Guidance*, February 1996 may be referenced in laboratory reviews and evaluations.

5.4.3 QA/QC For Mobile Laboratories

The process described in section 5.4.2 is directed toward fixed laboratories. Some projects may require the use of a mobile laboratory. These temporary laboratory facilities set up on site in the field during the sampling process, or during remediation, allow for very quick turn-around on analytical results. Mobile labs are usually contained in a van or small trailer which is set up on site for several weeks or several months. During site characterization, using a field lab can expedite the decision-making process on the need for further sampling while the drill rig is in operation. During remediation, a field lab can be used to check the efficiency of the remediation process. Mobile labs are not normally evaluated due to the short time frames they are in place. It is recommended that a minimum of 10% split or duplicate samples be sent to a fixed/evaluated lab for analysis and the results compared to those from the mobile lab. The contract for the mobile lab should specify the analytical requirements including QA requirements as well as referencing the EPA's *Good Laboratory Practices* and *Good Automated Laboratory Practices*.

EFD/EFAs should use field analytical methods versus fixed laboratories to determine vertical and horizontal extent of contamination, and perform 20% confirmation of the boundaries using fixed laboratory analytical work. This practice is standard in today's budget controlled environment arena, and is generally accepted by the regulatory agencies.

5.4.4 Laboratory Data Validation

The word validation, as used in reference to environmental data, is a process through

which the analytical procedures that generated the data is thoroughly checked. This includes the calibration of the analytical instrument(s), QC samples run with the field sample, the calculation of the results and many other checks. It is recommended that a minimum of 10% of analytical data be validated. Only validated data can be used to do a Baseline Risk Assessment according to the EPA's guidelines under CERCLA.

The only documented process for data validation is part of the EPA's Contract Laboratory Program. This process is contained in what is commonly referred to as the "Functional Guidelines," comprised of the following two documents: 1) *National Functional Guidelines for Organic Data Review*, EPA June 1991; and 2) *Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses*, EPA July 1988. These Functional Guidelines are designed to be used with the analytical data documentation package required by the Contract Laboratory Procedure Statements of Work for analytical methods. The Functional Guidelines can be applied to analytical methods other than Contract Laboratory Procedure. However, since other analytical methods do not specify the same quality control requirements and documentation requirements that Contract Laboratory Procedure does, the Functional Guidelines cannot be followed explicitly. There are software packages available (through EPA) to do portions of the data validation process electronically.

5.5 Field Screening Methods and Investigative Techniques

5.5.1 Field Screening Methods

There are numerous methods available to gather analytical data in the field. Field screening methods can be used to quickly check a large site and target specific areas for further in depth testing. It is recommended that when field screening methods are used, that some follow up samples should be analyzed in a fixed laboratory. Geophysical methods such as ground penetrating radar, seismic reflection, magnetometers and others can be used to help define the physical and chemical properties of contaminants, the distribution of the contaminants, and the subsurface hydrogeology and geology of the site. The successful remediation of a site depends on the ability to accurately define these components. Identification of the vertical and horizontal extent of contamination and quantifying the mass distribution of each contaminant phase determines the framework for selecting the appropriate remedial response.

EFD/EFAs should use field analytical methods versus fixed laboratories to determine vertical and horizontal extent of contamination, and perform 20% confirmation of the boundaries using fixed laboratory analytical work. RPMs should investigate the use of qualitative screening methods to reduce the collection of expensive samples to characterize the site.

5.5.2 Site Characterization Analysis and Penetrometer System (SCAPS)

SCAPS is a field screening technology which uses laser-induced fluorescence from a probe pushed into the soil to detect petroleum hydrocarbons. The SCAPS is a standard 20-ton truck with a cone-penetrometer which detects subsurface polynuclear aromatic hydrocarbon contamination in-situ and is used to test a large land area to locate a migrating plume of petroleum hydrocarbons. SCAPS is

fully self-contained and includes soil/groundwater sample retrieval capabilities, a grouting system to seal the investigation hole upon probe withdrawal, and a decontamination system. SCAPS is intended as a field screening tool. It gathers, processes, and displays real-time geotechnical and semi-quantitative contamination data. The user is able to quickly delineate a contamination plume without time-consuming iterations used in traditional sampling and laboratory analysis. Further information on SCAPS can be obtained from the NFESC (Code 413).

5.5.3 Investigation Derived Waste Management (IDWM)

EPA guidance on management of Investigative Derived Waste generated during IR activities allows IDW to be left on site in certain situations.

However, most states have developed their own policy regarding IDWM. Therefore, RPMs should contact the designated state representative for guidance. EPA and State policy should be incorporated into the IDWM Plan developed for each site investigation or remedial action. This plan should be reviewed by the state and EPA as part of the work plan review.

5.6 Site Characterization

Site Characterization may be conducted in one or more phases to focus sampling efforts and increase the efficiency of the investigation. Site characterization activities should be fully integrated with the development and evaluation of alternatives in the FS because estimates of actual or potential exposures and associated impacts on human and environmental receptors may be refined throughout the steps of the RI as new information becomes available.

During the Site Characterization stage of RI/FS Scoping, the Navy/Marine Corps develops and implements the SAP. The Navy/Marine Corps obtains and analyzes field data to assess the nature of any threats the site poses to human health or the environment and to support the analysis and design of potential response actions. Field data analysis and interpretation should be based on the QA/QC requirements outlined in the QAPP. This will ensure that legally defensible data are obtained and used in the Site Characterization. The major steps in Site Characterization include:

- Collection of soil, sediment, groundwater, surface water, and air samples as specified in the SAP;
- Analysis of samples in the laboratory;
- Evaluation of laboratory results to characterize the site;
- Determination of the adequacy of data for the development and evaluation of remedial alternatives; and
- Development of a Baseline Risk Assessment.

The results of field observations or laboratory analyses may show that site conditions are significantly different from what was anticipated during initial scoping efforts. Rescoping and additional sampling may then be necessary. Results may also indicate that the threat is more immediate than previously understood in which case removals or operable units may be initiated. However, if the Baseline Risk Assessment shows that a significant threat does not exist, then the RPM should prepare a “no further action” ROD or a DD.

The development and implementation of a successful remedial strategy is directly related to acquiring valid site characterization information pertaining to the nature of the contaminants, mass distribution and volume estimation of each contaminant phase, and an accurate understanding of the geologic and hydrogeologic processes affecting plume mobility. Technical considerations for designing and implementing a Site Characterization Program are:

- Improvement of the process by better integrating the investigative phase with the remedial phase to diminish the likelihood of incomplete site characterization and unnecessary follow-up studies;
- Consideration of the end result of an investigation and its significant affects on the total project cost;
- Weighing the concern that the investigative process represents a smaller percentage of the total project cost than the remedial process which constitutes the largest expenditure with the least control over costs. The investigative phase encompasses the following components:

Physical and chemical properties of the contaminant released;

Distribution of subsurface contaminants;

Subsurface hydrogeology and geology; and

Remedial objective.

The results of the Site Characterization will be documented in a draft RI Report. EPA’s *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*, OSWER Directive 9355.3-01 and

Table 5-1 contain the recommended format for the report. Figure 5-4 lists the elements of Site Characterization. Figure 5-5 shows key element relationships in a flow diagram.

5.6.1 Sampling

Sampling methods are dependent on the type and number of samples required to be collected, the surroundings from which they are being collected, and the number of people involved in the sampling. During the RI, a comprehensive SAP must be prepared and enacted so that enough data to make a decision about site and waste characteristics, potential hazards, and applicable treatment options can be generated.

Field investigation methods used in the RI may be selected and implemented to meet the scoping needs established during the Scoping process. These activities will ensure coordination with analytical laboratories. It is also important to obtain information regarding sample locations from maps, matrices, and relevant contaminant concentrations. Other sampling concerns include:

- Representative soil sampling to reflect the concentration of the parameter of concern at a given time;
- Sampling locations;
- Sampling equipment, e.g., scooping, coring, or auguring devices, dependent on soil conditions and contaminants present; and
- Preservation and storage of samples.

5.6.2 Background Concentrations

One of the most important features of the RI is the determination of background. Only statistical analysis can answer the question of whether or not enough background samples have been collected to adequately represent background conditions. The determination of background can greatly affect the remedial decision, especially if the chemical of concern is ubiquitous and shows up in all background samples; this will significantly influence the cleanup decisions for this site.

When appropriate, statistical methods should be used to determine the number and location of background samples to establish quantitative measures of risk. It is best to have determined background concentration in a statistical defensible manner with regulatory concurrence obtained on the sampling analysis protocol.

Background concentrations for soil samples can be established by finding an area that has not been subjected to contamination and that is fairly representative of the soil samples that will be taken to assess contamination. The heterogeneity of soils must be considered in the establishment of background. Enough soil samples must be taken to establish the range of background concentrations.

Sampling strategies for establishing background concentrations of substances in the water must take into consideration past and present flow rates and directions. Groundwater background concentrations can be established by determining the direction and variability of groundwater flow. Samples must be collected from groundwater upgradient or side gradient of the site to establish background. The downgradient samples will establish the effects of site activities. For surface water samples where a

Recommended Remedial Investigation Report Format

Executive Summary

1. Introduction
 - 1.1 Purpose of Report
 - 1.2 Site Background
 - 1.2.1 Site Description
 - 1.2.2 Site History
 - 1.2.3 Previous Investigation
 - 1.3 Report Organization
2. Study Area Investigation
 - 2.1 Includes field activities associated with site characterization. These may include physical and chemical monitoring of some, but not necessarily all, of the following:
 - 2.1.1 Surface Features (topographic, mapping, etc.)(natural and man-made)
 - 2.1.2 Contaminant Source Investigations
 - 2.1.3 Meteorological Investigations
 - 2.1.4 Surface/Water and Sediment Investigation
 - 2.1.5 Geological Investigations
 - 2.1.6 Soil and Vadose Zone Investigations
 - 2.1.7 Ground/Water Investigations
 - 2.1.8 Human Population Surveys
 - 2.1.9 Ecological Investigations
 - 2.2 Data Quality Objectives - Use the DQO process to determine types, quantity and quality of data needed to adequately define site characteristics.
 - 2.3 If technical memoranda documenting field activities were prepared, they may be included in an appendix and summarized in this report chapter.
3. Physical Characteristics of the Study Area
 - 3.1 Includes results of field activities to determine physical charact. These may include:
 - 3.1.1 Surface Features
 - 3.1.2 Meteorology
 - 3.1.3 Surface/Water Hydrology
 - 3.1.4 Geology
 - 3.1.5 Soils
 - 3.1.6 Hydrogeology
 - 3.1.7 Demography and Land Use
 - 3.1.8 Ecology

Table 5-1: Recommended Remedial Investigation Report Format

4. Nature and Extent of Contamination
 - 4.1 Presents the results of site characterization, both natural chemical components and contaminants in some of the following media:
 - 4.1.1 Sources (lagoons, sludges, tanks, etc.)
 - 4.1.2 Soils and Vadose Zone
 - 4.1.3 Groundwater
 - 4.1.4 Surface Water
 - 4.1.5 Air
5. Contaminant Fate and Transport
 - 5.1 Potential Routes of Migration (i.e., air, groundwater, etc.)
 - 5.2 Contaminant Persistence - If they are applicable (i.e., for organic contaminants) describe estimated persistence in the study area environment and physical, chemical, and/or biological factors of importance for the media of interest.
 - 5.3 Contaminant Migration
 - 5.3.1 Discuss factors affecting contaminant migration for the media of importance (e.g., sorption onto soils, solubility in water, movement of groundwater, etc.).
 - 5.3.2 Discuss modeling methods and results, if applicable
6. Baseline Risk Assessment
 - 6.1 Human Health Evaluation
 - 6.1.1 Exposure Assessment
 - 6.1.2 Toxicity Assessment
 - 6.1.3 Risk Characterization
 - 6.2 Environmental Evaluation
7. Summary and Conclusions
 - 7.1 Summary
 - 7.1.1 Nature and Extent of Contamination
 - 7.1.2 Fate and Transport
 - 7.1.3 Risk Assessment
 - 7.2 Conclusions
 - 7.2.1 Data Limitations and Recommendations for Future Work
 - 7.2.2 Recommended Remedial Action Objectives Appendices
 - A. Technical Memoranda on Field Activities, if available
 - B. Analytical Data and QA/QC Evaluation Results
 - C. Risk Assessment Methods

Source: *Guidance For Conducting Remedial Investigations and Feasibility Studies Under CERCLA, OSWER Directive 9355.3-01*, U. S. Environmental Protection Agency, October 1988.

Table 5-1: Recommended Remedial Investigation Report Format

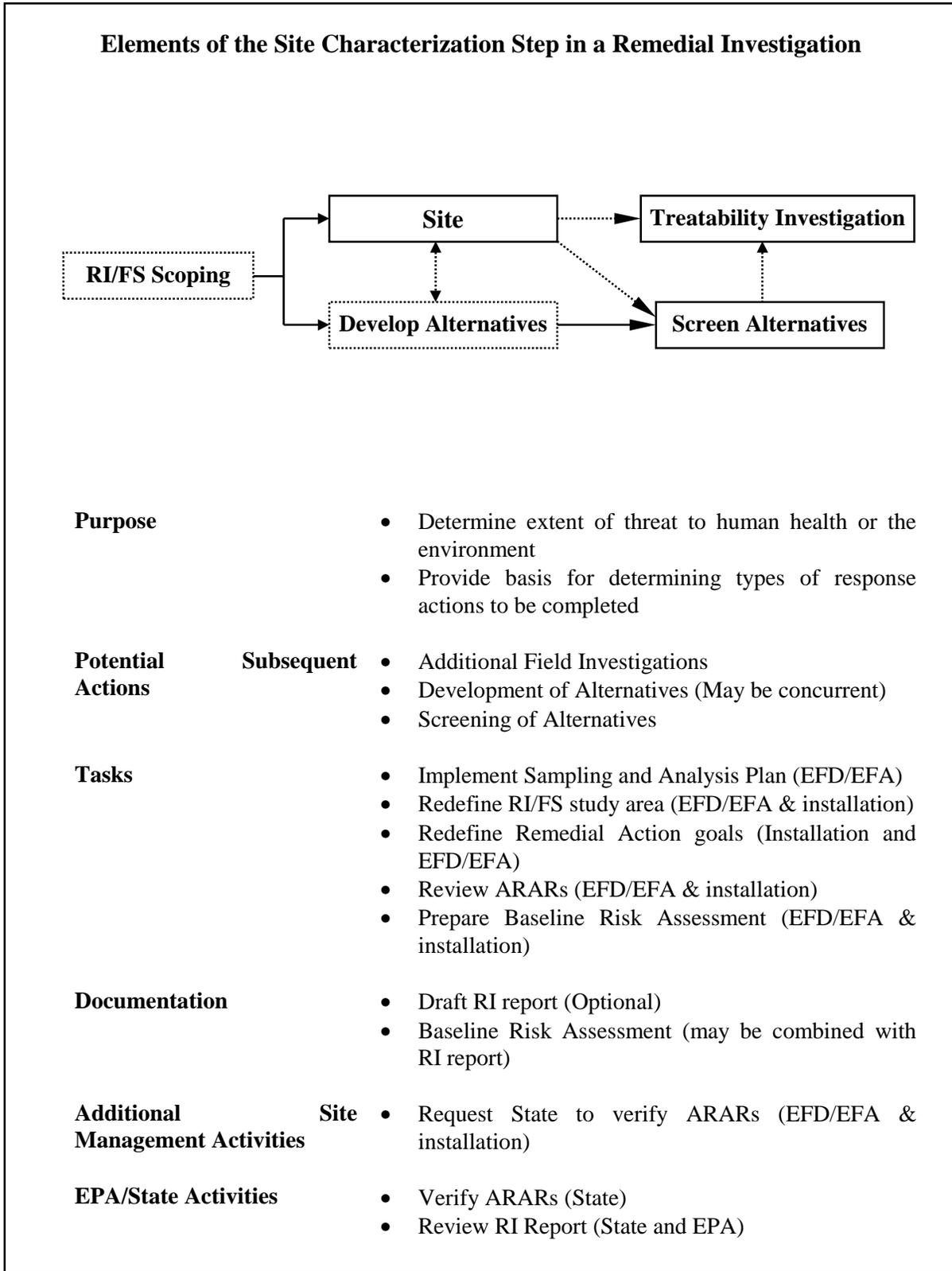


Figure 5-4: Elements of the Site Characterization Step in a Remedial Investigation

Flow Diagram for Site Characterization

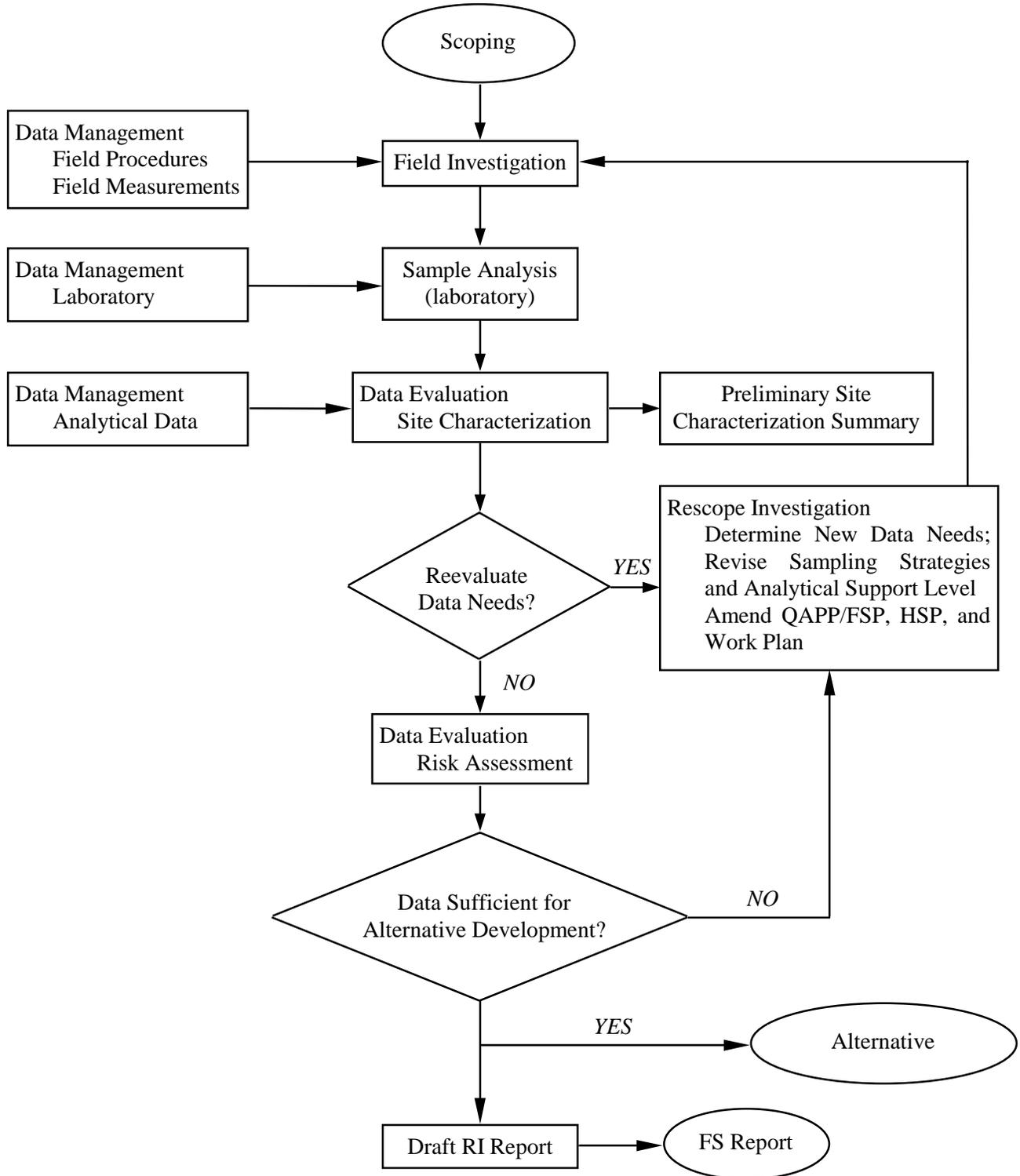


Figure 5-5: Flow Diagram for Site Characterization

direction of flow is obvious, samples up and down stream of the site must be taken close in time to be comparable.

Samples to establish background concentrations in air must be taken very close in time because air can move rapidly. Sampling locations at the perimeter of a site may be sufficient to establish background levels. After background concentrations are established, they are used to evaluate whether contamination exists in environmental samples. Ideally, background concentrations are expressed as ranges so sampling and analysis variability will not be significant in determining if environmental samples have elevated concentrations of contaminants.

Cleanup goals should not be lower than background levels.

Background concentrations are also established to provide critical input to the development of conceptual site models and to determine the affect a site has had on the chemical quality of different media such as groundwater, surface water, or soil. These effects must be determined before defensible estimates of risk posed by the site can be assessed.

5.7 Human Health Risk Assessment

A human health risk assessment is an integral part of the RI/FS process. It supplies a framework for developing the risk information necessary for decision-making at remedial sites. A human health risk assessment provides:

- Analysis of baseline risks and determines the need for action at sites;
- A basis for determining levels of chemicals that can remain in the

environment and still protect human health;

- A basis for comparing potential health impacts of different remedial alternatives; and
- A consistent process for evaluating and documenting public health threats at sites.

There are three basic parts to risk assessment:

- Baseline Risk Assessment - conducted during the Site Characterization; calculates the human health risk in the absence of any remedial action.
- Refinement of Preliminary Remediation Goals - conducted during the FS; calculates the amount of contamination that can be left on site and still be protective of human health; establishes the remedial action objectives.
- Remedial Alternative Risk Evaluation - evaluates which remedial action could offer the required degree of protection to human health.

The Naval Environmental Health Center at (757) 363-5555 is available to provide technical, medical-based review of human health risk assessment documents.

5.8 Baseline Risk Assessment

The Baseline Risk Assessment will be prepared as an integral part of the Site Characterization step in an RI/FS. Continuation of the RI/FS is contingent upon findings in the Baseline Risk Assessment.

Baseline Risk Assessments evaluate the potential threat to human health and the environment in the absence of any remedial action. The information developed in the

Baseline Risk Assessment provides the basis to:

- Determine whether or not additional remedial action is necessary at the site;
- Develop and evaluate remedial action alternatives;
- Justify the performance of a remedial action;
- Satisfy the NCP requirement to complete a detailed analysis of the “no further action” alternative, including potential public health impacts;
- Focus on the contamination problem associated with the site; and
- Document the site’s baseline risk and the primary causes of that risk.

The Baseline Risk Assessment Process can be divided into the following four components: 1) Identification of Contaminants through data collection and evaluation, 2) Exposure Assessment, 3) Toxicity Assessment, and 4) Risk Characterization. Figure 5-6 shows the relationships between these components

Contaminant Identification

The objectives of the Contaminant Identification component is to screen the information that is available on hazardous substances or wastes present at the site and to identify contaminants of concern in order to focus subsequent efforts in the risk assessment process. Indicator chemicals representing the most toxic, mobile, and/or persistent substances among those identified at the site or that have the best available information are selected, if needed. Indicator chemical selection may not be necessary if less than 10 to 15 chemicals are identified at

the site. All of the chemicals at the site are evaluated in such situations.

Exposure Assessment

The objectives of an Exposure Assessment are to identify actual or potential exposure pathways, to characterize the potentially exposed populations, and to estimate exposure levels. At sites where contamination has reached a human exposure point, actual site monitoring data collected during the RI may be used in the evaluation. At sites where contamination has not yet reached a human exposure point, it will be necessary to estimate how and when such exposure will take place. Chemical fate and transport equations and models may be useful tools for identifying potential pathways and predicting exposures. A combination of site monitoring data and environmental modeling results will be required to estimate chemical concentrations at exposure points at most sites.

Detailed guidance on conducting Exposure Assessments is available in the *Superfund Exposure Assessment Manual* (EPA, April 1988). Additional guidance can be found in the *Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, October 1988) and *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual* (EPA, December 1989).

Toxicity Assessment

The objective of a Toxicity Assessment is to compare acceptable levels of contamination with actual levels identified during the Exposure Assessment. Acceptable contaminant concentration levels should be based on concentration levels which would attain reference doses for noncarcinogens and

Flow Diagram for Baseline Risk Assessment

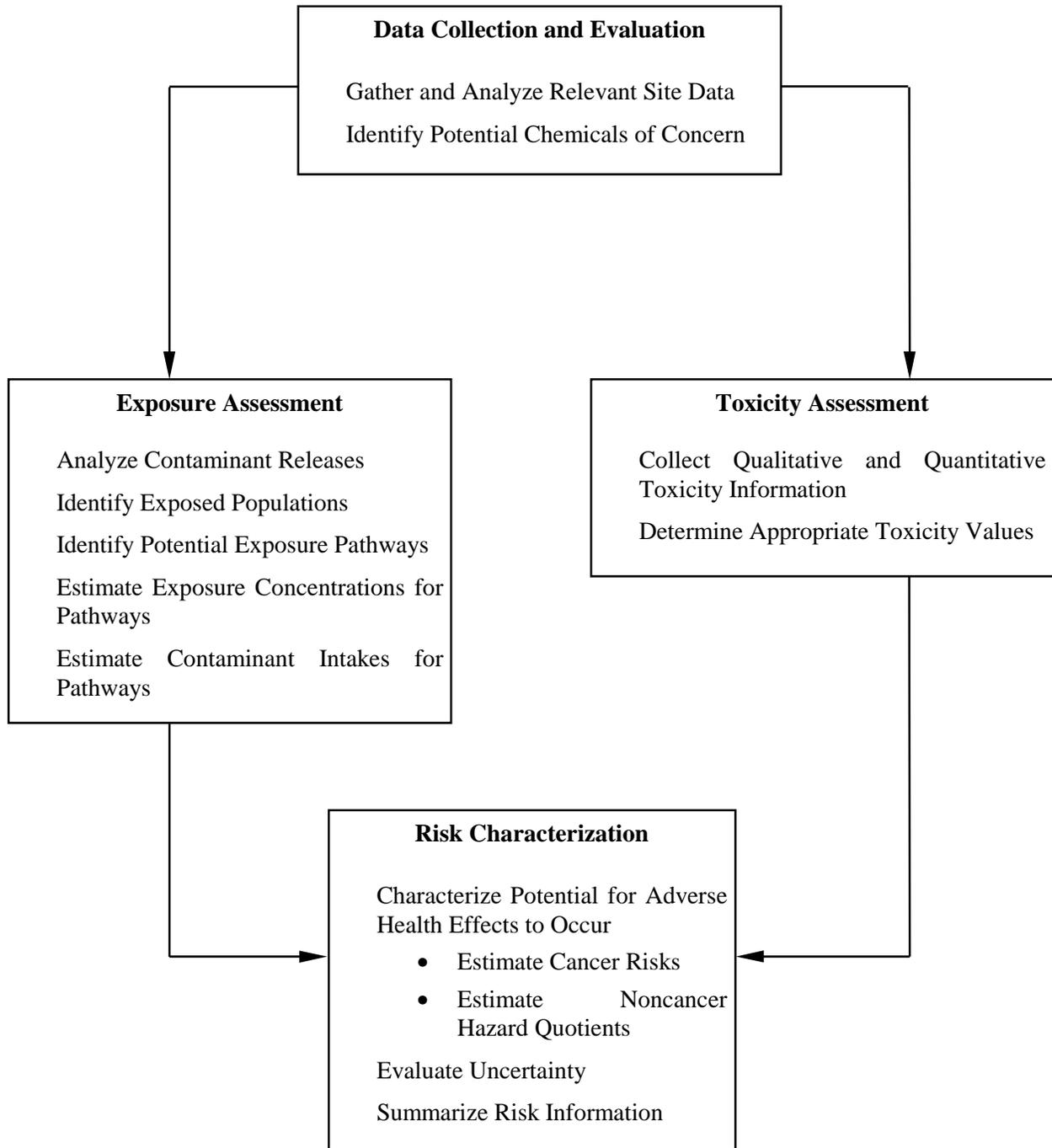


Figure 5-6: Flow Diagram for Baseline Risk Assessment

potency factors for carcinogens. Additional guidance for employing reference doses and potency factors and for determining toxicity descriptions for substances without reference doses or potency factors is contained in the *Superfund Public Health Evaluation Manual* (EPA, October 1986) and *Toxicology Handbook: Principles Related to Hazardous Waste Site Investigations* (EPA, 1985).

Risk Characterization

The Risk Characterization step is the final component of the Baseline Risk Assessment process. It is the process to estimate the potential of an adverse health or environmental effect derived in the Exposure Assessment. The objective of the Risk Characterization is to characterize the potential or actual carcinogenic, noncarcinogenic, environmental, mutagenic, and teratogenic risks identified from the integrated information developed during the Exposure and Toxicity Assessments. The Risk Characterization also includes major assumptions, scientific opinions, and uncertainty estimates. The Risk Characterization process serves as a key step in the ultimate site decision-making procedure and also serves as the bridge between risk assessment and risk management.

As stated in 40 CFR 300.430(e)(2)(I)(A)(2), the excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} is acceptable for known or suspected carcinogens. For regulatory purposes, the 10^{-6} risk level will be used as the point of departure for determining remediation goals for alternatives when ARARs are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure. For non-carcinogens, EPA has established for regulatory purposes that, when

the total hazard index for an exposed individual or group of individuals exceeds 1, there may be concern for potential non-cancer effects, such as respiratory illnesses.

The risk assessment must also include an uncertainty analysis to place the risk in proper perspective and to identify areas where additional data may improve the basis for remedial selection. EPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual*, (1989) contains guidance on conducting risk assessments.

Biological and ecological impacts must also be considered in the Baseline Risk Assessment. Flora and fauna in and around the site must be identified and included in the assessment process. Particular emphasis should be placed on identifying sensitive environments especially regarding endangered species and their habitats. Species that have key ecological functions in particular ecosystems such as primary or secondary producers, decomposers, scavengers, predators, or species that occupy key positions in the food chains of humans or other species are of prime importance. Bioaccumulation by food chain organisms such as aquatic invertebrates and fish may be particularly important to both environmental risk and human health risk assessment.

The results of the Baseline Risk Assessment may indicate that the site does not pose an actual or potential threat to human health or the environment. In these cases, the RI/FS will be terminated, and the "no further action" decision will be documented.

5.9 Ecological Risk Assessment

The NCP calls for the identification and mitigation of the environmental impacts such as toxicity, bioaccumulation, death,

reproductive impairment, growth impairment, and loss of critical habitat; and for the selection of remedial actions to protect organisms, populations, communities, and ecosystems.

Ecological Risk Assessment is a process that evaluates the likelihood that adverse ecological effects are occurring or may occur as a result of exposure to one or more stressors. As defined by EPA, a stressor is any physical, chemical, or biological entity that can induce an adverse ecological response. Adverse responses can range from sublethal chronic effects in an individual organism to a loss of an ecosystem function. Ecological Risk Assessment refers to a qualitative and/or quantitative appraisal of the actual or potential impacts of a hazardous waste site on plants and animals other than humans and domesticated species. A risk does not exist unless the following occurs:

- The stressor has the ability to cause one or more adverse effects; and
- It co-occurs with or contacts an ecological component long enough and at a sufficient intensity to elicit the identified adverse effect.

EPA guidance provides that, substances designated under CERCLA as hazardous are usually the stressors of concern. A natural resource damage assessment may be conducted at any NPL site at the discretion of the Natural Resource Trustees. An Ecological Risk Assessment is a necessary step for a natural resource damage assessment because it establishes the causal link between site contaminants and specific adverse ecological effects necessary for a natural resource damage assessment. The goal of the Ecological Risk Assessment for a natural resource damage assessment is to provide the information necessary to assist RPMs in making informed decisions. The specific objectives of the process are:

- To identify and characterize the current and potential threats to the environment from a hazardous substance; and
- To establish cleanup levels that will protect those natural resources at risk.

Ecological risk assessments require additional factors not needed in a human health risk assessment, in particular the chemicals of concern for ecological risk may be different than those for human health; once indicator chemicals are chosen; then the species and when in the life cycle they will be observed for effects from the indicator chemicals must also be chosen. The procedures and techniques for determining concentrations, dosing, etc. is all experimental in practice, and emphasis must be placed on gaining natural resource trustee concurrence as well as from the regulatory agencies. In addition, due to the complexity of ecological concerns, costs for a quantitative risk assessment is expensive.

It is recommended that an ecological risk assessment be approached in two (2) phases, qualitative and quantitative. At the end of the qualitative phase, evaluate the potential outcomes based on available information; if the recommended remediation will cause widespread damage to the ecological habitat, then a quantitative ecological risk assessment is not needed. If the recommended remediation will be beneficial to the habitat, a quantitative ecological risk assessment should be scoped focusing on the necessary criteria needed to confirm the remedial goal. For additional information on Ecological Risk Assessments, see the *Tri-Service Procedural Guidelines for Ecological Risk Assessment*.

5.10 Public Health Assessment

CERCLA established the Agency for Toxic Substances and Disease Registry (ATSDR). CERCLA, Section 104(j)(6)(a), requires the ATSDR to conduct Public Health Assessments (PHAs) for sites listed on the NPL. ATSDR may also perform PHAs under CERCLA, Section 104(j)(6)(b), for sites where individuals have been exposed to a hazardous substance for which the probable source of the exposure is a CERCLA release. In addition, ATSDR may perform PHAs for Non-NPL sites in accordance with CERCLA, Section 104(I). ATSDR also provides other functions such as health consultations, health education, and preparation of toxicological profiles. While the ATSDR is not a regulatory agency, its recommendations may be adopted by states and other regulatory agencies.

CERCLA stipulates that ATSDR and the Department of Defense (DoD) will enter into an agreement to conduct PHAs, health consultations, toxicological profiles, and other related activities. DoD has entered into a Memorandum of Understanding with ATSDR that delineates the responsibilities and procedures under which ATSDR and DoD will conduct PHAs and related activities. An annual plan of work, negotiated and signed by both ATSDR and DoD, projects ATSDR's activities for a given year. DoD is responsible for funding the activities specified in the Annual Plan of Work.

The purpose of a PHA is to assist in determining whether action to reduce human exposure to hazardous substances at a site should be taken and if additional information on human exposure and associated risks is needed. PHAs are complex evaluations based on SIs, RIs, environmental data, health outcome data, public health concerns, and other studies submitted to the ATSDR. The PHA will determine if a hazardous waste site has a past, present, or potential future adverse effect

on human health. Health consultations are focused assessments designed to answer specific public health concerns. PHAs and health consultations may lead to other ATSDR activities such as health studies and health education. The ATSDR will provide the Navy/Marine Corps with the results of the PHA and any recommendations for further action. Possible recommendations may include:

- Actions to reduce human exposure and mitigate the risks to human health by:
 - Use of alternate water supplies;
 - Relocation of affected individuals; and
 - Removal of hazardous substance(s).
- Epidemiological studies to determine the health effects on the population exposed to hazardous substances;
- Establishment of a registry of exposed persons and a tracking system for population migration; and
- Establishment of a health surveillance program.

ATSDR also provides toxicological profiles for hazardous substances found at DoD sites. These profiles may assist in evaluating human health impacts of contamination during the RI/FS. Toxicological profiles may be obtained by telephone at (404) 639-0700.

The Navy/Marine Corps interacts with ATSDR through the Navy Environmental Health Center (NAVENVIRHLTHCEN). EFD/EFAs will notify the NAVENVIRHLTHCEN regarding any site visit or other interactions with ATSDR. The NAVENVIRHLTHCEN is tasked with the following responsibilities:

- Serves as the Navy and Marine Corps ATSDR liaison;
- Provides Navy/Marine Corps input into the ATSDR Annual Plan of Work;
- Advises and assists with ATSDR activities at installations;
- Provides medical review and coordination of ATSDR documents and specific ATSDR requests;
- Assists installations in preparation for ATSDR site visits;
- Accompanies ATSDR during site visits;
- Assists in transferring data to ATSDR;
- Prepares and reviews responses to ATSDR requests;
- Directly interfaces with ATSDR public health assessor to discuss technical questions resulting from ATSDR documents;
- Provides education and training on ATSDR PHAs; and
- Provides consultation, oversight, coordination of Navy/Marine Corps-related ATSDR work such as toxicological profiles, pilot studies, health assessments, health advisories, epidemiological studies, disease registries, health surveillance studies, health consultations, case studies, emergency response, and health education.

5.11 Treatability Studies

Treatability studies are most often used to determine which remedial technique better addresses the chemicals of concern, and addresses matrix effects (e.g. clays), and chemical incompatibilities which may

preclude the use of some technologies (e.g. lead and incineration).

The Treatability Investigation is considered to be part of the RI, but it may be conducted at any time during the RI/FS phase. It is an optional step that determines information requirements for detailed analysis of alternative remedial technologies. The Treatability Investigation may also be conducted to further screen a potential alternative remedial technology as to its effectiveness to meet ARARs. It may include:

- The collection of additional field data; a SAP and a Site Health and Safety Plan should be prepared prior to collection of additional field data;
- Bench- and pilot-scale treatability testing; and
- Literature surveys for candidate control technologies.

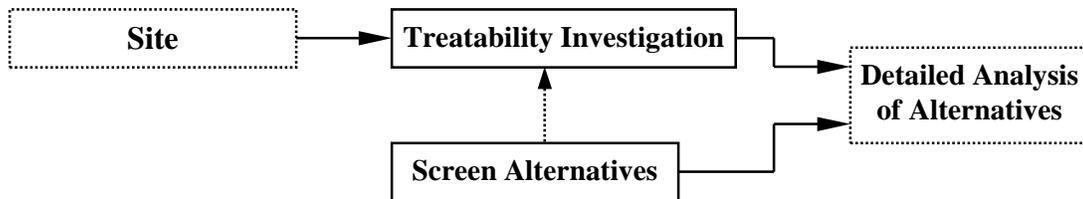
Figure 5-7 lists potential elements of the Treatability Investigation step.

5.12 Applicable or Relevant and Appropriate Requirements (ARARs)

ARARs are Federal and state (and sometimes local) laws and regulations that must be considered when choosing removal and remedial actions. Part of the RI/FS Scoping effort is to identify any preliminary Federal contaminant- and location-specific ARARs from available data and to define DQOs.

Under CERCLA, Section 121(d), an important consideration in the RI/FS process is the requirement that remedial actions comply with Federal ARARs and more stringent, issued state ARARs. EPA's *Interim*

Elements of the Treatability Investigation Step in a Remedial Investigation



Purpose		<ul style="list-style-type: none"> • Obtain data for detailed evaluation of alternatives
Potential Actions	Subsequent	<ul style="list-style-type: none"> • Detailed Analysis of Alternatives (EFD/EFA & installation)
Tasks		<ul style="list-style-type: none"> • Literature surveys on treatment technologies (EFD/EFA) • Bench- and pilot-scale Feasibility Tests (EFD/EFA) • Collect additional field data (EFD/EFA) • Include analysis/comparison of test results with ARARs
Documentation		<ul style="list-style-type: none"> • Remedial Investigation Report (EFD/EFA)

Figure 5-7: Elements of the Treatability Investigation Step in a Remedial Investigation

Guidance on Compliance with ARARs (9 July 87) defines ARARs as follows:

“A requirement under other environmental laws may be either ‘applicable’ or ‘relevant and appropriate’ to a remedial action, but not both. A two-tier test may be applied: first, to determine whether a given requirement is applicable; then, if it is not applicable, to determine whether it is nevertheless relevant and appropriate.”

Applicable Requirement

Applicable requirements are those cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations issued under Federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Applicability implies that the remedial action or the circumstances at the site satisfy all of the jurisdictional prerequisites of a requirement. For example, the minimum technology requirement for landfills under the Resource Conservation and Recovery Act (RCRA) would apply if a new hazardous waste landfill unit (or an expansion of an existing unit) was the selected remedy for a CERCLA site.

Relevant and Appropriate Requirement

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations issued under Federal or state law that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the

CERCLA site that their use is well suited to the particular site.

The relevance and appropriateness of a requirement can be judged by comparing a number of factors including the characteristics of the remedial action, the hazardous substances in question, or the physical circumstances of the site with those addressed in the requirement. For example, while RCRA regulations are not applicable to closing undisturbed hazardous waste in place, the RCRA regulation for closure by capping may be deemed relevant and appropriate. A requirement that is judged to be relevant and appropriate must be complied with to the same degree as if it were applicable. However, there is more discretion in this determination. It is possible for only part of a requirement to be considered relevant and appropriate with the rest being dismissed if judged not relevant and appropriate in a given case.

To-Be-Considered (TBC) Requirements

TBC requirements are non-issued advisories, e.g., reference doses or potency factors, criteria, and guidance issued by Federal and state governments. TBC requirements do not have the status of ARARs. However, Section 300.400(g)(3) of the NCP specifies that TBC requirements shall be identified as appropriate where ARARs do not exist or where ARARs have been determined to be insufficient to ensure protection of human health and the environment for a particular release. TBC requirements may be considered to determine the necessary level of cleanup for protection of health or the environment.

Types of ARARs

CERCLA response actions may have to meet several different types of requirements as shown by the classification of ARARs below:

Chemical-specific - Used to set health- or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. Examples include Maximum Contaminant Levels, 2) *Federal Water Quality Criteria*, 3) *National Ambient Air Quality Standards*, and 4) *RCRA Groundwater Protection Standards*.

These requirements may set protective cleanup levels for the chemicals of concern in the designated media or indicate an acceptable level of discharge, e.g., air emission or wastewater discharge, taking into account water quality standards, where chemical discharge occurs in a remedial activity. The more stringent ARAR should be complied with if the chemical has more than one such requirement. There are at present a limited number of actual ambient- or chemical-specific requirements. It may frequently be necessary to use chemical-specific advisory level TBC requirements such as Carcinogenic Potency Factors or Reference Doses in order to achieve remedies that are protective of health and the environment. While not actually ARARs, these chemical-specific advisory levels may factor significantly in establishing protective cleanup levels. Guidance for establishing such chemical-specific, health-based cleanup levels is found in the *Superfund Exposure Assessment Manual* (EPA 540/1-88/001, April 1988).

Performance, design or other action - specific requirements

Used to set controls or restrictions on particular kinds of activities for management of hazardous substances, pollutants, or contaminants. Examples would be: 1) RCRA regulations for closure of hazardous waste storage or disposal units, 2) RCRA incineration standards, and 3) Clean Water Act pretreatment standards for discharges to Publicly-Owned Treatment Works referenced in 40 CFR 403. These requirements are triggered not by the specific chemicals present at a site but by a particular remedial activity that is selected to accomplish a remedy. Since there are usually several alternative actions for any remedial site, very different requirements can come into play. These action-specific requirements may specify particular performance levels, actions, or technologies as well as specific levels (or methodology for setting specific levels) for discharged or residual chemicals.

Location specific - Used to set restrictions on activities depending on the characteristics of a site or its immediate environs. Examples may include: 1) Federal and state siting laws for hazardous waste facilities, and 2) sites on the *National Register of Historic Places*. These requirements function like action-specific requirements. Alternative remedial actions may be restricted or precluded depending on the location or characteristics of the site and the requirements that apply to it.

ARARs can only be identified on a site-specific basis. The RPM and the installation, to determine which ARARs are applicable, should consult local counsel or regulatory specialists. Every ARAR decision is a mixed technical/legal decision, and this is especially true when dealing with state ARARs. CERCLA, Section 121(d)(2)(A), states that

remedies must comply with “any issued standard, requirement, criteria, or limitation under a state environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria, or limitation.” The key to identifying state ARARs is to consider those which are 1) issued requirements of general applicability or 2) legally enforceable.

Administrative versus Substantive ARARs

Remedial actions conducted entirely on-site need only comply with the substantive aspects of ARARs and not the administrative aspects such as permitting (specifically exempted under CERCLA, Section 121(e)) or administrative reviews. Remedial actions which are not conducted entirely on-site must comply with substantive and administrative aspects including permitting. Administrative procedures are not considered ARARs but should be considered when planning and implementing remedial actions.

The RPM and installation should work closely with EPA and the states to ensure that each is notified of the requirements the others have determined to be ARARs and to ensure that appropriate ARARs are identified and considered at critical steps in the Remedial Action Process as outlined in Table 5-2. The EFD/EFA RPM, in consonance with the installation, should negotiate with EPA and the state to resolve any differences of opinion regarding Federal or state ARARs.

ARAR Waiver

A remedial action must meet all Federal and state ARARs upon completion unless one of the following waivers is found to be applicable under CERCLA, Section 121(d)(4)(A-F), or Section 300.430(f)(1)(ii)(C) of the NCP:

- The action selected is only part of a total remedial action that will meet the ARAR when completed;
- Compliance with the ARAR at the site will result in greater risk to human health and the environment than alternative options;
- Compliance with the ARAR is technically impractical from an engineering perspective;
- The remedial action selected will attain a standard of performance that is equivalent to that required under the otherwise applicable requirement through use of another method or approach; or
- For state ARARs, the state has not consistently applied (or demonstrated the intention to consistently apply) the ARAR in similar circumstances at other remedial actions within the state.

If an ARAR is waived for a proposed remedial action, CERCLA, Section 121(f)(3)(a), requires that, at least 30 days prior to the publication of the ROD, the Navy/Marine Corps must provide an opportunity for the state to concur or not concur with the proposed remedial action. If the state does not concur with the remedial action selected and desires to have the remedial action conform to the ARAR, the state may bring an action in the U. S. District Court within 30 days of notification to determine whether the remedial action selected is supported by substantial evidence.

Removals must, to the greatest extent practicable considering the emergency nature of the situation, attain Federal and state ARARs. In cases where the attainment of ARARs is not practicable, documentation

Navy/Marine Corps and State Roles in Identifying Compliance with ARARs

<u>STEP</u>	<u>Navy/Marine Corps</u>	<u>STATE</u>
RI/FS Scoping	Identify preliminary contaminant- and location-specific ARARs. Initiate communications to facilitate identification of state ARARs	State requested to provide preliminary contaminant- and location-specific ARARs within 30 days of receipt of request (NCP Section 300.515(g)(2)) or within the time period specified in the FFA (for NPL sites)
Site Characterization	Review Federal contaminant- and location-specific ARARs and TBC requirements	State requested to verify contaminant- and location-specific ARARs and TBC requirements
Screen Alternatives	Identify action-specific ARARs for each proposed alternative	State requested to identify action-specific ARARs for alternatives that passed through screening process within 30 days of request, or as specified in the FFA (for NPL sites)
Detailed Analysis of Alternatives	All ARARs and TBC requirements for each alternative are examined as a package to determine what is needed to comply with other laws and to be protective	State requested to certify identification of action-specific ARARs
Selection of Remedy	Selected alternative must be able to attain all Federal and state ARARs unless statutory waivers are invoked	
Remedial Design	Ensure that technical specifications of construction attain ARARs	State consulted to ensure that all identified ARARs are updated as needed

Table 5-2: Navy/Marine Corps and State Roles in Identifying Compliance with ARARs

must be produced that explains when the removal precludes the attainment of all ARARs.

Additional guidance to identify and comply with ARARs can be found in CERCLA, *Compliance with Other Laws Manual: Interim Final, Part I*, (EPA, August 1988) and *Part II* (EPA, August 1989).

5.13 Feasibility Study (FS)

The FS is an iterative process that is conducted concurrently and interacts closely with the RI. The primary focus of the FS is to ensure that the Navy/Marine Corps develops and evaluates appropriate remedial alternatives such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected. Development of alternatives must be fully integrated with the site characterization activities of the RI, and the combined RI/FS will lead to the selection of an optimal method for remediating the site. As the FS develops, additional data and field investigation requirements may be identified. Unexpected findings may require definition of new tasks outside the original scope of work.

The development and evaluation of alternatives must reflect the scope, characteristics, and complexity of the remedial action under consideration and the site problems being addressed. The overall objectives of the FS are to:

- Develop and evaluate potential remedies that permanently and significantly reduce the threat to public health, welfare, and the environment;
- Select a cost-effective remedial action alternative that mitigates the threat(s); and

- Achieve consensus among the Navy/Marine Corps, EPA, state, and local authorities regarding the selected response action and obtain the concurrence of EPA in the case of NPL sites.

The FS may begin during the Site Characterization, but the FS report will generally be separate from the RI report. It may be the case that for some Non-NPL work, Site Closeout may be accomplished at the end of RI thereby negating the need for an FS. Additionally, there are NPL sites where site closeout occurred at the end of the RI where the baseline risk assessment showed no further action was required, negating the need for a FS.

5.13.1 Alternative Development

The process of identifying, evaluating, and selecting the appropriate remedy begins with a review of control technologies and institutional controls that are appropriate to the site(s) and the threat it poses. A number of specific control technologies may ultimately be combined in the selected remedy depending on the number, spatial distribution, and complexity of sites in the RI/FS study area. Technologies that are not appropriate for use on any site in the RI/FS may be eliminated from further consideration. Appropriate technologies and institutional controls are then combined on a site-by-site basis to formulate complete, potentially protective alternatives for permanent remediation.

The set of alternatives being developed for evaluation must include a “no further action” alternative. Resources should not be expended on sites which pose little or no threat to humans or the environment. Also a “no further action” alternative may result from

location-specific ARARs, e.g., endangered species. Decisions to cease evaluating IR sites may be made:

- On the basis of a Baseline Risk Assessment if it is shown that the release poses no significant threat; or
- If during completion of the RI/FS the “no further action” alternative is the preferred alternative, considering all the criteria applicable to remedy selection, further action can be terminated.

Figure 5-8 lists the elements of the alternative development. Figure 5-9 shows, in a flow diagram, how these key elements are interrelated.

5.13.2 Alternative Screening

Alternatives identified in the first step of the FS may need to be screened using three broad criteria in order to select a reasonable number of alternatives for detailed analysis. The short- and long-term aspects of the following three criteria should be used to guide the development and screening of remedial alternatives as appropriate and to the extent sufficient information is available:

- Effectiveness in reducing the threat;
- Implementability; and
- Cost.

Effectiveness

This criterion focuses on the degree to which an alternative reduces toxicity, mobility, or volume through treatment; minimizes risks and affords long-term protection; complies with ARARs; minimizes short-term impacts; and how quickly the alternative achieves protection. Significantly less effective or less promising alternatives may be eliminated.

Alternatives that do not provide adequate protection of human health and the environment can also be eliminated from further consideration. Demonstrated ability of component technologies to achieve design goals should be addressed in evaluating the effectiveness criterion. Adverse environmental impacts that are predictable at this stage should also be considered in evaluating effectiveness. Calculations, assumptions, and references supporting these evaluations will be documented in the FS.

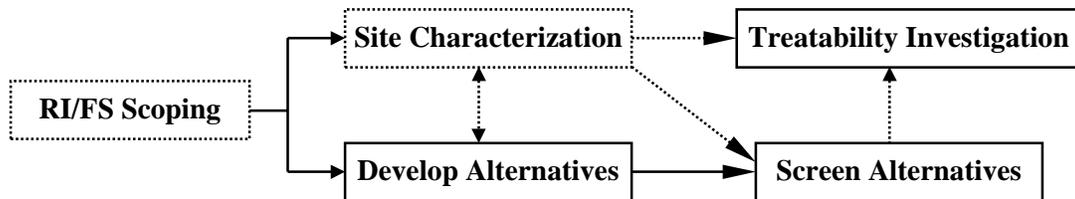
Implementability

This criterion focuses on the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative. Alternatives that are technically or administratively not feasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration. Factors such as constructability, expected opposition from the public, impact on the installation’s mission, compatibility with planned land uses, and availability of material, equipment, technical expertise, or off-site treatment and disposal facilities may be considered in evaluating implementability also.

Cost

The costs of construction and any long-term costs to operate and maintain the alternatives must be considered. Costs that are grossly excessive compared to the overall effectiveness of the alternative may be considered as a factor to eliminate the alternative. Alternatives providing effectiveness and implementability similar to another alternative but at a greater cost may

Elements of the Development of Alternatives in a Feasibility Study



Purpose		<ul style="list-style-type: none"> • Determine need for remedial action or operable units • Identify potential remedial action alternatives
Potential Actions	Subsequent	<ul style="list-style-type: none"> • Screen Alternatives
Tasks		<ul style="list-style-type: none"> • Identify potential treatment technologies (EFD/EFA & installation) • Identify containment/disposal requirements for residual or untreated wastes (EFD/EFA & installation) • Evaluate technologies (EFD/EFA & installation) • Assemble suitable technologies into alternative remedial actions (EFD/EFA & installation) • Identify action-specific ARARs (EFD/EFA & installation)

Figure 5-8: Elements of the Development of Alternatives in a Feasibility Study

Flow Diagram for the Development of Alternatives

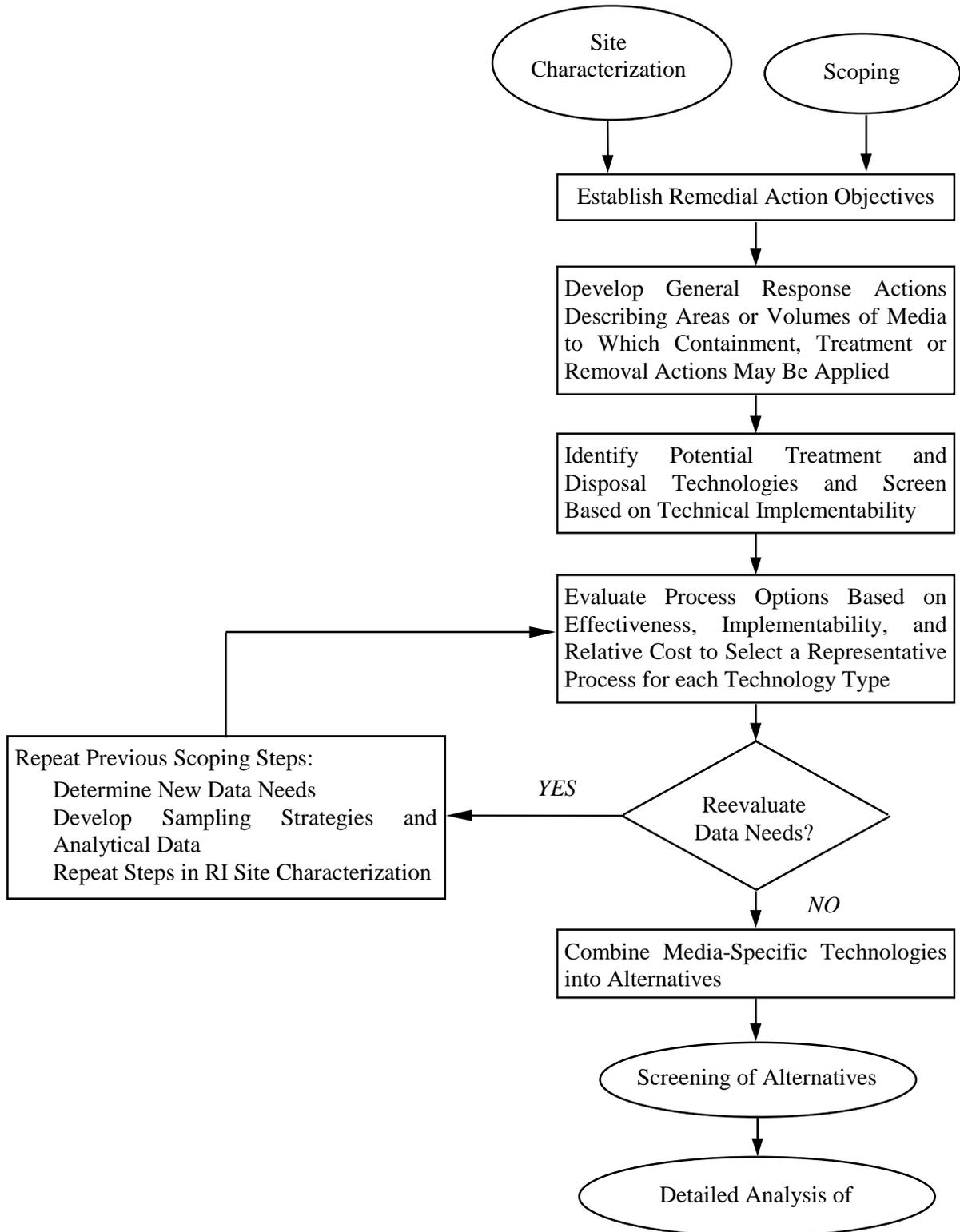


Figure 5-9: Flow Diagram for the Development of Alternatives

also be eliminated. At this stage, costs should be identified by order of magnitude (+50%, -30%) but should also include long-term operation and maintenance, as appropriate. Alternatives that offer significant advantages by one criterion should be retained for detailed analysis even if they are inferior by other criteria. Once a set of alternatives subject to detailed analysis is identified, they should be reviewed for applicable Federal location-specific or action-specific ARARs. Descriptions of the alternatives and ARARs should normally be transmitted to state regulatory agencies for identification of any state ARARs that may be more stringent. Permit applications often require considerable time and effort and should be identified as early as possible in the remedial process. The review of alternatives is required to determine if a permit is required and to initiate the appropriate action in a timely manner. This review will also determine whether any treatability investigation efforts are needed either to better define or cost an alternative or to provide information for predicting an alternative's effectiveness and environmental impacts. Figure 5-10 lists the elements of the Alternative Screening step.

5.13.3 Detailed Analysis of Alternatives and the Draft Feasibility Study.

Once a limited number of viable alternatives has been developed and ARARs have been identified, the alternatives are then evaluated against nine criteria as specified in 40 CFR 300.430 and listed in Table 5-3. State and local community acceptance may not be evaluated fully until the proposed plan is published and public review is completed during the Selection of Remedy step. The analysis of short-term effectiveness will include an evaluation of any impacts on the installation's mission.

Analysis of ARARs, long-term effectiveness and permanence, and the environmental impact component of short-term effectiveness will provide the evaluations required for compliance with the National Environmental Policy Act.

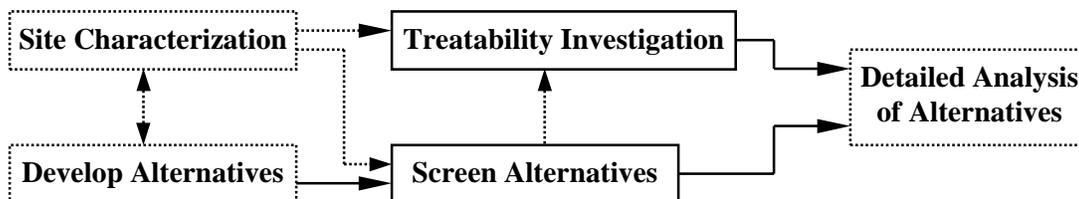
The Detailed Analysis of Alternatives will be presented in an FS or may be combined with the results of the RI in a combined RI/FS. Table 5-4 presents the recommended format for an FS. Figure 5-11 lists the elements of the Detailed Analysis of Alternative step. Figure 5-12 shows the relationship of key elements in a flow diagram.

5.13.4 Selection of Remedy, the Proposed Plan, and Decision Documents.

Selection of Remedy

The Selection of Remedy step begins with the EFD/EFA, the installation, the regulatory agencies, and the Restoration Advisory Board (RAB) identifying a preferred alternative from those alternatives evaluated in the FS. The preferred alternative will be based first on each alternative's ability to satisfy the threshold criteria as previously identified in Table 5-3 and then on trade-offs among alternatives considering the primary balancing criteria. Further, results of the risk assessment must be factored into the Selection of Remedy step. In the final component of the risk assessment process, a characterization of the potential risks of adverse health or environmental effects for each of the exposure scenarios derived in the exposure assessment is developed and summarized. The results of the RI and the Baseline Risk Assessment will serve as the primary means of supporting the selected remedy or documenting a "no further action" decision. Figure 5-13 lists elements of the Selection of Remedy step.

Elements of the Alternative Screening Step in a Feasibility Study



- | | | |
|---|-------------------|--|
| Purpose | | <ul style="list-style-type: none"> • Narrow list of potential remedial alternatives for detailed analysis |
| Potential Actions | Subsequent | <ul style="list-style-type: none"> • Field Investigations • Detailed Analysis of Alternatives |
| Tasks | | <ul style="list-style-type: none"> • Screen alternatives for: <ul style="list-style-type: none"> • Effectiveness (Installation and EFD/EFA) • Implementability • Cost |
| Additional Management Activities | Site | <ul style="list-style-type: none"> • Notify State of final alternatives for action/location-specific ARARs (Installation and EFD/EFA) |

Figure 5-10: Elements of the Alternative Screening Step in a Feasibility Study

Criteria for Evaluating and Comparing Alternatives Grouped by Their Roles in Selecting the Remedy

Threshold Criteria - Must be satisfied unless waived in accordance with 40 CFR 300.430(f)(1)(ii)(C)

- Overall protection of human health and the environment combines:

- Long-term effectiveness and permanence;
 - Short-term effectiveness;
 - Compliance with ARARs.
-

- Compliance with ARARs categorized as:

- Contaminant-specific;
 - Location-specific;
 - Action-specific;
 - Other criteria advisories and guidance.
-

Primary Balancing Criteria - Form basis for comparison

- Long-term effectiveness and permanence based on:

- Residual risk from untreated waste or treatment residuals remaining after remediation;
 - Adequacy and reliability including reliance on land-disposal, potential need to replace, and risks posed should components need replacement.
-

- Reduction of toxicity, mobility, or volume through treatment considering:

- Processes used;
 - Amount of hazardous substances, pollutants, or contaminants that are destroyed, treated, or recycled;
 - Degrees of reduction in toxicity, in mobility, and in volume;
 - Irreversibility of treatment;
 - Type, quantity, persistence, toxicity, mobility, and propensity to bioaccumulate of remaining hazardous substances;
 - Reduction in principal threats at the site.
-

- Short-term effectiveness including:

- Community impacts during implementation;
 - Impact on workers and the effectiveness and reliability of protective measures;
 - Environmental impacts during implementation and the effectiveness and reliability of mitigating measures;
 - Time until protection is achieved.
-

**Table 5-3: Criteria for Evaluating and Comparing Alternatives
Grouped by Their Roles in Selecting the Remedy**

-
- Implementability including:
 - Technical feasibility to include technical difficulties and unknowns in construction and operation, reliability, ease of replacement or augmentation, and ability to monitor effectiveness;
 - Administrative feasibility including need to coordinate with other agencies and ability and time required for permits and approvals;
 - Availability of services, materials, equipment, and specialists.

 - Cost including:
 - Capital, both direct and indirect;
 - Annual operation and maintenance;
 - Net present value.

Modifying Criteria - Considered in remedy selection

- State acceptance including:
 - Preference for and concerns with alternatives;
 - Comments on ARARs and proposed use of waivers.

- Community Acceptance

**Table 5-3: Criteria for Evaluating and Comparing Alternatives
Grouped by Their Roles in Selecting the Remedy**

Recommended Feasibility Study Report Format

Executive Summary

1. Introduction
 - 1.1 Purpose and Organization of Report
 - 1.2 Background Information (Summarized from RI Report)
 - 1.2.1 Site Description
 - 1.2.2 Site History
 - 1.2.3 Nature and Extent of Contamination
 - 1.2.4 Contaminant Fate and Transport
 - 1.2.5 Baseline Risk Assessment

2. Identification and Screening of Technologies
 - 2.1 Introduction
 - 2.2 Remedial Action Objectives - Presents the development of remedial action objectives for each medium of interest (i.e., groundwater, soil, surface water, air, etc.). For each medium, the following should be discussed:
 - 2.2.1 Contaminants of interest;
 - 2.2.2 Allowable exposure based on risk assessment (including ARARs);
 - 2.2.3 Development of remediation goals.
 - 2.3 General Response Actions - For each medium of interest, describes the estimation of areas or volumes to which treatment, containment, or exposure technologies may be applied.
 - 2.4 Identification and Screening of Technology Types and Process Options - For each medium of interest, describes:
 - 2.4.1 Identification and Screening of Technologies
 - 2.4.2 Evaluation of Technologies and Selection of Representative Technologies

3. Development and Screening of Alternative
 - 3.1 Development of Alternatives - Describes rationale for combination of technologies/media into alternatives. Note: This discussion may be by medium or for the site as a whole.
 - 3.2 Screening of Alternatives (if conducted)
 - 3.2.1 Introduction
 - 3.2.2 Alternative 1
 - 3.2.2.1 Description
 - 3.2.2.2 Evaluation
 - 3.2.3 Alternative 2
 - 3.2.3.1 Description
 - 3.2.3.2 Evaluation
 - 3.2.4 Alternative 3

Table 5-4: Recommended Feasibility Study Report Format

- 4. Detailed Analysis of Alternatives
 - 4.1 Introduction
 - 4.2 Individual Analysis of Alternatives
 - 4.2.1 Alternative 1
 - 4.2.1.1 Description
 - 4.2.1.2 Assessment
 - 4.2.2 Alternative 2
 - 4.2.2.1 Description
 - 4.2.2.2 Assessment
 - 4.2.3 Alternative 3
 - 4.3 Comparative Analysis

Bibliography
Appendices

Table 5-4: Recommended Feasibility Study Report Format

Elements of the Detailed Analysis of Alternatives Step in a Feasibility Study



- | | | | |
|---|---|-------------|--|
| Purpose | <ul style="list-style-type: none"> • Describe, evaluate, and compare alternatives • Selection of Remedy | | |
| Tasks | <ul style="list-style-type: none"> • Describe alternatives in sufficient detail for analysis (EFD/EFA & installation) • Evaluate and compare alternatives (EFD/EFA & installation) according to: <ul style="list-style-type: none"> • Overall protection of human health and the environment • Compliance with ARARs • Long-term effectiveness and permanence • Reduction of toxicity, mobility, or volume through treatment • Short-term effectiveness • Implementability • Cost • State acceptance • Community acceptance | | |
| Documentation | <ul style="list-style-type: none"> • Feasibility Study or RI/FS | | |
| Additional Management Activities | <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;">Site</td> <td> <ul style="list-style-type: none"> • Request State certify identification of ARARs (Installation and EFD/EFA) </td> </tr> </table> | Site | <ul style="list-style-type: none"> • Request State certify identification of ARARs (Installation and EFD/EFA) |
| Site | <ul style="list-style-type: none"> • Request State certify identification of ARARs (Installation and EFD/EFA) | | |
| EPA/State Activities | <ul style="list-style-type: none"> • Review Feasibility Study (State and EPA) • Certify identification of ARARs (State) | | |

Figure 5-11: Elements of the Detailed Analysis of Alternatives Step in a Feasibility Study

Flow Diagram for Detailed Analysis of Alternatives

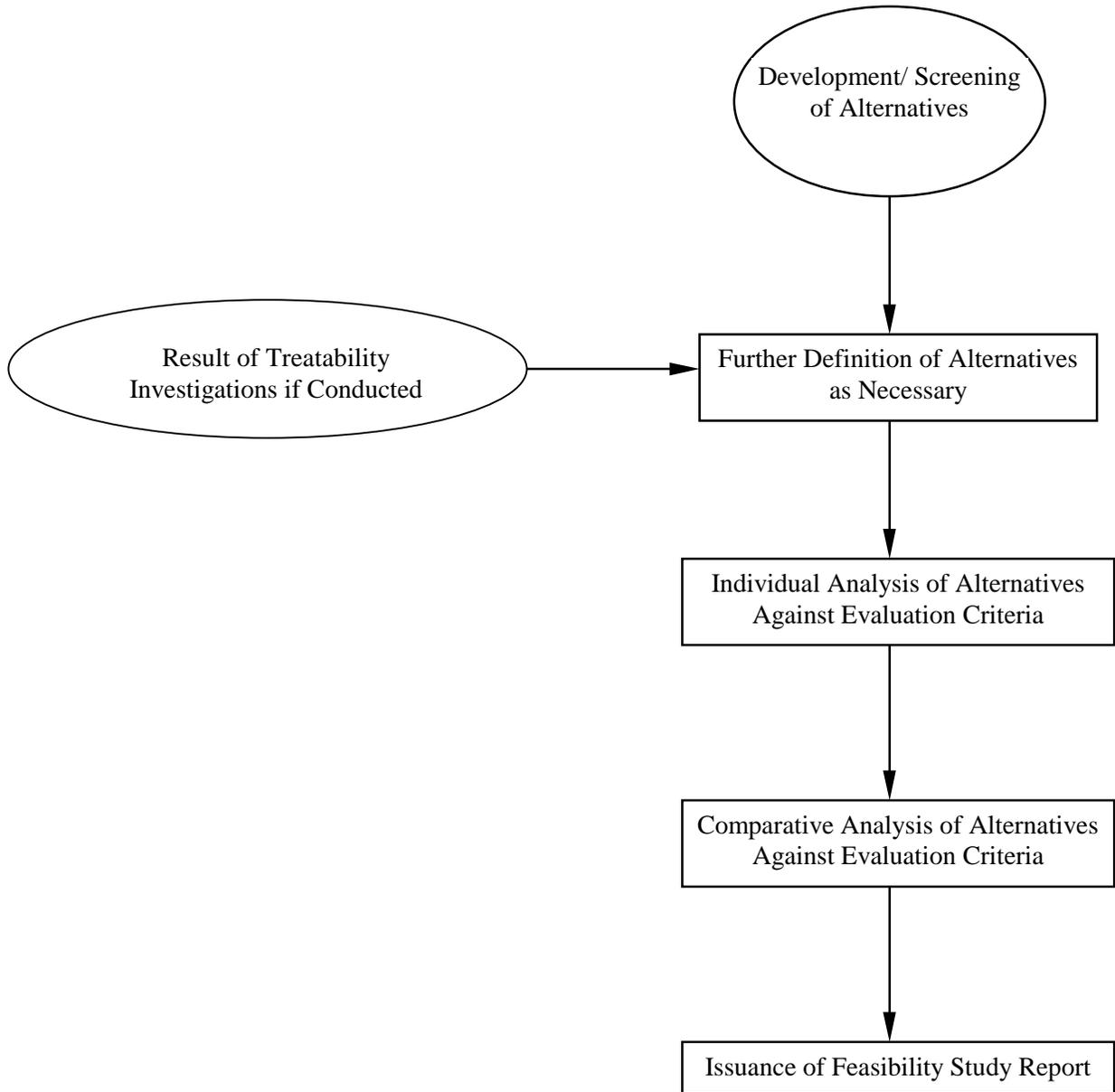
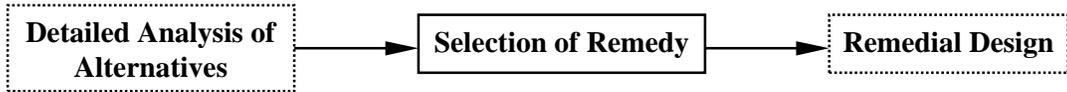


Figure 5-12: Flow Diagram for Detailed Analysis of Alternatives

Elements of the Selection of Remedy Step



- | | | |
|---|-------------------|--|
| Purpose | | <ul style="list-style-type: none"> • Select remedial action |
| Potential Actions | Subsequent | <ul style="list-style-type: none"> • No Further Action • Monitoring • Removal • Operable Units |
| Tasks | | <ul style="list-style-type: none"> • Select remedial action |
| Documentation | | <ul style="list-style-type: none"> • Proposed Plan • Notice of Proposed Plan availability • Public meeting transcript • Record of Decision or Decision Document including responses to comments on Proposed Plan • Notice of ROD availability |
| Additional Management Activities | Site | <ul style="list-style-type: none"> • Public meeting on Proposed Plan |
| EPA/State Activities | | <ul style="list-style-type: none"> • Review Proposed Plan • Participate in public meeting, if appropriate |

Figure 5-13: Elements of the Selection of Remedy Step

Proposed Plan

With the involvement of the regulatory agencies [see 40 CFR 300.430(f)(2)] and the

installation, the Navy/Marine Corps, as lead agency, prepares the Proposed Plan which discusses the preferred alternative for remediating the site. The Proposed Plan also briefly describes other alternatives that were considered and summarizes the information relied upon to select the preferred alternative. If waivers to ARARs are required, an explanation of the basis for the waiver should be included. Any formal state comments on ARARs or alternative selection should also be summarized in the Proposed Plan.

The Navy/Marine Corps will make the Proposed Plan available to the public; however, the FS usually is not sent to the public as it is a large document and too costly to mail. The Navy/Marine Corps will make the FS available at repositories open to the public.

For NPL sites, the Navy/Marine Corps will hold a public meeting on the proposed plan during the comment period if there is sufficient interest as expressed by the regulatory agencies, the RAB or other stakeholders.

5.14 Completion of Planning and Investigation

The Navy/Marine Corps formalizes the selection of the site remediation alternative discussed in the Proposed Plan in a written document. Listed below are the three types of Navy/Marine Corps formalized decision documents:

- Decision Document (DDs) - For non-NPL sites, it contains the official statement of remedial action(s) required for a site and demonstrates that the response action chosen is consistent with, and meets the requirements of, CERCLA and the NCP. The DD must be signed before initiation

of Remedial Action (RA). The Decision Document is similar to a Record of Decision for a NPL site.

- Record of Decision (ROD) - For NPL sites, it describes the remedy selection process and the remedy method selected; the official term used by CERCLA and the NCP for the documentation of a final remedial response action decision at an NPL site. To be consistent with the NCP, the selected remedy must be protective of human health and the environment, attain all ARARs for that site, be cost-effective, and use permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The ROD must be signed before initiation of RA.
- Action Memorandum - For Removal Action to be accomplished at NPL and non-NPL sites. For an Interim Removal Action - specifies what threat is being addressed and how long the action will remain effective; should also state what type of f may be conducted and how the removal action contributes to the implementation of the final action. For a Final Removal Action - specifies the performance standards or cleanup levels to be reached by the action.

All DD, RODs and Action Memorandums will be signed by the installation Commanding Officer/ Commanding General (CO/CG). Examples of these documents have been prepared by EFDs/EFAs. Interested parties should consult with the local RPM for a sample DD, ROD or Action Memorandum, if needed.

5.14.1 Decision Document (DD), Record of Decision (ROD) and Action Memorandum

The cognizant EFD/EFA shall prepare a DD/ROD at the conclusion of a RI/FS and provide the DD/ROD and a recommendation of action to the installation CO/CG with a copy to the major claimants. If the CO/CG disagrees or has questions on the DD/ROD they shall present the issues to the cognizant EFD/EFA and major claimant for discussion and resolution.

To support the selection of a remedial action at a site, all facts and site-specific policy determinations considered in the course of accomplishing actions specified in this chapter will be documented, as appropriate, in the DD/ROD. This documentation should be at a level of detail appropriate to the site situation and should be included in the administrative record. The documentation contained in the DD/ROD should explain evaluation criteria used to select a site-specific remedy in the FS stage (if appropriate).

The DD/ROD describes the following requirements related to the scope and objectives of the action:

- How the selected remedy is protective of human health and the environment and how the remedy eliminates, reduces, or controls exposures to human and environmental receptors;
- Attainment by the site of Federal and state ARARs;
- ARARs or other Federal and state laws that the remedy will not meet; any waivers invoked and the justification for invoking the waiver;
- How the remedy is cost-effective, i.e., provides overall effectiveness proportional to its cost;

- How the remedy uses permanent solutions, alternative treatment solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and
- Whether the preference for remedies using treatment which permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants as a principal element is, or is not, satisfied by the selected remedy. If this preference is not satisfied, the DD/ROD must explain why a remedial action involving such reductions in toxicity, mobility, or volume was not selected.

The DD/ROD also:

- Indicates, as appropriate, the remediation goals that the remedy is expected to achieve as discussed in the FS; performance measurements for groundwater, surface water, soils, air, and other affected environmental media should be identified as well as performance measurements for treatment processes and engineering controls;
- Addresses significant changes and the response to comments received during review of the FS;
- Describes whether hazardous substances, pollutants, or contaminants will remain at the site such that a review at least every five years would be required; and
- Provides, when appropriate, a commitment for further analysis and selection of long-term response measures within an appropriate time frame.

The Action Memorandum supporting a Removal Action contains the appropriate information previously described for

DDs/RODs. For non-time critical removal actions and, as appropriate, for time critical removal actions, the EFD/EFA makes available to the CO/CG an Engineering Evaluation/Cost Analysis which supports the proposed Removal Action (see section 3.2).

At the time of presentation of the DD, ROD or Action Memorandum for signature, the EFD/EFA makes the administrative record available for review. If the Commanding Officer/ Commanding General accepts the DD/ROD or Action Memorandum, they sign it. If there is any disagreement or questions concerning the ROD, further discussion and resolution by the EFD/EFA will be necessary. For NPL sites, the EFD/EFA forwards the ROD to the EPA regional office for concurrence. If EPA disagrees with the Navy/Marine Corps' selection of the remedial action negotiations on any disputed remedy selection between the Navy/Marine Corps and the EPA are required, EPA will then select the remedy. The Navy/Marine Corps, however, will have final decision authority for Non-NPL sites. A notice of the decision and the availability of the DD/ROD should be publicized in accordance with public participation guidance (see Chapter 10).

For additional information on preparation of Proposed Plans, Decision Documents, and Records of Decision, see EPA *Guidance on Preparing Superfund Decision Documents* (EPA, June 1989).

5.15 Negotiated Legal Agreements

The Defense Planning Guidance signed on 9 May 1994 by the Secretary of Defense states that "Components will ensure continued protection of human health and the

environment and will comply with legally enforceable agreements and orders."

Negotiated legal agreements include requirements that have been agreed to by the Navy/Marine Corps and a regulatory authority and have an established procedure for specifying deadlines for actions to be accomplished. Legal agreements also include unilateral court orders with enforceable deadlines. Legal agreements are a subset of "legal requirements" which are defined as any action or project eligible for Environmental Restoration, Navy (ER, N) funding that has a legal basis for the requirement. In a broader sense, legal requirements are all applicable Federal, state, interstate, and local statutory and regulatory requirements, both substantive and procedural. They also include requirements contained in statutory mandated or authorized documents such as permits, judicial or consent decrees, compliance orders, or cleanup agreements.

The provisions of negotiated legal agreements are both a factor in setting project execution priorities through risk management and a tool for formalizing Navy/Marine Corps commitments. The Navy/Marine Corps supports the use of negotiated legal agreements as a way of setting project milestones. However, new negotiated legal agreements must reflect Relative Risk Site Evaluations and Navy/Marine Corps Environmental Restoration funding controls. In effect, enforceable milestones in negotiated legal agreements must fit within budget and future years defense plan controls. All new negotiated legal agreements will include provisions for "rolling milestones" established in the light of relative risk and budget considerations. Rolling milestones link specific cleanup actions to the availability of funds in a given budget year and should be displayed in a Site Management Plan and not

in the body of the agreement. Existing negotiated legal agreements may require review with regulatory agencies and, if legally possible, may need to be amended to reflect funding controls and risk management factors.

5.15.1 Interagency Agreement (IAG)

CERCLA, Section 120(e), requires EPA to review the results of the RI/FS for any installation listed on the NPL. The EPA must enter into an Interagency Agreement (IAG) with the Navy/Marine Corps for the expeditious completion of all necessary remedial action at the facility within 180 days after EPA's review of the RI/FS. EPA's review of the RI/FS is not completed until issuance of the ROD.

The Navy/Marine Corps's policy is to negotiate and sign Federal Facility Agreements (FFAs) with EPA and the state, where possible, as soon as possible after EPA lists the installation on the NPL. The FFA is a pre-ROD type of IAG and becomes an IAG for a specific operable unit upon completion of the ROD for that operable unit and the identification of the selected remedial alternative. The FFA forms the basis for the IAG and, in most instances, will identify several separate sites which can be grouped into operable units. The FFA then becomes the IAG for each specific operable unit upon completion of the corresponding ROD and IAG requirements for each operable unit and the selection of the remedial alternative. As additional sites and operable units reach the ROD completion, no further action is required except to notify the public pursuant to CERCLA, Section 117, and the terms of the FFA. At no time during the process of transforming the FFA to the IAG will additional negotiation or signature be required by the Navy/Marine Corps, EPA, or the state. Although the FFA/IAG document will always

be available for public review, no additional public comment on that document is required when an operable unit reaches the ROD stage. The purposes of the IAG are as follows:

- Ensure that environmental impacts associated with past and present site activities are thoroughly investigated and that appropriate remedial action is taken as needed to protect public health, welfare, and the environment;
- Establish a procedural framework and schedule for developing, implementing, and monitoring response actions in accordance with CERCLA, the NCP, EPA policy and guidance, RCRA, and applicable state laws; and
- Facilitate cooperative exchange of information and participation of the Navy/Marine Corps, EPA, and appropriate state agencies in such actions.

5.15.2 Federal Facility Agreements (FFA) and Site Remediation Agreements

The FFA is a negotiated legal agreement governing the CERCLA and RCRA administrative process for cleanup at NPL sites. The provisions of these agreements are both a factor in setting project execution priorities through risk management, and a tool for formalizing our commitments so that selection of remedial action will be less adversarial. DON continues to support the use of negotiated legal agreements as a way of setting project milestones unless it is not advantageous to the Navy/Marine Corps.

FFAs outline the working relationship between the states, EPA, and the Navy/Marine Corps and clearly define mutual obligations.

The FFA has the following purposes:

- To ensure that the Navy/Marine Corps thoroughly investigates environmental impacts associated with past and present activities at the site and takes appropriate remedial action as necessary to protect public health, welfare, and the environment;
- To establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the site in accordance with CERCLA, the NCP, EPA guidance and policy, RCRA, and applicable state laws; and
- To facilitate cooperation, exchange of information, and participation of the Navy/Marine Corps, EPA, and appropriate state agencies in such actions and outline the working relationship between the parties, especially in terms of review processes and dispute resolution.

Figure 5-14 contains a brief synopsis of this document.

Concerning state remediation agreements, the Navy/Marine Corps' policy is to comply with all state laws which are consistent with CERCLA and the NCP. For states with mini-Superfund laws, it may be advantageous for the Navy/Marine Corps to negotiate a legal agreement with the state to define the responsibilities of each party to the cleanup of Non-NPL installations. The Federal Facility Site Remediation Agreement is an example of such a two-party agreement.

The following procedures are to be observed when negotiating FFAs and state remediation agreements:

- The Navy/Marine Corps will enter into agreements only if the provisions are realistically attainable and structured to

avoid excessive reporting, duplication of effort, and other administrative practices that reduce efficiency of the overall remedial response;

- Negotiations on an agreement should in no way impede the Navy/Marine Corps' responsibility to protect the public from harmful exposures. The agreement should also not halt efforts to obtain remedial action decisions addressing its sites;
- The Navy/Marine Corps will consult fully with EPA and the states regarding continuing IR efforts while negotiating the terms of the FFA;
- NAVFACENGCOM will negotiate the agreements on behalf of and in close coordination with the installation. Proposed agreements will be coordinated with the CNO/CMC and ASN(I&E);
- The agreements will be signed by the ASN (I&E). Final agreements will be forwarded to ASN(I&E) via the chain of command; and
- FFAs will become IAGs when the statutory requirements are incorporated after the ROD.

Existing negotiated legal agreements should be revisited with regulatory agencies and, if legally possible, amended to reflect funding

Federal Facility Agreement (FFA)

Purpose	<ul style="list-style-type: none">• For NPL sites, establish and document concurrence with EPA on remedy (not required for Non-NPL sites)
End Point	<ul style="list-style-type: none">• Remedial design
Tasks	<ul style="list-style-type: none">• Incorporate IAG requirements into FFA (EFD/EFA)• Notify Public (Installation and EFD/EFA)
Documentation	<ul style="list-style-type: none">• Review of alternatives and selection process• Arrangements for operation and maintenance• Site Management Plan
Site Management Activities	<ul style="list-style-type: none">• FFA becomes IAG• Incorporate IAG requirements in Administrative Record (EFD/EFA)• Notice to Public
EPA/State Activities	<ul style="list-style-type: none">• Review Proposed Plan• Participate in public meeting, if appropriate (Installation and EFD/EFA)

Figure 5-14: Federal Facility Agreement (FFA)
controls and risk management factors (see section 5.15.3).

5.15.2.1 Site Management Plan (SMP)

The SMP is a scheduling tool associated with FFAs and other negotiated legal agreements. The RPM also may develop an SMP for installations which do not have a negotiated legal agreement. The SMP usually addresses the following topics:

- Introduction:
 - Description of the facility;
 - Environmental history of the facility;
 - Purpose of the SMP, i.e., cleanup goals;
 - Format of the SMP.
- Sites (May be divided into Operable Units);
- Scope of Work:
 - Discussion of work completed and ongoing;
 - Planned IR Program activities at each site or Operable Unit.
- Site management schedules;
- Removal/interim actions;
- An estimated cost for each fiscal year until cleanup is completed at the site; and
- References.

The Navy/Marine Corps develops the SMP in consultation with regulatory agencies and the public. The Navy/Marine Corps considers the SMP to be a “living document.” The EFD/EFA updates the SMP annually following legislation establishing annual ER, N authorization and appropriation. Estimated cleanup costs will be projected to the

appropriate level of detail to permit sharing with the regulatory agency or the community. The SMP will provide anticipated milestones for future work necessary to address the potential adverse impacts of contamination of the site.

5.15.3 New Legal Agreements

The Navy/Marine Corps will continue to use negotiated legal agreements as a tool to formalize commitments. However, any new legal agreements signed with EPA or the states must incorporate the following principles:

- Recognize the reality of limited funding, prioritizing work using risk management, and fitting the work within DoD fiscal controls. The Navy/Marine Corps must maintain control of pace and timing of all work based on protection of human health and the environment and fiscal responsibility;
- Recognize the use of Relative Risk Site Evaluations and risk management as important criteria for programming, budgeting, and executing cleanup actions; and
- Include SMPs for setting enforceable and target milestones. SMPs will include rolling milestones which recognize cleanup funding controls established by the Navy/Marine Corps. Rolling milestones link specific cleanup actions to the availability of funds in a given budget year. Only after Congressional action do the milestones become enforceable.

Specifically, proposed enforceable milestones may be established for two years beyond the current fiscal year. *Proposed enforceable* milestones should be included only to the extent that they are executable within budget

and outyear controls and will become enforceable only after the corresponding budget process and Congressional appropriation. *Target* milestones should be established for the life of the project and must also reflect outyear fiscal controls. For example, an SMP updated by 30 May 1997 would include a review of the enforceable FY 97 milestones and would be adjusted per any Congressional action. It would also review and establish proposed enforceable milestones for the following two fiscal years (FY 98 and 99). The FY 98 proposed enforceable milestones would reflect the Navy/Marine Corps FY 98 budget request submitted to the Congress by the President in January 1997. The FY 99 proposed enforceable milestones would reflect the current Navy/Marine Corps fiscal controls. The FY 98 proposed enforceable milestones would become enforceable after the FY 98 Congressional appropriation and would be adjusted to reflect any Congressional reductions or program directions.

Each year this process is repeated. The 30 May 1998 updated SMP would review the FY 98 enforceable milestones and the FY 99 proposed enforceable milestones and make adjustments to these milestones depending on the outcome of the FY 99 budget process and FY 98 Congressional appropriation. At the same time, the target milestones for FY 00 would be “rolled” forward and become proposed enforceable milestones. The process repeats each spring in preparation of the new budget.

The initial draft SMP will be submitted as part of the signature package for the agreement. In addition, agreements that reflect partnered responsibilities in the preparation and review of deliverables are encouraged. For example, a work plan could be concurrently prepared and reviewed by the

signatories to the legal agreement and not just prepared by the Navy/Marine Corps for delivery to the regulators for their review. A deliverable developed jointly by the Navy/Marine Corps and the regulators achieves buy-in by all parties. When those participating in partnering establish deliverable due dates, the parties accept responsibility for timely accomplishment of the noted tasks. All parties have equal responsibilities in the process. Funding and staffing realities should be part of the partnering deliberations when setting dates.

5.16 Generic Time Line for RI/FS

The actual time required to conduct an RI/FS for a particular site will depend on a variety of factors. Figure 5-15 illustrates nominal times in months and a generic sequence of activities for conducting an RI/FS.

5.17 Record Keeping

It is important to ensure that all information collected during the IR Program response is maintained and safeguarded in organized, comprehensive records and files. If regulatory conditions change, response actions may occur years after the data has been collected. It is crucial that records be sufficiently detailed and protected to provide a complete and accurate history of the response action in support of any potential future legal actions. In addition, well-organized information helps the installation or Navy/Marine Corps answer inquiries from Congress or requests from the general public under the Freedom of Information Act. The IR Program process should not be considered

Generic Time Line For RI/FS

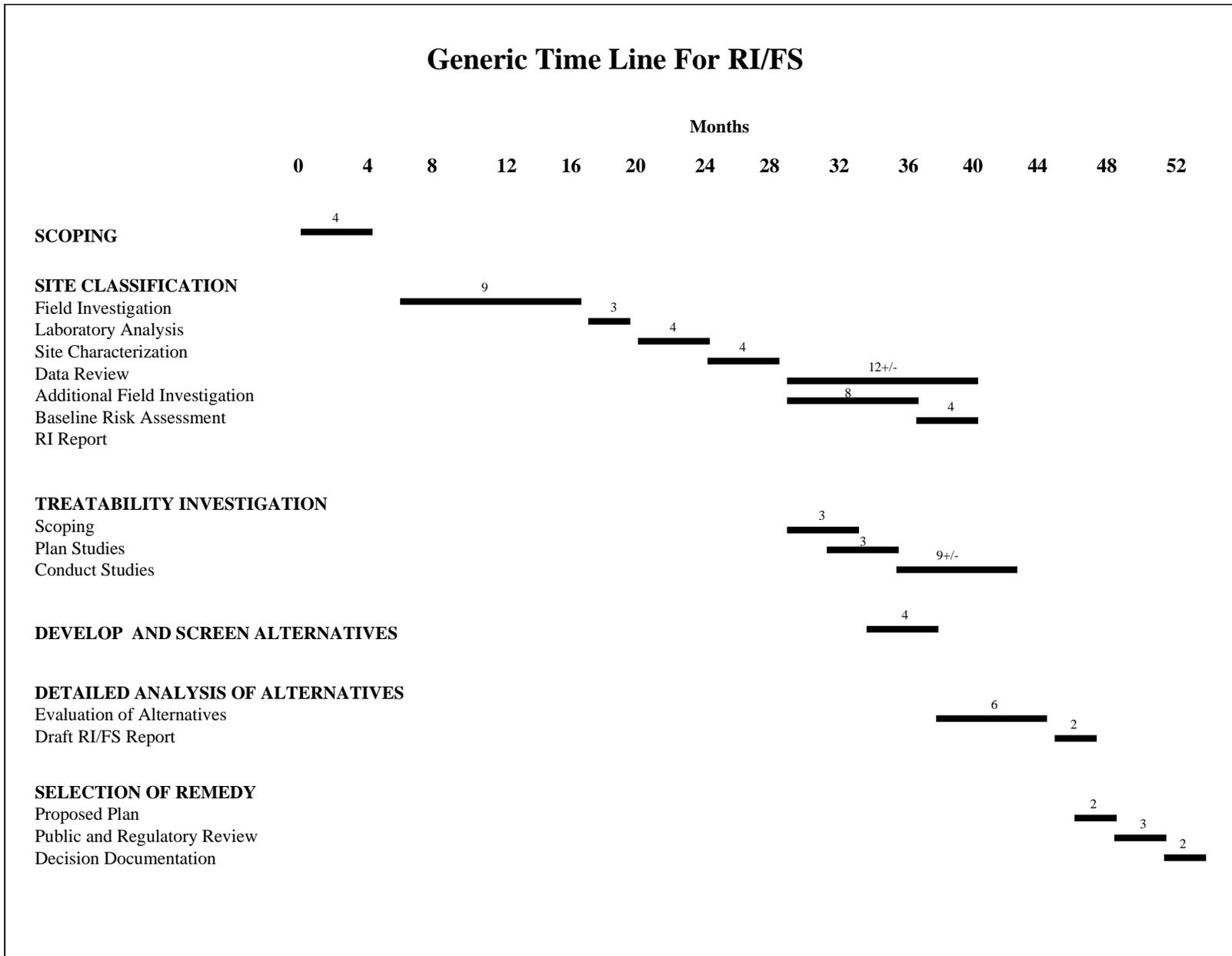


Figure 5-15: Generic Time Line For RI/FS

completed for a site until the Navy/Marine Corps completes all appropriate documentation of response action decisions and reports.

If an installation is closing, the RPM or the cognizant EFD/ EFA are responsible for collecting and maintaining the IR Program records which previously the installation had maintained.

Site records must be maintained for a period of 50 years following the discovery.

For information concerning the Administrative Record or Information Repositories, see **sections 10.2 and 10.3**.

5.18 State Role in the Remedial Action Process

CERCLA, Section 120, and 10 U.S.C. 2705 require that all response activities at Federal facilities be coordinated with Federal, state, and local authorities to implement CERCLA and NCP requirements for NPL and Non-NPL sites. For all sites, state ARARs and requirements for notification and public participation may need to be met. CERCLA requires DoD to ensure that EPA and appropriate state and local authorities have adequate opportunity to participate in the planning and selection of response actions including, but not limited to, review of all applicable data as it becomes available, the development of studies and reports, and review of and comment on response action proposals and activities prior to the initiation of any action. States also have a role in defining ARARs for both NPL and Non-NPL sites, and CERCLA, Section 121(d), requires that, with some exceptions, Federal facility remedial actions must comply with the state ARARs. States may play an even greater role at Non-NPL sites. CERCLA, Section 120(a)(4), specifies that state laws concerning removal and remedial actions, including state laws regarding enforcement, apply to removal and remedial actions at facilities owned or operated by the Federal government when such facilities are not included on the NPL. However, removal or remedial actions conducted entirely on-site need only comply with the substantive aspects of state laws and not the administrative aspects. If a state has additional policies or procedures requirements beyond those contained in the NCP, then higher Navy/Marine Corps authorities should be contacted for guidance prior to taking any action.

5.19 Streamlined Design-Build Options

~~Under Remedial Action Contracts (RACs), the contractor can prepare work plans based upon the RI/FS and ROD which serve the needs of the regulatory agencies and Navy for planning remedial actions. The key to effective use of the RAC is to maintain communications with the contractor as early as possible in the Remedial Action Process. The ROD establishes remedial action levels for cleanup. If the selected remediation is simple, detailed performance-based plans and specifications developed typically by the Comprehensive Long-Term Environmental Action, Navy (CLEAN) contractor may not be required and may, in fact, delay the implementation of the remedy. The EFD/EFA may expedite the award of the construction through the development of a Statement of Work (SOW) which includes standard specifications describing the intent of work to be accomplished. This scope is then forwarded to the RAC contractor by the Contract Specialist in the formal request for proposal. The overall objective of streamlined design-build is to forego a remedial design phase if possible.~~

Chapter Six

6. Remedial Design/Remedial Action (RD/RA)

The major activities of the Remedial Design (RD) and Remedial Action (RA) phase of the Remedial Action Process follow the completion of the Record of Decision (ROD) and lead to Site Closeout. The activities performed after the ROD are based on the information received during the Remedial Investigation/ Feasibility Study (RI/FS).

Response actions during the RD and RA phases include implementing the selected treatment and on-site/off-site monitoring. These activities will normally be accomplished by a Remedial Action Contract (RAC) contractor selected by the EFD/EFA. The Remedial Project Manager (RPM) should direct the contractor to develop an RD/RA work plan before remedial activities begin. The plan should be site-specific and include the information from previous plans and procedures developed during the RI/FS. These previous plans can be modified and changes incorporated by reference in the RD/RA work plan. Predesign activities and requirements should be outlined before beginning the design phase and include

scheduling, fast-track structuring, setting milestones, planning concurrent activities, and costing and budgeting. Additional guidance for implementing RD/RAs can be found in the *Superfund Remedial Design and Remedial Action Guidance* (EPA, June 1986).

6.1 Remedial Design (RD)

The purpose of RD is to convert the conceptual design for the selected remedy into a final design that is implemented. If the selected remedy was divided into operable units, the design may also be divided. The RD/RA for an operable unit must be integrated with the overall remediation of the site. Whether operable units are implemented before or after selection of the final Remedial Action, they should be consistent with the final action and not preclude its implementation. Operable units are subject to the requirements for decision documents, administrative records, information repositories, and public participation.

The frequency and level of internal design reviews are at the discretion of the RPM within the limits set forth in CERCLA or RCRA orders or permits. If during the RD step new information comes to light that would substantially alter the scope, cost, implementability, or effectiveness of the previously selected remedial action, the Selection of Remedy step may need to be repeated to include public participation requirements. **Chapter 10** contains additional guidance for when this situation occurs.

Following preparation of RD documents, the Community Relations Plan, prepared during RI/FS Scoping, should be reviewed and revised.

After completion of the final design, the RPM will issue a fact sheet to notify the media and public and, as appropriate, conduct a public briefing.

6.1.1 Remedial Action Contract (RAC)

The RAC can be used to streamline the design-build process for simple remediation projects. In such cases, preparation of a detailed design of the project is not necessary. Under the RAC contract, the contractor can prepare work plans based on the RI/FS and the ROD.

6.1.2 Design Guidance For Remedial Technologies

The NAVFAC Criteria Office (Code 15C) and the National Defense Center of Environmental Excellence have established a database of non-mandatory design guidance for remedial technologies on the Construction Criteria Base CD-ROM system. The goal of the guidance is to assist designers in determining and identifying important remedial technology design parameters. In the

future the criteria office will expand the design package and construction/ performance lessons learned data, based on new information received from users.

6.1.3 Permits and Approvals

Permits, approvals, and site access agreements, if required, will generally be obtained during RD. Cooperation between the RPM and installation legal, engineering, and public affairs staff may be needed to secure the permits.

The NCP, Section 300.400(e), provides that no Federal, state, or local permit is required for the portion of any removal or remedial action conducted entirely on the site. Although the Navy/Marine Corps is relieved of the procedural requirements to obtain permits for on-site actions, the Navy/Marine Corps is not relieved of the substantive requirements of Federal, state or local regulations and other laws which may be applicable or relevant and appropriate requirements (ARARs). Off-site remedial actions must comply with both substantive and procedural requirements identified as ARARs. Figure 6-1 lists the elements of the RD step.

6.2 Remedial Action (RA)

Upon completion of the RD, the EFD/EFA will begin implementation of RA. The RA step involves the award of a contract or Delivery Order to the RAC contractor to construct the selected remedy and implement the detailed design plans or performance specifications. RA activities require close cooperation between the Resident Officer in Charge of Construction (ROICC), the RPM, and the installation. The RPM is the technical manager for the RA and is responsible for oversight functions such as coordinating with

EPA, the state, and local officials, maintaining the administrative record, participating in appropriate community relations efforts, and assuring overall quality assurance/quality control. The RA step involves two sub-categories, Remedial Action Construction and Remedial Action Operation.

6.2.1 Remedial Action Construction

RA Construction is the period during which construction is occurring to implement the remedy. Remedial Action Operation is the period, following RA Construction, needed to operate installed equipment to accomplish remedial objectives. If the remedy is accomplished by actions taken during RA Construction, RA Operation is not needed and does not occur. The RA Construction end date signifies that the construction is complete, all testing has been accomplished and that the remedy will function properly. RA Construction may include a “shakedown” period used to insure that installed equipment operates as designed. At the end of RA Construction, DON considers the status of the cleanup to be “Remedy In Place.” Figure 6-2 lists the elements of RA Construction.

Elements of the Remedial Design Step



- | | |
|-------------------------------------|--|
| Purpose | <ul style="list-style-type: none"> • Prepare Performance Specifications for selected Remedial Action • Prepare RD/RA Work Plan |
| Potential Subsequent Actions | <ul style="list-style-type: none"> • Remedial Action |
| Pre-award Activities | <ul style="list-style-type: none"> • Prepare Scope of Work, and specifications (EFD/EFA) • Select contractor (EFD/EFA) • Award RAC Delivery Order(s) (EFD/EFA) |
| Post-Award Activities | <ul style="list-style-type: none"> • Monitor contractor's effort (EFD/EFA) • Revise Community Relations Plan (CRP), as necessary (Installation) • Conduct pilot scale testing, as necessary |
| Documentation | <ul style="list-style-type: none"> • Revised CRP (Installation) • Scope of Work and specifications (EFD/EFA) • RD/RA Work Plan • Remedial Design Fact Sheet |

Figure 6-1: Elements of the Remedial Design Step

6.2.2 Remedial Action Operation

The period of time needed to operate the installed equipment following completion of RA Construction is called RA Operation. RA Operation is the period during which equipment is operating or chemical or biological processes are underway to achieve the cleanup objective identified in the ROD or equivalent agreement with state or Federal regulatory agencies. RA Operation includes continuing actions such as groundwater treatment or soil venting that require operation time to reduce contaminants to applicable and acceptable cleanup standards, e.g., ARARs. Many remedial technologies require operation and maintenance of electro-mechanical equipment after installation of the remedial action equipment. O&M of equipment is an ongoing process and will last until completion of the remedial project. The Remedial Action Operation end date signifies that Remedial Action has been completed. If RA Operation is needed for a site, the end date of RA Operation is the Response Complete date. If RA Operation is not needed, the end of RA Construction is the Response Complete date. Figure 6-3 lists the elements of RA Operation. Formerly, DON designated RA Operation as Long Term Operation. See section **6.3 Post-Project Activities** for a discussion of actions, such as Long Term Monitoring, which may occur following Response Complete.

6.2.3 Resident Officer In Charge of Construction (ROICC)

The ROICC is the construction manager for the RA and is responsible for ensuring that the work is accomplished per plans and specifications and in a manner which protects human health, welfare, and the

environment. Because the selected RA has been agreed upon by regulatory agencies, the ROICC cannot make field changes without consultation with the RPM, the Contracting Officer's Technical Representative and the Contract Specialist. The ROICC should monitor the contractor's HSP and other procedures for compliance with the Occupational Safety and Health Administration regulations (29 CFR 1910). The ROICC will ensure that the Navy/Marine Corps and the remediation contractor follow an approved QAPP, both for implementing the selected remedy and verifying via field sampling and analysis that specified cleanup levels have been attained. In addition to ROICCs, the Navy/Marine Corps has tasked the Naval Technical Representatives (NTR) with monitoring RA construction.

6.2.4 Off-Site Disposal Facility Approval Requirements

On September 22, 1993 EPA issued the "Off-site Rule", 40 CFR Part 300.440, which provides that a facility used for the off-site management of CERCLA wastes must be in physical compliance with RCRA, or other applicable Federal and state laws. In addition, the following criteria must be met:

- Units receiving CERCLA wastes at RCRA Subtitle C facilities must not be releasing any hazardous wastes, hazardous constituents or hazardous substances;
- Receiving units at Subtitle C land disposal facilities must meet minimum technology requirements;
- All releases from non-receiving units at land disposal facilities must be

addressed by a corrective action program
prior to using any unit at the facility; and

Elements of Remedial Action Construction



Purpose	<ul style="list-style-type: none"> • Install remedial technologies 		
Potential Actions	<table border="0"> <tr> <td style="vertical-align: top;">Subsequent</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Remedial Action Operation, or • Long-Term Monitoring, or • No Further Action </td> </tr> </table>	Subsequent	<ul style="list-style-type: none"> • Remedial Action Operation, or • Long-Term Monitoring, or • No Further Action
Subsequent	<ul style="list-style-type: none"> • Remedial Action Operation, or • Long-Term Monitoring, or • No Further Action 		
Tasks	<ul style="list-style-type: none"> • Field activity management (Installation and EFD/EFA) 		
Documentation	<ul style="list-style-type: none"> • Worker Health and Safety Plan • Contractor documentation of work performed, equipment installed, site worker, and visitor logs; compliance with Worker Safety and Health Plan; and compliance with Data Quality Objectives • “As-built” drawings (EFD/EFA) • O&M Manual for electro-mechanical equipment (EFD/EFA) 		

Figure 6-2: Elements of Remedial Action Construction

Elements of Remedial Action Operation



Purpose		<ul style="list-style-type: none"> • Operate installed equipment
Potential Actions	Subsequent	<ul style="list-style-type: none"> • Post- Project Activities • Long-Term Monitoring • No Further Action
Tasks		<ul style="list-style-type: none"> • Operate installed equipment
Documentation		<ul style="list-style-type: none"> • Sampling and Analysis Plan for post-project activities • “As-built” drawings (EFD/EFA) • O&M Manual for electro-mechanical equipment (EFD/EFA)
Additional Management Activities	Site	<ul style="list-style-type: none"> • Program O&M resources for construction activities (EFD/EFA)

Figure 6-3: Elements of Remedial Action Operation

Elements of the Post-Project Activities Step



- | | | |
|-----------------------------|-------------------|--|
| Purpose | | <ul style="list-style-type: none"> • Ensure continued compliance with project goals |
| Potential Actions | Subsequent | <ul style="list-style-type: none"> • No Further Action • Reinitiating Response Action, if necessary |
| Tasks | | <ul style="list-style-type: none"> • Periodic review of compliance with project goals (Installation and EFD/EFA) • Operation and maintenance of electro-mechanical equipment (Installation) • Monitoring (Installation) |
| Documentation | | <ul style="list-style-type: none"> • Monitoring reports (Installation) • Compliance review reports (Installation) |
| EPA/State Activities | | <ul style="list-style-type: none"> • Review monitoring reports and 5-year compliance reviews as required |

Figure 6-4: Elements of the Post-Project Activities Step

- Environmentally significant releases from non-receiving units at Subtitle C treatment and storage facilities, and from all units at other than Subtitle C facilities, must also be addressed by a corrective action program prior to using any unit at the facility for the management of CERCLA wastes.

These requirements are applicable to RA at Navy/Marine Corps sites where wastes are being transported off-site for treatment or disposal. Off-site areas are areas which are not “On-site” (those areas, which include all suitable areas in very close proximity to the contamination, necessary for implementation of the response action.) The EPA Regional Offices maintain a list of acceptable off-site disposal facilities.

6.2.5 Remedial Action Documentation Requirements

The RPM should insure that the information repository contains a listing and a copy of all RA and O&M information reporting requirements and data needed to support site close-out and delisting.

6.2.6 Removal as a Remedy

Removals may be implemented at any time during the Remedial Action Process. Removals need to satisfy one of the following:

- Be implemented in response to an imminent threat; or
- Be effective in controlling the source or potential source of contamination; or
- Be able to substantially reduce the possibility of human exposure to hazardous substances.

6.3 Post-Project Activities

Post-project activities include Long Term Monitoring (LTM). LTM occurs at sites which have hazardous substances, pollutants or contaminants remaining at the site after Remedial Action has been completed (Response Complete) or is monitoring which confirms that previous site remediation continues to be effective. Long Term Monitoring would occur where the Navy/Marine Corps has determined that the low concentration of substance remaining at a site do not present a health or environmental risk. LTM also may occur when periodic sampling is required after Response Complete to substantiate that previous site remediation continues to be effective.

In accordance with CERCLA, Section 121(c), if hazardous substances, pollutants, or contaminants remain at a site after the RA, the RPM, in coordination with the installation, will review LTM records to ensure that human health and the environment are being protected. The RPM in coordination with the installation should submit the compliance review to the regulators, as appropriate, to obtain their comments. The compliance review will be made every five years beginning with the initiation of the RA for any RA which results in any hazardous substance, pollutant or contaminant remaining at the site.

Figure 6-4 shows the elements of the Post-Project Activities step. When an installation closes, the cognizant EFD/EFA becomes responsible for the long monitoring requirements.

Chapter Seven

7. Other Installation Restoration (IR) Program Considerations

This chapter identifies specific issues and activities that are associated or may occur concurrently with Installation Restoration (IR) Program activities. Many of the areas addressed here will have major impacts on the IR Program budget, prioritization, and schedule.

7.1 Resource Conservation and Recovery Act (RCRA) Corrective Action (CA)

Prior to the Hazardous and Solid Waste Amendments of RCRA in 1984, the term “corrective action” (CA) referred only to remedial action for groundwater contamination. The Hazardous and Solid Waste Amendments greatly expanded the government’s authority to require CA for releases of hazardous waste and hazardous constituents at facilities that manage hazardous waste. The amendments extended this authority to a wide range of responses to releases into all media from waste management activities. This CA authority is intended to provide the Environmental Protection Agency (EPA), or the state which has primacy via an approved hazardous waste management plan, the ability to control groundwater, surface water, and soil contamination and air pollution from volatile organic compounds, particles, fire, and explosions. The following RCRA Sections detail EPA’s and the state’s statutory authority:

- Section 3004(u): Requires corrective action for all releases of hazardous wastes or constituents from any Solid Waste Management Unit (SWMU) at a

treatment, storage, or disposal facility seeking or renewing a hazardous waste permit.

- Section 3004(v): Authorizes CA beyond a facility’s boundaries where necessary to protect public health and the environment. This action is required unless the facility owner/operator can demonstrate to the satisfaction of the EPA that it can not obtain permission to undertake such CA from the adjacent property owner.
- Section 3008(h): Provides for CA to address releases of hazardous wastes at facilities authorized to operate under interim status pursuant to RCRA, Section 3005(e) [42 U.S.C. 6925(e)]. This section also applies to existing facilities that should have, but failed to obtain, interim status. This CA authority potentially applies to all treatment, storage and disposal facilities regardless of whether they are continuing operations or closing.

CAs include:

- Containment, stabilization or removal of the source of contamination;
- Studies to assess the nature and health risks of contamination;
- Identification and evaluation of the remedies;
- Design and construction of the chosen remedy;

- Implementation of the remedy; and
- Monitoring to determine the effectiveness of the remedy.

A brief outline of the RCRA Corrective Action Process can be found in EPA's OSWER Directive 9902.3- 2A, *RCRA Corrective Action Plan (Final)*, May 1994.

7.2 Underground Storage Tank (UST) Sites

The Navy's and Marine Corps' UST programs involve both cleanup and compliance issues; however, only cleanup of past contamination from USTs is managed under the IR Program and eligible for ER, N funding.

Navy and Marine Corps UST compliance policy, found in OPNAVINST 5090.1B and MCO P5090.2, is to comply with all applicable Federal, state, and local regulations pertaining to USTs. The Naval Facilities Engineering Command's *Underground Storage Tank Program Working Guidance Document* details the Navy's UST program. The guidance describes the Navy's UST program, defines the responsibilities of various organizations within the Navy, and provides general technical information regarding UST management.

7.2.1 UST Cleanup Policy and Funding Guidance

USTs generally are all tanks and attached piping containing regulated substances in which the tank volume (including piping) is 10 percent or more beneath the surface of the ground. OPNAVINST 5090.1B and MCO P5090.2 identify specific exclusions.

The Navy/Marine Corps accomplishes compliance and cleanup actions through one

or a combination of the following funding categories:

- Claimant/installation managed funds;
- Military Construction (Tank replacement);
- Marine Corps managed funds, including Headquarters or installation managed funds; and
- Environmental Restoration, Navy (ER, N).

Under "special circumstances," ER, N funding can be used at otherwise ineligible UST sites. For example, a leaking UST located within the area of contamination of a CERCLA site or operable unit would most likely be cleaned up as part of the CERCLA response action since it may be impossible to conduct two separate response actions. These special circumstances must be evaluated on a site by site basis.

Removal or closure-in-place of leaking and abandoned tanks is not eligible for ER, N funding unless the removal/closure is a necessary part of a cleanup action.

Cleanup of a "recent" overfill spill from a tank is not eligible for ER, N funding. Spills covered or required to be covered by Spill Prevention, Control and Countermeasure plans are not eligible for ER, N funding. EPA issued Spill Prevention, Control and Countermeasure Plan regulations on 26 May 1977.

The following actions are compliance and not eligible for ER, N funding:

- Removal or permanent closure of non-leaking USTs;

- Annual or periodic regulatory testing requirements, such as groundwater sampling, tank tightness testing, and inventory control;
- Maintenance of leak detection, corrosion protection, and spill/overflow prevention systems;
- Tank replacement or upgrade; and
- New tank construction/installation, maintenance, record keeping, inspections, and management plans.

Compliance actions must be funded by installations or major claimants and should be carefully planned and budgeted. The overall Navy and Marine Corps UST programs are complex and encompass new tank design, tank operation and maintenance, tank upgrade, leak detection, corrosion protection, spill/overflow protection, and repair.

Figure 7-1 can be used to determine the ER, N eligibility for response to underground petroleum leaks. Additionally, **sections 8.5.1** and **8.5.2** detail actions eligible and ineligible for ER, N funding, respectively.

7.2.2 Reporting

Cleanup of an UST site under the IR Program must be added to the Restoration Management Information System (RMIS) IR data base by the Remedial Project Manager at the Engineering Field Division/Activity.

7.3 Real Property Transactions and Management

EFD/EFA real estate and planning personnel in conjunction with installation personnel

are responsible for ensuring that the IR Program is fully considered prior to engaging in real property transactions and as part of all land management decisions.

7.3.1 Sale or Transfer of Real Property

40 CFR 373.1, in accordance with CERCLA, Section 120(h)(1), requires all Federal agencies when contracting for the sale or transfer of real property to notify prospective purchasers if hazardous substances have been stored for a year or longer or have been released or disposed of on the property. This notice identifies the type and quantity of such hazardous substances and the time when the storage, release, or disposal took place.

Before conveying any real property on which any hazardous substances have been stored for a year or more, known to have been released, or disposed of, a Federal agency must comply with the provisions of CERCLA, Section 120(h)(3). Section 120(h)(3) requires that the deed for each property where hazardous waste was stored, released, or disposed of, must contain specific information regarding the hazardous substances and a covenant that warrants the following:

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining

ER, N ELIGIBILITY REQUIREMENTS FOR CONTAMINATION FROM UST SITES

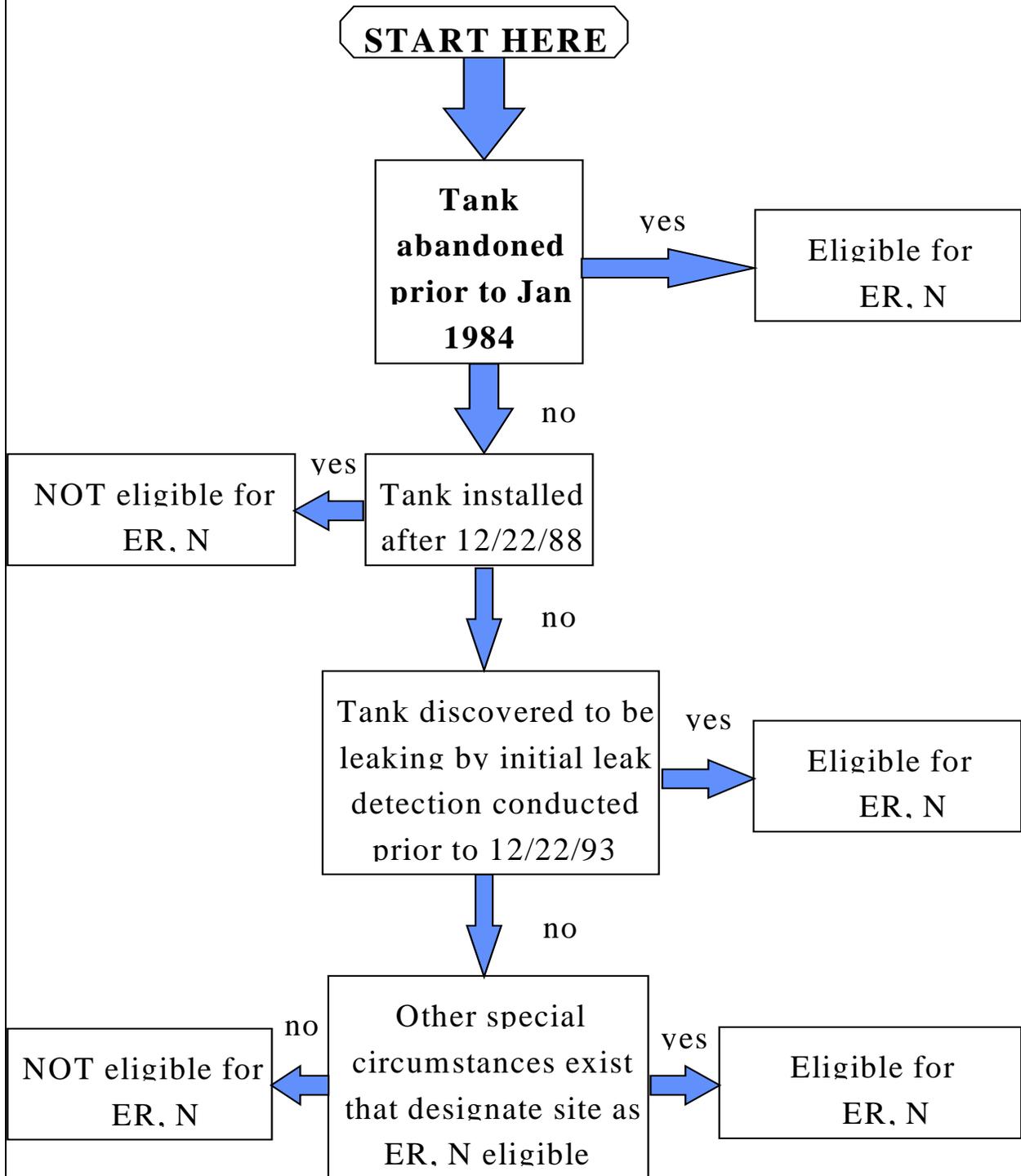


Figure 7-1: Environmental Restoration, Navy UST Eligibility

on the property has been taken before the date of such transfer. (A remedial action has been taken if the approved remedy has been constructed and demonstrated to EPA or the state to be operating properly and successfully); and

- The United States will conduct any additional remedial action found to be necessary after the date of such transfer. The Department of Navy (DON) is responsible for reporting property as excess to the General Services Administration and providing information on all inherent hazards. The DON will inform the General Services Administration of the expense of any needed cleanup actions and supervision of decontamination of the property (41 CFR 101-47.401-4).

The Navy/Marine Corps should be alert to potential hazardous substance contamination when it purchases or otherwise obtains real property. Property transfer evaluations which seek to identify past land uses and possible contamination should be completed prior to entering into any real property transaction. The extent of the contamination should be reflected in the appraisal and the purchase price if it is necessary to acquire a known contaminated site. *NAVFAC Contracting Manual* and *NAVFAC Real Estate Procedural Manual* provide further guidance to Navy/Marine Corps personnel involved in the sale or transfer of real property.

In addition to the previously described requirements, a Federal agency planning to terminate operations on real property which the U. S. owns must comply with the provisions of CERCLA, Section 120(h)(4). As stated in the Community Environmental Response Facilitation Act (CERFA) [Public Law 102-426] which amended CERCLA for BRAC properties “(4) Identification of uncontaminated property.... the head of the department, agency or instrumentality of the United States with jurisdiction over the property shall identify the real property on which no hazardous substances and petroleum products or their derivatives were stored for one year or more, or are known to have been released, or disposed of.” For parcels that are part of a site on the National Priorities List (NPL), EPA must concur in the parcel identification. For parcels that are not part of a site on the NPL, the concurrence of the appropriate state official must be sought. CERCLA Section 120 requirements apply regardless of whether the real property being conveyed is part of an NPL site. Additionally, a Federal agency would continue to have obligations under CERCLA Section 120(e) and any existing applicable FFA for conveyed real property that is part of an NPL site.

DON Environmental Policy Memorandum 95-01 of 26 May 1995 entitled *Environmental Requirements for Federal Agency-to-Agency Property Transfer at BRAC Installations* established the requirement for a summary document that must be forwarded to the Assistant Secretary of the Navy (Installations and Environment) [ASN (I&E)] as part of the package requesting approval for an agency-to-agency property transfer. It becomes the responsibility of the receiving agency to perform any additional environmental impact analysis required by NEPA as a result of its proposed future use of the property.

Federal agencies that have been identified to receive BRAC property from the Navy may decide not to accept the property until environmental restoration has been completed (partially or in full). Cleanup and management responsibilities must be established between the Navy and the receiving Federal activity and set forth in the transfer document. It is important that the Navy does not transfer property and cleanup responsibilities to another Federal agency that does not

have the ability and/or the requirements to put the same level of environmental protection in place, especially where the receiving Federal agency intends to transfer the property outside the Federal Government.

7.3.2 Disposal of Real Property Contaminated with Ammunition, Explosives, or Chemical Agents

It is the policy of the Navy to use every means possible to protect the general public from exposure to hazards from real property contaminated with ammunition, explosives, or chemical agents. In addition the permanent contamination of real property by the final disposal of ammunition, explosives, or chemical agents is prohibited. Real property that is known to be contaminated with ammunition, explosives, or chemical agents must be decontaminated with the most appropriate technology to ensure the protection of the public consistent with the proposed end use of the property.

All plans for leasing, transferring, excessing, disposing and/or remediating Navy real property when ammunition, explosives, or chemical agent contamination exists or is suspected to exist shall be submitted to the Department of Defense Explosive Safety Board (DDESB) through the NAVORDCEN (Code N71) for the review and approval of explosive safety aspects. These land disposal submissions shall state the intended use of the property, the nature and extent of on- and off-post contamination, location of the contaminated land, any improvements that may have been made, proposed detection and degree of decontamination, and the extent to which the property may be used safely without further decontamination. When the accountability and control of the contaminated real property is transferred, the required permanent record of contamination shall also be transferred.

Further detail on the requirements for the disposal of real property known or suspected to be contaminated with ammunition, explosives or chemical agents is outlined in NAVSEA OP 5, Volume 1, Sixth Revision entitled "*Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*."

7.3.3 Environmental Baseline Survey (EBS)

ASN (I&E)'s letter of 22 December 1993, states that "An EBS shall be prepared for all leases, easements, and transfers of real property. The scope of the EBS (investigation and documentation) must be appropriate to the type of real estate actions and property involved." EBS's draw heavily on information about the IR Program at an installation. NAVFAC's letter of 16 March 1995 states "...each EFD/EFA has the authority to determine the appropriate amount of investigation and documentation based upon the particular circumstances of the real estate instrument and the proposed use of the property. In making this determination the EFD/EFA needs to consider a number of factors including changes in current use, type of use, length of use, potential risk, etc. It would seem that the investigation and documentation could range from a note in the file saying no further documentation is necessary (through a review of existing environmental studies) to a full-blown EBS. In the final analysis it becomes a business judgment the EFD/EFA makes."

EFD/EFAs have the responsibility to prepare an EBS for all leases, easements and transfers for BRAC and Non-BRAC properties. The EFD/EFAs have the authority to determine the amount of information which is necessary for the EBS based on the preceding guidance and other available guidance on conducting an EBS.

7.3.4 Finding of Environmental Suitability for Real Property Transaction

Based on the review of the EBS, the EFD/EFA will prepare an environmental Finding of Suitability to Transfer (FOST) or an environmental Finding of Suitability for Real Property Transaction (FOSRPT). The FOST describes the basis for the deed restrictions to be included in any recorded deed(s); the rationale for the property being suitable for the intended use; and the future use restrictions for the property related to releases ‘noticed’ in the transfer documents and which are consistent with all the remedial decisions. The FOSRPT is similar to the FOST except it can be used for leases, easements, permits, and Host Tenant Real Estate Agreements. The EFD/EFA will use ASN, NAVFAC and other existing guidance to prepare and process these findings for BRAC and Non-BRAC properties.

7.4 Base Realignment and Closure (BRAC) Policy

The Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990, 10 U.S.C. 2687 note, govern the closure and realignment of DoD installations. The objective the DON Base Realignment and Closure (BRAC) Environmental Restoration Program is to complete necessary environmental restoration at those Navy/Marine Corps installations being closed under BRAC. Most methods and protocols in use by the DON for the IR Program are applicable to the BRAC installations. The differences in the two programs include:

- Scheduling - BRAC requires a more aggressive schedule of cleanup than the IR Program. Expedited response actions are emphasized;
- Funding - Congress established the DoD Base Closure Account which provided multi-year funds to pay for BRAC independently of the ER, N. This fund can only be used to investigate and remediate existing conditions at closing or realigning installations which have property identified for excessing. Costs to ensure environmental compliance of current operations are not supported by this account;
- Site Closure - Site closure under BRAC reflects the requirements associated with real property transfer. The FOST will be used to identify and document parcels of land that are environmentally suitable for transfer.

7.4.1 Indemnification

Although not part of CERCLA, transferees of base closure property are afforded additional protection through the National Defense Authorization Act for Fiscal Year 1993, Section 330, as amended. This section provides indemnification of such transferees for claims arising from the release of a contaminant as a result of DoD activities at any military installation (or portion thereof) that is closed pursuant to a base closure law.

7.4.2 BRAC Cleanup Plan (BCP)

In order to expedite the reuse and redevelopment of BRAC installations, the installation must undergo a “bottom up” evaluation of the environmental programs including cleanup activities. This review by the BRAC Cleanup Team (BCT) and the BRAC Environmental Coordinator includes:

- Reviewing selected technologies for application of expedited solutions;
- Implementing immediate removal actions to eliminate “hot spots” while investigation continues;
- Identifying transferable properties;
- Identifying overlapping phases of the cleanup process;
- Using improved contracting procedures;
- Interfacing with the community reuse plan and schedule;
- Embracing a bias for cleanup instead of studies;
- Validating the technology of the proposed remedy to ensure conformity with Fast Track Cleanup objectives;
- Identifying opportunities for application of presumptive remedies; and
- Using innovative management, coordination, and communication techniques, e.g., partnering.

The BRAC Cleanup Plan (BCP) is a product of this review. The BCP serves as a road map for the cleanup necessary to convey the property to communities for redevelopment. The BCP is a phased plan encapsulating and prioritizing requirements, schedules, and costs of the environmental programs to be implemented by the BCT for completing environmental action in support of the cleanup, reuse, and redevelopment of the installation. For sites with existing Federal Facility Agreements (FFAs), Interagency Agreements, and orders or decrees, the BRAC Environmental Coordinator, assigned as the DoD representative on the BCT, will propose and negotiate changes needed to expedite cleanup. BCPs should be made available to interested parties and community groups and become an integral part of the operations of the installation’s Restoration Advisory Board (RAB). However, while project level details are appropriate for BCT discussions/ consensus, only relevant summary financial data is appropriate for release to the public. Issues affecting the execution of the environmental cleanup program should be resolved at the BCT level or, where no dispute resolution can be made, ultimately by the DASN(I&E).

7.4.3 President’s Five Point Plan

On July 2, 1993, President Clinton announced a five part program to speed economic recovery at communities where military installations are slated to close. The Under Secretary of Defense for

Acquisition implemented the Five Point Plan with a strategy paper issued on July 15, 1993. The purpose of the plan is to provide DoD guidance to implement “Fast Track” cleanup initiatives. It involves a plan to expedite the disposal and reuse of closing military installations by creating partnerships and accelerating environmental cleanup activities. It establishes the Base Closure Team (BCT) for each DoD closing or realigning installation where property is available for transfer to the community. The plan empowers the team with the authority, responsibility, and accountability for environmental cleanup programs at these installations. The BCT is to emphasize those actions which are necessary to facilitate reuse and redevelopment. The policy’s scope also includes environmental cleanup programs and activities that support the lease or transfer of real property at affected installations. The plan promotes economic reuse of affected installations while satisfying applicable environmental protection laws and regulations. The Five Point Plan includes:

- Job-centered property disposal that puts local economic redevelopment first;
- Easy access to transition and redevelopment assistance for workers and communities;
- Fast track cleanup that removes delays while still protecting human health and the environment;
- Transition coordinators for each installation scheduled for closure or realignment to work with communities on cutting Federal red tape and freeing the installation for rapid, productive reuse; and
- Larger economic development planning grants.

For further guidance concerning the President’s Five Point Plan, see the Deputy Secretary of Defense Memorandum of 9 Sep 1993, *Fast Track Cleanup at Closing Installations* or SECDEF Letter of 2 July 1993, *Revitalizing Base Closure Communities*.

7.4.4 Defense Environmental Restoration Task Force (DERTF)

The National Defense Authorization Act for Fiscal Year 1991 (Public Law 101-510) established the Defense Environmental Response Task Force (DERTF). The Military Appropriations Act for Fiscal Year 1993 (Public Law 102-380) reconstituted and reconvened the DERTF. The DERTF functions as a DoD Federal Advisory Committee and provides an annual report to Congress on its findings and recommendations. Members of the DERTF include representatives of the following:

- Secretary of Defense;
- Attorney General;
- Administrator of the General Services Administration;
- Administrator of the Environmental Protection Agency; and
- Chief of Engineers, Department of the Army.

The annual report contains:

- Recommendations concerning ways to expedite and improve environmental response actions at military installations that are being closed or subject to closure;
- Any additional recommendations that the members of the DERTF consider appropriate; and
- A summary of the progress made by the Federal and state agencies in implementing the recommendations of the DERTF.

Issues which should be addressed by the DERTF should be provided to the respective DoD BRAC Environmental Coordinator.

7.4.5 BRAC Information on DENIX and the Internet

The Defense Environmental Network Information Exchange (DENIX) contains a multitude of information concerning DoD and service BRAC policy, schedules and other information. **Section 9.2.2** contains additional information on the subject.

The California Economic Diversification and Utilization Website (<http://www.cedar.ca.gov>) and the EPA Federal Facility Restoration and Reuse Office Website (www.epa.gov/swerffrr/) contain information on BRAC and links to other sources of information.

The Defense Environmental Network Information Exchange (DENIX) and DoD home page on the Internet contain information on how to obtain current DERTF status reports.

7.5 EPA's National Priorities List (NPL)

The boundaries of the installation are not necessarily the boundaries of the EPA NPL site. Rather, the site consists of all contaminated areas used to define the site and any other location where contamination has been located.

EPA issued policy guidance in 1994 entitled *Military Base Closures: Guidance on EPA Concurrence in the Identification of Uncontaminated Parcels Under CERCLA*. This policy clarifies that parcels of military installations identified as uncontaminated are not part of the NPL listing. Additionally, EPA issued policy memo *Clarification of NPL Listing Policy* on 3 August 1995 that specifically addresses this issue and clarifies that NPL sites include only contaminated areas.

7.6 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) does not apply to CERCLA response actions undertaken by Federal agencies. OPNAVINST 5090.1B and MCO P5090.2 state "IR Program actions that follow the NCP and fulfill public participation requirements are deemed to have complied with NEPA." The NEPA mandate for a fully-informed, well-considered decision involving the public is achieved through compliance with CERCLA, the NCP, and the Defense Environmental Restoration Program (DERP). The NCP requires public involvement (which the

DON accomplishes in part via the Restoration Advisory Board or Technical Review Committee) and that a remedial action meet legally applicable standards, requirements or criteria under Federal environmental laws. The DERP, 10 U.S.C. 2705, requires that the services meaningfully involve EPA, state, and local authorities in their efforts to carry out response actions.

Non-BRAC Navy construction, operation changes, dredging, demolition, modification, etc. require NEPA documentation.

7.6.1 NEPA and BRAC

A single NEPA document will be prepared for the new use of the BRAC property. In the past, one Environmental Impact Statement (EIS) was prepared for disposal after an installation was announced for closure and another several years later when the community's reuse plan was submitted. Only one NEPA document is required for both disposal and reuse by using the community's reuse plan as the preferred alternative unless it conflicts with statutory or regulatory requirements. DoD will initiate the NEPA Scoping Process when base closure is announced, and the DON will commit to completing the required EIS document based on the community's reuse plan within 12 months from the date the community submits its final reuse plan. EPA will become a cooperating agency in the NEPA process at closing bases.

BRAC interim leases require NEPA documentation.

7.7 Land Management

EFD/EFA real estate/planners need to coordinate with all installation staffs to ensure that real property planning and management decisions consider IR and potential site contamination issues, including ammunition, explosives, and chemical agent contamination. The RPM's responsibilities include ensuring that EFD/EFA planning and real estate personnel are aware of the installation's contaminated sites. Installation Master Plans, maintained by the installation or the EFD/EFA and updated every five years, should contain the locations of IR sites, and EFD Planning Division files should contain the appropriate IR documents for use by planners. Note -- Installations that historically have had a lower priority for the IR program or which are located at great distances from the cognizant EFD/EFA require greater effort on the part of the RPM to verify the environmental condition of the property.

Planners involved in developing and locating new facilities need to know where contaminated sites are and should interact with RPMs on the nature of the contamination, the length of the IR process, and the likely effects of the contaminated site on the proposed real property use. Similarly, EFD/EFA real estate personnel involved in outleasing Navy/Marine Corps property need to be aware of contaminated sites or contaminated groundwater so that appropriate decisions can be made.

Outleases should contain restrictions which protect Navy/Marine Corps property from contamination by the tenant. In particular, outleases should include a reference to 10 U.S.C. 2692 which states that SECDEF may not permit the use of a DoD installation for the storage or disposal of any toxic or hazardous material that is not owned by DoD.

Land use consideration should be a part of any risk assessment developed in the cleanup process as well as for remedy selection. CERCLA exposure assessments most often classify land into one of three categories: residential, recreational or commercial/ industrial. The Baseline Risk Assessment should address future land use that is both reasonable, from land use development patterns, and protective. CERCLA, Section 120(h)(3), further describes the DON's responsibilities for land transfer actions.

At BRAC installations, current and projected land use plays an essential role in determining cleanup levels. The Navy/Marine Corps will ensure that remedies and cleanup levels are in compliance with policy and consistent with community reuse plans. This is especially important at sites where ammunition, explosives, and chemical agent contamination was remediated to acceptable levels based on the projected reuse of the land.

In the absence of an approved reuse plan, remedies and cleanup standards should be based on the current land use or the most likely land use as identified in the reuse EIS. Risks should be presented for actual current and future land uses as well as those land uses required to be calculated by regulatory agencies. Cleanups based on projected land use which is different from the current land use may sometimes be in the best interest of both the Navy/Marine Corps and the community. If the Navy/Marine Corps proposes a cleanup which depends on land use restrictions, such restrictions and any appropriate institutional controls to establish and maintain the restrictions must be discussed in the Feasibility Study, the Proposed Plan, and the Record of Decision and clearly documented in the FOST. Further guidance on land use for BRAC properties can be found in the ASN(I&E) Memorandum of 17 Aug 1995, DON Environmental Policy Memorandum 95-02: *Consideration of Future Land Use in Determining Cleanup Standards For BRAC Property*.

Additional guidance on this subject can be found in EPA's OSWER Directive No. 9355.7-04, *Land Use in the CERCLA Remedy Selection Process*.

7.8 Off-Station (Third Party) Sites Where the Navy/Marine Corps is a Potentially Responsible Party (PRP)

An off-station or third party site is a private, state, or municipally owned or operated site which has received Navy/Marine Corps waste and now requires cleanup under CERCLA. EPA seeks to recover CERCLA response costs for assessments and cleanup costs from the Potentially Responsible Parties (PRPs) or get them to fund assessment and cleanup costs. DoD has no current or past ownership interest at PRP sites but does have a responsibility for cleanup of the site under CERCLA, Section 104(a)(3). DoD Services may fulfill their third party responsibilities by:

- Being actively involved in the steering committee for a PRP-led cleanup;
- Adjudicating or defending a claim against DoD or a Service for monetary contribution toward remediation of a PRP site; or

- Seeking Department of Justice assistance when there is cause to contest or challenge demands for DON contribution or participation; any settlement that may result in such a situation will normally be made from the judgment fund of the U.S.

Under CERCLA, the DON may become a PRP to enforcement actions taken to recover costs of cleanups. While EPA cannot sue the DON to recover such costs, non-Federal PRPs can; hence, the designation as “third party.” PRPs may include any of the following:

- The present owner or operator of the hazardous waste facility;
- The owner or operator of the hazardous waste facility at the time hazardous waste was disposed there;
- Anyone who transported hazardous waste to the facility; or
- Anyone who arranged for disposal at the site.

EPA uses the following procedures to notify and work with PRPs:

- The EPA Regional Office sends a “Special Notice” certified letter to the PRPs. This notification may occur before, during, or after EPA responses at a site. The EPA letter informs PRPs of their potential liability, provides a list of other known PRPs, and calls for PRPs to do any or all of the following:

Voluntarily remove their hazardous waste from the site;

Provide all available documentation on hazardous waste sent to the site (CERCLA requires PRPs to provide this information);

Voluntarily attend a meeting where EPA regional personnel will describe the problem and potential liability in more detail; or

Indicate a willingness to negotiate settlement for costs incurred by EPA to date.

- The EPA region will encourage PRPs to form a steering committee to undertake studies and site cleanup directly or by using an EPA contractor. The committee will determine appropriate division of costs between the PRPs and means of cost recovery from PRPs who do not participate in the committee.
- Where EPA chooses not to recommend committee formation or where the committee is unable to reach agreement with EPA, EPA may proceed with the cleanup using the CERCLA Trust Fund to initiate enforcement litigation against PRPs to recover Trust Fund expenditures.

Navy/Marine Corps policy regarding third party sites may be summarized as follows:

- When formally notified by EPA, state, or local authorities that an installation is a PRP at a CERCLA site, the installation must notify the cognizant EFD/EFA by correspondence and include a copy of the notifying letter and all other appropriate documents. The EFD/EFA will take the lead role in negotiating with EPA, the U.S. Attorney’s Office, and the PRP Steering Committee and will support the installation when community relations issues involving the notification arise;

- Use ER, N funds for the DON's negotiated fair share of study and cleanup costs for the site, as long as such costs are not incurred or assessed pursuant to a judgment, e.g., consent decree, or as part of a compromise settlement for which payment out of the Judgment Fund is authorized. ER, N funds may not be used to pay for outside counsel costs or costs associated with PRP committee legal expenses. EFD/EFA environmental counsel should work with EFD/EFA technical staff to ensure DON's interests are protected while at the same time not paying unallowable costs.

The cognizant EFD/EFA will provide support to the Office of General Counsel (OGC) litigation office and the Department of Justice when the PRP litigation has been filed against DON.

7.9 CERCLA Citizen Suit Provisions

The Superfund Amendments and Reauthorization Act (SARA), Section 310, added a new provision to allow citizen suits after signature of the Record of Decision against any person or Federal agency to enforce the requirements of CERCLA. Suits can be brought for either:

- Violation of any standard, regulation, condition, requirement, or order which has become effective pursuant to CERCLA to include any provisions of a CERCLA, Section 120, agreement regarding Federal facilities; or
- An alleged failure to perform any act or duty imposed by CERCLA, Section 120, which is not disciplinary.

The plaintiff must provide a 60-day notice to the alleged violator before any suit can be brought. An installation should immediately notify the chain of command and the appropriate EFD/EFA if it receives a notice of intent to sue. During the 60 days following the notice of intent to sue, DON personnel should identify relevant facts and information for use in negotiation or litigation, whichever occurs first. See OPNAVINST 5090.1 series for additional guidance.

7.10 Formerly Used Defense Sites (FUDS)

The Formerly Used Defense Site (FUDS) process parallels the IR Program process. ER, N funds the FUDS Program which must be in compliance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); however, the program structure is different. FUDS have two major components: inventory and remediation. The U. S. Army Corps of Engineers, serving as Executive Agent of the FUDS Program, investigates sites in the inventory phase to determine site eligibility. An eligible site is defined as a formerly controlled DoD site where DoD caused, or potentially caused, a contamination problem. The remediation phase of the FUDS process, as with the IR Program process, includes a Preliminary Assessment/Site Investigation, a Remedial Investigation/Feasibility Study, a Record of Decision, and a Remedial Design/Remedial Action.

Any questions concerning FUDS should be referred to Headquarters U. S. Army Corps of Engineers (202) 761-4705. The DON's responsibility for FUDS is informational only.

7.11 Government Owned / Contractor Operated (GOCO) Facilities

Government Owned/Contractor Operated (GOCO) facilities require special consideration and procedures to carry out IR-type activities. The Navy's liability and responsibility for cleanup at GOCO facilities is based upon its status as the "owner" of the facility. Past and present contractors share this liability since they are "operators" or "generators" at these facilities. It is possible that a facility could become GOCO subsequent to Navy operation when contamination occurred.

Navy policy requires current GOCO contractors to pay for any and all cleanup costs associated with their operation of Navy facilities. However, depending on how the Navy structures the GOCO contract, environmental costs may be allowable expenses and, hence, recoverable by the GOCO operator.

Navy actions to fulfill its CERCLA responsibilities should be consistent with its contractual requirements with the GOCO contractor. The result of failure to coordinate GOCO responsibilities between the Navy and the contractor may include submittal of a claim by the operating contractor under a Navy contract or loss of potential claims by the Navy against the operator. OPNAVINST 5090.1B requires that the following policy regarding GOCOs be adhered to when implementing the IR Program:

- NAVFAC will perform a Preliminary Assessment/Site Investigation at Navy GOCOs and will coordinate with the corresponding Claimant command prior to commencing the study. ER, N funds will be used for the Preliminary Assessment/Site Investigation;
- The results of the Preliminary Assessment/Site Investigation will be provided to the Claimant command for action. If the Preliminary Assessment/Site Investigation recommends additional follow-up work, the Claimant command will immediately initiate discussions with the contractor concerning contractor responsibilities and participation in the cleanup efforts;
- If the contractor declines to perform the follow-up studies, the Claimant command will request NAVFAC to conduct the work under the IR Program. ER, N funds will be used, and all costs for the follow-up study will be identified for future cost recovery actions, if appropriate;
- Similar scenarios will be followed for any Remedial Design/Remedial Actions including removal actions and interim remedial actions. The Navy will pursue cost recovery actions against the contractor where appropriate; and
- All actions, i.e., studies and cleanups, performed at GOCOs will be consistent with CERCLA and the NCP. All GOCOs will also provide administrative records and community relations plans. If the DON funds studies and cleanup with ER, N, Technical Review Committees/Restoration Advisory Boards must be convened.

All timetables associated with CERCLA, Section 120, apply if a GOCO is placed on the NPL, and the Navy will ensure that these timetables are met.

The EFDs/EFAs will negotiate FFAs for GOCO facilities placed on the NPL. The negotiated and signed FFA should in no way be construed as the DON's acceptance of the contractor's/operator's share of the liability for cleanup costs associated with the GOCO site.

7.12 Firing Ranges (CERCLA vs. RCRA)

The regulation of ordnance-related waste and particularly the question of when do munitions become classified as a RCRA-regulated waste has been an unresolved issue between EPA and DoD for several years. DoD's policy guidelines establish that munitions used in training activities which are conducted for personnel training and safety, such as firing ranges, will become hazardous waste when an authorized DoD official determines the munitions should be discarded rather than be retained as an item of military ordnance.

Small arms firing ranges contaminated with large amounts of lead are coming under increased attention under RCRA and the Clean Water Act. Periodic disposal of soil from berms must be handled as hazardous waste, and lead-contaminated runoff from berms falls under non-point source, storm water, or point source regulations. For firing ranges that have closed and require cleanup or remediation, the CERCLA regulations will apply except for Part "B" permitted facilities where cleanup is proceeding under RCRA.

7.13 Unexploded Ordnance (UXO)/ Ordnance and Explosive Wastes (OEW) and the IR Program

Depending on the actual site, unexploded ordnance and explosives may or may not be considered a waste. It is, however, a safety concern which must be dealt with during any survey or investigation of an IR site.

The IR Program is divided into four groups: Group A - Program Management and Support, Group B - Hazardous and Petroleum Waste, Group C - Ordnance and Explosive Waste, and Group D - Technology Demonstration and Validation. Projects specifically for the cleanup of sites contaminated with hazardous substances or wastes of Ordnance and Explosive Waste (OEW) from past practices are to be included in Group B, if they present risk to human health and the environment. Projects for the mitigation of human safety risks from OEW are to be included in Group C.

The Risk Assessment Code as outlined in MIL-STD-882C, *System Safety Program Requirements*, 19 Jan 93, determines the Risk Management Concept used to prioritize OEW projects. For further information, see ODUSD(ES) guidance of 14 April 94.

Additionally, the Navy's Ordnance Environmental Support Office, Indian Head, Maryland is available to assist RPMs when an IR, Solid Waste Management Unit (SWMU) or Area of Concern (AOC) site is discovered at an active or BRAC installation.

7.14 Natural Resources Management

Cleanup plans have the potential to adversely affect natural, cultural, and human resources, both directly and indirectly. These potential impacts include such resources as wetlands, endangered species and other sensitive biological species and habitats, archeological and historical resources, air quality, water quality, traffic and access, coastal zone concerns, public safety, Native American concerns, Environmental Justice, local community sensitivities, and others. For many of these resources, there are other environmental laws and policies to consider and/or comply with, to varying extents, depending on the type of cleanup program and the type of impact. The principal laws and policies include: the Endangered Species Act, the National Historic Preservation Act, the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the Clean Water Act (esp. sections 404 and 401), the Clean Air Act (conformity), the Coastal Zone Management Act, the Migratory Bird Treaty Act, and Executive Order 12898 on Environmental Justice. The cleanup manager should be considering such resources in cleanup plans, and should consult with Navy NAVFAC environmental planners and environmental counsel dealing with the above laws, for input and advice regarding such resources of concern and any related compliance requirements.

In addition, natural resources management in the IR Program includes ensuring that environmental resources are considered during the following:

- Remedial actions such as removals, disposals, and relocation of hazardous wastes;
- Transfer of real property;
- Granting of leases; or
- Base closures.

A Natural Resources Damage Assessment is required to collect and analyze information to determine injury to, destruction of, or loss of natural resources resulting from a past or present hazardous waste release or oil spill.

Ecological Risk Assessments (ERAs) determine whether or not a proposed remedial action may adversely affect the natural resources of an area. An ERA may be required before any remedial action can proceed. Also, EPA has directed that ERA's be performed at all NPL sites in order to protect wildlife, fisheries, endangered and threatened species, and valued habitats. The ERA will examine the ecological effects and routes of exposure associated with any hazardous substance release or threat of release and provide estimates of environmental effects of various proposed remedial alternatives.

NAVFAC has developed the *Natural Resources Management Procedures Manual, NAVFAV Manual P-73* which provides comprehensive guidance for implementing requirements of pertinent laws, Executive Orders, and SECNAV, OPNAV, and Marine Corps instructions which may be used for further reference.

7.14.1 Natural Resources Trustees

Natural Resources Trustees are responsible for the Natural and Cultural Resources Management Program within the Federal government. These Federal trustees have statutory responsibilities

with regard to protection or management of natural resources or stewardship as a manager of Federally-owned land. State agencies and Indian tribes may also be trustees.

CERCLA designates the President as the “trustee” for all Federally protected or managed natural resources on behalf of the public. The President, by issuing E.O. 12580 and following the NCP, designates heads of specified departments, including DoD, as National Resource Trustees. National Resource Trustee responsibilities include:

- Using natural resources professionals to evaluate impacts of oil and hazardous substances spills and releases and to assist in appropriate actions;
- Providing for natural resources expertise in contingency planning;
- Developing mitigation plans in response to Navy/Marine Corps spills on Navy/Marine Corps land;
- Assessing natural and cultural resources damages to mitigate spill impacts. This includes conducting a preliminary survey on all areas affected by the discharge or release to determine if natural resources are or will be affected; and
- Carrying out any plans to restore, rehabilitate, replace, or acquire equivalent natural resources.

Natural Resource Trustees include DoD, NOAA and DOI.

7.14.2 Historic and Archaeological Resource Program (HARP)

The DON’s HARP is based on the National Historic Preservation Act (NHPA) and the Archaeological Resources Protection Act (ARPA). The NHPA established the Advisory Council on Historic Preservation (ACHP) and authorized the Secretary of the Interior to maintain a National Register of Historic Places which lists sites and objects of significance in American history as well as archaeological and cultural objects of significance. NHPA Section 106 requires the proponent of an “undertaking” to consider and evaluate the effect the “undertaking” may have on historic or archaeological properties. The term “undertaking” includes a broad range of activities including construction, rehabilitation and repair projects, demolition, licenses, Federal property transfers, testing during environmental investigation (e.g., borings through floors of historic buildings, sampling for asbestos, etc.) and many types of remedial actions.

The five steps of the NHPA Section 106 Review Process are:

- Identifying and evaluating historic properties;
- Assessing effects;
- Consulting with appropriate persons/organizations;
- Requesting ACHP comment; and
- Deciding and acting.

To identify the Navy properties that the proposed action may affect, the Navy reviews background information and consults with the State Historic Preservation Officer (SHPO) and the ACHP. Based upon this review, the Navy will determine what additional professional surveys or other field studies are needed and will conduct such studies.

The effects of an undertaking must be taken into account if historic or archaeological properties are found. If there is an adverse effect, the Navy/Marine Corps will need to enter into consultation with the appropriate parties to resolve the adverse effects. The Navy/Marine Corps, the State Historic Preservation Officer, the ACHP, or other interested parties may agree on measures to avoid, reduce, or mitigate the adverse effects on historic properties or to accept such effects in the public interest. The Navy/Marine Corps must then submit written documentation as specified in 36 CFR 800.8(d) to the ACHP and request comment. The Navy/Marine Corps must consider the ACHP's comments and notify the council of its decision.

ARPA prohibits the excavation, removal, damaging, alteration, or defacement of archaeological resources on Federal property without a permit. "Archaeological resources" are identified as any material remains of past human life or activities which are at least 100 years old and which are of archaeological interest as determined by the implementing regulation, 32 CFR 229. The ARPA permitting process does not apply to excavations performed by the Navy itself; however, the Section 106 process of the NHPA does apply. The EFD's/EFA's have been delegated the authority to issue ARPA permits and should be consulted when any remedial action may have an impact on any archaeological resource.

7.15 Off-Base Contamination

Contamination from a Navy/Marine Corps installation may migrate off the installation or come on to the installation from off-base sources. CERCLA, Section 104(e), delegates authority to DoD, under E.O. 12580, to provide access and inspection monitoring when the release is on, or the sole source of the release is from, DoD property. The DON is required to investigate the geographic boundaries of the contaminated site when it is suspected that the release is migrating from that site and may be required to enter real property which may not belong to the Federal government. EPA must be consulted to access private property. The legal right of entry for the purpose of investigating contamination of off-base sites can be handled in a variety of ways to include:

- The EFD/EFA and installation can approach the landowner and seek permission to perform the required investigations. This may require payment, or the landowner may allow access for free; or
- The EFD/EFA and installation (in conjunction with NAVFAC HQ) will coordinate Department of Justice assistance to either condemn a right of entry or provide a compliance order allowing access and entry.

In either case, the EFD/EFA legal staff should be involved as soon as it is determined that a right of entry onto adjacent land is necessary to determine the extent of contamination.

Considerations for off-base access must be taken into account when entering into FFAs and agreeing to timetables for completion of work. The Commanding Officer/ Commanding General

of the installation will review and sign the Record of Decision and decision documents involving the cleanup of contamination on land that is not controlled by the Navy/Marine Corps but which is the DON's cleanup responsibility.

7.16 Radiological Issues in IR and BRAC

Radiological issues pose special challenges at IR or BRAC sites. The CERCLA process to investigate, characterize, and remediate (if necessary) potential chemical contamination under the oversight of EPA or the appropriate state agency also applies to radioactivity, both naturally occurring and man-made. However, assessment of radiological issues is often complex, entails overlapping regulatory authority including some exercised by the Navy itself, and may involve specialized knowledge and expertise which IR contractors lack. A significant factor during the assessment and evaluation of sites for radiological contamination is the ubiquitous presence of naturally occurring radioactivity that varies with geophysical characteristics of the site.

7.16.1 Responsibilities and Coordination of Issues

The radioactivity present at Navy installations may be broadly characterized as Naval Nuclear Propulsion Program (NNPP) radioactive material and General Radioactive Material (G-RAM).

7.16.1.1 Naval Nuclear Propulsion Program (NNPP)

The NNPP in the Office of the Chief of Naval Operations (OPNAV N00N, which is also part of NAVSEA as Code 08, Nuclear Propulsion Directorate) is responsible for all matters pertaining to naval nuclear propulsion, including the control of radioactivity associated with the operation and servicing of naval nuclear propulsion plants. NNPP regulates this radioactivity pursuant to the Atomic Energy Act of 1954, Executive Order 12344 and Public Law 98-525 (42 U.S.C. 7158). Because of this statutory authority as a regulator, the NNPP must be involved in the remedial action process (under CERCLA, RCRA, or BRAC) at Navy installations and shipyards frequented by nuclear powered warships.

7.16.1.2 General Radioactive Material (G-RAM)

G-RAM includes man-made radioactivity used for medical and general industrial purposes, as well as naturally occurring radionuclides employed for industrial purposes; in short, it includes all non-NNPP radioactivity which may be addressed under the IR Program at Navy installations. Examples of G-RAM include gauges which had dial markings painted with luminous radium paint, commodity items such as electronic tubes and smoke detectors containing radioactive materials, and small radioactive sources used for calibration and testing of radiation detection instruments. NAVSEA (07R) is the Radiological Control Program Office, and has responsibility for removal of Low-Level Radioactive Waste (LLRW) derived from G-RAM. NAVSEA 07R has designated the Naval Sea Systems Command Detachment Radiological Affairs Support Office (NAVSEADET RASO) as the technical support center for non-medical G-RAM technical issues; BUMED has responsibility for medical sources of radioactivity.

7.16.1.3 NAVFAC/ NNPP/ NAVSEADET RASO Interface

In administering the IR Program, EFDs/EFAs are responsible for coordination of any radiological issue which may arise during an installation's IR Program. Such issues may arise from regulator or public/ Restoration Advisory Board (RAB) questions, sampling or work plans, community relations plans (see **Chapter 10**), Federal Facility Agreements, or any other IR Program documentation.

At installations frequented by nuclear powered warships, EFDs/EFAs should inform the NNPP and NAVSEA 07R of any agreements or plans being developed to investigate or clean up NNPP or G-RAM radioactivity, respectively. In addition, the NNPP has an interest in G-RAM issues to ensure the consistency of effort at sites under NNPP jurisdiction. For any G-RAM radiological issue at other installations, NAVSEA 07R/NAVSEADET RASO only need be kept informed.

7.16.2 Historical Radiological Assessments

Naval nuclear-capable shipyards are preparing Historical Radiological Assessments (HRAs) for themselves and for naval installations frequented by nuclear powered warships, to document historical radiological policies and practices, and to compile existing radiological environmental data. HRAs use the format of CERCLA Preliminary Assessments, and their goal is to determine whether further investigation or remediation is required. Specific information contained and evaluated in the HRA comes from:

- Environmental monitoring and sampling programs;
- Low-Level Radioactive Waste management practices;
- Low-Level Radioactive Waste Shipment and Disposal Records; and
- Navy radioactive material permits/ Nuclear Regulatory Commission licenses.

HRAs are two-volume documents: Volume I addresses NNPP radioactivity, while Volume II covers G-RAM. When the Navy prepares Preliminary Assessments under CERCLA for EPA's scoring the installation for possible listing on the National Priorities List (NPL), the HRA supports this effort. At sites listed on the NPL, the HRA will be used to satisfy FFA provisions, as required. Therefore, NAVFAC EFDs/EFAs need to ensure that NAVSEA 07/NAVSEADET RASO and the NNPP are represented on the Navy's FFA negotiating teams at installations where that is warranted. At closing installations, the HRA will be used to support other base closure documentation. Funding for HRA is either from the Environmental Restoration, Navy through NAVFAC, or directly from the Base Closure Account for installations facing realignment or closure.

7.16.3 Radiological Programs for BRAC

At installations facing realignment and closure where NNPP work has been conducted, the date of operational closure is normally established as the date of nuclear closure, as determined by the Director, NNPP.

To support closure, the following documents, which the EFD/EFAs or contractors who work for them prepare, are likely to contain radiological information which must be reviewed by the appropriate organization (NNPP and/or NAVSEA 07R) prior to release to either regulators or the public:

- Installation Reuse and Disposal Environmental Impact Statement;
- Environmental Baseline Survey;
- BRAC Cleanup Plan;
- Transfer of Claimancy Agreement (from current claimant to NAVFAC); and
- Leases or other documents to transfer facilities to the community.

NAVFAC EFDs/EFAs must allow adequate time for such document review, and should incorporate such reviews into the schedules for document completion.

7.16.4 Radioactive Waste Disposal

The NNPP is responsible for proper disposal of waste generated under its cognizance, so any issue pertaining to such waste should be referred to them. The remainder of this section applies to G-RAM only.

The Deputy Chief of Naval Operations (Logistics) is designated as the resource sponsor for the LLRW Disposal Program, which includes radioactive residue from decontamination products and property contaminated with radioactivity, to the extent that decontamination is not economically feasible. The Deputy Chief of Naval Operations (Logistics) provides guidance and resources to the program managers for execution of the LLRW Disposal Program.

In 1992, the Assistant Secretary of Defense appointed the Department of the Army as the DoD Executive Agent for the management of the disposal of LLRW. NAVSEA 07R is the Navy's program manager for oversight of the LLRW Disposal Program. Installation Commanding Officer's/ Commanding General's are responsible to dispose of non-NNPP LLRW only through this program, and only with authorization of NAVSEADET RASO. In addition, they must comply with instructions and guidance issued by NAVSEA 07R and NAVSEADET RASO for every non-NNPP LLRW disposal action. CNO designated NAVSEADET RASO as the single Navy agent for disposal of non-NNPP LLRW materials.

7.16.5 Mixed Waste

Mixed waste is radioactive waste mixed with hazardous waste and is regulated under both RCRA and the Atomic Energy Act. The Director, NNPP, handles all policy and other matters pertaining to such radioactive mixed waste if the waste resulted from naval nuclear propulsion work; the Deputy Chief of Naval Operations (Logistics) (N4), is responsible for all other Navy mixed waste. Navy facilities that generate and store mixed waste associated with NNPP work are included in the Federal Facilities Compliance Act process.

Under the Federal Facilities Compliance Act of 1992, the U. S. Department of Energy (DOE) is required to prepare Site Treatment Plans to address treatment of mixed waste for each site under DOE cognizance that generates and stores mixed waste. The Site Treatment Plan identifies treatment options for each mixed waste stream present.

7.17 U.S. Environmental Protection Agency's Superfund Administrative Reforms

EPA has instituted new Superfund reforms aimed at controlling costs while protecting public health by assuring more consistency, streamlining processes to save time and money, creating new choices for cost-effective cleanup options, and encouraging economic redevelopment. Among these reforms will be the establishment of cost-effective "Rules of Thumb" and an EPA National Remedy Review Board to ensure costs are appropriate to cleanup needs; setting criteria for reopening remedy decisions at selected sites where better science will achieve the same level of protection with potential cost savings; implementing directives to ensure rigorous attention to costs in the development of cleanup options and remedy selection; and establishing a national risk-based priority setting to select sites for funding based on the principle of cleanup of "worst sites first."

The main item of interest to the DON will be EPA's effort to "make smarter cleanup choices that protect public health at less cost."

These reforms will be based on the following:

- Controlling remedy costs and promoting cost-effectiveness by:
 - Reviewing proposed high cost remedies to ensure that costs are not disproportionate to cleanup benefits;
 - Revisiting remedy decisions to consider significant new information or technologies advancement;
 - Clarifying the role of costs in developing cleanup options and selecting remedies including presumptive remedies; and
 - Clarifying the basis for remedy selection at each site including costs and benefits of cleanup alternatives.
- Ensuring all risk assessments are grounded in reality by:
 - Soliciting stakeholder input to identify and make consistent use of current information about a site and its inhabitants; and
 - Standardizing components of the risk assessment process that vary little from site to site; and issuing national criteria for the review, approval, and reporting of Superfund risk assessments.
- Establishing a lead regulator at each site undergoing cleanup activities under competing Federal and state authorities to eliminate overlap and duplication;

- Reforming NPL listing and deletion policies by ensuring that response actions that have been taken up to the time of listing are considered when listing sites on the NPL; and deleting “clean” parcels from the NPL; and
- Establishing formal national priority-setting systems for funding Federal facility and Superfund cleanups based on the principle of “worst case first.”

For additional information, see the EPA’s *Superfund Administrative Reforms - Overview*, draft final, October 1995.

7.18 Contracting Issues

The following information summarizes basic concepts in procurement as they apply to the IR Program. In general, the Navy/Marine Corps’ contracting effort with regard to the IR Program is two-pronged, with the “Comprehensive Long-Term Environmental Action, Navy“ (CLEAN) contracts providing professional services during study/design phase of the IR Program and the Remedial Action Contract (RAC) providing the actual remediation and long-term maintenance. SECNAV approved the original Acquisition Plan and strategy for the CLEAN and RAC contracting vehicles in 1988.

Innovative contracting mechanisms that may prove effective for removing above and below ground storage tanks include the Environmental Job Order Contract (JOC) and the “Tank Yank” contracts. These contracts are both Indefinite Quantity contracts with Fixed Price contract line items. They are in the experimental stage and will be refined to provide additional contracting tools to the IR team. Fixed price contracts remain an important part of the Navy/Marine Corps’ environmental acquisition strategy when the scope of a project can be exactly defined and adequate cost history can be obtained to establish a reasonable unit price. Further guidance on contracting issues can be found in the Deputy Assistant Secretary of Defense, *Defense Environmental Restoration Program Manual*, March 1990.

7.18.1 Comprehensive Long-Term Environmental Action, Navy (CLEAN)

CLEAN contracts for professional environmental studies and designs are one year Cost-Plus-Award-Fee (CPAF) contracts with nine one year options. The EFDs/EFAs award the CLEAN contracts on a regional basis. CLEAN contracts also provide professional expertise during the post-award construction phase of the remediation.

7.18.2 Remedial Action Contract (RAC)

Remedial Action Contracts accomplish IR remediation projects. NAVFAC Contracting Officers select contractors based on technical expertise and price competition according to the individual source selection plan set forth in the solicitation. Evaluation factors that go into the selection of award include technical capability, management ability, quality of key people, experience with various types of environmental remediation, and proposed rates. The EFDs/EFAs award these contracts regionally. Early Navy/Marine Corps contracting strategy was to complete a CLEAN contract design and turn it over to a RAC contractor for execution. However, today Partnering between the CLEAN and RAC contractors, state, and Federal regulators has integrated the efforts of all parties concerned for the purpose of obtaining more timely, cost-effective site remediation.

Chapter EIGHT

8. **Priorities / Eligibility / Funding**

Priorities for Defense Environmental Restoration Program (DERP) funding will be determined on the basis of risk management which includes:

- Compliance with planning guidance;
- A site's relative risk;
- Installation concerns and priorities; and
- Stakeholder concerns and priorities.

Under devolvement as part of the Navy/Marine Corps' Total Obligational Authority, the Environmental Restoration, Navy (ER, N) appropriation will now be reviewed in all internal program and budget processes. Current guidance from CNO(N4) and CMC(L) stresses the need to maintain an effective cleanup program, make use of relative risk evaluations, and renegotiate legal agreements, as necessary, to remain within funding controls.

8.1 Planning Guidance

The Defense Planning Guidance signed on 9 May 1994 by the Secretary of Defense states that "Navy/Marine Corps will ensure continued protection of human health and the environment and will comply with legally enforceable agreements and orders." The Navy/Marine Corps uses this guidance for planning, programming, and budgeting for the Installation Restoration (IR) Cleanup Program.

8.2 Site Relative Risk

The risk management concept used to determine cleanup priorities requires that each site be placed in a high, medium, or low relative risk category. It is the task of the Remedial Project Manager (RPM) and the installation to organize existing data necessary to rank the IR sites, program to obtain missing data, and determine the site priorities. The following definitions provide a general description of the relative risk categories:

- High Relative Risk Site - Sites where contamination is present and conditions indicate a migration pathway is completed to human, or sensitive ecological species receptors at concentrations presently posing public health or environmental threat or contamination could easily and rapidly migrate to such a receptor population.
- Medium Relative Risk Site - Sites where human, ecological, or sensitive species receptors are present, a migration pathway exists, and evidence indicates that transmission of a contaminant to receptors is not expected to occur at levels of public health or ecological concern within the next 5 to 10 years.
- Low Relative Risk Site - Sites where contaminant presence does not currently pose a threat to human, ecological, or sensitive species receptors and is not likely to pose a threat in the future because of low contaminant hazard, absence of a pathway completion scenario, or absence of human, ecological, or sensitive species receptors.

The Deputy Secretary of Defense has endorsed stabilized funding and the use of relative risk to determine program priorities.

8.3 Installation and Stakeholder Concerns and Priorities

Final determination of funding priorities will be accomplished by NAVFACENGCOM in coordination with the installation and the Restoration Advisory Board (RAB). Risk management decisions to adjust funding priority may include considerations such as technical feasibility, efficient business requirements, mission impacts and stakeholder perspectives in addition to relative risk.

8.4 Defense Environmental Restoration Program (DERP) Categories

8.4.1 Installation Restoration (IR) Program

The Deputy Under Secretary of Defense (Environmental Security) [DUSD(ES)] established the IR Program as one of three categories of the DERP. Under the risk management concept, the IR Program is divided into four groups as follows:

- Group A - Program Management and Support to include:

Program management, civilian salaries, travel, and training to support an effective program;

Site assessment work required to determine status of relative risk for hazardous or petroleum waste sites or risk assessment code for ordnance/explosive waste site;

Long-term operation and monitoring of remedial systems;

Eligible fines and penalties;

Potentially Responsible Party (PRP) liabilities; and

Technology application management and support.

- Group B - Hazardous and Petroleum Waste to include:

Identification, investigation, and cleanup of contaminants at installations (including off-site) and formerly used defense sites (FUDS) properties. This program focuses on cleanup of contamination from past Department of Defense (DoD) activities to ensure that threats to public health and the environment are eliminated. The term “contaminant” includes CERCLA hazardous waste, petroleum, oil, and lubricants and DoD unique materials such as biological or chemical warfare materials. This group also includes toxicological data collection.

- Group C - Ordnance and Explosive Waste to include:

Identification, investigation, and removal of DoD owned and abandoned ordnance and explosives wastes (OEW) which present an explosive hazard to human safety. This does not include targets and ordnance debris. This group is limited to FUDS unless

specific CNO approval is obtained. Remediation or cleaning of active ranges and disposal sites are a Navy/Marine Corps responsibility and should be programmed within Navy/ Marine Corps mission resources.

- Group D - Technology Demonstration and Validation to include:

Technology demonstration and validation in accordance with PBD 299, *Realignment of RDT&E Budget Activities*, December 3, 1993.

8.4.2 Other Hazardous Waste (OHW) Program

Other Hazardous Waste (OHW) Program efforts are the second category of activities included in the DERP. These activities cover hazardous waste reduction equipment, process changes, and other hazardous waste minimization initiatives. The goal of the OHW Program is to encourage demonstration and validation of technology to reduce hazardous waste generation. OHW projects are the responsibility of the Navy/Marine Corps and should be programmed within Navy/Marine Corps resources.

8.4.3 Building Demolition/Debris Removal (BD/DR) Program

The third category of activities included in the DERP is the Building Demolition/ Debris Removal (BD/DR). The goal of the BD/DR Program is to protect human health and safety by removing unsafe buildings, structures, and debris resulting from past Navy/ Marine Corps operations.

8.5 ER, N Eligible and Ineligible Projects

DoD establishes the policy for determining ER, N eligible and ineligible projects. Current DoD and Navy/Marine Corps guidance should be consulted to assist in making this determination.

8.5.1 Activities Eligible for ER, N Funding

DERP policy takes into account actions to eliminate unacceptable human exposure to contamination and removal of imminent threats to human health and the environment. Activities eligible for DERP funding include:

- Investigations to identify, confirm, and determine risks to human health and the environment; feasibility studies or engineering evaluations/ cost analyses (EE/CA); remedial action plans and designs; and removal or remedial actions;
- Technology demonstration and validation necessary to conduct cleanups;
- Expenses associated with cooperative multi-party cleanup plans and activities including litigation expenses;
- Remedial actions to protect or restore (not enhance) natural resources damaged by contamination from past hazardous waste disposal activities;
- Cleanup of low level radioactive waste sites which have been identified as IR Program sites;

- Management expenses associated with the IR Program. Management expenses are those overhead costs required for adequate program oversight and management;
- Operation and maintenance (O&M) costs for remedial and monitoring systems;
- Immediate actions necessary to address health and safety concerns such as providing alternate drinking water supplies or treatment of contaminated drinking water when the hazard results from a release from Navy/Marine Corps property;
- Studies to locate **abandoned** underground tanks; activities to determine whether a release has occurred; and cleanup of contamination;
- Response to releases from in-service tanks discovered during **initial** integrity testing (leak detection monitoring) per 40 CFR 280 where testing was conducted prior to the regulatory date of 22 December 1993;
- CERCLA response actions and eligible RCRA corrective actions identified in Federal Facility Agreements (FFAs)/ Inter Agency Agreements;
- Support services provided by another agency in accordance with 10 U.S.C. 2701(d);
- Fines and penalties imposed by regulatory agencies assessed under the authority of the Federal Facilities Compliance Act associated with IR Program activities; and
- Corrective actions at solid waste management units (SWMUs) required by RCRA, Sections 3004(u) and 3008(h) except as described in the following section.

For additional information, see **section 7.2**, Underground Storage Tank Sites.

8.5.2 Activities Not Eligible for ER, N Funding

The following activities are not eligible for DERP funding:

- Expenses associated with the defense and settlement of claims against the U. S. under the Federal Tort Claims Act, 28 U.S.C. 1346(b), 2671-2672 and 2674-2680;
- Environmental restoration activities in foreign countries;
- State supported services prior to 17 October 1986, past state costs not reasonably documented, and state services in support of non-IR Program funded cleanup activities of FUDS, unless approved by DUSD(ES);
- Costs of testing, storing, disposing, or replacing polychlorinated biphenyl (PCB) transformers;
- Costs of asbestos and lead based paint surveys, containment, removal, or disposal;
- Costs of spill prevention and containment measures for currently operating equipment and facilities;
- Cleanup costs of spills associated with current operations;

- Closing or capping sanitary landfills unrelated to a hazardous waste cleanup action;
- Construction of hazardous waste storage, transfer, treatment, or disposal facilities, except when part of an IR Program response action;
- Testing or repair of active underground tanks and costs of replacing leaking underground tanks;
- Costs of operation, maintenance, or repair to hazardous waste transportation, storage, and disposal (TSD) facilities which are currently in use, i.e., regulated or permitted, except when part of a DERP response action;
- Costs of hazardous waste disposal operations, including associated management and operational costs, unless the costs result from implementation of a DERP response action;
- Actions (contingency response and closure) at regulated TSD units which meet standards under 40 CFR 264 and which have been issued a final operating permit under 40 CFR 270;
- Facility improvements to meet RCRA operating standards at TSD units;
- UXO clearance from active or former ranges;
- Remediation and/or closure of Open Burning/Open Detonation/Static Firing sites which are included in a RCRA hazardous waste treatment permit or permit application or portions of prior permitted sites on which actual treatment operations have been conducted since the interim status permit was issued; and
- Remediation of active impact ranges and firing tables.
- Actions at RCRA Solid Waste Management Units that are Hazardous Waste Management Units (HWMUs) are not eligible for ER, N funding unless contamination from the HWMU is commingled with contamination from another ER, N eligible CERCLA, UST or RCRA Corrective Action site and occurred from operations which ceased prior to the unit being regulated as a HWMU. Part of the operational requirement to operate a HWMU is to close it, i.e., remove or decontaminate all residues, liners, subsoils, etc. that are contaminated as a result of the operation. These closure actions should be included in the O&M requirements for the unit and should not be funded by ER, N.
- Cleanups within buildings (e.g., PCB contaminated floor cleanups, etc.).

8.6 Environmental Restoration, Navy (ER, N) Funding Guidance

In a 3 May 1995 memorandum, the Deputy Secretary of Defense devolved the Environmental Restoration Program to the Services beginning in FY 97. This shifts programming responsibility to the individual services and the Navy/ Marine Corps cleanup effort will be reviewed along with all Navy/Marine Corps requirements in programming and budgeting. The current practice whereby the Navy is responsible for executing the Cleanup Program for both the Navy and the Marine Corps remains unchanged.

Budgets and execution plans will continue to be developed based on DoD and Navy/Marine Corps funding guidance. The Navy/Marine Corps will no longer compete with the other services for the restoration funds but will now be responsible for its own DERP requirements. The restoration account will remain centrally-managed through CNO(N45) down to NAVFACENGCOM and the Engineering Field Divisions/ Engineering Field Activities (EFDs/EFAs). EFDs/EFAs will still program and manage ER, N funds. The Navy/Marine Corps will request funds in an Environmental Restoration, Navy (ER, N) appropriation for all cleanup efforts. The creation of these new restoration appropriations is subject to Congressional authorization and appropriation approval as part of the FY 97 budget submission.

Beginning in FY 84, DoD allocated DERA funds to the Navy/Marine Corps during the execution year. As of FY 97, Congress devolved DERA to the military Departments. Funds are now transferred from DoD to the appropriate military Department's Environmental Restoration Account.

Congress authorizes and appropriates ER, N funds for the DERP under 10 U.S.C. 2703. It is Navy/Marine Corps policy to use ER, N, as the exclusive source of funding for environmental restoration at active installations as defined in the DERP. Other types of funds are not authorized to be used in lieu of, or to supplement ER, N funds. This does not preclude the use of other funding to clean up current spills or conduct activities that are not eligible for the DERP.

ER, N funding may also be used to demonstrate new or innovative detection or cleanup technologies that offer the potential to markedly reduce time or costs. The use of ER, N funds for multi-agency demonstration projects must be approved by the Assistant Secretary of the Navy (Installations and Environment) [ASN(I&E)].

8.6.1 Area of Concern (AOC)

An AOC is a discrete area of suspected contamination that has not been entered into the DoD RMIS database. The Navy/Marine Corps uses ER, N funding for any needed investigations of AOCs for relative risk site evaluations.

8.6.2 Planning and Construction At / Near Contaminated Sites

Site contamination discovered during the planning, design, or construction of Navy/Marine Corps installation projects, especially MILCON projects, can delay project completion, increase cost, and adversely impact the Navy/Marine Corps mission. Project planning, construction, and environmental personnel should work together to avoid siting projects on contaminated sites and take appropriate action during any of the project stages when contamination is discovered.

To identify contamination problems or potential problems early in the siting process, the EFD/EFA should review available information from IR studies including records searches, personal interviews, soil borings, chemical and physical analysis, and other relevant data. Soil investigations performed to determine foundation conditions should seek evidence of contamination.

Installations and EFD/EFAs are encouraged to identify IR sites on base wide Computer Aided Design/Geographic Information Systems (CAD/GIS) to assist in the process of reviewing prospective construction project locations and assuring that new construction projects are not located on IR sites.

The installation environmental staff should ensure that public works personnel are informed about the location of IR Program sites, and formal review of all siting proposals should consider the proximity and potential impact of IR Program sites at an early stage. Installation personnel, including individuals from the Public Works Department who work in or around contaminated sites, should be informed of the geographic boundaries of the sites and receive appropriate training at a level relative to the nature of their work and the site contamination.

The EFD/EFA, the installation's Public Works Department, and the installation's or the EFD/EFA's Contracting Officer should work together to develop a notification for all contractors who work or may work in or near a contaminated site. This notification includes, for example, identification of the geographic boundaries of the site prior to allowing contractors into the area even where the contractors are building security fencing around the contaminated site and may include immediate training in proper health and safety procedures and should take into consideration the nature of the work to be accomplished and the nature and location of the hazardous substances.

All efforts should be made to ensure that projects are not constructed on contaminated sites. However, there may be times when the project is being planned or is underway and contamination is discovered. In such instances, the following applies:

- If contamination is discovered or suspected at the location of a proposed project before design begins, ER, N may be used to investigate the nature and extent of contamination to determine the necessary cleanup or control measures and to fund the environmentally acceptable alternative. This may be accomplished by adding the site to an on-going IR study or initiating a study if one is not already underway at the installation. The priority of IR studies should not be changed as a result of other project requirements. If the project cannot be resited or revised to avoid the contamination, project funds may be used to remediate the site;
- If site contamination is discovered between project design authorization and start of construction (usually award of contract), ER, N funds may be used to accomplish the necessary response action. The lowest cost, environmentally acceptable response is eligible for ER, N funding. Project funds must pay for additional costs required for project construction;
- ER, N funds are available after the start of construction only to the extent required to satisfy CERCLA and the DERP. If contamination is discovered during the performance of work under a MILCON contract and cleanup of the contamination is ER, N eligible, the cleanup of the contamination should be funded using the MILCON account if the additional work required to clean up the contamination constitutes an in-scope change to the original contract. Previously unknown contamination discovered during the performance will normally constitute a differing site condition as determined by the *Changes and Differing Site*

Conditions clauses of the construction contract. ER, N funds transferred into the O&M, N or MILCON account, as appropriate, may be used to fund the cost of cleanup if the work: (a) is ER, N eligible, and (b) constitutes an out-of-scope change to the construction contract. The priority of such work for ER, N funding will be determined using the relative risk approach. The schedule of the MILCON project will not determine the cleanup effort's priority for ER, N funding.

8.6.3 Regulatory Oversight

The process established by the Defense/ State Memorandum of Agreement (DSMOA), as negotiated and signed between DoD and the states, will be used to provide ER, N funds to state regulatory agencies for payment of oversight costs. These costs should include state oversight, inspection, review, comment, participation in meetings, and public outreach programs related to the Navy/Marine Corps IR Program within that state. The Navy/Marine Corps also will use ER, N funds to pay state oversight costs associated with FFAs that require state involvement at Navy/Marine Corps NPL sites. However, where neither an FFA nor a DSMOA exists, the Navy/Marine Corps does not have authority to use ER, N funds to pay state oversight costs. Similar costs associated with EPA oversight are not eligible for payment under ER, N. The DoD supports EPA's budget requests so that proper funding levels are provided for adequate EPA oversight of the DERP.

8.6.4 Other Federal Agency Costs

ER, N can be used to fund the purchase of technical support services. Other Federal agencies such as the Fish and Wildlife Service, U. S. Geological Survey, other DoD agencies, and the Agency for Toxic Substances Disease Registry (ATSDR) may also provide assistance to the Navy/Marine Corps' IR Program, and ER, N may be used to purchase these support services. The EFD/EFA must prepare an Economy Act determination and finding before formalizing such agreements.

Although the Navy/Marine Corps does not provide funding for DoD's oversight of the Navy/Marine Corps IR Program, it is important that the Navy/Marine Corps identify outyear funding requirements for its programs so that DoD can establish future dollar baselines which can then be used to identify the amount of ER, N funding necessary for DoD's overall DERP management requirements.

8.6.5 Cleanup Funding Process

The Senate Appropriations Committee, funds each service's cleanup program based on identified IR Program needs and their priority. Funds are transferred to each service's O&M account. It is vital that the RPM accurately and comprehensively identify all program requirements for each budget submittal in order to obtain required funding.

The DON provides the received ER, N funds to NAVFACENGCOM HQ for program execution. NAVFACENGCOM HQ then allocates these funds to the EFDs/EFAs. Installation RPM's located at the EFDs/EFAs administer the program for installations under their jurisdiction. At the installation level, the IR Program may involve several contracts and contractors. Close

coordination between the EFD/EFA and installation and realistic programming and budgeting can ensure the timely processing of supporting information for budget submissions and smooth program execution.

At the EFD/EFA level, the RPM should work with the installation to gather all necessary information to identify these requirements. This information should include:

- Quantity and location of contamination (sources include Preliminary Assessments, Site Inspections, and Remedial Investigations);
- Identification of highest priority area(s);
- Identification of the requirements for cleanup or closeout; and
- Time and resources needed to accomplish the work for all sites or operable units.

8.6.6 Fact Sheets

Originally requested by CNO in February 1993, the EFDs/EFAs submit Fact Sheets to provide information about the environmental restoration efforts in the field. CNO requires the Fact Sheets for both ER, N and BRAC funded contract awards of \$250,000 or more directed to environmental cleanup work. The RPM is required to submit the Fact Sheets to NAVFACENGCOM HQ for all removals, remedial actions, or other cleanup actions when the project has been substantially completed or \$250,000 or more has been expended on the project. Fact Sheets provide highlights and “good news” of actual cleanup work performed by the EFDs/EFAs and are good sources of information when responding to programmatic questions and identifying innovative cleanup technologies in use.

8.7 Base Realignment and Closure (BRAC) Budget/ Funding Guidance

Separate funding procedures have been established for cleanup requirements at installations being closed or realigned under the Defense Authorization Amendments, the Base Closure and Realignment Act (BRAC 88), and the Defense Base Closure and Realignment Act of 1990 (BRAC 91, 93 & 95). BRAC costs will be identified on a line item basis as part of the budget process, and eligible BRAC projects will be specifically budgeted against the base closure account.

All IR Program costs on real property which is to be disposed of as a result of a closure or realignment must be charged to the BRAC account. All environmental surveys, e.g., asbestos, environmental baseline surveys for transfer, PCBs, etc., required for disposal of BRAC-related real property will be charged to the base closure account.

Cleanup priorities at BRAC installations are normally driven by economic reuse decisions. The Relative Risk Site Evaluation may be useful for establishing cleanup priorities where economic reuse is not an issue.

8.7.1 BRAC Underground Storage Tanks (USTs)

The Navy/Marine Corps has implemented a BRAC UST Program to comply with all regulations to accomplish base closure or excess property. The Navy/Marine Corps retains the possibility of liability under CERCLA for any past Navy/Marine Corps releases of hazardous substances from USTs even if they sell or donate the land to other parties. Proper closure and removal of all USTs will reduce the Navy/Marine Corps' potential liabilities.

USTs that do not meet regulatory standards should be removed or closed prior to property transfer, and all funding required will be accessed through the BRAC account. In addition, small, old tanks may be removed or closed if an economic analysis/risk assessment determines this as the best course of action.

The BRAC Cleanup Team will be responsible for development of the BRAC Cleanup Plan which will encapsulate and prioritize requirements, schedules, and cost of the environmental actions in support of UST cleanup. The BRAC Environmental Coordinator is responsible for providing direction for the use of BRAC environmental funds to accomplish UST cleanup, removal, and abatement actions within the resources available.

8.8 Cost Estimating

Cost estimating of IR Program projects is based on reliable source information. The following sources may assist in establishing project funding needs:

- Environmental equipment manufacturers;
- Managers from other installations;
- U. S. Department of Labor general wage rates for the area where the work will be done;
- Publications such as Mean Cost Data and estimating guides; and
- Computer models.

Any request for funding must include the preliminary cost estimate. A costing file should be maintained to include all background information such as contractor quotes, calculations, scheduling printouts, and lists of contacts and telephone contact records. This information will be essential if questions arise about the cost estimate when reviewed for funding priority. Estimates may include project funding and O&M funding requirements for long-range planning efforts.

8.8.1 Work Breakdown Structure (WBS)

Each remedial project has a unique set of environmental concerns, and program management must match these concerns with the appropriate level of resources both in time and money. The Work Breakdown Structure (WBS) is one way to accomplish this. The WBS, based on MIL-STD-881, consists of three major tasks to identify environmental concerns and requirements of the project:

1. Determine the elements of the system most critical to the project;
2. Focus the resources on the most critical elements; and

3. Track progress in meeting schedules and requirement.

The WBS identifies elements which comprise the overall project and make up the services, data, and facilities needed to develop, produce, operate, and support the project (common elements). It provides a quick visual indication of requirements and possible impacts to project completion. The WBS provides a program management tool to identify, assess, and control project concerns.

The RPM and EFDs/EFAs, as a team, should be able to identify those elements necessary to support the project. Once the team identifies these elements, responsibilities can be assigned and resources for assessment, planning, and control of the project can be assigned and initiated.

8.8.2 Documenting Cost and Performance for Remediation Projects

The Federal Remediation Technologies Roundtable and EPA's Technology Innovation Office, in the *Guide to Documenting Cost and Performance for Remediation Projects* (EPA/542/B-95/002), have developed a framework to standardize the documentation and collection of cost and performance data for remediation technologies used at Federal cleanup sites. The guide presents information on the following topics:

- Use of standardized terminology to describe site background, site characteristics, treatment systems, and cost;
- Identification of a baseline set of the most important cost and performance data elements to be collected for individual technologies; and
- Documentation of procedures used to measure matrix characteristics and design system operating parameters.

Innovative Technology

The Navy/Marine Corps is committed to furthering the use of innovative treatment technologies in the IR Program. The Guide is to be used as a baseline for collecting data to document cost and performance data for the innovative remediation technologies being selected and implemented under the Navy's special environmental technology initiatives [Navy Environmental Leadership Program (NELP) and the Hydrocarbon National Test Site (HNTS)].

Implementation

The RPM will use the *Guide* to document cost and performance data for removals and remedial actions including projects using innovative technologies.

8.9 Salary Support

ER, N salary and support funding is intended to provide assistance to installations to meet oversight requirements but it is not intended to fully fund oversight. Salary and Support requirements must compete for funding and may not be available every year. Recent reductions to the Navy/Marine Corps ER, N allocation have resulted in a diminished level of funding

available for salary and support. Priority is given to NPL sites and schedules that are being driven by compliance agreements. ER, N funds to assist an activity are only available until the base IR work is complete. Funds are provided by the servicing EFD/EFA directly to the installation. Major Claimants monitor their installations to ensure that ER, N salary and support funds are spent in direct support of the oversight of the Navy/Marine Corps' IR program. These funds are not to be used to fund site specific projects.

By 31 July of each year, Major Claimants must provide summary data to CNO detailing current fiscal year expenditures for the first three quarters, estimated fourth quarter expenditures, and requirements for the coming fiscal year with a narrative justification.

Chapter Nine

9. Reports, Information Systems and Other Tools For Remedial Project Managers

Congressional and regulatory agency requirements necessitate the collection and reporting of considerable amounts of information to ensure compliance with various legislative acts. As part of the Installation Restoration (IR) Program, the Chief of Naval Operations (CNO) and the Naval Facilities Engineering Command (NAVFACENGCOM) use reports and information systems to track and report the status of IR site cleanup. This chapter details the reports and information systems required for and in support of the IR Program.

9.1 External Reports

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) mandates numerous reporting requirements. Although the Deputy Under Secretary of Defense (Environmental Security)[DUSD(ES)] is responsible for accomplishing the Defense Environmental Restoration Program (DERP) in accordance with CERCLA, CNO and NAVFACENGCOM play an important part in the generation of information and in its use. It is important for all IR Program participants to document the steps of their response process, including requested and completed interactions with the Environmental Protection Agency (EPA), state and local governments, and local communities. DUSD(ES) compiles a number of external reports from Navy/Marine Corps information and provides this information to Congress, EPA and other regulators, special interest groups, and other interested parties.

9.1.1 Release of Hazardous Substances

CERCLA, Section 103(a), requires the Commanding Officer/Commanding General of an installation to immediately report the discovery of a hazardous substance release from installation in a reportable quantity to the National Response Center at telephone (800) 424-8802. 40 CFR 302.5 sets forth the amount of released material in a 24 hour period requiring a report. The Commanding Officer/Commanding General will notify appropriate Federal and state regulatory agencies of the release as required. OPNAVINST 5090.1B and MCO P5090.2 describe in detail the responsibilities for release response for the Navy and Marine Corps, respectively.

9.1.2 Potential Release of Hazardous Substances

CERCLA, Section 103(c), requires the submittal of a notification report to EPA of the existence of any site where hazardous substances may have been stored, treated, or disposed from which there could potentially be a release. The initial reporting date was June 1981; however, EPA continues to compile information in their database to track responses.

9.1.3 Annual Report to Congress

The Navy/Marine Corps must submit a detailed description, on a state-by-state basis, of the status of each installation involved in the DERP during the previous year. CERCLA, Section 120(e)(5), requires that the annual report be submitted to Congress. The annual report includes the following items:

- Success stories highlighting significant DERP project activities to clean up sites and reduce risk to human health and the environment;

- A listing by state of the number of National Priorities List (NPL) and Non-NPL sites under the jurisdiction of the Department of Defense (DoD) at which hazardous substances have been identified;
- A narrative summary for each NPL installation including action dates, contaminants, funding, and a description and status of studies and cleanup activities; and
- A report on Interagency Agreements (IAGs) status for NPL sites including:
 - a summary of public comments received,
 - a description of the instances in which no agreement was reached, and
 - cost estimates and budgetary proposals for each IAG.

NAVFACENGCOM is responsible for coordinating the Navy/Marine Corps input to the Annual Report. Preparation of the report occurs in the first and second quarters of each fiscal year with submittal to Congress and distribution to states and the public at the end of the second quarter.

The Restoration Management Information System (RMIS) is a major source of information for the Annual Report. It is important that the Remedial Project Manager update the RMIS data (as incorporated into the NORM database) on a regular basis and maintain accurate records of DERP activities in order to ensure that data used to prepare the report is current.

9.1.4 President's Budget Submittal

DoD is required to submit a DERP report as part of its annual budget request. This information is compiled from responses to DUSD(ES)'s budget call which is forwarded for action in July with response due in August of each year. CNO provides information supporting the Navy/Marine Corps requirements for Environmental Restoration, Navy (ER, N) funds to DUSD(ES) for inclusion in DoD's budget submittal.

9.2 External Information Systems

DoD maintains management information systems which contain data about the IR Program. DoD uses these systems to manage and report program information. The CNO and NAVFACENGCOM provide data for these systems per DoD direction.

9.2.1 Restoration Management Information System (RMIS)

The Restoration Management Information System (RMIS) is a centralized repository for information on DoD environmental restoration activities at active military installations. The RMIS data will be incorporated into the NORM database. DoD uses RMIS to prepare information included in DoD's Annual Report to Congress. DoD uses the information in RMIS primarily to provide a status on the DERP. The Remedial Project Manager (RPM) updates site status data in the Defense Site Environmental Restoration Tracking System (DSERTS) which the Naval Facilities Engineering Service Center provides to DoD for updating RMIS. RMIS tracks installation and site data to reflect progress in completing the IR Program. The automated RMIS

contains site information for military installations under the control of the military services (U.S. Army, Air Force, Navy and Defense Logistics Agency) and formerly used defense sites. Each site record contains information that includes site name and description, contaminants, phase and status of the IR Program and/or Base Realignment and Closure (BRAC) activities, IAG dates, cost information, and if the site is on the NPL.

9.2.2 Defense Environmental Network Information Exchange (DENIX)

As part of an effort to consolidate environmental information management throughout DoD, DoD created a DoD-wide electronic information exchange to facilitate and support communications and environmental awareness. DoD developed the Defense Environmental Network Information Exchange (DENIX) to provide DoD personnel in the environmental arena with a central communications platform that allows access to environmental, legislative, compliance, restoration, and DoD guidance information. DENIX incorporates the data, information, and requirements of DoD Components and contains all the information that was previously available in the DoD, Navy, Army, and Air Force systems. DENIX provides the capability to review environmental publications on-line, send and receive electronic mail via the DENIX host and the Internet, enter into interactive discussion forums about various subject areas, upload and download data files, and access listings of environmental training. The following information is available on the DENIX database:

- World, national, Federal, and state news;
- Service-specific news, events, and reports;
- Policy, guidance, and directives.
- Legislative and regulatory news;
- Environmental publications;
- Training directories;
- Environmental contacts directory;
- Presidential and Congressional calendars; and
- Discussion formats.

Appendix D is a DENIX User Application.

9.3 Internet Use

The Internet is a communication system to relay information and access environmental databases including Navy/Marine Corps environmental databases and systems. The Navy/Marine Corps uses the Internet to provide an information service to Navy/Marine Corps personnel in support of environmental programs. The services provided will:

- Manage, operate, and interface environmental databases;
- Provide information on environmental programs;

- Provide training and education on environmental systems; and
- Distribute program studies, reports, and assessments.

A few major IR and related environmental Uniform Resource Locators for the Internet include:

- Naval Facilities Engineering Command - “<http://www.ncts.navy.mil./homepages/navfac>”

9.4 Geographic Information Systems (GIS)

The Tri-Service community uses a number of computer-based systems for the storage, retrieval, and analysis of spatial information. These systems fall within the general categories of Geographic Information Systems (GIS). All of these systems store and display information that has some spatial or location significance to a user; however, the data structure and specific capabilities of the systems can vary significantly. There are two primary data structures for GIS: raster and vector. These systems store and reference spatial data in fundamentally different ways to achieve differing objectives. The Tri-Services implemented the *Tri-Service Spatial Data Transfer Standards (SDTS)* to alleviate the problems of differing systems when transferring data.

The *Tri-Service SDTS* employs terminology and data structures not specific to any software product. Provisions for raster GIS, vector GIS, and Computer-Aided Design and Drafting (CADD) systems have been made to accommodate the widest user base in the Tri-Services community. The *SDTS* provides an exchange mechanism for the transfer of spatial data between dissimilar computer systems. The *SDTS* specifies exchange constraints addressing formats, structure, and content for spatially referenced vector and raster data. The *SDTS* was approved as the *Federal Information Processing Standard (FIPS) 173* in July 1992. NAVFACENGCOM’s policy states that when spatial data sets are transferred between dissimilar computer systems, *the Tri-Service SDTS* and *FIPS 173* are mandatory.

The Tri-Service CADD/GIS Technology Center is an inter-service vehicle working to set standards, coordinate CADD/GIS-related activities within the Services, promote system integration, accomplish centralized procurement, and provide assistance for the installation, training, operation, and maintenance of CADD/GIS technologies. The functions of the Center are:

- Standards development;
- Information clearinghouse;
- Providing a technical role in acquisitions;
- Providing technical consultancy;
- Application development;
- Evaluating technology developments and recommending CADD/GIS policy; and
- Interfacing with professional organizations, standards organizations, academia, and industry.

For further information concerning the *Tri-Service SDTS* or other GIS information, NAVFACENCOM HQ Code 41 GIS Program Manager.

9.5 Statistics and Statistical Packages

The Navy/Marine Corps uses a multitude of statistical packages to accomplish its many environmental evaluations and assess health hazards, risk factors, sampling/monitoring patterns, and other environmental management analysis. One statistical package used by the Navy/Marine Corps is geostatistics.

Geostatistics is a set of statistical tools developed by the mining industry to estimate ore concentrations. Typical cleanup site investigations involve extensive sampling and monitoring. Sampling plans are developed on ad hoc basis resulting in significant cost and time to complete the investigation and the collection of redundant information. EPA advocates geostatistics to provide a logical framework for sampling and analysis of environmental data and for more efficient investigations and cleanups. Geostatistics incorporates the underlying spatial correlation of the data and allows point estimation and mapping of concentrations or other spatial data at unsampled locations. In addition, geostatistics provides a standard deviation measure of accuracy for each estimated value. Environmental applications of geostatistics include:

- Optimizing existing sampling and monitoring plans;
- Risk assessments;
- Accurate delineation of site contamination;
- Assessing adequacy of existing data; and
- Optimizing cleanup plans.

For additional information on the use of Data Quality Objectives for geostatistics see **section 4.7**.

9.6 Modeling Techniques

Modeling techniques summarize analyses of site information to facilitate decision-making throughout all stages of the remediation process. Not all decision-makers are technical specialists so models are developed for generalists and for the public. Models incorporate site characteristics and hypotheses of site features not yet known with the goal to synthesize and produce a conclusion. Modeling is used in the IR Program typically to assess the risk or health hazard of a contaminant or to assess the cleanup status of an IR site.

Mathematical-based models can be used to estimate both groundwater flow and chemical fate and transport in the environment. Models have been used to define recovery well capture zones, predict the fate and transport of compounds of concern, evaluate risk, and define well head protection areas. Selection of a model should be based on project-specific needs and the complexity of the hydrogeological regime for the specific study area. There are numerous models that use two- or three-dimensional analysis. Models that evaluate two dimensions can be

set to evaluate either lateral and horizontal or horizontal and vertical situations. Three-dimensional models evaluate lateral, horizontal, and vertical interactions.

Groundwater flow models require a knowledge of the hydrogeologic framework and the chemical characteristics of the groundwater. Information needed includes the following:

- Number of aquifers and aquicludes under the site;
- Horizontal and vertical extent of the aquifer or aquiclude;
- Sources of recharge;
- Affects of pumping or injection on the site;
- Type of sources at the site;
- Aquifer classification; and
- Hydraulic characteristics.

Fate and transport modeling requires assessment of two basic properties. The properties requiring assessment are physiochemical and biologic process effects of the subsurface environment that control the actual transport of the compounds of concern. The modeling process includes the development of a site-specific conceptual model, selection of the model software to be used, development of the model database, and model calibration. The site conceptual model is the first step in the development of the site-specific groundwater model and includes a qualitative analysis of information on the hydrogeologic regime for the site area. Developing the specific model requires understanding the requirements and the available information on aquifer characteristics. The development of a model database includes the defining information for the model selected grid or cell size, structure, or format of the actual data in the model. Once a model has been set up, it must be calibrated so that it accurately reflects site-specific conditions.

9.7 NORM Site Data Management Implementation

The NORM Site Data Management Software Program is being developed for the NAVFACENGCOM IR sites for ER, N and BRAC Programs. The database management system's purpose is to "normalize" site data information between current NAVFACENGCOM database models. These models provide site information for program reporting and budget building requirements. The site data in the following databases will be normalized: RRSEM, Cost To Complete, and the Financial Information System. The normalized database management system will integrate these databases into a single site management tool for implementation at all NAVFACENGCOM offices.

9.7.1 Cost to Complete (CTC)

Cost to Complete (CTC) is a budgeting tool for cost reporting and projecting. CTC methodology has been developed by the Navy to generate site budget costs for cleanup of both ER, N and BRAC programs. The Navy developed the CTC to assist the EFDs/EFAs in applying the latest site information to generate cost estimates for the budget submission in accordance with NAVCOMPT and DUSD(ES) requirements.

The RPM will “build” the initial requirement costs for each site cleanup at the phase and site level. These site requirements costs are then applied to the budget process where schedules and targets are programmed in by the EFD/EFA. The RPM uses CTC to develop long-range site cost requirements and assign these site costs to specific fiscal years during the budget process.

The CTC methodology is a continuous process that the RPM and EFD/EFA will use to update the site cleanup strategy. The frequency of updates is based on the needs identified by the RPM, EFD/EFA, and NAVFACENGCOM. In April of each year, NAVFACENGCOM will report on the estimated cost to complete the Navy/Marine Corps IR Program. Significant changes from the previous year should be identified and discussed. The discussion should include changes that are the result of revised treatment trains, added or deleted sites, and streamlined management procedures. These changes should be developed by individual site and be reflected in the cleanup database.

The CTC system is a single model used for both ER, N and BRAC programs. This single system retrieves and processes current site data and maintains separation of the data for the ER, N and BRAC programs.

The key to obtaining reasonable and accurate budget estimates by site and by phase is by applying a thorough review process. CTC generates specific report to assist in the review process. The foundation of all reports is the Site Detail Report which presents the detailed cost line items for studies and remediation at each site. These detail items are consistent with the Work Breakdown Structure (WBS) level II with unit costs and quantity inputs. Other roll-up reports will present the detailed site information in summary format for program reporting and review. Further information and guidance on the CTC Model may be obtained from the CTC Leader or BRAC Coordinator at NAVFACENGCOM.

The key items in the CTC include:

- Applies to ER, N and BRAC programs;
- Builds costs at the site detail level (Work Breakdown Structure II);
- Standardizes detailed unit costs Navy/Marine Corps wide and using the Remedial Cost Engineering and Requirements System and historical Navy/Marine Corps costs;
- Applies cost modifiers (location factors and escalation from the current 95 Unit Price Book to base year) to account for labor, material, and equipment variations;
- Bases outyear estimates in base year dollars;
- Bases default settings on historical program trends and costs;

- Reports costs by phase for each site to NAVFACENGCOMs NORM for program and budget coordination;
- Prepares standard reports while in CTC - (Site Detail Report - WBS level 2);
- Makes adjustments to phase or site costs at the site detail level (WBS level 2) ;
- Assigns seven phases to CERCLA, RCRA, and UST with LTO and LTM as separate phases.
- RPM assigns duration of LTO and LTM;
- Uses the SUCCESS estimating and management system application with full MS windows capabilities and lookup of assemblies and unit costs.

As site projects move to the year of execution, CTC estimates are usually replaced with detailed government cost estimates. Actual cost are then captured in a historical cost database, which provides input to updating unit prices that CTC uses.

9.7.2 Defense Site Environmental Restoration Tracking System (DSERTS)

The Navy is using NORM to supply the information needed for the Defense Site Environmental Restoration Tracking System (DSERTS) - a DoD computer-based tracking system used to track environmental restoration activities at installations. DSERTS has been designed to be an automated method for tracking the installation and site data by collecting and maintaining information about environmental remediation and providing reports that detail the information. Data gathered by DSERTS will be submitted to RMIS for DoD processing and will be used as the principal source of the Navy/Marine Corps' part in the Annual Report to Congress. The following site descriptive data is available from the DSERTS database:

- Site name;
- Description;
- Governing statute;
- Funding Program;
- NPL/Non-NPL status;
- Contaminants;
- Remediation phase; and
- Media
- Date when all cleanup will be completed at a site (Response Complete date).

9.7.3 Relative Risk Site Evaluation Model (RRSEM)

The DON and the other military services use a relative risk ranking procedure to determine which sites need cleanup action the soonest. The relative risk ranking considers the concentration of the contaminant, whether there is a pathway through which the contaminant can migrate, and whether there are people or ecosystems along that pathway which will be affected. RAB members and the regulatory agencies provide input to the ranking process. The relative risk ranking is considered along with other program management factors to determine the priority of sites for cleanup within funding limits. Other management factors considered are requirements in legal agreements, military readiness, stakeholders' concerns, availability of innovative technologies, and packaging of cleanup actions for cost-effective contracting.

The model uses the information on contaminant chemicals and their toxicity, migration pathways, and the existence of human or ecological receptors to place the sites into "High," "Medium," and "Low" relative risk categories. The following information is available from the RRSEM:

- Installation name;
- Federal Facility Identification Number;
- Site name;
- Site description;
- Media evaluated;
- Site rank;
- Site POC information;
- NPL/Non-NPL site status;
- RMIS site type;
- Agreement type;
- Funding type;
- Contaminants;
- Contaminant concentration;
- Contaminant toxicity;
- Receptor description; and
- Pathway description.

The following reports may be generated by the RRSEM System:

- Site Summary Worksheet;
- Media Specific Worksheets;

- Site Ranking Report;
- Site Compounds Report;
- Site Factors Calculations Report;
- Site Factor Descriptions Report; and
- Site Rank and Source Report.

The grouping of sites or AOCs into one of the three categories is not a substitute for either a Baseline Risk Assessment or health assessment, nor is it a means of placing sites into a “no further action” category. It is an evaluation of site information at a point in time based on three key factors: the contaminant hazard factor (CHF); the migration pathway factor (MPF); and the receptor factor (RF). Factor ratings are based on a quantitative evaluation of contaminants and a qualitative evaluation of pathways and human or ecological receptors in three media most likely to result in significant exposure: groundwater, surface water/sediment, and surface soils.

The framework evaluates each media using the three factors (CHF, MPF and RF) that relate to risk assessment. Each of the three factors is given a rating, e.g., Significant, Moderate, or Minimal, based on available site information for a given media. The framework combines the CHF, MPF, and RF ratings for each media at a site using a relative risk evaluation matrix to obtain a risk designation of High, Medium, or Low. The framework chooses the highest media designation as the risk designation for the site.

Additional information may be obtained from DoD’s *Relative Risk Primer* and the Naval Facility Engineering Command’s *Relative Risk Site Evaluation System Manual*.

For additional information, see **section 8.2**.

RRSEM is included in the NORM database.

9.8 Innovative Technology Case Studies

The Navy/Marine Corps is encouraging RPMs to communicate among each other about their favorite accomplishments via case studies. This is an adaptation of a more complex EPA information exchange. The Case Studies are *for* RPMs and *not* for Headquarters. They are meant to be different from similar write-ups used for public relations, budget justification, or management oversight. Their purpose is to convey lessons learned from one RPM to another. They are intended to emphasize how RPMs overcame obstacles to accomplish noteworthy projects. The focus is on overcoming administrative issues, especially for using innovative technologies, and a "how did you do that?" or "what worked and what didn't" approach. The hope is that application of good ideas and avoidance of mistakes can save IR dollars.

- The case study concept started as an effort to get innovative technology to be used, but in discussion with EFDs/EFAs, it blossomed to include any effort from which others can learn. ~~The process is simple. RPMs fill out a two page form and send it~~

to NAVFACENGCOM HQ; NAVFACENGCOM HQ summarizes the information on a graphic layout, issues the summary, and disseminates more detailed information by hard copy and electronic transmission to all RPMs. Any project from which the RPM learned important lessons, especially where money was saved, is a candidate for a Case Study. Based on available information, there are many good examples at all EFDs/EFAs. Case Studies will be internal NAVFACENGCOM documents so that RPMs can be succinct, candid, and use the jargon of NAVFACENGCOM RPMs to make composing and using the studies as easy as possible. Appendix E-6 includes an instruction form and three examples of Case Studies.

Chapter Ten

10. Administrative Record, Information Repository and Community Relations

This chapter outlines the legal and regulatory requirements for the administrative record, the information repository and public participation in the Installation Restoration (IR) Program, and discusses the public affairs and community relations actions which should be accomplished.

Community relations promote communication between the public and the Navy/Marine Corps concerning the status of remediation at installations. Navy/Marine Corps responsibilities during the remedial process include:

- Informing the community of any action taken;
- Responding to inquiries; and
- Providing information about any releases of hazardous substances.

CERCLA Sections 113 and 117, require public involvement at specific stages of the response action. Table 10-1 summarizes the required community relations actions.

10.1 Legal Requirements

CERCLA, Section 117, Public Participation, requires that before adoption of any plan for remedial action the Navy/Marine Corps must take the following steps:

- Publish a notice and brief analysis of the proposed plan and make such a plan available to the public;
- Provide a reasonable opportunity for submission of written and oral comments and an opportunity for a public meeting at or near the installation regarding the proposed plan and any proposed findings under CERCLA, Section 121(d)(4) (relating to cleanup standards). The Navy/Marine Corps will make a transcript of the

meeting and make such transcript available to the public;

- Publish notice of the final remedial action plan adopted and make this document available to the public before commencement of any remedial action. Such a final plan will be accompanied by a discussion of any significant changes (and the reason for such changes) in the proposed plan and a response to significant comments, criticisms, and new data submitted in written or oral presentations;
- Publish all notices in a major local newspaper of general circulation and make the notice available to the public at or near the installation.

10.2 Administrative Record

CERCLA, Section 113(K), requires the establishment of an administrative record which will form the basis for the selection of the response action. Executive Order 12580 delegates the responsibility for the administrative record to the heads of executive agencies and departments. EPA

Required Community Relations Actions

Actions	PA	SI	RI	FS	Proposed Plan & ROD/ Decision Document	RD	Remedial Actions*	Removal Actions* < 120 days	Removal Actions* > 120 days
Admin. Record			X	X	X	X	X	X	X
Estab. TRC/RAB			X	X		X	X		
Contact State & Local Officials	X	X	X	X	X	X	X	X	X
Comm. Interviews ⁽¹⁾			X	X		X			
Inform. Repository			X	X	X	X	X		X
Public Meetings & Workshops			X	X	X	X			
Public Notice			X	X	X	X	X	X	X
Fact Sheet or Summary				X	X	X			
Community Relations Plan			X	X		X	X		X
Public Comment Period					X			X	X
Responsiveness Summary					X			X	X

* In addition to or concurrent with the RI and FS requirements.

⁽¹⁾ Usually the community relations interviewed is conducted only once and not during each phase.

Table 10-1: Required Community Relations Actions

executive agencies and departments. EPA retains the authority to promulgate regulations which govern the creation of the administrative record.

The administrative record consists of all documents that have a legal bearing and which were used to make the decision regarding the response action for a site. It is a compilation of all documents which the Navy/Marine Corps used to select a remedial action or removal action for a site. Regardless of the nature of the hazardous waste site, an administrative record must be maintained. The EFD/EFA must establish and update the administrative record for the remedial action and send copies to the installation, state, and EPA as appropriate. Installations must ensure that a copy of the administrative record is available to the public at or near the hazardous waste site and that notice of the availability of the record is made part of the record.

The administrative record will be the basis for any future legal review of decisions made concerning remedial action taken at a site by the Navy/Marine Corps, and it must be available for public review and comment by the end of the RI/FS Scoping step.

The EFD/EFA will maintain an administrative record file comprised of all collected documents and information unique to a site and a comprehensive index, which together will make up the administrative record, to enable both the Navy/Marine Corps and the public to locate and retrieve documents included in the file. In addition, the index will provide a degree of control over documents in the record. The creation of the index will prevent persons from altering the record simply by physically adding to or removing documents from the file. The index can be organized by subject or in chronological order

and should be updated whenever the administrative record file is updated.

To avoid unnecessary duplication, documents that pertain to multiple sites need not be included in each record, but one copy of each document must be made available at the same location as the index.

EPA has issued regulations which specifically detail the documents which must be placed in the administrative record. Tables 10-2 and 10-3 provide guidance on the documents which must be part of an administrative record for removals and remedial actions, respectively. Expedited response actions should be treated like removals for purposes of compiling an administrative record. RI/FSs should be treated as a "phase" of the remedial action and not a "removal" for purposes of the administrative record. CERCLA mandates that an administrative record be kept on each response action taken and a copy be made available to those persons at or near the site as part of the public participation requirement. The Commanding Officer/ Commanding General of an installation will review the administrative record when the EFD/EFA presents the ROD or DD for signature.

Final documents which are part of the Navy/Marine Corps' decision-making process should be kept as part of the administrative record. Draft documents should only be included if they contain information that forms the basis of selection of the response action and the information is not included in any other document in the administrative record file. If questions arise, the matter should be referred to the cognizant EFD/EFA office of counsel. The RPM should review the administrative record file when developing the proposed plan for remedy selection and identify those documents which

Administrative Record Documents For Removal Actions

- | | |
|---|---|
| <ul style="list-style-type: none">• Notice of availability of record for public information• Public Comments, if any• QA/QC'd raw data⁽¹⁾• Removal Preliminary Assessment Report• Site Inspection Report• Any other factual data relating to reasons why a particular removal action at the site was selected• Chain of Custody forms⁽¹⁾• Engineering Evaluations• Cost analysis documents• Final data summary sheets of technical models used to evaluate the site• Action Memorandum• ATSDR health assessment (draft versions not included)• Memoranda on major site-specific policy and legal interpretations, e.g., off-site disposal availability, compliance with other environmental statutes, special coordination needs (e.g., dioxin)• Information from telephone logs relied on in selecting response• New technical information (such as appropriate TRC minutes) | <ul style="list-style-type: none">• Guidance documents and technical sources⁽²⁾• Health and Safety Plan• Response to significant comments• Copies of any notices, including notices to states, Natural Resource Trustees, notices of availability of information• Community Relations Plan• Documentation of meetings during which the public and any other involved parties present information upon which the Navy/Marine Corps bases its decision on selection of a removal action (may be after-the-fact restatement of issues raised)• Administrative Orders• Affidavits or other sworn statements of expert witnesses• Amendments to Action Memorandum, including ceiling increase Action Memorandum and Action Memorandum on technical changes; information which caused the Navy/Marine Corps to change the decision, comments, and responses to comments• Documentation of opportunity for consultation with the state on the scope of the removal action; comments from state, if any, and responses to substantive comments• Index of documents in the record |
|---|---|

Footnotes:

⁽¹⁾ QA/QC'd raw data, e.g., results of QC runs, chromatograms, mass spectra, and chain of custody forms are part of the record and available to the public but need not be in the same physical location as the administrative record.

⁽²⁾ Guidance documents and technical sources may be kept in a central location by the RPM. They need not be in each site-specific record. The index to the record should reference titles of relevant guidance documents and technical sources.

Table 10-2: Administrative Record Documents For Removal Actions

Administrative Record Documents For Remedial Actions

- Notice of availability of record for public information
 - Preliminary Assessment Report
 - Site Inspection Report
 - QA/QC'd raw data⁽¹⁾
 - Data summary sheets (usually part of the FS)
 - Chain of Custody forms⁽¹⁾
 - Quality Assurance Project Plan
 - Initial work plan and amendments thereto
 - RI/FS (final deliverable for public comment)
- Public comments (including a late comments section)
- Any factual data relating to why a particular removal action at the site was selected
 - Information from telephone logs relied on in selecting response
 - Proposed plan and brief analysis of plan
 - Feasibility Study (final deliverable released for public comments)
 - Endangered Assessment or other public health assessment
 - ATSDR health assessment (draft versions not included)
 - Memoranda on major site-specific policy and legal interpretations, e.g., off-site disposal availability, compliance with other environmental statutes, special coordination needs (e.g., dioxin)
 - Documents relating to state involvement, e.g., ARAR determinations, opportunity to comment on screening of alternatives, FS, proposed plan, selected remedy
- Guidance documents and technical sources⁽²⁾
 - Health and Safety Plan
 - Response to significant comments
 - Transcript of required public meeting(s) on the proposed plan
 - Community Relations Plan
 - Documentation of meetings during which the public and any other involved parties present information upon which the Navy/Marine Corps bases its decision on selection of a removal action (may be after-the-fact restatement of issues)
 - Administrative Orders
 - ROD, including statement of basis and purpose of selected action; summary of alternatives considered; and explanation of why the Navy/Marine Corps chose the preferred alternative; explanation of any statutory preference under Section 121(b) not met; explanation of significant differences between the Proposed Plan and ROD
 - Amendments to the ROD, information which caused the Navy/Marine Corps to change its decision, comments, and responses to those comments
 - Relevant documents generated during a RCRA corrective action proceeding at the site, if applicable
 - Affidavits or other sworn statements of expert witnesses
 - FFA at NPL sites
 - New technical information (such as appropriate TRC/RAB minutes)
 - Index of documents in the record

Footnotes:

⁽¹⁾ QA/QC'd raw data, e.g., results of QC runs, chromatograms, mass spectra, and chain of custody forms are part of the record and available to the public but need not be in the same physical location as the administrative record.

⁽²⁾ Guidance documents and technical sources may be kept in a central location by the RPM. They need not be in each site-specific record. The index to the record should reference titles of relevant guidance documents and technical sources.

Table 10-3: Administrative Record For Remedial Actions

support the site-specific remedy outlined in the proposed plan. The administrative record will include any public comments addressing the choice of remedy which have been generated by the proposed plan and the Navy/Marine Corps response to those comments.

A formal administrative record is not required for actions at past hazardous waste sites on Non-NPL RCRA permitted facilities which are being characterized or remediated under RCRA. However, the RPM needs to be able to provide documentation detailing information used to select a removal or remedial action at the site. Additionally, the RPM is encouraged to obtain public and Restoration Advisory Board (RAB) member review and comment on permits and permit modifications necessary to accomplish site remediation.

10.3 Information Repository

An information repository is the physical location(s) where a collection of site information is located. The repository includes items related to the site which may or may not be suitable for inclusion in the administrative record. Typical locations for information repositories are libraries, town halls, or public health offices. Locations should have handicapped access, be open in the evenings and on weekends, and have copying facilities available. The Navy/Marine Corps is responsible for establishing, maintaining, and deciding what should be in the repository. The integration of the community relations activities with the use of the repository are a key element of the Community Relations Plan (CRP). Documents to be included in the information repository are:

- Administrative Record;
- CRP;
- Technical Assistance Grant application process information;
- Preliminary Assessment/Site Inspection (PA/SI) reports;
- Removal Action - Action Memorandum or Engineering Evaluation/Cost Analysis
- RI/FS Work Plan;
- Final RI report;
- Draft and final FS;
- Response to significant comments;
- Signed ROD;
- Remedial Design Work Plan;
- Fact sheets;
- Guidance documents;

- Site sampling results;
- CERCLA and NCP regulations;
- Copy of cooperative agreements;
- *Federal Register* with NPL listing of the installation sites, if applicable; and
- Copies of pertinent press releases.

During removal actions and remedial actions at hazardous waste sites, the installation should establish an Information Repository at or near the location of the response action. The Information Repository should contain a copy of items made available to the public including information on Technical Assistance Grants, releases, brochures, or fact sheets regarding response actions and notices which propose delisting a site from the NPL. The administrative record file will be a part of the Information Repository. The installation should notify all interested parties of the establishment of the Information Repository.

The NCP requires an Information Repository for all remedial actions and any removal actions that exceed 120 days. Any document containing technical site information or non-technical descriptive information may be included in the Information Repository. For example, data on sources and types of contaminants from previous cleanup actions or spills or cleanup schedules would be candidates for inclusion in the Information Repository. Further information on the Information Repository contents can be obtained from the *Community Relations in Superfund: A Handbook* (EPA, 1992).

10.4 Community Relations For Removal Actions

The National Oil and Hazardous Contingency Plan (NCP) in Section 300.415(m) details community relations requirements for removal actions. The Navy/Marine Corps will designate a spokesperson to inform the community of actions taken, respond to inquiries, and provide information concerning the removal action. They will coordinate releases or statements made by participating agencies, and immediately notify affected citizens, state and local officials, and when appropriate, civil defense or emergency management agencies.

10.4.1 Removal Action With Less Than 6 Months Before Beginning Removal Activity

Where the Navy/Marine Corps determines that a removal is appropriate and less than six months exist before on-site removal activity must begin, the Navy/Marine Corps will:

- Publish a notice of availability of the administrative record file established pursuant to NCP, Section 300.820, in a major local newspaper of general circulation not less than 60 days prior to initiation of on-site removal activity;
- Provide a public comment period of not less than 30 days from the time the administrative record file is made available for public inspection pursuant to NCP, Section 300.820(b)(2);
- Prepare a written response to significant comments pursuant to NCP, Section 300.820(b)(3).

10.4.2 Action Extending Beyond 120 Days

For removal actions where on-site action is expected to extend beyond 120 days from the initiation of on-site removal activities, pursuant to NCP Section 300.415(m)(3), the Navy/Marine Corps will:

- Conduct interviews with local officials, community residents, public interest groups, or other interested or affected parties, as appropriate. This will be done to solicit their concerns, information needs, and how or when citizens would like to be involved in the process;
- Prepare a formal community relations plan (CRP) based on the interviews and other relevant information, specifying the community relations activities that the Navy/Marine Corps expects to undertake during the response;
- Establish an information repository;
- Place an administrative record file in at least one repository;
- Inform the public of the establishment of an information repository and provide notice of availability of the administrative record file for public review.

(If the installation has already completed each of the above tasks, it is not required to do them again specifically for the removal. Instead, they would be required to announce to the public that information pertaining to the removal would be added to the information repository and administrative record. Interviews do not need to be conducted specifically for a removal action.)

10.4.3 Actions with Planning Period of at Least Six Months

For removal actions with a planning period of at least six months prior to initiation of on-site removal, pursuant to NCP Section 300.415(m)(4), the Navy/ Marine Corps will:

- Comply with all the requirements of a removal action, where on-site action is expected to extend beyond 120 days from initiation of on-site removal action, prior to the completion of the engineering evaluation/cost analysis (EE/CA);
- Publish a notice of availability and brief description of the EE/CA in a major local newspaper of general circulation pursuant to NCP, Section 300.820;
- Provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments after the completion of the EE/CA pursuant to NCP, Section 300.820(a). Upon timely request, the Navy/Marine Corps will extend the public comment period by a minimum of 15 days;
- Prepare a written response to significant comments, pursuant to NCP, Section 300.820(a).

10.5 Community Relations for Remedial Investigation/ Feasibility Study (RI/FS) and Selection of Remedy

NCP Section 300.430(c) and (f)(3) detail community relations for RI and selection of remedy.

10.5.1 Community Relations for RI/FS

For RI/FS, pursuant to NCP Section 300.430(c) , the Navy/Marine Corps will:

- Conduct interviews with local officials, community residents, public interest groups or other interested or affected parties, as appropriate, to solicit their concerns and information needs, and to learn how and when citizens would like to be involved;
- Prepare a formal CRP based on the interviews and other relevant information, specifying the community relations activities that the Navy/Marine Corps expects to undertake during the remedial response;
- Establish at least one local information repository at or near the location of the response action. This should contain a copy of items made available to the public, including information that describes the availability of an EPA Technical Assistance Grant (TAG) at National Priorities List (NPL) sites.
- Inform the public of the establishment of the information repository.

10.5.2 Community Relations to Support Selection of Remedy

For community relations to support the selection of remedy (after preparation of the proposed plan), pursuant to NCP Section 300.430(f)(3), the Navy/Marine Corps will:

- Publish a notice of availability and a brief analysis of the proposed plan in a major newspaper of general circulation;
- Make the proposed plan and supporting analysis and information available in the administrative record file;
- Provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments on the proposed plan and the supporting analysis and information including the RI/FS. Upon timely request, the Navy/ Marine Corps will extend the public comment period by a minimum of 30 additional days. (Note - Schedules should be built including the maximum time for public comment.);
- Provide the opportunity for a public meeting to be held during the public comment period at or near the installation regarding the proposed plan and the supporting analysis and information;
- Keep a transcript of the public meeting and make the transcript available to the public;

- Prepare a written summary of significant comments, criticisms, and new relevant information submitted during the public comment period and the Navy/Marine Corps' response to each issue. This responsiveness summary will be made available with the Record of Decision (ROD).

10.5.3 Community Relations Requirements After Publication of the Proposed Plan

Pursuant to NCP Section 300.430(f)(3)(ii), community relations after publication of the proposed plan and prior to the adoption of the selected remedy in the ROD will take into account the following:

- If new information is made available that significantly differs from the original proposal in the proposed plan, include a discussion of the significant changes and reasons for the changes in the ROD;
- If a change could not reasonably be anticipated by the public based on the information available in the proposed plan or the supporting analysis and the information in the administrative record, the Navy/Marine Corps will, prior to adoption of the selected remedy in the ROD, issue a revised proposed plan and seek additional public comment. This will include a discussion of the significant changes and the reasons for such changes.

10.5.4 Community Relations Requirements When a ROD is Signed

Pursuant to NCP Section 300.430(f)(6) when the ROD is signed, the Navy/ Marine Corps will:

- Publish a notice of availability of the ROD in a major newspaper of general circulation;
- Make the ROD available for public inspection and copying at or near the installation prior to the commencement of any remedial action.

10.6 Community Relations Requirements for Remedial Design/Remedial Action (RD/RA)

NCP Section 300.435(c) details community relations requirements for RD/RA. Prior to initiation of RD, the Navy/Marine Corps will review the CRP to determine whether it should be revised to describe further public involvement activities during RD/RA that are not already addressed or provided in the CRP.

If the RA differs significantly from the remedy selected in the ROD with respect to scope, performance, or cost, the Navy/ Marine Corps will:

- Publish an explanation of significant differences when the differences in the RA change, but do not fundamentally alter, the remedy selected in the ROD with respect to performance or cost;

- Propose an amendment to the ROD if the differences in the RA alter the basic features of the selected remedy with respect to scope, performance, or cost.

10.7 Navy/Marine Corps Public Participation Guidance

The following directives provide Navy and Marine Corps public participation guidance:

- OPNAVINST 5090.1B 15-5.11
- MCO P5090.2 14413

Navy/Marine Corps requirements are more comprehensive than the NCP; for example, the Navy requires formal CRPs at all IR Program sites, whether or not they are National Priorities List (NPL) sites. Any installation can do more than is required in the Navy/Marine Corps guidance.

10.7.1 Community Relations Plan (CRP)

The CRP provides for interaction between the public, elected officials, and environmental groups in order to obtain their input at appropriate points. A CRP must be developed and implemented for removal actions and remedial actions at all IR sites unless the action is an emergency action or for a removal action, the Navy determines that less than six months exist before on-site removal activity begins.

The CRP will be based on research conducted and community interviews with state and local officials, citizen and community groups, interested residents, and local media representatives. The research and community interviews will be used to acquire a first-hand understanding of the community concerns and issues, the level of public interest, and the information needs of the citizens. Community information activities must be integrated with the technical activities of a site study and remedial action. The CRP must be closely coordinated by the EFD/EFA Public Affairs Office (PAO), the Remedial Project Manager (RPM), and the regional environmental coordinator. The CRP should be completed concurrent with the Remedial Investigation/Feasibility Study (RI/FS) and will consist of:

- Background and history of community involvement at the site including local activity and interest plus key issues;
- Site history including environmental history;
- IR objectives;
- Community relations activities to meet IR objectives; and
- A list of officials, citizen/community groups, and media contacts.

When preparing the CRP, the installation must coordinate closely the CRP with the EFD PAO, the RPM, and the regional environmental coordinator. NAVFAC-ENGCOM and its EFDs/EFAs are available to help prepare the CRP.

Public information activities must be closely integrated with the technical activities of the site study and RA. A close working relationship should be built between the technical staff, public affairs staff, and others supporting the efforts. The installation is responsible for keeping the EFD RPM and PAO informed of all community relations activities.

The CRP and the Naval Nuclear Propulsion Program (NNPP)

The following two policy items apply to CRPs for environmental remediation at installations in the Naval Nuclear Propulsion Program (NNPP):

- Information concerning potential environmental radiological contamination at installations where nuclear powered ships were operating or serviced should only be released subject to the restrictions of applicable DON regulations regarding release of information which includes coordination with NNPP (NOON/NAVSEA Code 08) prior to release; and
- Release of information under the CRP should focus on issues covered by the CERCLA remediation process; public affairs matters outside the realm of the CERCLA remediation process, whether or not they involve matters under the cognizance of the NNPP, remain subject to other established DON channels for release of information.

Further information concerning the NNPP can be found in U.S. Navy, NAVFACENGCOM letter 5090 181A/92 0728 of 21 December 1992, *Community Relations Plans for Environmental Remediation at Installations in the Naval Nuclear Propulsion Program*.

10.8 Partnering in the IR Program

Partnering is the process that brings together key players in a project to work as a team. With the support of the Office of the Deputy Assistant Secretary of the Navy for Environment and Safety, partnering is now being applied for environmental programs to bring together the efforts of the Navy/Marine Corps, EPA, the Office of the Under Secretary of Defense (Environmental Security), the other military services, and the Department of Energy. The Department of Navy (DON) advocates the use of Partnering for all environmental missions with the commitment that partnering will enable DON to accomplish its missions more effectively and efficiently. Within the IR Program, the RPM (in close coordination with the installation) will have overall responsibility for establishing the partnering guidelines and serving as the advocate in the partnering process. For more information on the Partnering Process, see NAVFACENGCOM *Guide to Partnering for Environmental Projects*.

10.9 Responsibilities

Commanding Officers/Commanding Generals of Navy and Marine Corps installations will:

- Prepare a Community Relations Plan (COMNAVFACENGCOM and its EFD/EFAs are available to provide support for community relations programs, including assisting installations with preparing, implementing and reviewing their CRP.);
- Keep regional environmental coordinators (RECs) and EFDs/EFAs informed of all public participation actions;

- Inform the public of the availability of EPA TAGs;
- Establish and maintain the information repository;

10.10 Sites on the National Priorities List (NPL)

For sites on the NPL, the Navy/Marine Corps will:

- Coordinate news releases and other community relations activities with EPA and the state as required in any existing Federal Facility Agreements (FFA); and
- Inform the public and interested citizen groups of the availability of EPA TAGs.

10.11 Non-NPL Sites

At non-NPL sites, the installation is to follow Navy/Marine Corps, CERCLA, and NCP guidance. If the state in which the site is located has its own legislation and guidance on community relations, the installation should incorporate as much of this guidance as possible into its CRP provided it does not conflict with Federal or Navy/Marine Corps guidance.

10.12 Resource Conservation and Recovery Act (RCRA) Sites

At Resource Conservation and Recovery Act (RCRA) sites funded by the Environmental Restoration, Navy (ER, N), public participation and community relations will be accomplished by keeping the Restoration Advisory Board or Technical Review Committee informed of the status of site cleanup. If sufficient public interest exists, additional community relations activities such as those described in EPA's National Contingency Plan for CERCLA sites should be accomplished, as necessary.

10.13 Technical Assistance Grants (TAGs)

Congress included provisions in the amended CERCLA [Superfund Amendments and Reauthorization Act (SARA)] to establish a Technical Assistance Grant (TAG) Program. The intent of the Program is to foster informed public involvement in decisions relating to site-specific cleanup strategies under CERCLA. The EPA's Superfund TAG Program provides a grant of up to \$50,000 to community groups to hire technical advisors to help citizens understand and interpret site-related technical information for NPL sites.

Congress and the EPA have established specific requirements and guidelines for recipients of TAGs. For example, the group must provide 35% of the total costs of the project to be supported by TAG funds and must budget the expenditure of the funds to cover the entire cleanup period. Congress has also stipulated that only one TAG award may be made per NPL site at any one time.

When EPA places an installation on the NPL, the installation should contact EPA for the appropriate information and guidance on requirements for TAG recipients. This information should be made available to the public through news releases, fact sheets, public meetings, or

through any other method deemed to be appropriate, and should be included in the information repository.

10.14 Technical Review Committee (TRC)/ Restoration Advisory Board (RAB)

In an effort to increase community participation and awareness in IR sites and fulfill the requirements of CERCLA, the Navy/Marine Corps instituted Technical Review Committees (TRCs) and Restoration Advisory Boards (RABs). The TRC/RAB approach will improve the Navy/Marine Corps' IR Program by increasing community understanding and support for IR efforts and ensuring remedial/response actions are responsive to community requirements.

The Navy/Marine Corps will establish TRCs and, as appropriate, RABs for all installations with IR response actions beyond the PA/SI phase. CERCLA, Section 211, details that the TRC/RAB will review and comment on response actions and proposed response actions on the installation. It is the Navy/ Marine Corps' goal to use the TRC/RAB to facilitate input from all affected parties. The Commanding Officers/Commanding Generals of Navy/Marine Corps installations will set up the TRC/RAB in accordance with OPNAVINST 5090.1B and MCO P5090.2.

RABs are actually an expansion of the TRC concept. A RAB is an advisory board designed to act as a focal point for the exchange of information between the installation and the local community regarding restoration activities. The RAB's purpose is to bring together community members of diverse interest to enable an early and continued two-way flow of information, concerns, and requirements between the affected community and the installation.

10.14.1 Restoration Advisory Board (RAB) Implementation

Navy and Marine Corps policy differs on formation of RABs. By Navy policy, all installations that currently have TRCs shall convert them to RABs. Installations that currently do not have TRCs or where there is remedial investigations or cleanup underway shall establish RABs.

The Navy policy is more extensive than the Marine Corps policy which parallels the DoD policy which states that a RAB must be formed when installation closure involves transfer of property to the community. For closing or realigning installations where property is not being transferred to the community, a RAB must be formed where there is sufficient sustained community interest as indicated by:

- Petition of 50 or more citizens; or
- Requested by Federal, state, or local governments.

If an installation has made a good faith effort to solicit community interest and can document that no interest was found, a RAB need not be formed. In such circumstances, it is important that the process of identifying stakeholder interest be repeated to ensure that the public is given opportunities to express interest in participating in the installation's cleanup process.

Prior to the formation of a RAB, a public notice will be placed in a local newspaper of general circulation to announce the formation of the RAB. The public notice will be published in advance of the meeting and will include the following information:

- Time and location of the meeting;
- Notice of intent to establish a RAB;
- Purpose of the RAB;
- Membership opportunities;
- That the meeting is open to public attendance and participation;
- Name and telephone of points of contact for additional information; and
- Topics for consideration at the initial RAB information meeting.

The RAB will be comprised of members from the local community and representatives from the Navy/Marine Corps, the state, and EPA. Community members selected for the RAB will reflect the diverse interests within the local community. RAB members should live and/or work in the affected community or be impacted by the restoration program. The RAB composition should be developed to reflect the interests and concerns of the local community. Potential candidates for inclusion on a RAB are:

- Local residents/community members;
- Local reuse committees;
- TAG recipient;
- Current TRC members;
- Local government officials and agencies;
- Business community;
- School districts;
- Installation employees and residents;
- Local environmental groups and activists;
- Civic and public interest organizations;
- Religious community; and
- Other regulatory agencies.

To assist in a smooth transition, if a Navy/Marine Corps installation already has a TRC established, the TRC should be converted into a RAB instead of establishing a separate committee. Modifications to convert a TRC to a RAB are accomplished by: adding a community co-chair; increasing community representatives; and making the meeting open to the public. Navy/Marine Corps membership should consist of a minimum of two members with the

EFD/EFA RPM serving as a member or as a technical consultant to the RAB. The existing TRC members should be given preference for a seat; however, the final make-up of the RAB should reflect the community's diverse interests.

Once selected, RAB members require initial training in their duties. The Navy/Marine Corps installation will work with the state, EPA, and environmental groups to develop methods to quickly train the new RAB members. The Navy Environmental Health Center (NAVENVIRHLTHCEN) can assist with RAB training, environmental risk communication, and other community assistance services. Potential training for RAB members may take the form of:

- Formal training sessions;
- Workshops;
- Informal briefings;
- Briefing booklets;
- Past fact sheets;
- Maps; and
- Site tours.

The RAB should be fully functional in six months and have set up or completed procedures for the successful development and final implementation of a working RAB. The following items are to be completed to establish or promote an efficiently functioning RAB:

- Selection Panel set up by the installation Commanding Officer/ Commanding General;
- Selection of RAB members;
- Development of a mission statement outlining the overall purpose of the RAB;
- Training of RAB members; and
- Development of RAB operating procedures that include:
 - Policies on attendance;
 - Procedures for replacing, adding, or removing members;
 - Co-chair length of service;
 - Methods of resolving disputes;
 - Process for responding to public comment; and
 - Procedures for public participation.

Each RAB meeting should have a purpose and agenda. Possible meeting agendas/formats may include;

- Review of "old" business;

- Update by project technical staff;
- RAB member discussions;
- Non-RAB member discussion period;
- List of action items for RAB members, and
- Discussion of next meetings agenda.

The Navy/Marine Corps will ensure adequate administrative support to establish and operate the RAB. The Navy/Marine Corps installation will provide the administrative and logistics support to the RAB using ER, N funds at non-Base Realignment and Closure (BRAC) installations or BRAC funds at closing installations.

Further information concerning RABs can be obtained in U.S. Department of Defense and U.S. EPA, *Restoration Advisory Board Implementation Guidelines*, DUSD(ES), Sep 1994.

10.14.2 Roles and Responsibilities of Key RAB Members

The Navy/Marine Corps installation Co-Chair is responsible for:

- Coordinating with the community co-chair to prepare and distribute an agenda prior to each RAB meeting;
- Ensuring that DoD participates in an open and constructive manner;
- Attending all meetings and ensuring that the RAB has the opportunity to participate in the restoration decision process;
- Ensuring that community issues and concerns related to restoration are addressed;
- Ensuring documents distributed to the RAB are also made available to the general public;
- Ensuring that an accurate list of interested and/or affected parties is developed and maintained;
- Providing relevant policies and guidance documents to the RAB in order to enhance the RAB's operation;
- Ensuring that adequate administrative support is provided to the RAB;
- Referring issues not related to restoration to appropriate installation official to address; and
- Reporting meeting proceedings to the installation.

The RPM role is to serve as a member of the RAB or as a technical consultant to the RAB.

The Community Co-Chair is responsible for:

- Coordinating with the Navy/Marine Corps installation co-chair and RAB community members to prepare an agenda prior to each meeting;

- Ensuring that community members participate in an open and constructive manner;
- Ensuring that community issues and concerns related to restoration are addressed;
- Assisting with the dissemination of information to the general public;
- Reporting meeting proceedings to the community; and
- Serving without compensation.

The RAB community member is responsible for:

- Attending all meetings;
- Providing advice and comment on restoration issues and concerns;
- Representing and communicating community interests and concerns;
- Acting as a conduit for the exchange of information between the community, Navy/Marine Corps installation, and environmental oversight agencies regarding the installation's restoration and reuse programs;
- Reviewing, evaluating, and commenting on documents and other such materials related to installation restoration and closure, if applicable; and
- Serving without compensation.

The state member is responsible for:

- Attending RAB meetings;
- Serving as an information, referral, and resource bank for communities, installations, and agencies regarding installation restoration;
- Reviewing documents and other materials related to restoration;
- Ensuring that state environmental standards and regulations are identified and addressed by the Navy/Marine Corps installation;
- Facilitating flexible and innovative resolutions of environmental issues and concerns; and
- Assisting in education and training for the RAB members.

The EPA member is responsible for:

- Attending RAB meetings;
- Serving as an information, referral, and resource bank for communities, installations, and agencies regarding installation restoration;
- Reviewing documents and other materials related to restoration;
- Facilitating flexible and innovative resolutions of environmental issues and concerns;

- Ensuring that Federal environmental standards and regulations are identified and addressed by the Navy/Marine Corps installation; and
- Assisting in education and training for the RAB members.

The BRAC Cleanup Team (BCT) member at closing installations is responsible for:

- Maintaining a close working relationship with other members of the RAB; and
- Providing timely and accurate information to the RAB.

Chapter Eleven

11. Training

Federal officers and employees who violate or who supervise other employees who violate Federal or state environmental laws, regulations, or permits may be criminally liable for such violations. Liability can be predicated upon the action or inaction of the Federal official after learning of the environmental violation

Under CERCLA, persons with direct participation and control over hazardous substances can be held personally liable for cleanup costs. CERCLA also provides for criminal penalties for failure to notify Federal officials upon release of hazardous materials.

As a prospective Remedial Project Manager (RPM), the importance of adequate and comprehensive training in fulfilling the requirements of environmental laws must be stressed not only for the individual RPM but for any person involved in identifying, assessing, or controlling hazardous substances/hazardous waste on a Federal site. For answers to specific questions regarding Federal employee responsibility for environmental non-compliance, the employee should contact the installation staff judge advocate, the REC or AEC environmental counsel or the office of counsel of the servicing EFD/EFA.

Table 11-1 summarizes environmental and other areas in which Navy/Marine Corps personnel should be trained and knowledgeable.

11.1 Remedial Project Manager and Associated Navy/Marine Corps Personnel Training Requirements

Remedial Project Managers (RPMs) are the Navy/Marine Corps' primary personnel involved in accomplishing the cleanup of past hazardous waste sites. Section 300.120(b)(1) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) states that DoD "shall provide On-Scene Coordinators/RPMs responsible for taking all response actions" to address release of contaminants from DoD properties. Under Section 300.120(e) of the NCP, the RPM is the prime contact for remedial or other response actions being taken at sites on the National Priorities List (NPL) and for sites not on the NPL but under the jurisdiction, custody, or control of a Federal agency. The RPM coordinates, directs, and reviews the work of other agencies, and contractors to assure compliance with the NCP, Record of Decision (ROD), consent decree, administrative order, and lead-agency approved plans applicable to the response.

In addition to the RPM, Navy/Marine Corps personnel actively involved with the IRP activities such as the installation's IR Manager or IR Coordinator, and personnel involved in identifying, assessing, or controlling hazardous substances/ hazardous waste on the installation are encouraged to obtain training similar to that obtained by the RPMs.

Environmental and Related Training Requirements

Topical Areas	C.O./ X.O.	Install. Environ. Manager	Install. IR Manag	OGC/ JAG	ROICC / Staff	PubAff Officer	Emerg. Res. Team	Contract Officer	EFD Staff	EFD RPM	Visitors to IR Site
IR Program Orientation	x	x	x	x	x	x	x	x	x	x	
CERCLA, as amended	x	x	x	x	x			x	x	x	
RCRA, as amended	x	x	x	x	x			x	x	x	
RPM Training										x	
HM/HW Indoctrination	x	x	x	x	x	x	x	x	x	x	
HM/HW Control/Manage	x	x	x		x		x				
HM/HW Permitting & Record Keeping				x	x			x		x	
Health & Safety	x	x	x	x	x	x	x	x	x	x	x
Emergency Response Contingency Planning	x	x	x	x		x					
Emergency Response Procedures	x	x	x	x	x	x	x		x	x	x
Spill Resp. & Cleanup					x		x	x			
Environmental Risk Communications & Public Dialogue	x	x	x	x	x	x	x	x	x	x	x

Table 11-1: Environmental and Related Training Requirements

11.1.1 RPM Responsibilities

RPM categories of responsibility include:

- Legal - Ensures compliance with applicable laws and regulations; identifies cleanup criteria and accomplishes tasks in accordance with regulatory agreements; and assists in the preparation of the Administrative Record;
- Project Management and Administration - Oversees work performed by contractors and evaluates their performance; manages project and schedule; prepares funding requests; assists in negotiation of the FFA (or state version); and assists in maintenance of the Administrative Record;
- Technical - Reviews documents for technical adequacy; prepares decision documents; coordinates and reviews site sampling and analysis; develops conceptual models of contaminated sites; reviews technical proposals; and monitors technology performance;
- Health and Safety - Ensures compliance with health and safety plans; updates health and safety procedures as necessary; and
- Regulatory and Community Interface - Coordinates work with local, state, and the Environmental Protection Agency (EPA) regulatory agencies; holds public meetings; corresponds with stakeholders; communicates plans and accomplishments to the public; and responds to questions.

11.1.2 Navy/Marine Corps RPM Training Policy

Under Navy/Marine Corps policy, an RPM should be capable of performing or overseeing the performance of essential tasks within 36 months of assignment as an RPM. RPM supervisors must ensure that training on each essential task is provided to each RPM within 36 months of assignment as an RPM. The publication, *Remedial Project Manager (RPM) Job Tasks and Training Courses*, (NAVFACENGCOM letter 5090 41BJ/950073 of 15 March 1995) lists training which a new RPM should complete within the first twelve and thirty-six months of serving as an RPM. See **section 11.10** for the training source for this program.

Completion of these courses satisfies the RPM training requirements detailed in the Navy *Environmental and Natural Resources Program Manual* (OPNAVINST 5090.1B) for Engineering Field Division/Engineering Field Activity (EFD/EFA) personnel assigned duties involving environmental restoration or remediation. In addition to ensuring proper training, the RPM supervisor will maintain and provide each RPM a copy of their individual Remedial Project Manager Training Plan. The training plan details training which has occurred, projected dates for future training, and if an RPM has demonstrated competency in one or more tasks and/or has received a waiver by the RPM's supervisor of that particular training requirement.

The following training is required within twelve months of assignment as an RPM:

- Installation Restoration Health and Safety Course;
- Contracting Officer Technical Representative Course; and

- One of the following introductory courses:

Superfund and the NCP;
 Fundamentals of Superfund; or
 Installation Restoration Program.

The following additional training is required within thirty-six months of assignment as an RPM:

- Installation Restoration Health and Safety Refresher Course;
- Installation Restoration Supervisor Course;
- Quality Assurance in Environmental Analysis Course;
- Navy Environmental Restoration Implementation Course;
- Risk Communication and Public Dialog Workshop;
- One of the following risk assessment courses:

Risk Assessment Guidance for Superfund; or
 Hazardous/Toxic and Radioactive Waste Risk Management Decision Making.

- One of the following groundwater contamination courses:

Introduction to Groundwater Investigations;
 Geotechnical Aspects of Hazardous and Toxic Waste Sites;
 Transport and Remediation of Subsurface Contaminants; or

Groundwater Monitoring, Protection, and Remediation.

- And one of the following remediation technologies courses:

Treatment Technologies for Superfund;
 Innovative Treatment Technologies; or
 Site Restoration Tools, Techniques and Technologies.

11.2 Hazardous Material and Hazardous Waste

Hazardous material and hazardous waste (HM/HW) is regulated by requirements of the Hazardous Materials Transportation Act; Occupational Safety and Health Administration (OSHA); the Clean Water Act; the Clean Air Act; the Toxic Substances Control Act; and the Federal Insecticide, Fungicide, and Rodenticide Act in addition to CERCLA and RCRA. Personnel will require training in the content and requirements of these acts and regulations. The level of training received will depend on the individual's responsibilities and duties under the IR Program. Personnel may also receive training through the EPA's Hazardous Materials Training Program. See **section 11.10** for information on the training source for this program.

11.2.1 Hazardous Material/ Hazardous Waste Introductory Training

Management personnel responsible for IR sites and the personnel involved in actual HM/HW operations require an introductory training which includes:

- The importance of HM/HW management;

- Overview of applicable legislation; and
- Overview of the activity's HM/HW management program.

11.2.2 Control and Management

Personnel involved in handling HM/HW will require training in HM/HW control and management. This training will be provided in accordance with 29 CFR 1910 and 29 CFR 1926 and will include:

- Characterization and classification of HM/HW;
- Proper completion of manifests;
- Proper use of Material Safety Data Sheets; and
- Specific aspects of the HM/HW Management Program relevant to the individual's job including:

Use;

Handling;

Inspection;

Labeling;

Packaging;

Transportation;

Treatment;

Storage; and

Disposal.

- Safety, health, and hazards pertinent to the individual's job;
- Work practices to minimize risk; and
- Medical surveillance requirements.

11.3 Permitting and Record Keeping

Personnel involved in the administrative and legal aspects of managing an IR site will require training in applicable permitting and record keeping. The training will include the following topics:

- General facility standards;
- Land disposal;
- Incineration;
- Corrective action;
- CERCLA/RCRA interface;
- Reports required of HM/HW generators; and
- Facility management planning.

11.4 Health and Safety

Training is an integral part of the Health and Safety Program for site cleanup projects. OSHA standards in 29 CFR 1910, *General Industry Standards*, and 29 CFR 1926, *OSHA Construction Standards*, detail training requirements. Personnel will maintain their proficiency in the use of equipment and their knowledge of safety requirements by frequent training. Personnel working with HM/HW will receive proper health and safety training prior to engaging in HM/HW operations. Table 11-2 presents health and safety training requirements. Personnel who complete training will receive a written certificate of training accomplished. Health and safety training is required for the following categories of personnel:

- Personnel exposed to hazardous substances, health hazards, or safety hazards must have 40 hours of off-site

Health and Safety Training Requirements

Hazardous Waste Cleanup Sites¹				
Staff	Initial	Field	Ann. Refresher	
Routine site employees	40 hours	24 hours	08 hours	
Routine site employees (min. expos.)	24 hours	08 hours	08 hours	
Non-routine site employees	24 hours	08 hours	08 hours	
Supervisor/Managers	Initial	Field	Haz. Waste Manag.	Annual Refresher
Routine site employees	40 hours	24 hours	08 hours	08 hours
Routine site employees (min. expos.)	24 hours	08 hours	08 hours	08 hours
Non-routine site employees	24 hours	08 hours	08 hours	08 hours
Treatment, Storage, and Disposal Sites				
General site employees	24 hours initial or equivalent 08 hours annual refresher			
Emergency response personnel	Training to a level of competency Annual refresher			
Other Emergency Response Staff²				
Level 1 - First responder ³ (awareness level)	Sufficient training or experience in specific competencies Annual refresher			
Level 2 - First responder ⁴ (operations level)	Level 1 competency and 08 hours initial or experience in specific competencies Annual refresher			
Level 3 - HAZMAT technician ⁵	24 hours of Level 2 and experience in specific competencies Annual refresher			
Level 4 - HAZMAT specialist ⁶	24 hours of Level 3 and experience in specific competencies Annual refresher			
Level 5 - On-the-scene incident commander ⁷	24 hours of Level 2 and additional competencies Annual refresher			

¹ See 29 CFR 1910.120(e) and (p)(7)

² See 29 CFR 1910.120(q)(6)

³ Witnesses or discovers a release of hazardous material and who is trained to notify the proper authorities

⁴ Responds to releases of hazardous substances in a defensive manner, without trying to stop the releases

⁵ Responds aggressively to stop the release of hazardous substances

⁶ Responds with and in support to HAZMAT technicians, but who has specific knowledge of various hazardous substances

⁷ Assumes control of the incident scene beyond the first-responder awareness level

Table 11-2: Health and Safety Training Requirements

instruction and 3 days field experience under the direct supervision of a trained, experienced supervisor. Training will include practical and hands-on use of equipment and exercises designed to demonstrate and practice classroom instruction. Personnel will receive an additional eight hours of refresher training annually;

- On-site managers and supervisors of personnel engaged in HM operations will require training equal to the above plus eight additional hours in managing HM operations. Managers will receive an additional eight hours of refresher training annually; and
- HM/HW trainers must be trained at a level higher than the subject matter they are teaching.

11.4.1 Personal Protective Equipment Use

Personnel are required to receive training in the use of personal protective equipment (PPE). Training in PPE use allows the user to become familiar with the equipment in a non-hazardous situation and increases efficiency of operations performed by personnel wearing PPE. The discomfort and inconvenience of wearing PPE creates resistance to the conscientious use of PPE. This training will provide the user with the full awareness of the need for PPE and the motivation to use and maintain the PPE. The training will be completed prior to actual PPE use in a hazardous environment and will be repeated annually. The training will include the following:

Selection;

- Use;
- Limitations;
- Proper fit procedures;
- Inspection;
- In-use monitoring;
- Heat stress related injuries and the potential impact of over-protection;
- Donning and doffing procedures;
- Decontamination; and
- Maintenance and storage.

11.5 Explosive Safety

All personnel engaged in operations that involve ammunition, explosive, and other hazardous materials must be trained and qualified to perform their assigned duties quickly and safely. As outlined in NAVSEA OP 5, Volume 1, Sixth Revision, *Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*, specific personnel requirements such as physical and mental fitness, passing chemical agent screening, enrollment in a qualification and certification program and completed safety training exist for these personnel. Mandatory and recommended explosive safety training is identified in Appendix D of NAVSEA OP 5.

11.6 Emergency Response

Emergencies require prompt action to prevent or reduce injuries. Emergency response training is required to reduce injuries from the hazards of fire, explosion, and release of toxic vapors or gases.

11.6.1 Emergency Response Contingency Planning

Personnel require training in the development of a hazardous substance incident response plan. The training will be in accordance with the NCP. The training will be designed to improve a manager's awareness of hazard response. This training will ensure that all hazardous substance spills, fires and explosions are responded to safely and efficiently. Training will address legal, technical and financial aspects of contingency planning, and encompass such topics as:

- Local, state, and Federal responsibilities;
- Local, state, and Federal ordinances;
- Contracts and cooperative agreements;
- Development of a response plan;
- Types and storage of hazardous materials; and
- Preventive measures.

11.6.2 Emergency Response Procedures

Immediate and informed response is essential in an emergency. All on-site personnel, visitors, contractors, off-site response groups, and others entering the site must have some level of emergency training. 29 CFR 1910 and 40 CFR 264, require emergency training for personnel. All personnel and visitors should be briefed on basic emergency procedures such as decontamination, emergency signals, and evacuation routes.

Members of an emergency response team will be trained in containing and terminating releases. The level of competency each member is expected to demonstrate is dependent on the member's specific duties. Response members will be trained in:

- Hazard recognition;
- Identification of hazardous materials;
- Safe operating procedures;
- Control, containment, and/or confinement procedures;
- Decontamination; and
- Termination procedures.

11.7 Spill Response and Cleanup

Personnel responsible for participating in spill response and cleanup operations should receive training covering the following topics:

- First-response considerations;
- Hazard evaluation;
- Site entry, control, and decontamination procedures;
- Containment methods;
- Disposal operations;
- Health and safety considerations and requirements; and
- Use of field monitoring instruments.

11.8 Environmental Risk Communication and Public Dialogue

It will be necessary for management and technical response staff and public affairs staff, to meet with citizens, participate in meetings, review citizen comments, consider how citizens input might affect response decisions, and document the Navy/Marine Corps' response to citizen input. Thus, it is recommended that management, technical staff including the RPM, and public affairs staff participate in training concerning:

- Improving verbal and non-verbal communication skills;
- Developing open dialogue with community stakeholders;
- Developing effective media and public meeting techniques; and
- Identifying stakeholder concerns.

Personnel may receive Environmental Risk Communication/Public Dialogue training through the Navy Environmental Health Center (NAENVIRHLTHCEN). See **section 11.10** for information on the training course.

11.9 Training Certification and Record Keeping

Employees and supervisors who have completed the required training and field experience for their positions must be certified by the instructor as having satisfied the requisite training. A written certificate will be given to each person certified. Any person who has not been certified or who does not meet the equivalent training requirements will be prohibited from engaging in hazardous waste operations. A record of training should be maintained in each employee's personnel file to confirm that every person assigned to a task has had adequate training for that task and that every employee's training is up-to-date. The contractor will maintain, on-site, documentation certifying that their on-site personnel meet all medical clearance and training criteria including copies of individual certificates. RCRA, as set forth in 40 CFR 264.16, requires that training records on current personnel be kept until closure of the facility. Training

records on former employees must be kept for at least three years from the date the employee last worked at the facility.

11.10 Training Sources

The following organizations are sources for environmental training for the stated programs:

- Environmental and Natural Resources Program (RPM Training Program).

Environmental and Natural Resources Program
Navy Training Program
Program Management Office
Naval School, Civil Engineer
Corps Officers
3502 Goodspeed Street, Suite 1
Port Hueneme, CA 93043-4336
Telephone: (805) 982-5655

- Environmental Risk Communication and Public Dialogue

Navy Environmental Health Center
2510 Walmer Avenue
Norfolk, VA 23513-2617
Telephone (757) 363-5555

- Health and Safety Training for compliance with 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*

Naval Facilities Engineering
Service Center
1100 23rd Avenue
Port Hueneme, CA 93043-4370

- USEPA Environmental Response Division

Environmental Response
Division
U.S. Environmental Protection
Agency
26 West Martin Luther King
Drive
Cincinnati, OH 45268
Telephone: (513) 569-7537

- USEPA Emergency Removal/HazMat

Emergency Removal/HazMat

USEPA Region VII
726 Minnesota Avenue
~~Kansas City, KS 66101~~
Telephone: (913) 236-3720

- Training Section, Office of Solid Waste and Emergency Response

Training Section
Office of Solid Waste and Emergency Response
USEPA (OS-110), Room 3603
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 382-4515

- Superfund Training, Office of Solid Waste and Emergency Response

Superfund Training
Office of Solid Waste
and Emergency Response
USEPA (OS-110), Room 3603
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 382-4369

Chapter Twelve

12. Health and Safety

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR 300) provides for the protection of workers involved in response actions. The Installation Restoration (IR) Program which uses the NCP (40 CFR 300.150, *Worker Safety*) as guidance for accomplishing response actions must also comply with the requirements of the Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910 *Industry Standards* and 29 CFR 1926, *OSHA Construction Standards*.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 126(a), requires the protection of health and safety of workers engaged in hazardous waste operations and the general public during response actions. As directed by CERCLA, OSHA issued rules 29 CFR 1910 and 29 CFR 1926. The OSHA rules specify the requirements for protecting the health and safety of workers involved in hazardous substance response activities and provide that an occupational health and safety program be established for the protection of workers at a response site.

The three components of a Health and Safety Program are:

1. Preparation of a Site Health and Safety Plan;
2. Site briefings; and
3. Site inspections.

In addition, in states with occupational safety and health (OSH) laws, these laws may also apply to response actions. The occupational safety and health requirements of other Federal agencies may also apply. The requirements of this chapter apply at all Navy/Marine Corps Installation Restoration (IR) Program sites, including Government Owned/Contractor Operated facilities and contractor activities at these IR Program sites.

12.1 Health and Safety Plan

The Site Health and Safety Plan (HSP) establishes procedures for protecting the health and safety of all personnel working at the site or responding to an emergency at the site. The plan must contain information about known or suspected hazards; routine and special safety procedures that will need to be followed; and other instructions for safeguarding the health and safety of site personnel, visitors, and emergency responders. Before operations at a site commence, all safety aspects of site operations should be examined. The Site HSP should be prepared prior to the Site Inspection, Remedial Investigation, and Remedial Action field activities and concurrently with the Sampling and Analysis Plan. An HSP is written based on the anticipated hazards for the expected working conditions. The plan will be conspicuously posted or distributed to all workers, supervisors, contractor and government inspectors, and emergency response personnel; and will be discussed with them by the site safety and health officer. The plan must be reviewed periodically to keep it current. The review should take place at the same time that other site activities are reexamined.

The contractor will prepare the Site HSP which includes procedures for responding to probable hazardous substances at each hazardous waste site. The Remedial Project Manager (RPM) will coordinate the review of the HSP with the Engineering Field Division/Engineering Field Activity

(EFD/EFA) Safety and Health Manager to ensure that the plan protects the health and safety of the workers. The Navy Environmental Health Center (NAVENVIRHLTHCEN) is available to provide an occupational health review of these documents. Information about this service may be obtained by telephone at (757) 363-5556/5547/5557, or DSN 864-5556/5547/5557.

The plan must contain safety requirements for routine hazardous response activities and also for unexpected emergencies. The distinction between routine and emergency site safety planning is the ability to predict, monitor, and evaluate routine activities. In accordance with 29 CFR 1910 and 29 CFR 1926, each Site HSP will address the following:

- The name of a Site Health and Safety Officer and the names of key personnel and alternates responsible for site safety and health;
- A safety and health risk analysis for existing site conditions and each site task and operation;
- Employee training assignments;
- A description of personal protective equipment (PPE) to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- A description of the frequency and types of air monitoring, personnel monitoring, environmental sampling techniques, and instrumentation to be used;
- Site control measures;
- Decontamination procedures;
- Standard Operating Procedures for handling, transporting, labeling, and disposing of hazardous wastes at the site;
- A spill containment program meeting the requirements of 29 CFR 1910;
- Action levels, permissible exposure levels, or threshold limit values for each contaminant; and the required actions if the limits are reached or exceeded;
- Entry procedures for confined spaces; and
- An emergency response plan meeting the requirements of 29 CFR 1910 for safe and effective responses to emergencies including the necessary PPE and other equipment. The RPM will provide this plan to the installation emergency response team for coordination during the contractor's work on the installation.

Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from having a written emergency response plan. However, they must develop an emergency action plan which meets the requirements of 29 CFR 1910.38(a).

Appendix F is a Health and Safety Plan Review Checklist.

12.2 Site Briefings and Site Access

As part of an effective Health and Safety Program, safety/pre-entry briefings will be held prior to initiating any site activity and at other times as necessary to ensure that workers, supervisors, inspectors, and emergency response personnel are apprised of the provisions of the Site HSP and that it is being followed. The contractor accomplishing site investigation and cleanup is responsible for determining the degree of site access. The contractor determines the best method for controlling access and is responsible for enforcing access control procedures. Prior to entering an area of known or potential contamination, all visitors (private or government) must meet medical surveillance and training requirements established by the HSP. Visitors will be briefed by the contractor's Safety Officer on standard safety operating procedures prior to entering these areas.

12.3 Standard Procedures For Safety

Standard procedures for safety will be established for IR response actions and will include safety precautions and operating practices that all responding personnel must follow. The procedures must protect the personnel from a variety of physical, chemical, and biological hazards.

Specific standard operating procedure (SOP) requirements exist for operations involving ammunition or explosives. As required by NAVSEA OP 5, Volume 1, Sixth Revision entitled *Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*, a written SOP must be developed prior to starting any process involving ammunition or explosives. Guidance for writing SOPs is provided by NAVSEAINST 8023.11 (series) *Standard Operating Procedures for the processing of Expendable Ordnance at Navy and Marine Corps Activities* and applies whether the work is performed by Navy or contractor personnel at a government-owned activity or by Navy personnel at other activities. The SOP must be approved by the Commanding Officer at active activities and by the organization assigned cleanup responsibility at inactive sites.

12.3.1 Personal Practices

EPA publication *Standard Operation Safety Guides* (1992) and NAVENVIRHLTHCEN recommend the following personal practices:

- Eating, drinking, smoking, chewing gum or tobacco, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated;
- Hands and face must be washed upon leaving the work area;
- Whenever decontamination procedures for outer garments are in effect, the entire body will be washed as soon as possible after the protective garment is removed;
- No facial hair which interferes with a satisfactory fit of the mask-to-face seal is allowed on personnel required to wear respirators;
- Contact with contaminated or suspected contaminated surfaces should be avoided;

- Medicine may exacerbate the effects of exposure to toxic substances. Prescribed drugs should not be taken by personnel on response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless approved by a qualified physician; and
- Alcohol exacerbates the effects of exposure to toxic substances. Alcoholic beverages should be avoided in the off-duty hours but especially during response operations.

12.3.2 Operating Procedures

EPA publication *Standard Operation Safety Guides*, (1992) and NAVENVIRLHLHCEN recommend the following operating procedures:

- All personnel going onto an IR site will be trained and briefed on anticipated hazards, personal protective equipment to be worn, safety practices to be followed, emergency procedures, and communications;
- Any required respiratory protection and chemical protective clothing will be donned by all personnel prior to going into areas designated for wearing protective equipment;
- Visitors entering an exclusion/work zone requiring respiratory protection will provide their own respiratory PPE in addition to providing documentation that they are qualified to wear subject PPE;
- Personnel on-site must use the buddy system when entering an exclusion zone or hazardous area. A minimum of two other persons, suitably equipped, are required as safety backup during initial site entry and for emergency response purposes;
- Visual contact will be maintained between pairs of on-site and safety personnel. Initial site entry team members should remain close together to assist each other during emergencies;
- At all times while operations are being performed on-site, a minimum of two contractor personnel trained in adult first aid/CPR and blood borne pathogens control will be available on-site to render emergency care. Off-site personnel may be contacted to provide assistance and emergency transport;
- Personnel should practice unfamiliar operations off-site prior to performing the actual procedure on an IR site;
- Site entrances and exits will be designated and emergency escape routes delineated. Warning signals for site evacuation must be established;
- Communications using radios, hand signals, signs, or other means must be maintained between initial entry members at all times. Emergency communications will be prearranged in case of radio failure, site evacuation, or other reasons;
- Prior to commencing site operations, establish appropriate communications with all potential emergency response organizations such as the Federal On-Scene Coordinator (installation Commanding General or Commanding Officer), Local Emergency Planning Committee, the National Response Center, local poison control centers, and local medical facilities (civilian and military);

- Wind indicators visible to all personnel should be strategically located throughout the site;
- Personnel and equipment in the contaminated area should be minimized consistent with effective site operations;
- Work areas for various operational activities will be established; and
- Procedures for leaving a contaminated area will be planned and implemented prior to going on-site. Work areas and decontamination procedures will be established based on expected site conditions.

12.4 Medical Surveillance

Medical surveillance requirements of 29 CFR 1910.120 and 1910.1030 for contractor employees should be documented in the remedial action contract (RAC). Navy personnel will also comply with the medical surveillance requirements of 29 CFR 1910.120 and 1910.1030 and OPNAVINST 5100.23. Contractor medical surveillance programs may provide useful information for Navy personnel. EFDs/EFAs and installations will ensure that appropriate personnel are included in a medical surveillance program.

12.4.1 Personnel Covered

A medical surveillance program will be instituted for the following personnel:

- All personnel who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limits, without regard to the use of respirators, for 30 days or more a year;
- All personnel who wear a respirator for 30 days or more a year; and
- Personnel who are members of a hazardous material emergency response team.

12.4.2 Frequency of Medical Examinations and Consultations

Medical examinations and consultations will be made available for personnel covered by a medical surveillance program on the following schedule:

- Prior to assignment;
- At least once every 12 months for each individual covered;
- At termination of employment or reassignment to an area where the individual would not be covered by the surveillance program. Examination is not required if the individual had received an examination within the last six months;
- As soon as possible upon notification by an individual who has developed signs or symptoms indicating possible overexposure to hazardous substances or other health hazards;
- As soon as possible when an unprotected individual has been exposed to hazardous substances or other health hazards; and

- At more frequent times if the examining physician determined that an increased frequency of examinations is medically necessary.

12.4.3 Content of Medical Examinations and Consultations

All personnel covered by a medical surveillance program will receive medical examinations. The examinations will include their medical and work history. It will place special emphasis on symptoms related to the handling of hazardous substances and other health hazards. The examination will appraise their fitness for duty to include the ability to wear required PPE under conditions that may be expected at the work site. The medical examination will determine an individual's ability to wear a respirator if wearing a respirator is a job requirement. The content of medical examinations or consultations will be determined by the examining physician. Medical tests to be conducted often include: pulmonary function tests, chest X-ray, electrocardiogram, and various blood tests.

12.4.4 Examination by a Physician and Costs

All medical examinations and procedures will be performed by or under a certified occupational medicine physician and will be provided without costs to the individual, without loss of pay, and at a reasonable time and place.

12.4.5 Information Provided to the Physician

The following information will be provided to the examining physician:

- A copy of 29 CFR 1910;
- A description of the individual's duties where occupational exposure occurs;
- The individual's exposure levels or anticipated exposure levels;
- A description of any PPE used or to be used including the associated exposure level of hazard; and
- Information from any previous medical examination which is not readily available to the examining physician.

12.4.6 Physician's Written Opinion

A copy of the examining physician's written opinion will be obtained and furnished to the individual. The physician's written opinion will include the following:

- The physician's opinion as to whether the individual has any detected medical conditions which would place the individual's health at increased risk of material impairment from work in hazardous waste operations or emergency response or from respirator use;
- The physician's recommended limitations upon the individual's assigned duties;
- The results of the medical examination and tests;

- A statement that the physician informed the individual of the results of the medical examination and any medical conditions which require further examination or treatment; and
- The written opinion obtained by the individual will not reveal specific findings or diagnoses unrelated to occupational exposure.

12.4.7 Record Keeping

An accurate record of medical surveillance will be maintained. An individual's medical record should contain the following information:

- Any occupational exposure;
- Use of respirators and personal protective clothing;
- Any work-related injuries;
- Physician's written opinion of medical problems and treatment; and
- Record of all medical examinations.

12.5 Blood Borne Pathogens

For IR activities with potential exposure to blood or other potentially infectious materials, the exposure control requirements of 29 CFR 1910 for contractor employees should be documented in the RAC. Navy/Marine Corps personnel will also comply with the requirements of 29 CFR 1910. Contractor exposure control plans may provide useful information for exposure control plans for Navy/Marine Corps personnel. EFDs/EFAs and installations will ensure that appropriate personnel are included under an exposure control plan.

Where personnel are or may have an occupational exposure to blood or other potentially infectious materials, an Exposure Control Plan must be established to eliminate or minimize personal exposure. The Exposure Control Plan will contain the following components at a minimum:

- Exposure determination for each employee listing classification, tasks, and procedures where occupational exposure occurs;
- Schedule and methods of compliance with occupational exposure requirements;
- Hepatitis B vaccination and post-exposure evaluation for employees with occupational exposure;
- Communication of hazards to employees using labels, signs, and briefings;
- Record keeping of each employee with occupational exposure; and
- Procedures for evaluating exposure incidents.

Personnel will be provided with appropriate PPE that does not permit blood or other potentially infectious materials to pass to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

12.6 Health Hazard Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances and other health hazards to determine the level of personal protection on site. Air monitoring must be conducted to identify any immediately dangerous to life and health (IDLH) situations. Periodic monitoring will be conducted when:

- Work begins on a different portion of the site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated; and
- Personnel are handling leaking drums or containers or working in areas with obvious liquid contamination.

After IR site cleanup operations commence, those personnel with the greatest potential for exposures to hazardous substances must be monitored.

12.7 Personal Protective Equipment

Anyone entering an IR site must be protected against potential health hazards. The purpose of personal protective equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered at the site. The Site HSP will include a PPE Program established for the IR site cleanup operations and will address:

- Site conditions;
- PPE selection, use, maintenance and storage, decontamination, inspection, in-use monitoring, limitations and program evaluation;
- PPE training and proper fit procedures; and
- PPE donning and doffing procedures;

12.7.1 Personal Protective Equipment Selection

PPE will be selected and used in accordance with the requirements of 29 CFR 1910, Subpart I, 29 CFR 1910.120 and OPNAVINST 5100.23. Personnel will select and use PPE which will provide protection from potential health hazards as identified during the site characterization and analysis. Selection will be based on an evaluation of the performance characteristics of the PPE relative to the task-specific conditions and duration and the hazards identified at the site. PPE is separated into four levels of protection based on four levels of hazards as identified in 29 CFR 1910, Appendix B. Consideration of the defined levels of protection will aid in the selection of PPE.

The selection of appropriate PPE involves three steps:

1. Identifying the hazards;
2. Evaluating the hazards; and
3. Providing proper PPE to suit the conditions and the individual.

The following factors should also be considered in the selection of PPE:

- Permeation;
- Degradation;
- Penetration;
- Heat transfer;
- Durability;
- Flexibility;
- Temperature effects;
- Ease of decontamination;
- Compatibility with other equipment; and
- Duration of use.

Heat stress related injuries are always a significant concern when wearing personal protective clothing, regardless of ambient conditions. The use of personal protective equipment decreases the body's ability to eliminate excess heat and care must be taken not to "over protect" employees. Use only as much PPE as required to prevent employee exposure to hazardous materials.

12.7.2 Immediately Dangerous to Life and Health Situations

Positive pressure, self-contained breathing apparatus or positive pressure, air-line respirators equipped with an escape air supply must be used during Immediately Dangerous to Life and Health (IDLH) or potential IDLH conditions. Totally-encapsulating chemical protective suits level A protection, as defined in Appendix B of 29 CFR 1910, will be used in conditions where contact of the skin by the hazardous substances may result in an IDLH situation.

12.7.3 Testing of Personal Protective Equipment

In accordance with 29 CFR 1910 and 29 CFR 1926, certain testing capabilities are required for particular items of PPE. Appendix A of 29 CFR 1910 sets forth non-mandatory examples of tests which may be used to evaluate compliance with the PPE's required capabilities. 29 CFR 1910 requires that the fit of respirators be determined when they are issued and that the fit be checked each time the respirator is worn. The two types of fit tests for respirators are as follows:

- Qualitative fit-testing;
 - Negative pressure check;
 - Positive pressure check; and
 - Irritant smoke test.
- Quantitative fit-testing to determine actual protection factor.

12.8 Emergency Response

Emergencies require prompt action to prevent or reduce the effects of the cause of the emergency. Immediate hazards of fire, explosion, and release of toxic vapors or gases are of prime concern. Emergencies vary in respect to types and quantities of material, hazards, number of responders involved, type of work required, population affected, and other factors. Coordination with installation emergency response teams and development of an emergency response plan will ensure safe and effective emergency response. Personnel should be alert for indicators of potential hazardous situations. In addition, they should be aware of signs and symptoms in themselves and others that warn of hazardous exposure. Regular meetings should be held before and after each day's work assignments. Discussions will include:

- Tasks to be performed;
- Time constraints such as rest breaks and air tank changes;
- Potential hazards, their effects, how to recognize symptoms, concentration limits, and other danger signals; and
- Emergency procedures.

12.8.1 Emergency Response Plan

An Emergency Response Plan for responding to emergency situations must be developed and included in the Site HSP. The plan will be general in content and must be developed prior to any emergency response and implemented when an emergency occurs. The emergency response plan for on-site and off-site emergencies must address, as a minimum, the following elements:

- Pre-emergency planning;
- Personnel roles, lines of authority, training, and communication;
- Emergency recognition and prevention;
- Name and telephone numbers of emergency points of contact;
- Safe distances and places of refuge;
- Site security and control;
- Evacuation routes and procedures;
- Decontamination;
- Emergency medical treatment and first aid;
- Emergency alerting and response procedures;
- Critique of response and follow-up; and
- PPE and emergency equipment.

12.8.2 On-site Emergency Response

The on-site emergency response plan must be compatible and integrated with the disaster, fire, and/or emergency response plans of local, state, and Federal agencies. The plan will be rehearsed regularly as part of the overall training program for site operations. The on-site emergency response plan will be reviewed periodically and amended to keep it current with site conditions. An on-site emergency response plan will be implemented based upon the information available at the time of the emergency and an evaluation of the emergency conditions. An on-site emergency response plan will address the same elements as the emergency response plan in addition to the following elements:

- Site topography, layout, and prevailing weather conditions; and
- Procedures for reporting incidents to local, state, and Federal government agencies.

In addition, an alarm system must be installed at the IR site in accordance with 29 CFR 1910 to notify personnel of an on-site emergency situation, to stop work activities, to lower background noise in order to speed communication; and to begin emergency procedures.

12.8.3 Off-site Emergency Response

The senior official responding to a hazardous substance or waste incident will establish an incident command system (ICS). All emergency responders and their communications will be coordinated and controlled through the ICS. The official-in-charge will identify all hazardous substances or conditions. The official-in-charge will implement emergency operations based on the hazardous substances and/or conditions and will ensure appropriate PPE is worn by responders. During the initial emergency response operations, a self-contained breathing apparatus must be worn at all times by personnel receiving possible exposure to hazardous substances or other health hazards. The official-in-charge will limit the number of emergency responders at the site to those actively performing emergency operations. In addition, operations performed in a hazardous area will be performed using the buddy system in groups of two or more. Back-up personnel will stand by with equipment ready to provide assistance or rescue. Qualified basic life support personnel must be standing by with medical equipment and transportation capability.

The official-in-charge will designate a safety officer who is knowledgeable in fire fighting or rescue operations and hazardous substance handling procedures. The safety officer's specific responsibilities are to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency. When activities are judged by the safety officer to be unsafe and/or to involve an imminent danger condition, the safety officer must have the authority to alter, suspend, or terminate those activities.

12.8.4 Emergency Medical Care and Treatment

The medical program will address emergency medical care and treatment of on-site personnel including possible exposures to toxic substances and injuries resulting from accidents or physical hazards. The following elements should be included in an emergency care program:

- Name, address, and telephone number of the nearest medical facility;

- The facilities ability to provide care and treatment of personnel exposed or suspected of being exposed to toxic substances;
- Administration arrangements for accepting patients;
- Arrangements to obtain ambulance, emergency, fire, and police services;
- Emergency showers, eyewash fountains, and first-aid equipment readily available on-site;
- Arrangement for on-site certified first-aid/CPR personnel;
- Procedures for the rapid identification of the substance to which personnel have been exposed;
- Procedures for decontamination of injured personnel and preventing contamination of medical personnel, equipment, and facilities;
- Protocols for heat stress and cold exposure monitoring and working in adverse conditions especially when wearing PPE at level C or higher; and
- Medical evacuation requirements.

12.8.5 Post Emergency Response

If it is determined necessary to remove hazardous substances, health hazards, or contaminated material following completion of the emergency response, such operations must be conducted appropriately for the site conditions and hazards.

Chapter Thirteen

13. Research, Development, Test and Evaluation

The Office of the Secretary of Defense (OSD), operating through the Deputy Under Secretary of Defense, Environmental Security, establishes policy and monitors the Armed Forces' execution of the Department of Defense (DoD) hazardous waste site cleanup program through the Installation Restoration (IR) Program.

The 1986 Superfund Amendments of the CERCLA, in Section 211 established the Defense Environmental Restoration Program (DERP) and provided for Research, Development, Test and Evaluation (RDT&E) of:

- Methods for reducing the quantities of hazardous waste generated;
- Methods for treatment, disposal, and management (including recycling and detoxifying) of hazardous waste;
- Cost-effective technologies for cleanup of hazardous substances;
- Toxicological data collection and methodology on risk of exposure to hazardous waste; and
- Testing, evaluation, and field demonstration of innovative methods to control, contain, and treat hazardous substances.

This chapter discusses available Navy/Marine Corps, Environmental Protection Agency (EPA), and other RDT&E resources.

13.1 Navy/Marine Corps RDT&E Responsibilities

The purpose of RDT&E with respect to the Navy/Marine Corps IR Program is to develop improved investigation and cleanup technologies and make them available. Many innovative technologies have been developed and demonstrated which improve the speed and cost-effectiveness of cleanup at Navy/Marine Corps sites. These new technologies have been developed by the Navy/Marine Corps, the services, or other Federal agencies.

The Navy/Marine Corps has made the conscious decision to integrate RDT&E into its framework for the IR Program. To make maximum use of scientific and engineering talent, the Navy/Marine Corps draws upon expertise from several organizations.

13.2 Naval Facilities Engineering Command

The Naval Facilities Engineering Command (NAVFACENGCOM) manages the Navy/Marine Corps DERP effort. NAVFACENGCOM and its subordinate commands [EFDs/EFAs and the Naval Facilities Engineering Service Center (NFESC)] provide expertise in environmental engineering and coordinate Navy/Marine Corps RDT&E efforts. The execution of Navy/Marine Corps RDT&E is a collaborative effort of various supporting organizations and a NAVFACENGCOM action officer.

13.3 General Support Organizations

NFESC develops major RDT&E technologies for Navy and Marine Corps installations. NFESC provides consulting services to project

managers at Navy/Marine Corps restoration sites and plans and conducts applied research and demonstration projects to support restoration objectives.

The Naval Command, Control and Ocean Surveillance Center, RDT&E Division (NCCOSC NRaD) provides expertise in near-shore water contamination cleanup technologies.

The Naval Sea Systems Command's Ordnance Environmental Support Office addresses ordnance waste sites and range cleanups.

The Naval Research Laboratory provides input when a technology supports the opportunity for technical base development. NAVFACENGCOM assesses basic scientific research conducted under the auspices of the Chief of Naval Research for possible environmental application.

Each of the Navy/Marine Corps RDT&E providers makes use of knowledge residing in academia and EPA through contracted or cooperative agreements.

13.4 Environmental and Installation Restoration RDT&E

The environmental effort within DoD is divided into the five program areas of Cleanup, Compliance, Conservation, Pollution Prevention, and Technology. RDT&E programs cover all of these "pillars" including the Cleanup or IR area. DoD describes RDT&E by a numerical sequence from 6.1 (basic research) to the full scale test 6.4 (demonstration/validation).

The Office of Naval Research (ONR) administers RDT&E levels 6.1 through 6.3A. CNO administers RDT&E levels 6.3B and higher. ONR policy identifies 6.1 RDT&E by its general scientific category, e.g., chemistry,

so there is no 6.1 environmental research. The 6.2, Development, and 6.3A, Advanced Technology Demonstration, programs include very little cleanup related projects.

Since 1990, Navy/Marine Corps has reduced its 6.1-6.3A environmental cleanup RDT&E based on a 1990 joint service study called "Reliance" which allocated cleanup RDT&E to the Army and Air Force. While the "Reliance" recommendations were not binding on 6.3B level RDT&E, CNO (N45) policy is that the Navy/Marine Corps will not invest 6.3B or 6.4 money in cleanup RDT&E. The Navy/Marine Corps does conduct a limited cleanup RDT&E effort under OSD-financed RDT&E programs. There is substantial cleanup RDT&E performed throughout the rest of DoD, the Department of Energy (DOE) and EPA.

The Tri-Service Environmental Quality Research and Development Strategic Plan (EQ Strategic Plan) tracks the DoD Cleanup RDT&E. This compendium of RDT&E efforts addresses user needs discovered in an annual assessment administered by OSD. The offices of the Joint Engineers (JE) manage the "EQ Strategic Plan." The JEs are the head civil engineer for the Army, Air Force, and the Department of the Navy (DON) (Commander, NAVFACENGCOM). The lead service for the EQ Strategic Plan changes bi-annually and the DON is the lead for 1995 and 1996.

The EQ Strategic Plan includes projects financed under the Strategic Environmental Research and Development Program and the Environmental Security Technology Certification Plan. The Plan identifies and tracks all DoD Cleanup RDT&E. Figure 13-1 presents the configuration of the RDT&E Program. For information concerning the Program, contact NAVFACENGCOM at

telephone (703) 325-6463. Appendix E-1 provides a detailed list of Tri-Service EQ Strategic Plan Projects. While the work will change due to funding constraints, the list of experts shown in Appendix E-1 is a source of valuable information.

These experts listed in Appendix E-1 estimated the unit cost of cleanup using innovative technologies. Appendix E-2 are the estimated unit costs.

The Environmental Security Technology Certification Program (ESTCP) provides funds to DoD activities to field demonstrate new and emerging technologies and facilitates their transition from RDT&E to routine use in the field. Appendix E-3 provides a list of currently funded ESTCP projects.

The NFESC operates the Hydrocarbon National Test Site (HNTS) at NCBC Port Hueneme, CA. The HNTS, part of the Tri-Service and EPA National Environmental Technology Demonstration Program, provides a well-characterized site for applied research, demonstration, and evaluation of promising clean-up and monitoring technologies. For information concerning the HNTS, contact NFESC at telephone (805) 982-1618. Appendix E-4 contains a list of ongoing or recently completed demonstrations at the HNTS.

13.5 Innovative Technologies

Innovative technologies are non-standard technologies which can be used for site investigation or cleanup. Remedial Project Managers (RPMs) and Comprehensive Long-Term Environmental Action, Navy (CLEAN) and Remedial Action Contract (RAC) contractors are encouraged to take advantage of innovative technologies when practicable.

Innovative technologies can be divided into three categories--Emerging, Adaptive and Available. Emerging refers to technologies that require development and testing to meet the users requirements. These technologies require full RDT&E. Adaptive are commercially available technologies that require some testing and evaluation to meet specific user requirements. In most cases specifications and detailed criteria will be needed before they can be transferred to the field. Available are commercially available technologies that require little or no modification for the user. This may also include areas where an existing technology needs minor modification or improvement.

Examples of these innovative environmental technologies include:

- Emerging - small arms range remediation, hydroblasting recycling system
- Adaptive - reduced solids precipitation, hard chrome plating zero discharge rinse system
- Available - sodium bicarbonate cleaning. Appendix E-5 contains a list of Available cleanup technologies.

13.5.1 Regulatory Approval of Innovative Technologies

NAVFACENGCOM policy states that all innovative technology efforts will be coordinated with regulators and that they be part of the decision-making process. When

DoD Cleanup RDT&E Structure

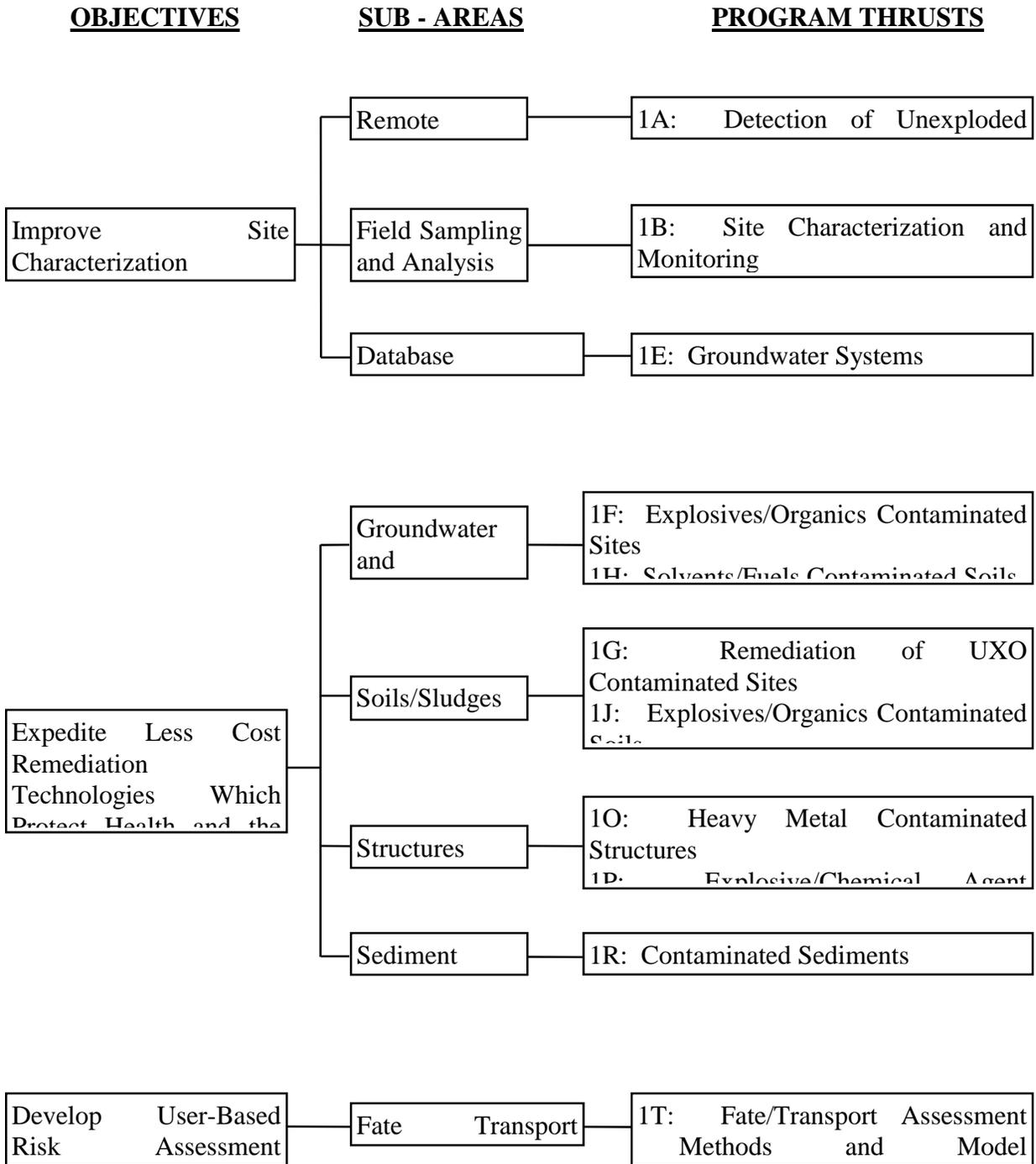


Figure 13-1: DoD Cleanup RDT&E Structure

dealing with an innovative treatment technology, regulatory agencies may require a demonstration permit. Since demonstration permits, treatability studies, or similar partial approvals are easier to obtain than final cleanup agreements, permits, or Records of Decisions (RODs), they are often a good way to start.

13.5.2 Administrative Support for Innovative Technologies

Obtaining demonstration permits requires the preparation of work plans, health and safety plans, monitoring plans, Quality Assurance/Quality Control plans, a regulatory review process, and presentations to Restoration Advisory Boards (RABs) or similar communications. If the innovative cleanup technology is in the Available category, required plans should be part of the RAC contractor responsibility. In the case of an Emerging technology demonstration, an EFD/EFA may choose to assist a vendor.

13.5.3 Innovative Technologies for Complete Site Cleanup

NAVFACENGCOM policy is that innovative technology should be employed with the expectation of applying it to the entire site not just demonstrating its feasibility on a portion of the site. When a demonstration phase is necessary, a plan (fiscal/regulatory/contractual) to convert the demonstration to a final action, e.g., removal/ROD, should exist. It is also recognized that an innovative cleanup technology may be part of a treatment train and not, in and of itself, the process that will clean up the entire site. This will require adequate planning to combine innovative technology with other conventional work such as digging and drilling.

13.5.4 Innovative Technologies for Other Than Cleanup

Many innovative technologies will not be directed at actual cleanup. The Site Characterization Analysis and Penetrometer System (SCAPS), geostatistics, and NCCOSC NRaD work in the use of bio-sentinels for long-term monitoring are prime examples of innovative technologies that are not in the direct treatment train/cleanup path.

13.6 Navy/Marine Corps Innovative Programs

The Navy/Marine Corps has established various programs, organizations, and working groups to further the use of innovative technologies in the Navy/Marine Corps IR Program. Programs established by Navy/Marine Corps include:

- Alternative Restoration Technology Team;
- NFESC Technology Application Teams;
- Tiger Team;
- Innovative Remedial Action Contract; and
- Navy Environmental Leadership Program

13.6.1 Alternative Restoration Technology Team

The Alternative Restoration Technology Team (ARTT) has been established for the purpose of facilitating the use of innovative technologies in the Navy/Marine Corps IR Program. ARTT tasks as they relate to site remediation include:

- Identifying barriers that inhibit implementation of innovative technologies;

- Recommending process changes to eliminate or minimize the impact of barriers to implementing technologies;
- Establishing and coordinating communication between RPMs from various EFDs/EFAs;
- Assisting with formulation of policies and procedures needed to develop and implement new technologies; and
- Developing and recommending initiatives that will support use of innovative technologies.

The ARTT may include representatives from CNO (N45), NAVFACENCOM (Code 40), CMC (LFL), NFESC (Code 41), EFDs/EFAs, Public Works Centers (PWCs) and others as necessary. Each of the following organizations are responsible for assigning team members as appropriate:

NAVFACENCOM

As the executive manager for the Navy/Marine Corps IR Program, NAVFACENCOM will encourage use of innovative technologies by working to identify and eliminate barriers to their use.

NFESC

NFESC is the executive agent for the working group. Specific NFESC responsibilities include: coordinating meetings, maintaining meeting records, and assuring that recommendations developed by the working group are organized and forwarded to NAVFACENCOM as appropriate.

EFDs/EFAs

As the primary user of innovative technologies and the primary source of engineering assistance to Navy and Marine Corps activities, EFDs/EFAs are encouraged

to provide specific input regarding mission needs.

Public Works Centers (PWCs)

As a resource of environmental support services, the PWCs are encouraged to identify and use innovative technologies to support EFDs/EFAs and activities.

In an effort to encourage free and open discussion of Navy/Marine Corps specific issues, the working group will not include representatives from the private sector. However, representatives from the private sector may be asked to provide informational presentations and participate in focused discussions as appropriate. Each participating organization is responsible for providing funding through existing funding channels to support attendance at meeting and to perform minor technical tasks between meetings. If requested and as necessary, NAVFACENCOM will provide funding for specific projects to support the innovative technology working group.

The innovative technology working group is an advisory group. The group has not been given authority to establish policy. The current ARTT membership consists of representatives from NAVFACENCOM HQ, the EFDs/EFAs, and NFESC. For further information, contact NAVFACENCOM at telephone (703) 325-8176.

13.6.2 NFESC Technology Application Teams (TATs)

NFESC has formed Technology Application Teams (TATs) to provide the tools necessary for the EFD/EFAs and PWCs to use new and innovative technologies routinely to reduce site cleanup costs. The TATs identify the need for the technology, barrier(s) to its

routine use, tools to remove those barriers, and develop those tools either in-house or on contract. Some examples of these tools are brochures, technical data sheets, videos, standard statements of work, standard design guidance, specialty contracts, in-house technical consultants, and training seminars. As the TATs develop the tools, NAVFACENGCOM will ask for input from EFD/EFA and PWC customers on their perceptions of the barriers to technology implementation and the tools needed to overcome those barriers. NFESC may be contacted for more information concerning the following TATs:

- Base Catalyzed Decomposition Process
- Biopiles
- Bioventing and Bioslurping
- Landfill Capping
- National Test Site Technologies
- Small Arms Range Remediation
- Wetlands for Non-point Source Treatment
- Intrinsic Bioremediation and Risk Assessment

13.6.3 Tiger Team

In an effort to reduce the overall cost and enhance technology transfer within the Navy/Marine Corps' IR Program, NAVFACENGCOM tasked NFESC to perform a review of current and near future Environmental Restoration, Navy (ER, N) and BRAC site remedial technology selections. NFESC reviewed FY 96 through FY 99 projects for potential technology and strategy changes which could be implemented to reduce costs.

The Tiger Team contains experienced environmental professionals including individuals with expertise in innovative technologies, remedial project management, technology transfer, total environmental cost control, environmental planning and analysis, and environmental cost estimating. The team members are from the Navy/Marine Corps, Army, USGS, academia, and the private sector.

The Tiger Team holds technical discussions with RPMs and remedial technical managers (RTMs) to examine cleanup projects. The team works with the RPMs/RTMs to identify the latest cost avoidance strategies and technologies. If a viable alternative is agreed upon, the team prepares a preliminary cost estimate of both the currently selected technology and the alternative technology. The Tiger Team uses the Remedial Action Cost Engineering and Requirements (RACER) to perform the cost estimate. The team inputs data into RACER which reflects specific project conditions and requirements gathered during the site discussions. All estimates represent life cycle costs to completion, not fiscal year costs. The EFDs/EFAs retain the final decision to implement recommended alternative technologies. Factors that affect the decision include other cost impacts such as re-design, treatability costs and general acceptability.

NFESC provides follow on support to the EFDs/EFAs if they choose to pursue a Tiger Team recommendation. This support includes technical expertise to assist in implementing the recommended alternative technology and training on the latest technologies. NFESC also provides technical experts to meet with regulatory agencies and RABs to explain new strategies at specific sites and provides other technical input as the project progresses.

Through the use of innovative technologies, these potential cost savings enable NAVFACENCOM to make the decreasing ER, N and BRAC budgets go farther toward meeting the Navy/Marine Corps' environmental commitments. For information about the Tiger Team contact NFESC at telephone (805) 982-1276.

13.6.4 Innovative Remedial Action Contract (RAC)

NFESC has acquired a Remedial Action Contract (RAC) to perform remedial actions with primary focus on using cost-effective innovative technologies and methodologies. The purpose of the contract is to systematically extend innovative technologies into ongoing remediation activities at Navy/Marine Corps installations, foster the implementation of new engineering technologies, and provide a flexible vehicle for RPMs to do so.

The Navy awarded Battelle and its Team Subcontractors, Foster Wheeler, ATG, and Hazen, a \$50 million, 5-year Cost-Plus-Award-Fee Indefinite Delivery/Indefinite Quantity Remedial Action Contract ending in September 2000. The Contractor will be tasked to provide a wide range of services including testing, evaluating, and implementing innovative technologies and methodologies. The Contractor and their Team will perform remedial actions, removal actions, emergency response actions, treatability and pilot studies; provide facility operation, maintenance and instruction; and prepare technology transfer packages. The Contractor's scope of work includes all contaminants and contaminated media except for radioactive materials, nuclear, biological and chemical warfare agents, and explosive ordnance. These services are available to Navy and Marine Corps installations and

other Government agencies. Points of Contact (POCs) are listed below for information on accessing the Contract.

Remedial Action Contract
Innovative Technology
RAC N47408-95-D-0730
POC: Naval Facilities Engineering Service Center, Environmental Department
Code 414NT, (805) 982-5478
Code 414TM, (805) 982-1600

13.6.5 Navy Environmental Leadership Program

The focus of the Navy Environmental Leadership Program (NELP) initiative is on finding new and better ways to conduct day-to-day management of activity environmental programs. NAS North Island, CA, and NAVSTA Mayport, FL, were selected and are providing "test beds" for innovative cleanup technologies which will have broad applicability Navy-wide to speed up compliance and cleanup and reduce cost.

The Navy solicited special technology contracts for South and Southwest Divisions of NAVFACENCOM for innovative technologies. These contracts resulted in the Navy Technology Initiative I (NTI I) cleanup efforts which are presented in Table 13-1. POCs for NTI I technologies are:

NAS North Island: (619) 545-1125

SWESTDIV: (619) 532-2337

NAVSTA Mayport: (904) 270-6730

SOUTHDIV: (804) 820-5605

NELP Projects

Technology	Purpose	Primary Customer	Method of Implementation
Augmented Bioremediation using BAC-TERRA Soil Remediation Tech	Demon. & implem. for cleanup at NASNI IR Site 9 - Chemical Disposal Area and Mayport Pest. a (SMMU 19).	Facilities with contaminated sites. Targets: solvents, hydrocarbons (PAHs and chlorinated), salt stab.	Demonstration/Procurement via contractual vehicle with Fifco International, Inc. SWDIV/NASNI & SDIV/MAYPORT
In-situ Soil Remediation with Deep Soil Mixing and Stabilization	In-situ solid./ stab. of contaminated soils at NASNI IR Site 11 - Bldg 39 Runoff catchment area.		Demonstration/Procurement via contractual vehicle with Novaterra, Inc. SWDIV/NASNI
Catalyst Enhanced Bioremediation	In-situ catalyst-enhanced bioventing/biosparging to remediate org. contam. in soil at NASNI IR Site 9 - Chemical Disposal Area.	Facilities with contaminated soil sites. Targets: PCE, TCE, PCP, PAHs, and possibly PCBs.	Demonstration/Procurement via contractual vehicle with Global Environmental Services. SWDIV/NASNI
Low Temperature Thermal Desorption	Remediation of Petroleum and Chlor. HC in Mayport Pesticide Area(SMMU 15).	Facilities with hydrocarbon contaminated soil.	Procure. via contractual vehicle with Southwest Soil Remediation, Inc. SDIV/MAYPORT
Bioaugmentation	Microbial augmented bioremediation of HC contaminated soils. Fire Fighter Training Area	Facilities with hydrocarbon contaminated soils and concrete surfaces.	Procurement via contractual vehicle with RHS Technical Services. SDIV/MAYPORT
Soil Washing - TERRA- KLEEN Solvent Extraction of PCBs from Soil	Remediation of PCBs in Soil through soil washing, which leads to volume reduction, using Terra-Kleen method.	Facilities w/PCB contaminated soil.	Demon. via EPA SITE Prog. and implem. for time-critical removal actions at 3 NASNI IR Sites via contract SWDIV/ NASNI
Pervaporation of VOCs in Groundwater using Zenon	Removal of VOCs and some SVOCs from groundwater using a cross-flow	Facilities having groundwater contaminated with VOCs and some	Demonstration via EPA SITE Program. EPA to develop ITER with results. NASNI looking

Environmental Technology	pervaporation system (membrane process).	SVOCs.	to export results. SOUTH reviewing. SWDIV/NASNI
2D & 3D High Resolution Seismic Reflection Surveys to Image Subsurface.	Characterization technology using seismic refraction and reflection to provide survey data that facilitates the optimum placement of remedial systems.	Activities with inadequate info or complex subsurface features affecting contaminant migration. Targeting DNAPLS.	Characterization and mapping of NASNI IR Site 9. Report being generated for export. Presentation scheduled for EFD/EFA/PWC WG mtg. SWDIV/NASNI

Table 13-1: NELP Projects

NELP Navy Technology Initiative II (NTI II) is a follow-on innovative technology search. Success stories from the NTI II program will be disseminated Navy-wide by NFESC.

NFESC plans to solicit for innovative technology as part of NELP NTI II with a Broad Agency Announcement (BAA) for each activity (NAS North Island and NAS Mayport). Both BAAs will direct vendors to answer the Navy's needs with innovative technology in the areas of clean-up, compliance, pollution prevention, and natural resources conservation. For information about the program contact NFESC, Code 414, at telephone (805) 982-1548.

13.7 EPA Superfund Innovative Technology Evaluation (SITE) Program

In response to the 1986 Superfund Amendments and Reauthorization Act (SARA), which recognized a need for an "Alternative or Innovative Treatment Technology Research and Demonstration Program," EPA, Office of Solid Waste and Emergency Response and the Office of Research and Development established the Superfund Innovative Technology Evaluation (SITE) Program. EPA's National Risk Management Research Laboratory in Cincinnati, Ohio, administers the SITE Program.

The SITE Program encourages the development and implementation of innovative treatment technologies for hazardous waste site remediation and monitoring and measurement technologies for evaluating the nature and extent of hazardous waste site contamination. The goal of the SITE Program is to provide environmental decision-makers with new, viable treatment options that may have performance or cost advantages compared to traditional treatment technologies. The program provides the technology developer an opportunity to demonstrate its technology's capability to process and remediate wastes. EPA evaluates the technology and provides an assessment of its potential for use in future cleanup actions. The SITE Program includes the following component programs:

- Demonstration Program - Conducts and evaluates demonstrations of promising innovative technologies to provide reliable performance, cost, and applicability information for future site characterization and cleanup decision-making;
- Emerging Technology Program - Provides funding to developers to continue research efforts from the bench- and pilot-scale levels to promote the development of innovative technologies;
- Monitoring and Measurement Technologies Program - Develops technologies that detect, monitor, and measure hazardous and toxic substances to provide better, faster, and more cost-effective methods for producing real-time data during site characterization and remediation; and
- Technology Transfer Program - Disseminates technical information on innovative technologies to remove impediments for using alternative technologies.

Further information concerning the EPA SITE Program can be found in U.S. EPA, *Site Innovative Technology Evaluation Program* (EPA/540/R-94/526), Office of Research and Development, November 1994.

Reports, capsules, or bulletins for the Demonstration Program and the Emerging Technology Program may be obtained by telephone at (513) 569-7562 or by mail from:

U.S. Environmental Protection Agency
National Risk Management Research Laboratory
Center for Environmental Research Information
26 West Martin Luther King Drive
Cincinnati, OH 45268

13.7.1 Demonstration Program

The major focus of the SITE Program is on the component Demonstration Program which is designed to provide engineering and cost data on selected technologies. The Demonstration Program has 111 demonstration projects. Of these projects, 71 are completed demonstrations and 40 are ongoing. The projects are divided into the following areas:

- Physical or chemical treatment (47);
- Physical or chemical thermal desorption (18);
- Biological degradation (18);
- Thermal destruction (12);
- Solidification or stabilization (9);
- Materials handling (3);
- Physical or chemical radioactive waste treatment (2); and
- Other (2).

EPA prepares an Innovative Technology Evaluation Report (ITER), Technology Capsule, and Demonstration Bulletin at the conclusion of a SITE demonstration. These reports evaluate available information on the technology and analyze its overall applicability to other site characteristics, waste types, and waste matrices. EPA distributes the reports to provide reliable technical data for environmental decision-making and to promote the technology's use.

13.7.2 Emerging Technology Program

EPA provides technical and financial support to developers for bench- and pilot-scale testing and evaluation of innovative technologies under the Emerging Technology Program. With this program, a developer will research and develop a technology for field application and possible evaluation under the Demonstration Program. The Emerging Technology Program has 71 projects. Of these projects, 39 are completed and 32 are ongoing. The projects are divided into the following areas:

- Physical or chemical treatment (38);
- Biological degradation (17);

- Thermal destruction (9);
- Materials handling (5); and
- Solidification or stabilization (2).

13.8 Federal Remediation Technologies Roundtable

In 1990, various Federal agencies created the Federal Remediation Technologies Roundtable to establish a process for exchanging applied hazardous waste site remediation technology information, consider cooperative efforts of mutual interest, and develop strategies and analyze remedial problems that will benefit from the application of innovative technologies. Since its inception, the Roundtable has served as a platform for interagency cooperation and collaborative efforts. These collaborative efforts have led to technology development and demonstration partnerships with industry and a unified Federal approach to assessing the effectiveness of technologies. Through semi-annual meetings, the Roundtable brings together Federal agency program managers allowing them to learn about technology-related efforts of mutual interest; benefit from the collective technical experience with specific technologies; and form partnerships to pursue specific projects. The Roundtable is comprised of representatives from several Federal agencies:

- Office of Deputy Under Secretary of Defense (Environmental Security);
- U.S. Army Corps of Engineers;
- U.S. Army Environmental Center;
- U.S. Air Force Civil Engineering and Support Agency;
- Naval Facilities Engineering Service Center;
- U.S. Environmental Protection Agency, Office of Research and Development;
- U.S. Environmental Protection Agency, Technology Innovation Office;
- U.S. Department of Energy, Office of Environmental Restoration;
- U.S. Department of Energy, Office of Technology Development; and
- U.S. Department of Interior.

Publications of the Federal Remediation Technologies Roundtable, including the *Synopsis of Federal Demonstrations of Innovative Site Remediation Technologies*, may be obtained from:

National Center for Environmental Publications and Information (NCEPI)
 P. O. Box 42419
 Cincinnati, OH 45242

13.8.1 Screening Matrix and Reference Guide

The DoD Environmental Technology Transfer Committee and the Federal Remediation Technologies Roundtable developed in a cooperative effort the *Remediation Technologies*

Screening Matrix and Reference Guide. RPMs may use the guide to screen and evaluate candidate cleanup technologies for contaminated waste sites. The guide presents information on the following topics:

- Contaminant - addressing properties and behavior of contaminants potential treatment technologies based on their applicability to specific contaminants and media;
- Treatment - providing an overview of each treatment process group and how it will impact technology implementation;
- Treatment technology profiles - enabling RPMs to perform a detailed analysis of the remedial action alternatives; and
- Treatment Technologies Screening Matrix - providing an overall summary of treatment technologies with development status, availability, residuals produced, treatment train, contaminants treated, system reliability/ maintainability, cleanup time, overall cost, and O&M/capital intensive status.

13.9 EPA Technology Innovation Office (TIO)

The mission of the Technology Innovation Office (TIO) is to increase applications of innovative treatment technology by government and industry to contaminated waste sites. TIO increases usage of innovative techniques by removing regulatory and institutional impediments. In addition, TIO provides richer technology and market information to targeted audiences of Federal agencies, states, consulting engineering firms, responsible parties, technology developers, and the investment community. The scope of the mission extends to Superfund sites, corrective action sites under the Resource Conservation and Recovery Act (RCRA), and underground storage tank cleanups. Actions taken by TIO include:

- Making available cost and performance information on new technologies;
- Providing market information to technology vendors;
- Providing information on testing and validation services for commercializing technologies; and
- Disseminating information via:
 - Electronic bulletin boards;
 - Newsletters;
 - Monographs; and
 - Technical briefs.

Information on the program may be obtained by telephone at (703) 308-8800 or by mail at the following address:

U.S. Environmental Protection Agency

Technology Innovation Office
401 M Street, SW
Washington, D.C. 20460

13.10 Consortium for Site Characterization Technologies

The Consortium is one of several pilot verification programs operating under the aegis of the EPA's Environmental Technology Verification Program. The goal of the Consortium is to increase the use of innovative characterization technologies to assess and remediate contaminated sites. To attain this goal, the Consortium will:

- Identify, demonstrate, evaluate, verify, and transfer information about innovative and alternative monitoring, measurement and site characterization technologies to developers, users, and regulators; and
- Define and demonstrate a process for verifying the performance of innovative site characterization technologies. By developing this process, the Consortium will facilitate the independent testing and demonstration of technologies that can generate the data necessary to evaluate and verify their performance.

The Consortium brings together the interests of Federal and state regulators, Federal technology evaluation and verification entities, and potential end users such as DoD, DOE, and private companies of these technologies to facilitate independent verification of technology performance. The DON acts as the representative for DoD. Information on the program may be obtained by telephone at (702) 798-2432 or fax at (702) 798-2261 or by mail at the following address:

Mr. Eric Koglin
U.S. EPA, National Exposure
Research Laboratory
Characterization Research Division
PO Box 93478, Las Vegas, NV 9193-3478
email: Koglin.Eric@EPAMAIL.EPA.GOV

13.11 Western Governors Association

In December 1992, western governors and the Secretary of Defense, Energy, and Interior, and the Administrator of EPA formed a Federal advisory committee to develop recommendations on changes in state and Federal policy needed to expedite the development and use of cheaper and safer innovative cleanup technologies. The Committee, known as the Committee to Develop On-Site Innovative Technologies (DOIT), has enlisted the help of a variety of key players to identify, test, and evaluate new, more cooperative approaches to deploy promising innovative waste remediation technologies and clean up Federal waste sites. The DOIT project has established four working groups to accomplish this task: the Mixed Waste Working Group, the Military Bases Working Group, the Military Munitions Working Group, and the Abandoned Mine Waste Working Group. The DON's main focus of participation is the Military Bases Working Group which has a mission to expedite development and commercialization of innovative technologies acceptable to the public for investigating, remediating, and managing waste contaminants at

military installations. A major effort affecting the DON program is the regulatory validation of the SCAPS. For further information, contact SOUTHWESTDIV, (619) 532-1152.

13.12 Full and Open Competition and Innovative Technology

When considering the use of innovative technology, especially where the concept may be proprietary, the question of competition, sole source procurement, and unsolicited proposals will arise. This subject is also covered in Chapter 6 of the *Federal Acquisition Regulations (FAR)*.

13.12.1 Unsolicited vs. Solicited Proposals

The NAVFACENGCOM policy is to avoid unsolicited proposals. The NTI is a solicitation to preclude the need for unsolicited proposals and is the preferred way to handle vendor inquiries. By advertising DON needs and seeking innovative proposals, the DON seeks to alert the marketplace of its needs. NFESC is DON's technology transfer expert and is in charge of screening unsolicited proposals.

Appendix A

List of Acronyms

ACHP	Advisory Council on Historic Preservation
AEC	Area Environmental Coordinator
AGC(I&E)	Assistant General Counsel (Installation and Environment)
AIRFA	American Indian Religious Freedom Act
AL	Action Level
AM	Action Memorandum
AOC	Areas of Concern
APOW	Annual Plan of Work
ARAR	Applicable or Relevant and Appropriate Requirement
ARPA	Archaeological Resources Protection Act
ASN(I&E)	Assistant Secretary of the Navy (Installation and Environment)
ATSDR	Agency for Toxic Substances and Disease Registry
BAA	Broad Agency Agreement
BCP	BRAC Cleanup Plan
BCP	Base Closure Plan
BCT	BRAC Cleanup Team
BD/DR	Building Demolition/Debris Removal
BEC	Base Environmental Coordinator
BMP	Best Management Practices
BOA	Basic Ordering Agreement
BRAC	Base Realignment and Closure
BUMED	Bureau of Medicine and Surgery
CA	Corrective Action
CADD	Computer-Aided Design and Drafting
CAMU	Corrective Action Management Unit
CBC	Construction Battalion Center
CECOS	Civil Engineer Corps Officers
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CHF	Contaminant Hazard Factor
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CLP	Contract Laboratory Program
CMC	Commandant of the Marines Corps
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CNO	Chief of Naval Operations
CO	Commanding Officer or Contracting Officer
COTR	Contracting Officer's Technical Representative
C ³ P ² T	Cleanup, Compliance, Conservation, Pollution Prevention, and Technology
CPAF	Cost Plus Award Fee
CRP	Community Relations Plan
CPR	Cardio-pulmonary Resuscitation
CTC	Cost to Complete
CWA	Clean Water Act
D & N	Discovery and Notification
DCNO(L)	Deputy Chief of Naval Operations, Logistics
DD	Decision Document
DDESB	Department of Defense Explosive Safety Board

DENIX	Defense Environmental Network and Information Exchange
DEPSECDEF	Deputy Secretary of Defense
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERPMIS	Now RMIS
DERTF	Defense Environmental Restoration Task Force
DLA	Defense Logistics Agency
DNAPL	Dense Non-Aqueous Phase Liquids
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOIT	Develop On-Site Innovative Technology
DON	Department of the Navy
DOT	Department of Transportation
DQO	Data Quality Objective
DSERTS	Defense Site Environmental Restoration Tracking System
DSMOA	Defense and State Memorandum of Agreement
DUSD(ES)	Deputy Under Secretary of Defense (Environment and Security)
EBS	Environmental Baseline Survey
EE	Engineering Evaluation
EE/CA	Engineering Evaluation/Cost Analysis
EFA CHES	EFA Chesapeake
EFA MW	EFA Midwest
EFA NW	EFA Northwest
EFA	Engineering Field Activity
EFD	Engineering Field Division
EIS	Environmental Impact Statement
EO	Executive Order
EO	Explosive Ordnance
EPA	Environmental Protection Agency
EQ	Environmental Quality
EQIS	Environmental Quality Information System
ER	Environmental Restoration
ERA	Ecological Risk Assessment
ER, N	Environmental Restoration, Navy
ESD	Explanation of Significant Differences
ESTCP	Environmental Security Technology Certification Program
ETTC	Environmental Technology Transfer Committee
FACSO	Facilities Systems Office
FAR	Federal Acquisition Regulation
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Act
FFSRA	Federal Facility Site Remediation Agreement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIPS	Federal Information Processing Standard
FIS	Financial Information System
FOSL	Finding of Suitability for Lease
FOST	Finding of Suitability for Transfer
FS	Feasibility Study

FSP	Field Sampling Plan
FUDS	Formerly Used Defense Sites
FY	Fiscal Year
FYDP	Future Years Defense Plan
GFP	Government Furnished Property
GIS	Geographic Information System
GOCO	Government Owned/Contractor Operated
G-RAM	General Radioactive Material
GSA	General Services Administration
HazMat	Hazardous Material
HARP	Historic and Archaeological Resource Program
HM/HW	Hazardous Material/Hazardous Waste
HM	Hazardous Material
HNTS	Hydrocarbon National Test Site
HQ	Headquarters
HRA	Historical Radiological Assessment
HRS	Hazardous Ranking System
HS	Hazardous Substance
HSP	Health and Safety Plan
HSWA	Hazardous and Solid Waste Act
HTW	Hazardous and Toxic Waste
HW	Hazardous Waste
IAG	Interagency Agreement
ICS	Incident Command System
IDLH	Immediately Dangerous to Life and Health
IDWM	Investigation Derived Waste Management
IR	Installation Restoration
ISSA	Interservice Support Agreement
ITER	Innovative Technology Evaluation Report
JAG	Judge Advocate General
JE	Joint Engineers
JOC	Job Order Contract
LANTDIV	EFD Atlantic Division
LEPC	Local Emergency Planning Committee
LOE	Level of Effort
LFL	Land Use and Military Construction Branch, Headquarters Marine Corps
LIF	Laser-Induced Fluorescence
LLRW	Low Level Radioactive Waste
LSI	Listing Site Inspection
LTM	Long Term Monitoring
MCL	Maximum Contamination Level
MCO	Marine Corps Order
MESO	Marine Environmental Support Office
MILCON	Military Construction
MIL-STD	Military Standard
MOU	Memorandum of Understanding
MPF	Migration Pathway Factor
MSDS	Material Safety Data Sheet
MTF	Medical Treatment Facility
NACIP	Navy Assessment and Control of Installation Pollutants
NAGPRA	Native American Graves Protection and Repatriation Act

NAS	Naval Air Station
NASNI	Naval Air Station North Island, CA
NAVCOMPT	Navy Comptroller
NAVENVIRHLHCEN	Navy Environmental Health Center
NAVFACENGCOM	Naval Facilities Engineering Command
NAVSEADDET	Naval Sea Detachment
NAVSEASYSKOM	Naval Sea Systems Command
NAVSTA	Naval Station
NCEPI	National Center for Environmental Publications and Information
NCP	National Contingency Plan
NECIS	Naval Environmental Compliance Information System
NEHC	Navy Environmental Health Center
NELP	Navy Environmental Leadership Program
NEPA	National Environmental Policy Act
NEPDB	Naval Environmental Protection Data Base
NFA	No Further Action
NFESC	Naval Facilities Engineering Service Center
NHPA	National Historic Preservation Act
NNPP	Naval Nuclear Propulsion Program
NORTHDIV	EFA Northern Division
NOSC	Naval Ocean Systems Center
NOSC	Navy On-Scene Coordinator
NOSCDR	Navy On-Scene Commander
NPL	National Priorities List
NRC	National Response Center
NRDA	National Resource Damage Assessment
NRT	National Response Team
NTI	Navy Technical Initiative
NTR	Navy Technical Representative
O&M	Operations and Maintenance
OASN(I&E)	Office of the Assistant Secretary of the Navy (Installations and Environment)
ODUSD(ES)	Office of the Deputy Under Secretary of Defense, Environment and Security
OESO	Ordnance Environmental Support Office
OEW	Ordnance and Explosive Wastes
OGC	Office of the General Counsel
OHW	Other Hazardous Waste
OMB	Office of Management and Budget
ONR	Office of Naval Research
OPM	Office of Personnel Management
OPNAVINST	Chief of Naval Operations Instruction
OPNAVNOTE	Chief of Naval Operations Note
ORD	Office of Research and Development
OSC	On-Scene Coordinator
OSD	Office of the Secretary of Defense
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PA	Preliminary Assessment
PACDIV	EFD Pacific Division
PAH	Polynuclear Aromatic Hydrocarbon

PAO	Public Affairs Officer
PCB	Polychlorinated Biphenyl
PCE	Perchloroethylene
PCP	Pentachlorophenol
PE	Performance Evaluation
PEL	Permissible Exposure Level
PHA	Public Health Assessment
POC	Point of Contact
POL	Petroleum-Oil-Lubricant
PP	Proposed Plan
PPE	Personal Protective Equipment
PR	Preliminary Review
PRG	Preliminary Remediation Goals
PRP	Potentially Responsible Party
PWC	Public Works Center
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
R & D	Research and Development
RA	Remedial Action
RA-C	Remedial Action - Construction
RA-O	Remedial Action - Operation
RAB	Restoration Advisory Board
RAC	Remedial Action Contract
RACER	Remedial Action Cost Engineering and Requirements
RASO	Radiological Affairs Support Office
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDT&E	Research, Development, Test, and Evaluation
REC	Regional Environmental Coordinator
RF	Receptor Factor
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RFP	Request for Proposal
RI	Remedial Investigation
RMIS	Restoration Management Information System
ROD	Record of Decision
ROICC	Navy Resident Officer in Charge of Construction
RPM	Remedial Project Manager
RQ	Reportable Quantity
RRSEM	Relative Risk Site Evaluation Model
RTM	Remedial Technical Manager
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SCAPS	Site Characterization Analysis and Penetrometer System
SDTS	Spatial Data Transfer Standards
SECNAV	Secretary of the Navy
SECDEF	Secretary of Defense
SHPO	State Historic Preservation Office/Officer
SHSO	Site Health and Safety Officer
SI	Site Inspection
SITE	Superfund Innovative Technology Evaluation

SMP	Site Management Plan
SOUTHDIV	EFD Southern Division
SOUTHWESTDIV	EFD Southwest Division
SOW	Statement of Work
SSI	Screening Site Inspection
ST	Storage Tank
STP	Site Treatment Plans
SV	Sampling Visit
SVOC	Semivolatile Organic Compounds
SWMU	Solid Waste Management Unit
TAG	Technical Assistance Grant
TAT	Technical Applications Team
TBC	To Be Considered
TCE	Trichloroethylene
TIO	Technology Innovation Office, EPA
TLV	Threshold Limit Value
TRC	Technical Review Committee
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
USACE	U. S. Army Corps of Engineers
USC	United States Code
USD(A)	Under Secretary of Defense (Acquisition)
USGS	U. S. Geological Survey
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VIP	Vertical Induction Profiling
VOC	Volatile Organic Compound
VSI	Visual Site Inspection
WBS	Work Breakdown Structure
WESTDIV	EFD West Division

Appendix B

Definitions

- Action Levels (AL) - Unless otherwise specified in a NAVOSH standard, one-half the relevant permissible exposure limit (PEL), threshold limit value (TLV).
- Action Memorandum - For Removal Action to be accomplished at NPL and non-NPL sites. 1) For an Interim Removal Action - specifies what threat is being addressed and how long the action will remain effective; should also state what type of final action may be conducted and how the removal action contributes to the implementation of the final action. 2) For a Final Removal Action - specifies the performance standards or cleanup levels to be reached by the actions.
- Adjacent Property - Either those properties contiguous to the boundaries of the property being surveyed or other nearby properties.

- **Administrative Record** - A compilation of information used to make the remedial decisions for a site. It is established for all CERCLA sites which have progressed through the Preliminary Assessment or Site Investigation phases or where a removal action is being accomplished. It is Finding of Suitability to Transfer - A document which describes the basis for the deed restrictions to be included in any recorded deed(s); the rationale for the property being suitable for the intended use; and the future use restrictions for the property related to releases 'noticed' in the transfer documents and which are consistent with all the remedial decisions. The Navy/Marine Corps makes the Administrative Record available to the public at the start of the remedial investigation for remedial actions and at the time of engineering evaluation/cost analysis (EE/CA) for removal actions.
- **Adsorption** - The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid or liquid as opposed to absorption, the penetration of substances into the bulk of the solid or liquid.
- **Applicable Requirements** - Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable.
- **Aquifer** - A natural underground supply of water, usually found permeating porous rock.
- **Archaeological Resources** - Material remains of past human life that are capable of contributing to scientific or humanistic understanding of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques.
- **Area Environmental Coordinator** - Responsible for coordination of environmental issues within their designated EPA region. Appoint RECs and NOSC's within AEC's area of responsibility.
- **Area of Concern (AOC)** - A discrete area of contamination or suspected contamination in the PA/SI (or RFA) phase that has not been entered into the DoD RMIS database.
- **Baseline Risk Assessment** - An analysis of the potential adverse health effects (current or future) caused by contaminant releases from a site in the absence of any actions to control or mitigate these releases. Provides a basis to determine whether remedial action is necessary, the justification for performing remedial actions, and to assist in determining what exposure pathways need to be remediated.
- **Bioaccumulate** - The ability of a plant or animal to bring a substance to a higher concentration in its own tissue than is found in its food supply or surrounding air, water, or soil.
- **Blood borne Pathogens** - Pathogenic microorganisms that are present in human blood and can cause diseases in humans. These pathogens include hepatitis B virus and human immunodeficiency virus (HIV).
- **BRAC Cleanup Plan (BCP)** - The road map for expeditious cleanup necessary to facilitate conveyance of property to communities for redevelopment.
- **BRAC Environmental Coordinator (BEC)** - The DoD representative on the Base Closure Team; has the responsibility and implementation authorities for environmental cleanup programs related to the transfer of the installation's real property.

- BRAC Environmental Funding - Includes all NAVFAC centrally-managed environmental projects, except NEPA, that are funded through the BRAC account such as environmental studies, clean up, compliance, and restoration. It includes Marine Corps installation for restoration work only.
- Building Demolition/Debris Removal (BD/DR) - One of the program categories under DERP that covers demolition and removal of unsafe buildings or structures at FUDS properties that have not had beneficial use since transfer to state or local governments or native corporations in Alaska. BD/DR projects are a Component's responsibility and should be programmed within Component resources.
- Carcinogen - A substance capable of causing cancer (carcinogenicity is the ability to cause cancer).
- CERCLIS (CERCLA Information System) - EPA's comprehensive database and management system that inventories and tracks releases addressed or needing to be addressed by the Superfund Program. CERCLIS contains the official inventory of CERCLA sites and supports EPA's site planning and tracking functions.
- Closeout - Occurs when DON considers no further response actions under the IR Program to be appropriate for the site and no significant threat to public health or the environment exists and regulatory concurrence has been received.
- Comprehensive, Long-Term Environmental Action, Navy (CLEAN) Contract - Contract to provide professional services during the study/design phase of the IR Program.
- Conceptual Model - Describes a series of working hypotheses of how the stressor might affect ecological components. Describes ecosystem potentially at risk and the relationships between measurement and assessment endpoints and exposure scenarios. Provides a three-dimensional understanding of contaminant sources, pathways, and receptors and tools needed to identify and fill data gaps, screen remedial alternatives, and evaluate the performance of remedial actions.
- Contaminant Fate and Transport - Pathways or routes for migration of a contaminant off site, e.g., windblown dust, surface water runoff, erosion, and drainage ditches. A decreasing gradient of contamination may exist with increasing distance from a site.
- Contaminant Hazard Factor (CHF) - A factor derived from a comparison of the contaminant concentrations at a site to: 1) establish risk-based standards, 2) preliminary remediation goals, or 3) health/ecological risk-based criteria.
- Cultural Resource - A generic term commonly used to include buildings, structures, districts, sites, objects of significance in history, architecture, archaeology, engineering, or culture. The term also includes associated documents and records.
- Database - Usually on-line or CD-ROM based information systems. These systems may be searched based on a number of parameters and yield a large amount of information in a short period of time.
- Data Quality Objectives (DQOs) - Quantitative and qualitative statements specified to ensure that data of appropriate quality are collected during IR Program field activities.
- Decision Documents (DDs) - For non-NPL sites, it contains the official statement of remedial action(s) required for a site and demonstrates that the response action chosen is consistent with, and

meets the requirements of, CERCLA and the NCP. The DD must be signed before initiation of Remedial Action (RA). The DD contains the official statement of remedial actions required for a site. Demonstrates that the response action chosen is consistent with, and meets the requirements of, CERCLA and the NCP; and documents Navy/Marine Corps decisions regarding response action selection. Decision Documents include a Record of Decision required at NPL sites and a “decision document” similarly formatted and required at Non-NPL sites. Both documents must be provided before RD/RA.

- Defense Environmental Network and Information Exchange (DENIX) - A DoD-wide information exchange to facilitate and support communications and environmental awareness; consists of an integrated set of menus comprising a collection of application programs, databases, bulletin boards forums, and UNIX utilities to complement other existing services available; provides access to a wide variety of information which can be downloaded to personal computers.
- Defense Environmental Restoration Account (DERA) - DoD-established account to pay the cost of DoD responses to clean up hazardous substance sites. DERA funds are transferred to the services for uses consistent with the DERP; the DoD counterpart to EPA’s Superfund regulated under CERCLA.
- Defense Environmental Restoration Program - Formally established by Congress in 10 U.S.C. 2701-2707 and provides centralized management for the cleanup of DoD hazardous waste sites consistent with the provisions of CERCLA, the NCP, and Executive Order 12580.
- Defense and State Memorandum of Agreement (DSMOA) - Represents a commitment between DoD and the state to cooperate in meeting cleanup goals and schedules and also establishes the procedural framework for payment of state services. The DSMOA is not, however, a funding document.
- Discharge - Any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil. Includes any threat of discharge.
- Disposal - The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or in any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters including groundwater.
- Ecological Risk Assessment - A quantitative and/or qualitative appraisal of the actual or potential effects of a hazardous waste site on plants and animals other than people or domesticated species.
- Ecosystem - The biotic community and abiotic environment within a specified location and time.
- Effectiveness - The degree to which an alternative reduces toxicity, mobility, or volume through treatment, minimizes residual risks and affords long-term protection, complies with ARARs, minimizes short-term impacts, and how quickly it achieves protection.
- Emergency Response - Response to those circumstances that may immediately endanger human health or the environment where the release or threatened release is on, or the sole source of the release is from, a Navy facilities.
- Emerging Technology - A technology in the development stage (pilot-scale testing, bench-scale study) of production. A theoretically sound technology that has not had the application needed to become widely accepted.

- Environment - Includes the navigable waters, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the U. S. and any other surface water, groundwater, drinking water supply, land surface or subsurface strata, or ambient air within the U. S. or under the jurisdiction of the U. S..
- Environmental Risk - The potential or likelihood of injury, disease, or death resulting from human exposure to a potential environmental threat.
- Exposure Assessment - The determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure.
- Exposure Incident - A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.
- Exposure Pathways - The "routes" by which ecological receptors can be exposed to contaminants, i.e., 1) for terrestrial plants - root absorption, 2) for aquatic animals or plants - direct contact with water and/or ingestion of food or sediment, 3) for aquatic plants, and 4) for terrestrial animals - inhalation, ingestion, and dermal absorption.
- Facility - As defined under CERCLA, any building, structure, installation, pipe or pipeline, well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft; or any site or area where hazardous substances have been deposited, stored, disposed of, placed, or otherwise come to be located.
- Fast Track Cleanup - A common sense approach to the cleanup of contamination at closing bases. Parcels with no contamination will be identified quickly and made available for transfer.
- Fate - Disposition of a material in various environmental compartments, e.g., soil or sediment, water, air, biota, as a result of transport, transformation, and degradation.
- Feasibility Study (FS) - Identifies alternatives for remediation or cleanup of a site and recommends the most feasible cleanup strategy. The FS emphasizes data analysis and is generally performed concurrently and in an interactive fashion with the RI, using data gathered during the RI.
- Federal Agency Hazardous Waste Compliance Docket - Established by Congress under SARA to identify Federal facilities that must be evaluated for potential inclusion on the NPL. EPA compiles and maintains information on the cleanup status of these sites.
- Federal Facility Agreement (FFA) - Intended to establish roles and responsibilities and to improve communications between all parties by allowing EPA and the state to review all work in support of remedy selection at an NPL site, outlines the working relationship between states, EPA, and the Navy.
- Final Actions - Those actions that achieve the final cleanup objectives, considering long-term effectiveness and permanence, for the particular site, media, or operable unit.
- Finding of Suitability to Transfer - A document which describes the basis for the deed restrictions to be included in any recorded deed(s); the rationale for the property being suitable for the intended use;

and the future use restrictions for the property related to releases ‘noticed’ in the transfer documents and which are consistent with all the remedial decisions.

- Food Chain - A hierarchy of the organisms in an ecosystem, organized according to who eats whom.
- Geostatistics - A set of statistical tools developed by the mining industry to estimate ore concentrations and now advocated by EPA to provide a logical framework for sampling and analysis of environmental data and to provide for more efficient site investigations and cleanups.
- Groundwater - Water in a saturated zone in stratum beneath the surface of land or water.
- Hazard Ranking System (HRS) - A method established by the EPA using such factors as amount and toxicity of contaminants, potential mobility, pathways for human exposure and proximity of population centers to evaluate the relative potential hazard to health and the environment of a contaminated site. Information from the PA/SI is used for scoring Federal sites. Sites receiving scores above 28.5 (and having the highest potential for affecting human health, welfare, and the environment) are put on the NPL.
- Hazardous Substance (HS) - Any material which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may pose a substantial hazard to human health or the environment when released or spilled. Does not include POL, natural gas, or synthetic gas usable as fuel.
- Hazardous Waste (HW) - A solid waste or combination of solid wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or to a serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health and the environment when improperly treated, stored, transported, disposed of or otherwise managed.
- Health and Safety Plan (HSP) - A plan which establishes procedures for protecting the health and safety of response personnel during all operations, including emergencies, conducted at an Installation Restoration site.
- Health Hazard - A chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic effects may occur in exposed personnel.
- Immediate Danger to Life and Health (IDLH) - A condition at an Installation Restoration site requiring cleanup personnel to wear personnel protective equipment (PPE) to mitigate the site conditions which, without appropriate PPE, would be dangerous to their life or health.
- Imminent Threat - A threat posed by a site if human exposure in excess of applicable human health or environmental criteria is predictable prior to implementation of an effective remedial action or an operable unit thereof.
- Implementability - One of three criteria of the alternative screening process focusing on the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative.
- Indemnification - The process which involves the exemption of a party from a legal penalty.

- Information Repository - The physical location(s) where a collection of site information (including the administrative record) is located.
- Innovative Technology - A new or existing full-scale technology developed to improve the speed, cost-effectiveness, and/or efficiency of cleanup actions.
- Installation - The real property owned, formerly owned, or leased by the Navy, including a main base and any associated contiguous real properties identified by the same real property number.
- Installation Restoration (IR) Program - Established in 1984 to help identify, investigate, and cleanup contamination on DoD properties; conducted under the auspices of CERCLA, as amended; the DoD equivalent to the EPA Superfund program.
- Interagency Agreements (IAG) - A formal agreement between the EPA, the state, and the Navy that establishes objectives, responsibilities, procedures, and schedules for remediation at each installation. An FFA becomes an IAG for an operable unit or site cleanup at an installation once the ROD is signed and new schedules are negotiated for the remedial action.
- Interim Action - Those removal actions that only partially address a problem or only address the problem for a short time. Interim actions require further study and possibly action in addition to the interim action. Interim actions are most appropriate to mitigate immediate threats while allowing time for studies to be conducted, as necessary, to determine a final solution.
- Interim Remedial Action - An early response action that is identified and implemented at any time during the study or design phase; limited in scope and addresses only areas or media for which a final remedy will be developed by the RI/FS process; should be consistent with the final remedy for a site.
- Land Management - Programs and techniques to manage lands, wetlands, and water quality including soil conservation, erosion control, and non-point source pollution, surface and subsurface waters, habitat restoration, control of noxious weed and poisonous plants, agricultural outleasing, range management, identification and protection of wetlands, watersheds, flood plain management, landscaping, and grounds maintenance.
- Lead Agency - The agency that provides the OSC/RPM to plan and implement response action under the NCP.
- Legal Agreement - A means of setting project milestones; current Navy/Marine Corps environmental cleanup program funding policy requires incorporating relative risk site evaluations and Navy/Marine Corps environmental restoration funding controls.
- Legal Requirements - Any action or project that is eligible for DERA funding and has a legal basis for the requirement. Most Navy/Marine Corps cleanup projects fall under this definition. Examples include studies and cleanups based on CERCLA, RCRA Corrective Action requirements and RCRA UST authority. Broadly defined as all applicable Federal, state, interstate, and local statutory and regulatory requirements, both procedural and substantive, as well as requirements contained in statutorily mandated or authorized documents.
- Legally Enforceable Agreement and Order - Considered the same as a legal agreement.

- Long Term Monitoring - is monitoring which occurs at sites which have hazardous substances, pollutants or contaminants remaining after Remedial Action has been completed (Response Complete) or is monitoring which confirms that previous site remediation continues to be effective. Long Term Monitoring would occur where the Navy/Marine Corps has determined that the low concentrations of substances remaining at a site do not present a health or environmental risk. LTM also may occur when periodic sampling is required after Response Complete to substantiate that previous site remediation continues to be effective.
- Long Term Operation - See definition for Remedial Action Operation.
- Mature Innovative Technology - Technologies usually available from the RAC contractor.
- Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water that is delivered to any user of a public water system. Remedial actions shall attain MCLs goals where such goals are relevant and appropriate to the circumstances of the release.
- Migration Pathway Factor (MPF) - Represents the likelihood of a migration medium (groundwater, surface water, air, and soil) to complete an exposure pathway.
- Mixed Waste - HW that has become mixed with radioactive waste creating a combination that is regulated under both RCRA and the Atomic Energy Act.
- Monitoring - Used to track the presence, migration, or threat posed by contaminants at a site; may be used at a site between response actions or when no other response action is appropriate until information or site status changes.
- Mutagenic - Having to do with a mutation in a gene that causes mutation in an organism.
- National Priorities List (NPL) - The compilation of sites scoring 28.5 or higher on the EPA HRS which require long-term evaluation and remedial response. Proposed sites for the NPL, after a public hearing, may be included in a final NPL. Sites listed then receive priority for IR Program funding.
- National Resources Trustees (NRTs) - Federal trustees with statutory responsibilities with regard to protection or management of natural resources or stewardship responsibilities as a manager of Federally-owned land; trustees may also be state agencies or Indian tribes.
- National Response Center (NRC) - The national communications center for handling activities related to response actions. Acts as the single point of contact for all pollution incident reporting.
- Natural Resource Damage Assessment - Used to determine the extent of destruction, injury, and loss of the natural resource and assess damages for that injury and the loss of use of the resource as a result of a spill or release.
- Natural Resource Trustee (NRT) - Those agencies who have statutory responsibilities with regard to protection or management of natural resources or stewardship responsibilities as a manager of Federally-owned land. State agencies and Indian tribes may be trustees.
- Navy On-Scene Coordinator (NOSC) - The Navy official predesignated to coordinate Navy oil and hazardous substances (OHS) pollution contingency planning and direct Navy OHS pollution response efforts in the preassigned area.

- No Further Action (NFA) - Sites that do not warrant moving further in the site evaluation process; a site that does not pose a significant threat to public health or the environment; decision must be documented and may be reversible if future information reveals additional remedial action is warranted.
- Occupational Exposure - Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.
- On-Scene Coordinator - The predesignated Federal official who coordinates and directs Federal responses under subpart D of the NCP; or the official designated by the lead agency to coordinate and direct removal actions under subpart E of the NCP.
- On-site - The areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action.
- Operable Unit (OU) - A discrete action that comprises an incremental step toward comprehensively addressing site problems; an action that manages, eliminates, or mitigates a release, threat of a release, or pathway of exposure. OUs may be actions that completely address a geographical portion of a site or a specific site problem or the entire site.
- Other Hazardous Waste (OHW) Operations - One of the DERP categories covering hazardous waste reduction equipment, process changes, and other hazardous waste minimization initiatives. OHW objectives are a Component's responsibility and should be programmed within Component resources.
- Partnering - The process that brings together key players in a project to work as a team. Positive leadership, customer focus, employee empowerment, and continuous process improvement are hallmarks of the partnering process.
- Performance Evaluation (PE) Sample - Contains known quantities of analytes (unknown to the laboratory) sent to a laboratory for analysis as part of the lab evaluation.
- Permissible Exposure Limit (PEL) - The maximum permissible concentration of a toxic chemical or exposure level of a harmful physical agent (normally averaged over an 8-hour period) to which a person may be exposed.
- Plume - The mass of pollution in the air as it travels downwind from its source; the term is also applied to the movement of water pollution, a in "thermal plume," which is the mass of heated water that travels downstream in a river from where a power plant or factory discharges heated water.
- Pollutant (Contaminant) - Includes, but not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions, or physical deformations in such organisms or their offspring.
- Pollution Migration Pathways - Common transport mechanisms for environmental pollutants to include: wind, rain, surface water, groundwater, and human intervention, i.e., pipes, drainage

ditches, and roads. Also includes physical influences such as topographical and geological influences and biological influences such as food pathways.

- Polychlorinated Biphenyl (PCB) - Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees. Prior to stringent regulation of PCBs, PCBs were used as a fire retardant and for other purposes, such as sound insulating felt and electrical cables.
- Polycyclic Aromatic Hydrocarbon (PAH) - A highly reactive compound consisting of hydrogen and carbon atoms arranged in multiple rings.
- Potentially Responsible Party Site - Sites where the DoD has no current or past ownership interest and where the DoD has a partial responsibility for cleanup of the site under CERCLA.
- Preliminary Assessment (PA) - Consists of a review of available historical information (also known as a records search) concerning installation activities and land use. A PA may include an on-site reconnaissance, if appropriate.
- Preliminary Remediation Goals (PRGs) - Concentrations of contaminants for each exposure route that are believed to provide adequate protection of human health and the environment based on preliminary site information. Assist in setting parameters for the purpose of evaluating technologies and developing remedial alternatives. May be used for risk screening.
- Presumptive Remedy - An expedited approval process, not the only technically feasible alternative, used to accelerate site-specific analysis of remedies by focusing the feasibility study efforts.
- Proposed Plan - Supplements the RI/FS and provides the public with a reasonable opportunity to comment on the preferred alternative for remedial action as well as alternative plans under consideration and to participate in the selection of remedial action at a site.
- Public Health Assessment (PHA) - The evaluation of data and information on the release of hazardous substances into the environment in order to assess any current or future impact on public health, develop health advisories or other recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects.
- Radioactivity - A property of certain types of matter, characterized by the spontaneous transformation of the nuclei of its atoms and the emission of radiation.
- Receptor Factor - Represents the potentially affected human and ecological receptors within a reasonable vicinity of a site. The receptor factor is divided into three levels: identified receptor probability, potential receptor probability, and limited receptor probability.
- Record of Decision (ROD) - For NPL sites, it describes the remedy selection process and the remedy method selected; the official term used by CERCLA and the NCP for the documentation of a final remedial response action decision at an NPL site. To be consistent with the NCP, the selected remedy must be protective of human health and the environment, attain all ARARs for that site, be cost-effective, and use permanent treatment technologies or resource recovery technologies to the maximum extent practicable.
- Regional Environmental Coordinator - Serves as the senior Navy officer in a local region to coordinate environmental matters and public affairs. Designated by the Area Environmental Coordinator and may be designated as NOSC for spill response.

- Relative Risk - The grouping of sites or AOCs in the DERP into High, Medium, or Low categories based on an evaluation of site information using three key factors of Contamination Hazard, Migration Pathway, and Receptors.
- Release - Defined by CERCLA as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment. For purposes of the NCP, release also means the threat of a release.
- Relevant and Appropriate Requirement - Those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or state law that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be relevant and appropriate.
- Remedial Action (RA) - Includes removing waste from a site for off-post treatment or disposal, containing the waste on-site or treating the waste off-site; and action that provides the final remedy for a site.
- Remedial Action Contract (RAC) - A multi-year Cost-Plus-Award Fee contract which the Navy uses to provide for remediation and long-term maintenance of Navy Installation Restoration sites.
- Remedial Action Construction - is the period during which construction is occurring to implement the remedy.
- Remedial Action Operation - is the period, following RA Construction, needed to operate installed equipment to accomplish remedial objectives. If the remedy is accomplished by actions taken during RA Construction, RA Operation is not needed and does not occur.
- Remedial Action Process - Provides a careful progression through the four phases of identification, investigation, cleanup, and closure of a site in the IR Program.
- Remedial Design (RD) - The technical analysis and procedures which follow the selection of remedy for a site and result in a detailed set of plans and specifications for implementation of the remedial action.
- Remedial Investigation (RI) - A detailed study that includes soil and water sampling to determine the nature and extent of contamination at a site; includes a health assessment which estimates risks to human health and the environment as a result of the contamination. The RI emphasizes data collection and site characterization and is generally performed concurrently and in an interactive fashion with the FS.
- Remedial Project Manager (RPM) - The official designated by the lead agency to coordinate, monitor, or direct remedial or other response actions under subpart E of the NCP.
- Remedy In Place - The end of Remedial Action Construction. All construction necessary to implement the remedy to address contamination at a site has occurred.

- Removal Action - An action to abate, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous substance; such actions may be taken during any phase of the remedial action process. A removal action can be used for fast and significant reductions in risk and to mitigate longer-term threats.
- Reportable Quantity (RQ) - The specified amount of a hazardous substance that when released in excess of that amount to the environment, must be reported under EPCRA, Section 304.
- Response - As defined by CERCLA, Section 101(25), means remove, removal, remedy, or remedial action, including enforcement activities related thereto. A “response action” is characterized by the extent to which the threats are mitigated by the action, either interim or final.
- Response Complete - Occurs at the end of Remedial Action Operation (or Remedial Action Construction if there is no Remedial Action Operation) when DON considers all necessary actions have been taken to cleanup or address contamination at a site, no further response actions under the IR Program are appropriate for the site and no significant threat to public health or the environment exists.
- Restoration Advisory Board (RAB) - A group established for the purpose of allowing individuals the opportunity to give advice to an installation on the installation’s restoration program and to act as a focal point for the exchange of information between an installation and the local community.
- Restoration Management Information System (RMIS) - A DoD database used to track information on the status and progress of activities at sites in the DERP. It is used to support the Annual Report to Congress.
- Risk - A complex evaluation of both the amount of potential damage and the probability of the damage actually occurring.
- Risk Assessment - Distinctly different from risk management in that the risk assessment establishes that a risk is present and defines a range or magnitude of the risk. A concept grounded in probability, not certainty. The ultimate outcome of a risk assessment is the need to decide on what action is appropriate based on the results.
- Risk Evaluation - Vary in scope from simple comparisons of contamination to health-based levels to full-blown risk assessments addressing all contaminants and pathways. A risk evaluation conducted as part of the EE/CA is called “streamlined” risk evaluation. Most risk evaluations for removal actions are limited to those contaminants and pathways which the removal action will address.
- Risk Management Concept - Serves as a general framework for Components to build their out-year IR Programs taking into consideration relative risk as a major factor. Ensures that higher risk sites receive higher priority in the cleanup process; focuses on risk while also evaluating all relevant factors at a particular cleanup site. Involves the evaluation of the criteria for selection of the preferred remedy and, using information from the risk assessment and the listing of remedial options, ultimately allows for the selection of a preferred remedy.
- Risk Management Priorities - Relative risk, legal agreements, military readiness, stakeholder’s concerns, innovative technologies, and cost effective contracting procedures help determine the priority of sites for cleanup within funding limits.

- Risk Screening - Used to determine if contamination is a threat and to establish cleanup levels. Compares site data to screening levels or criteria to determine if a potential problem may exist.
- Rolling Milestones Provision - Calls for annual updates to agreement milestones based on yearly appropriations; milestones are displayed in a Site Management Plan.
- Sampling and Analysis Plan (SAP) - Provides a process for obtaining sampling data of sufficient quantity and quality to satisfy data needs. Consists of two parts: the Field Sampling Plan, which describes the number, type, and location of samples and the type of analyses; and the Quality Assurance Project Plan, which describes policy, organization, and functional activities and the data quality objectives and measures necessary to achieve adequate data for use in planning and documenting the removal action.
- Site - 1) A location on an installation's property where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located; a site consists of all contaminated areas within the area used to define the site and any other location to or from which contamination from that area has come to be located; 2) An NPL site would include all releases evaluated as part of the HRS analysis.
- Site Characterization and Penetrometer System (SCAPS) - A field screening method that uses fluorescence to detect petroleum hydrocarbon compounds through a probe pushed into the ground. Fully self-contained and includes soil/groundwater sample retrieval capabilities and a remote decontamination system.
- Site Closeout - Conducted when no further response actions under the IR Program are considered appropriate for the site and when site cleanup confirms that no significant threat to public health or the environment exists. Appropriate regulatory concurrence should be sought concerning the Navy/Marine Corps' determination that no further action is necessary at the site.
- Site Inspection (SI) - An on-site visit consisting of limited sampling and analysis designed to verify and augment the preliminary findings of the PA. Generates, if necessary, sampling and other field data to determine if further action or investigation is appropriate.
- Solid Waste - Includes solid, liquid, semi-solid, and contained gaseous material.
- Solid Waste Management Unit (SWMU) - Any unit in which wastes have been placed at any time, regardless of whether the unit was designed to accept solid waste or hazardous waste; units to include old landfills, wastewater treatment tanks, and leaking process or waste collection sewers. Only past releases from SWMUs that also meet the definition of a CERCLA release are eligible for remediation through the IR Program.
- Source - Area where hazardous substances or petroleum products have been deposited, stored, released, disposed of, or placed.
- Sovereign Immunity - The sovereign (i.e., the federal government) is above the law and therefore immune from suit. Ancient concept based in Anglo-Saxon law. The United States is not subject to federal, state, intrastate or local laws and regulations unless Congress waives sovereign immunity. Many federal environmental laws, including the CAA, CWA, RCRA and SDWA contain waivers of sovereign immunity that make federal facilities subject to federal, state, intrastate and local laws. No two waivers are identical and all waivers are strictly construed in favor of the sovereign by the courts.

- Stakeholder - Interested parties including individual residents that live near the installation; representatives of citizen, environmental, and public interest groups whose members live in the vicinity of the installation, workers involved or affected by installation operations, and elected and appointed local government officials. The term “stakeholder” is used in the context of RABs.
- Stressor - Any physical, chemical, or biological entity that can induce an adverse environmental response.
- Superfund Amendments and Reauthorization Act (SARA) - Reauthorized the funding provisions, authorities, and requirements of CERCLA and associated laws in 1986.
- Technical Assistance Grants (TAGs) - For NPL installations, provides up to \$50,000 to community groups for the purpose of hiring technical advisors to help citizens understand and interpret site-related technical information for themselves. The group must provide 35% of the total cost of the project to be supported by TAG funds and must budget the expenditure to cover the entire cleanup period.
- Technical Review Board (TRC) - Established to facilitate review and comment on technical aspects of response actions and proposed actions with respect to releases or threatened releases at Navy installations. Navy policy is to convert all TRCs to RABs.
- Technology Demonstration - A field-scale demonstration of a technology used to generate performance and cost data.
- Teratogenic - Having to do with a birth defect caused by an induced substance.
- Third-Party Sites - Non-Federally-owned sites that allegedly have received potentially hazardous substances from the Navy/Marine Corps. The EPA has lead authority for cleanup at non-Federally-owned sites.
- Threshold Limit Value (TLV) - Established by the American Conference of Governmental Industrial Hygienists. Refer to airborne concentrations of a substance and represent conditions under which it is believed that nearly all workers may be exposed day after day without adverse effect.
- To Be Considered (TBC) Requirements - Non-promulgated advisories (such as reference dose or potency factors), criteria, and guidance issued by Federal and state governments and not having the same status as ARARs; supplement ARARs where they do not exist or are insufficient to protect human health and the environment.
- Toxicity - 1) The harmful effects produced by a substance; 2) the capacity of a substance to cause any adverse effects, as based on scientifically verifiable data from animal tests or epidemiology.
- Uncontaminated Property - For purposes of BRAC property which is to be transferred, real property on which no hazardous substances and no petroleum products or their derivatives, including aviation fuel and motor oil, were stored for one year or more, known to have been released, or disposed of.
- Underground Storage Tank (UST) - All tanks and attached piping containing regulated substances in which 10 % or more of the tank volume (including piping) is beneath the surface of the ground.

- Undertaking - Any Federal, Federally-assisted, or Federally-licensed action, activity, or program, new or continuing, that may have an effect on National Register resources and therefore triggers Section 106 of CERCLA consultation responsibilities.
- Vadose - Having to do with or occurring in the unsaturated area between the earth's surface and the water table.
- Volatile Organic Compounds (VOCs) - Carbon-containing substances released by both natural processes and human activities that readily produce fumes; their reaction with nitrogen oxides in sunlight produces photochemical smog.

Appendix C

References

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Appendix D

DENIX User Application

Name: _____ Title: _____

Major Claimant: _____ Branch of Service: _____

Subordinate Command: _____

Organization Name: _____ Organization Code: _____

Address Line 1: _____

Address Line 2: _____

City: _____ State: ____ Zip Code: _____

Commercial Telephone No. : _____

DSN Telephone No.: _____ Fax No.: _____

Duty Areas: _____

If you are a contractor for DoD or a Federal or state agency employee, please have the DoD agent for whom you work fill out the following:

DoD POC: _____ Code: _____

Contract No.: _____ Start/End Date: _____

Date: _____ Telephone No.: _____

Signature: _____

Please fax or mail this information to: **DENIX Support Office**
USACERL
ATTN: Kim Grein
2902 Newmark Drive
Champaign, IL 61821
(217) 373-6790 (commercial)
(217) 373-7270 (FAX)

Appendix E

Innovative Technologies

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Appendix E-1

Tri-Service EQ Strategic Plan Projects

THRUST 1.A: Detection of Unexploded Ordnance

Product Title	Expected Availability (FY)
Improved Ground Platform for Surface/Buried UXO Detection (\$1.6K/Acre) POC: Ms. Kelly Rigano (410) 671-1557	96
Airborne Platform for Surface & Shallow Buried UXO Detection (\$1.2K/Acre) POC: Ms. Kelly Rigano (410) 671-1557	96
Marine Multisensor Platform for Underwater UXO Detection (\$1.2K/Acre) POC: Mr. John Lathrop (904) 234-4667	98
Advanced Multisensor Ground Platform (\$1.2K/Acre) POC: Ms. Kelly Rigano (410) 671-1557	99
Second Generation Airborne Multisensor Platform for Enhanced Surface/Buried Detection POC: Ms. Kelly Rigano (410) 671-1557	99

THRUST 1.B: Site Characterization and Monitoring

Product Title	Expected Availability (FY)
SCAPS II - Geophysical Enhanced POL and Explosives Sensors POC: Dr. E Ernesto Cespedes (601) 634-2655	95
SCAPS III - SCAPS II plus VOC and Solvent Sensors POC: Dr. Ernesto Cespedes (601) 634-2655	96
SCAPS IV - SCAPS III plus Heavy Metal Sensors POC: Dr. Ernesto Cespedes (601) 634-2655	97
SCAPS Sampler/Analytical Instrument Interface POC: Dr. Ernesto Cespedes (601) 634-2655	97
Remediation Efficacy Monitoring POC: Capt. Warren Schultz (202) 767-0192	97
Sensor Platform E-SMART POC: Mr. Bruce Nielsen (904) 283-6227	97
Rapid Optical Screening Tool (ROST) POC: Mr. Bruce Nielsen (904) 283-6227	98
Monitoring Application Matrix POC: Mr. Bruce Nielsen (904) 283-6227	98

THRUST 1.D: Analytical Systems

Product Title	Expected Availability (FY)
X-Ray Fluorescence for Metals POC: Mr. Marty Stutz (410) 671-1568	95
Improved Methods for Other Organics (\$50-\$300/Sample) POC: George Robitaille (410) 671-1576	95
Metals Speciation Methods (\$20-\$75/Sample)*	96
Improved Methods for Agent (\$10-\$300/Sample)*	96
Portable Field Methods (\$20-\$200/Sample)*	97
Methods for Agent Degradation Products (\$50-\$300/Sample)*	97
Improved Methods for Special Organics (\$30-\$150/Sample)*	98

* The POC for listed product is Ms. Ann Strong (601) 634-2726

THRUST 1.E: Groundwater Systems

Product Title	Expected Availability (FY)
DoD Groundwater Modeling System (GMS) v 1.0	94
Guidance on Use of Existing Models	95
Initial Subsurface Conceptualization Tools	95
Pump & Treat Module	95
Subsurface Barrier Design	95
Optimal Plume Capture Design Module	96
DoD GMS v 1.5	96
Steam Injection / Vapor Extraction Design	96
Facilitated Transport Module	97
In-situ Remedial Design Module for Explosives	97
DoD Groundwater Modeling System v2.0	98
In-Situ Biotreatment Remediation Modules for Fuels and Solvents	98
Electrokinetics Design Module	98
DoD Modeling System v 3.0	00
Advanced Fuels / Solvents Remedial Design Methods	00

NOTE: The POC for all products listed above is Jeffery P. Holland, 601-634-2644.

THRUST 1.F.1: Explosives/Organics Contaminated Groundwaters - Biological

Product Title	Expected Availability (FY)
Off-Gas Treatment Using Biofilters POCs: WES-Mark Zappi-601-634-2856 and AEC-Mark Hampton-410-671-1559	97
Low Level Loaded Bioreactor POC: WES-Mark Zappi-601-634-2856 and AEC-Mark Hampton-410-671-1559	98
Sorbent Assisted Bioreactors POCs: WES-Cynthia Teeter-601-634-4260 and AEC-Mark Hampton-410-671-1559	98
Attached Growth Explosives Bioreactor POCs: WES-Mark Zappi-601-634-2856 and AEC-Mark Hampton-410-671-1559	99
AFFF Bioreactor POC: US Navy-Carmen Lebron-805-982-1616	99
Landfill Leachate Treatment System POC: US Navy-Ms. Leslie Karr 805-982-1618	BYD

THRUST 1.F.2: Explosives/Organics Contaminated Groundwaters - Physical/Chemical

Product Title	Expected Availability (FY)
Ultraviolet Based AOPs POCs: WES-Mark Zappi-601-634-2856, AEC-Rick O'Donnell-410-671-1589, US Navy-Carmen Lebron-805-982-1616	95
Peroxone Oxidation POCs: WES-Mark Zappi-601-634-2856 and AEC-Rick O'Donnell-410-671-1589	97
Titanium Dioxide Oxidation POCS: WES-Mark Zappi-601-634-2856 and AEC-Rick O'Donnell-410-671-1589	97
Second Generation UV AOPs POCs: WES- Mark Zappi-601-634-2856 and AEC-Rick O'Donnell-410-671-1589	97
Sonolytic Peroxone Oxidation POCs: WES-Mark Zappi-601-634-2856 and AEC-Rick O'Donnell-410-671-1589	99
Organiphylic Clay and Resin Adsorption POCs: WES-Beth Fleming-601-634-3943 and AEC-Wayne Sisk-410-671-1559	00
Electron Beam Oxidation POCs: WES-Mark Zappi-601-634-2856 and AEC-Rick O'Donnell-410-671-1589	00

THRUST 1.G: Remediation of UXO Contaminated Sites

Product Title	Expected Availability (FY)
First Generation Low Cost Excavator (\$50K/Acre)	96
Second Generation UXO Detection and Remediation System (\$40K/Acre)	98
Third Generation UXO Detection, Remediation, and Disposal System	00
NOTE: The POC for all products listed above is Ms. Kelly Rigano (410) 671-1557	00

THRUST 1.H: Solvents Contaminated Groundwater

Product Title	Expected Availability (FY)
Crossflow Air Stripping with CATOX POC: MAJ Mark Smith (904) 283-6126	95
Steam Extraction POC: Mr. Paul Carpenter (904) 283-6187	96
Bioreactors POC: Ms. Cathy Vogel (904) 283-6208	96
Aquifer Flushing POC: CPT Jeff Stinson (904) 283-6254	97
Funnel-and-Gate Systems POC: MAJ Mark Smith (904) 283-6126	98
DNAPL Remediation POC: CPT Jeff Stinson (904) 283-6254	99
Biological Treatment for Solvents POC: Ms. Cathy Vogel (904) 283-6208	00

THRUST 1.I: Fuels Contaminated Groundwater

Product Title	Expected Availability (FY)
Anaerobic Degradation of Fuel POC: Ms. Alison Thomas (904) 283-6303	95
Aphron-Enhanced Bioremediation POC: Ms. Erica Becvar (904) 283-6225	95
Surfactant Curtain: System POC: CPT Jeff Stinson (904) 283-6254	97
Advanced Bioremediation POC: Ms. Cathy Vogel (904) 283-6126	98
Bioslurping JP-5 POC: Mr. Ron Hoeppel (805) 982-1655	98

THRUST 1.J.1: Explosives/Organics Contaminated Soils - Biological

Product Title	Expected Availability (FY)
Composting of Explosives POCs: WES-Kurt Preston: 601-634-4106; AEC-Mark Hampton: 410-671-1559	95
Explosives Bioslurry Treatment POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671-1559	95
Nitrate Ester Biodegradation POC: US Navy-Mr. Doug Elstrodt 301-743-4365	95
PAH Biocells POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671-1559	97
Enhanced Explosives Bioslurry POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671-1559	97
PCB Bioslurry Treatment POCs: WES-Mark Zappi 601-634-2856; AEC-Mark Hampton 410-671-1559	99
In situ PAH Biotreatment POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671-1559	99
PCB Biocells POCs: WES-Mark Zappi 601-634-2856; AEC-Mark Hampton 410-671-1559	99
OTTO Fuel POC: US Navy-Carmen Lebron 805-982-1616	99
In situ Explosives Biotreatment POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671 1559	00
In situ PCB Biotreatment POCs: WES-Mark Zappi-601-634-2856; AEC-Mark Hampton-410-671-1559	00
Pesticide Biotreatment POC: WES-Mark Zappi-601-634-2856	00
Chemical Agent Biotreatment POC: WES-Mark Zappi-601-634-2856	BYD
AFFF Bioslurry POC: US Navy-Dr. D. B. Chan 805-982-4191	BYD

THRUST 1.J.2: Explosives/Organics Contaminated Soils - Physical/Chemical

Product Title	Expected Availability (FY)
Physical Separation POCs: WES-Mark Bricka-601-634-3700 and AEC: Rick O'Donnell-410-671-1559	97
Chemical Extraction of Explosives POCs: WES-Mark Zappi-601-634-2856 and AEC: Wayne Sisk-410-671-1559	97
Based Catalyzed Treatment of PCBs POC: US Navy: Carmen Lebron-805-982-1616	98
Landfill Capping POC: US Navy	99
Electrokinetics POCs: WES-Mark Zappi-601-634-2856 and AEC: Wayne Sisk-410-671-1559	00
Chemical Treatment of Explosives POCs: WES-Mark Bricka-601-634-3700 and AEC: Wayne Sisk-410-671-1559	00
Soil Washing/Flushing POCs: WES-Mark Zappi-601-634-2856 and AEC: Wayne Sisk-410-671-1559	BYD

THRUST 1.L: Solvents/Fuels Contaminated Soils

Product Title	Expected Availability (FY)
Chlorinated Solvent Vapor Treatment POC: Mr. Bud Hoda, (916) 643-0830	94
Radio Frequency Soil Treatment POC: Mr. Paul Carpenter (904) 283-6187	95
Ex Situ Treatment POC: Ms. Leslie Karr, (805) 982-1618	96
Bioventing Non-Petroleum Compounds POC: Ms. Cathy Vogel, (904) 283-6208	97
Hydrazine/Propellant Biotreatment POC: Ms. Cathy Vogel, (904) 283-6208	98
Deep Thermal Soil Treatment POC: Mr. Paul Carpenter, (904) 283-6187	98
Advanced Biotreatment Systems POC: Ms. Cathy Vogel, (904) 283-6208	00
SIVE (impermeable soils) POC: Dr. D. B. Chan, (805) 982-4191	BYD

THRUST 1.N: Inorganics Contaminated Soils

Product Title	Expected Availability (FY)
Physical Separation Technologies POC: Mr. Mark Bricka (601) 634-3700	98
White Phosphorous (WP) Treatment POC: Mr. Mark Bricka (601) 634-3700	99
Improved Immobilization Technologies POC: Mr. Mark Bricka (601) 634-3700	99
Extraction Technologies POC: Mr. Mark Bricka (601) 634-3700	00
In Situ Treatment Systems POC: Mr. Mark Bricka (601) 634-3700	BYD

THRUST 1.O: Heavy Metal Contaminated Structures

Product Title	Expected Availability (FY)
Extraction Techniques for Metal Contaminated Building Residue (\$100-\$200/Ton) POC: Mr. Mark Bricka (601) 634-3700	97
Volume Reduction/Immobilization Techniques for Metal Contaminated Residue POC: Mr. Mark Bricka (601) 634-3700	98

THRUST 1.P: Explosive/Chemical Agent Contaminated Structures

Product Title	Expected Availability (FY)
Nondestructive Decon of Energetic Contaminated Structures POC: Mr. Rick O'Donnell (410) 671-1589	95
Nondestructive Decon of Energetic Process Scrap POC: Mr. Rick O'Donnell (410) 671-1589	95
Nondestructive Decon of Chemical Agent Structures POC: Rick O'Donnell (410) 671-1589	96
Nondestructive Decon of Energetic Process Equipment POC: Rick O'Donnell (410) 671-1589	98
Pressurized Oxidation of Structures POC: Rick O'Donnell (410) 671-1589	00

THRUST 1.R: Contaminated Sediments

Product Title	Expected Availability (FY)
Sediment Remediation Guidance Document POC: Mr. Daniel E. Averett, (601)634-3959	94
Multi-Contaminant Treatment Approach POC: Dr. Sabine E. Apitz, (619)553-2810	96
Guidance for Dredging White Phosphorus Contaminated Sediment POC: Mr. Daniel E. Averett, (601)634-3959	96
Benthic Contaminant Flux Sampling Device POC: Mr. Bart Chadwick, (619)553-5333	97
Confined Disposal Facility Management Techniques to Control Contaminant Loss POC: Mr. Daniel E. Averett, (601)634-3959	97
Rapid Sediment Toxicity Assays POC: Dr. Sabine E. Apitz, (619)553-2810	98
In Situ Sediment Characterization System POC: Dr. Sabine E. Apitz, (619)553-2810	99
Physical Remediation Technology POC: Dr. Sabine E. Apitz, (619)553-2810	99
Predictive Techniques for Contaminant Losses During Dredging POC: Mr. Daniel E. Averett, (601)634-3959	99
Bioremediation Technology POC: Dr. Sabine E. Apitz, (619)553-2810	00
PCB Treatment Technology POC: Dr. Sabine E. Apitz, (619)553-2810	00
Treatment Train for Sediment Remediation POC: Dr. Sabine E. Apitz, (619)553-2810	BYD
Dredging and Confined Disposal Facility (CDF) Treatment System POC: Mr. Daniel Averett, (601)634-3959	BYD

THRUST 1.T: Fate/Transport Methods and Model Development

Product Title	Expected Availability (FY)
Geochemical Process Methodology POC: Dr. Jim Brannon (601) 634-2667	96
Surface Water Model POC: Dr. Mark Dortch (601) 634-3517	96
Marine Sediment Dispersal Model POC: Shun Ling (703) 325-0295	96
Groundwater Heterogeneity Model POC: Dr. Jeff Holland (601) 634-2644	96
Watershed Model POC: Dr. Patrick Deliman (601) 634-3623	97
Chemical Warfare/Hazardous and Explosive Wastes Fate Prediction Method POC: Dr. Herb Fredrickson (601) 634-2667	97
Bioaccumulation/Concentration Exposure Model POC: Dr. Carlos Ruiz (601) 634-3784	97
Biomarkers for Monitoring Attenuation Rates POC: Dr. Victor McFarland (601) 634-2667	97
Microbial Biomonitor POC: Dr. Herbert Fredrickson (601) 634-3716	98
Multimedia Assessment Model POC: Dr. Mansour Zakikhani (601) 634-3806	98
Chemical Warfare/Hazardous & Explosive Wastes Transport Model POC: Dr. Mark Dortch (601) 634-2667	98
Integrated Marine Fate Model POC: Shun Ling (703) 325-0295	98

THRUST 1.U Risk and Hazard Assessment Model

Product Title	Expected Availability (FY)
Exposure Probability Model POC: Dr. Mark Dortch (601) 634-3517	96
Uncertainty Analysis Techniques POC: Dr. Mansour Zakikhani (601) 634-3806	96
Human Cancer Model POC: Jesse Barkley (301) 619-7653	96
Genotoxicity Model POC: Jesse Barkley (301) 619-7653	97
Developmental & Reproductive Toxicity Model POC: Henry Gardner (301) 619-2020	97
Multimedia Risk Assessment Model POC: Dr. Tom Dillon (601) 634-7653	98
Aquatic and Wetland Hazard Assessment Model POC: Dr. Tom Dillon (610) 634-3922	98
Terrestrial Foodchain Hazard Assessment Model POC: Dr. Dick Lee (601) 634-3585	98
Neuro & Immuno Toxicity Model POC: Henry Gardner (301) 619-2020	98
Preliminary Bioassay/Biomonitor for Human Health POC: Henry Gardner (301) 619-2020	99
Environmental Risk Assessment Model POC: Dr. Tom Dillon (601) 634-3922	99

Appendix E-2

Emerging Cleanup Technologies

Technology	Demonstration	Implementation	Unit Cost
Remediation of Explosives/Organics Contaminated Soils			
Physical Separation	1996	1998	\$40-\$200/Ton
Composting	1991	1993	\$100-\$400/Ton
Bio-Slurry	1994	1996	\$50-\$200/Ton
In Situ Biodegradation	1996	1998	\$50-\$100/Ton
Chemical Extraction	1996	1999	\$50-\$200/Ton
Electrokinetics	1997	2000	\$30-\$75/Ton
Remediation of Explosives/Organics Contaminated Groundwater			
OZONE	1993	1995	\$0.5-\$10/1000 Gal
Peroxone	1994	1996	\$0.10-\$2/1000 Gal
Advanced Adsorption	1997	1999	\$0.02-\$1/1000 Gal
Ex Situ Biotreatment	1997	1999	\$0.02-\$2/1000 Gal
In Situ Biotreatment	1997	1999	\$0.02-\$1/1000 Gal
Remediation of Metals Contaminated Soils			
Physical Separation	1995	1998	\$30-\$200/Ton
Electrokinetics	1997	1999	\$20/Ton
Metal Extraction	1995	1996	\$40-\$125/Ton
Remediation of Metals Contaminated Groundwater			
Ion Exchange	1995	1998	\$0.10-\$40/1000 Gal
Xanthate Precip.	1996	1998	\$0.75-\$2/1000 Gal
Site Characterization/Detection of Buried Unexploded Ordnance			
STOLS	1994	1995	\$1,600/Acre
RADAR	1994	1995	\$1,000/Acre
Multi-Sensor Ground Platform	1996	1997	\$600/Acre
Multi-Sensor Airborne Platform	1997	1998	\$1,200/Acre

Emerging Cleanup Technologies (Continued)

Technology	Demonstration	Implementation	Unit Cost
Remediation of Buried Unexploded Ordnance			
Enhanced UXO Tech.	1995	1996	\$50,000/Acre
Remote Detection/Removal	1996	1997	\$40,000/Acre
Characterizing Contaminants in Soils and Groundwater			
POL	NOW	1993	\$10-\$40/FT
Explosives/Energetics	1994	1995	\$10-\$40/FT
Solvents	1996	1997	\$10-\$40/FT
Heavy Metals	1996-97	1998	\$10-\$40/FT
Treatment of Fuels/Solvents in Soils			
Bioventing (Fuels)	1993	1995	\$5-\$30/Ton
RF Heating/Vapor Extraction	1993	1995	\$40-\$60/Ton
Steam Injection/Vapor Extraction	1994	1995	\$50-\$80/Ton
Advanced Biotreatment (Solvents)	1996	1999	\$70-\$80/Ton
Treatment of Fuels/Solvents in Groundwater			
Crossflow Air Stripping with Catalytic Oxidation	1993	1996	\$1.5-\$5.5/1000 GAL
Liquid Phase Catox	1995	1997	\$3/1000 GAL
In Situ Bioremediation	1996	1997	\$1-\$6/1000 GAL
Plume Retardation	1999	2000	\$1-\$2/1000 GAL
DNAPL Remediation	2000+	2000+	\$15-\$30/1000 GAL

Appendix E-3

Environmental Security Technology Certification Program Projects

In-situ Anaerobic Bioremediation of Fuel Contaminated Groundwater at NWS Seal Beach. The proposed technology is applicable to the remediation of groundwater with fuel hydrocarbons, such as gasoline. The process involves placement of wells at a contaminated site and adding nutrients to enhance anaerobic biodegradation. As the microorganisms did not need oxygen, this process will cost less to implement than more conventional aerobic systems. For further information, contact NFESC at telephone (805) 982-1616. Status: Ongoing.

Full-Scale Demonstration of Vitrification Technology on Contaminated Soils and Sludges. The proposed technology is applicable to virtually all types of contaminated soils. Recent advances in the technology have reduced the cost of implementing this technology. The demonstration will analyze the cost of a new system and determine its effectiveness in the field. For further information, contact NFESC at telephone (805) 982-1671. Status: Ongoing.

Small Arms Range Remediation. This joint project with the Army and Bureau of Mines will demonstrate and validate physical separation and soil washing technologies to remove lead particles from bullet-laden soil found in impact berms at small arms ranges. For further information, contact NFESC at telephone (805) 982-1668. Status: Ongoing.

High Resolution Seismic reflection to Characterize and Plan Remediation at Hazardous Waste Sites. The proposed seismic technology is a non-invasive technique to identify contaminant migration pathways, to determine the subsurface structure and stratigraphy to optimize the placement of remediation systems, and possibly directly detect the presence of DNAPLs. For further information, contact NFESC at telephone (805) 982-4833. Status: New Start.

Permeable Reactive Wall Remediation of Chlorinated Hydrocarbons in Groundwater. The proposed in situ permeable reactive wall, composed of fine iron powder, is placed down-gradient of the DNAPL contaminant plume. The DNAPLs react with the iron to form chloride ions, effectively dechlorinating the DNAPLs to harmless products. For further information, contact NFESC at telephone (805) 982-1671. Status: New Start.

Appendix E-4

Hydrocarbon National Test Site Projects

BioCell Treatment of Petroleum Contaminated Soils. This small-scale ex-situ technology uses naturally occurring microbes to destroy organic contaminants in soil. For further information, contact U. S. Army Waterways Experiment Station at telephone (601) 634-3815, or NFESC at telephone (805) 982-1636.

Bio Pile Remediation. This ex-situ technology uses naturally occurring microbes to destroy organic contaminants in soil. For further information, contact NFESC at telephone (805) 982-1808 or (805) 982-4853.

Groundwater Circulation Well Environmental Cleanup Systems. This in-situ remediation technology provides a cost-effective method to remediate gasoline and other hydrocarbon contaminated groundwater. For further information, contact the Naval Research Lab at telephone (202) 767-0192 or NFESC at telephone (805) 982-1636.

Hot Air Vapor Extraction for Fuel Hydrocarbon Cleanup. This fast-track ex-situ remediation technology combines thermal, heap pile, and vapor extraction techniques to remove and destroy hydrocarbon contamination in soil. For further information, contact NFESC at telephone (805) 982-1263 or (805) 982-1636.

Stable Isotopes of Carbon to Monitor Biodegradation of Pollutant Compounds. This study analyzes the ratio between ^{12}C and ^{13}C to determine bioremediation rates of organic compounds. For further information, contact the Naval Research Lab at telephone (202) 767-0192 or NFESC at telephone (805) 982-1636.

Appendix E-5

Available Innovative Cleanup Technologies

The table below is a list of available innovative cleanup technologies. It was mainly taken from the “Innovative Site Remediation Technology” monograph series prepared under EPA auspices and directly supported by the DON.

TECHNOLOGIES THAT CAN BE CONSIDERED AVAILABLE:

Technology	Typical Use
Thermal desorption	Physical separation of organics in soil by heating as part of a treatment train
Air/sparging	Gaseous well extraction (/trmt) of volatiles in the water table by inducing air
Chemical Treatment (including UV)	Use of process chemistry to oxidize, precipitate, or alter state of any contaminant
Soil washing (ex-situ) Soil flushing (in-situ)	Use of primarily water to clean granular soil by dissolution of contaminant
Chemical Extraction (ex-situ)	Use of solvent/chemicals to separate difficult contaminants from soil/water
Vacuum Extraction	Gaseous well systems for volatile organics in permeable soils w/heat for non-volatile
Ex-situ bioremediation	Augmented HC trmt in rows/piles/compost (soil) and reactors (soil slurry or water)
In-situ bioremediation	Augmented chain HC trmt in place (soil or water) including induced air <i>bioventing</i>
Natural attenuation	Oxidation/reduction by indigenous species when longer time can be factored out
Non-clay capping	Evapotranspiration system, drainage control, monitoring only - for landfills
Other ^[1]	

[1] A technology need not be on this list to be considered innovative, and combinations of technologies are expected to be used.

The Wastech Monograph Series on Innovative Site Remediation Technology includes the following volumes:

- Volume 1 - Bioremediation;
- Volume 2 - Chemical Treatment;
- Volume 3 - Soil Flushing/Soil Washing;
- Volume 4 - Stabilization/Solidification;
- Volume 5 - Solvent/Chemical Extraction;
- Volume 6 - Thermal Desorption;

- Volume 7 - Thermal Destruction; and
- Volume 8 - Vacuum Vapor Extraction.

For information on the Monograph series contact the American Academy of Environmental Engineers by telephone at (410) 266-3311 or by mail at the following address:

American Academy of Environmental Engineers
130 Holiday Court
Suite 100
Annapolis, MD 214021

Appendix E-6

NAVFAC RPM Case Studies

(Questions/information requested on this form are for guidance only. Please vary the information as you see fit to produce a case study useful to your peers. This form will not exceed 2 pages)

Date prepared

SECTION I: SITE INFORMATION

SITE/LOCATION: site number and Naval Activity, City, State
DESCRIPTION: brief explanatory name
CONTACT: person, EFD/A and phone number
TECHNOLOGY: brief identification
CONTAMINANTS: most important pollutants
LEGAL DRIVER: usually: NPL, CERCLA non-NPL, UST/POL, or RCRA/SWMU

SECTION II: EXPERIENCES ENCOUNTERED *(answer all applicable)*

RI/FS or RFI/CMS: Give brief site description based on initial studies and sampling and the rationale used to select initial remedy. If an innovative investigation technique, such as cone penetrometer, saved money describe it here and in Section III.

IRA OR PILOT REMEDIATION: If an IRA or pilot technology application was used, explain what happened. If other than full and open competition was used, how was action accomplished?

TREATABILITY STUDY: If a treatability study was performed, explain its results especially if it changed initial thinking.

PRESUMPTIVE REMEDY: If used, how was it chosen? (Put explanation of regulatory approval in Section III.)

RD: Describe the technology. How was it chosen? Who did the design: what was the design/construct interface? What kind of contract was used? Any design problems or hard choices? If proprietary technology or other than full and open competition was involved, how was it done? Describe contracts division assistance here and with RA.

RA/IMPLEMENTATION: Did you get the technology you wanted: how or why not? Who did the work: what kind of contract, role of subcontractors? Did they do a good job? Any problems/unusual circumstances: how were they resolved? Were there differences between design and what's there now? Describe final configuration. Is it working? What is the current status?

SECTION III: REGULATORY REQUIREMENTS/COMMUNITY INVOLVEMENT

FEDERAL: Which EPA region, internal department? Were they cooperative, timely? If not how did you get them involved? What cleanup standards/criteria prevailed? Were they strict or flexible? Did other relevant standards (e.g. air) play an important role? Did EPA have to approve of the technology? What did it take to get that approval? How did EPA play in any TRC/RAB meetings? Was there a ROD, interim ROD: if not what authority was used for the go decision?

STATE: Which agency/division: were they the primary regulator? Was a time factor imposed? Was state approval of technology required? Address similar issues in Federal questions above. How did it go with the state regulators: were local regulators involved? How did you make it work?

COMMUNITY: Was there a TRC: who were they, did they help? Was there a RAB or comparable committee: who were they, how were they involved? Was community approval of technology required/obtained? Were there problems: how did you solve them?

SECTION IV: OPTIONS CONSIDERED/COST AVOIDANCE

Dig & Haul to landfill or incineration (on or off-site) are norms of conventional technology. Pump and treat is conventional where treatment is a process such as carbon adsorption or air stripping. Pump and treat can be innovative. Natural attenuation involving monitoring only is the most innovative. A lot falls in between.

The purpose of innovative technology is to save money. If the technology didn't save, it is a lesson we need to learn. If only one option was considered, could a comparison be made with a conventional technology to arrive at a cost avoidance. If several options were considered, explain how final decision was made. Was there an overriding timing, health, or risk issue that drove the decision regardless of cost.

What thinking related to cost went into the technology decision? Give a **numerical** cost avoidance and explain how it was estimated or explain us if a less costly technology could have been used if overriding factors had not precluded such a decision.

SECTION V: WHAT WORKED WELL

What are you proud of? What did you do right? What gems of wisdom did you apply purposefully or stumble across that you can share with the rest of us. (*think of 'you' as a plural word*)

SECTION VI: IF WE HAD IT TO DO OVER AGAIN

What didn't work (*technical or administrative*); how would you correct it? What would you have done differently that would have made it easier? Give it your best 20-20 hindsight.

SECTION I: SITE INFORMATION

SITE/LOCATION: Site 21 MCB Camp Lejeune, Jacksonville, NC

DESCRIPTION: Transformer Storage Lot

CONTACT: Katherine Landman, LANTDIV, (804) 322-4818 DSN 262

TECHNOLOGY: Excavation & Off-Site Disposal

CONTAMINANTS: PCBs and Pesticides

CONCENTRATIONS: Pesticides: max detected 34,000 ppb (incl. 4, 4'-DDD, 4, 4'-DDE, 4,4'-DDT, Chlordane). PCBs: max detected 4600 ppb (Aroclor-1260).

ACTION LEVELS: ROD identified remediation goals based on risk as follows: total PCBs 0.37 ppm, 4, 4'-DDD 12 ppm, 4, 4'-DDT 8.4 ppm, total Chlordane 2.2 ppm.

LEGAL DRIVER: NPL, FFA

DECISION DOCUMENT: ROD, Explanation of Significant Differences (ESD)

SECTION II: EXPERIENCES ENCOUNTERED

Site 21 has a history of pesticide usage and reported transformer oil disposal. The site was used as a transformer storage lot. Oil was drained from transformers into an on-site pit. Another portion of the site was used for pesticide mixing and for cleaning of pesticide application equipment. Indiscriminate disposal of excess pesticides is also believed to have occurred here.

An RI/FS was initiated in 1993 for Site 21 as part of Operable Unit No. 1 (including Sites 21, 24, and 78). The RI identified three areas of concern (AOCs) of surface soil contamination at Site 21. AOC 1 was located in the northern portion of the site in the vicinity of the transformer oil disposal pit. AOC 1 exhibited elevated levels of PCBs in surface soils. AOCs 2 and 3 were adjacent to one another in the southern portion of the site in the vicinity of the pesticide mixing area. AOC 2 also exhibited elevated levels of PCBs in surface soils. AOC 3 exhibited elevated levels of pesticides in surface soils.

Remediation goals were developed during the FS based on the site risk assessment and regulatory standards and applicable references. Significant potential ecological risk was present due to PCBs in surface soil. However, no specific criteria exists with regards to acceptable cleanup levels when driven by ecological risk. In lieu of any specific guidance, remediation goals for PCBs in soil were based on EPA Region III risk-based soil screening criteria (RBCs) for industrial soils. Thus, the remediation goal for PCBs was set at the RBC of 0.37 ppm.

The selected remedial alternative for surface soils at Site 21 was excavation and off-site disposal. This alternative and the corresponding remediation goal of 0.37 ppm for PCBs was documented in the ROD signed in September 1994.

SECTION III: REGULATORY REQUIREMENTS/COMMUNITY INVOLVEMENT

The change in the remedial goal for PCBs at Site 21 needed to be documented. This change constituted a significant deviation from the original ROD. Since the selected remedy was not fundamentally altered by this change, an amendment to the ROD was not required. Instead, an Explanation of Significant Differences was prepared, placed in the administrative record, and a notice summarizing the ESD was published in a local newspaper.

SECTION IV: OPTIONS CONSIDERED/COST AVOIDANCE

The LANTDIV RAC contractor was tasked with the excavation and disposal of the PCB and pesticide contaminated soils. Initial excavation work indicated that the areas of concern were potentially much larger than estimated based on RI sampling data. Faced with a potentially much larger and more costly project than originally anticipated or budgeted, the project team, consisting of LANTDIV, the RAC contractor, the RI/FS contractor, the State of North Carolina, and EPA Region IV, discussed possible alternatives. Field screening was performed to fully delineate the three areas of concern to estimate full excavation and disposal costs.

Results of the field screening confirmed that the AOCs were considerably larger than estimated. Field screening also allowed an evaluation of contamination levels within the areas of concern. Screening results showed that a considerable amount of the additional area to be excavated consisted of low levels of PCBs, only slightly above the remediation goal of 0.37 ppm. This was unexpected, as RI results indicated that contaminated areas exhibited consistently high levels of PCBs with little transition to clean areas (i.e. soils tended to be highly contaminated or clean). Since this remedial goal was based on a non-enforceable standard (EPA Region III RBCs, as driven by ecological risk), the project team decided to re-evaluate the selection of the remediation goal.

Several facts were brought out during the re-evaluation of the remedial goal. Between the time that the ROD was signed and the actual excavation commenced, the Region III RBC for PCBs in industrial soil was raised from 0.37 ppm to 0.74 ppm. Also, since the selected level was based on a non-enforceable standard, other applicable standards were revisited to determine if a higher enforceable standard might apply. TSCA requirements and State of North Carolina standards were candidates. The lowest enforceable standard was the State of North Carolina standard, set at 1 ppm, and intended for residential soils. However, although not a formal standard, NC had previously applied a level 10 ppm at other industrial sites, and was willing to apply that level to Site 21. EPA Region IV was willing to support this level as well. In addition to being acceptable to regulators, a cost analysis showed that application of 10 ppm as a remedial goal for Site 21 would be financially feasible.

SECTION V: WHAT WORKED WELL

Formal partnering had recently been initiated with the MCB Camp Lejeune team when this issue arose. The project team included all primary stakeholders - regulators, activity representative, EFD, remediation contractor and investigation/design contractor. This allowed for a team approach to finding a solution. Once the problem was identified, all parties worked together to find an alternative that would be acceptable to all in a timely manner. In addition, no one on the team had ever been involved with a revision to a ROD of any kind, so the process of preparing an ESD was new to everyone. The team approach was a significant factor in the ultimate success of this project.

Although the team members all realized that there were provisions for amending a ROD in the NCP, in preparing the ESD we realized that we had tended to view RODs as unchangeable - fixed forever, no matter what circumstances may arise. However, we all learned a valuable lesson that RODs are not carved in stone; with sufficient justification and documentation, they can be modified when appropriate.

SECTION VI: IF WE HAD TO DO IT OVER AGAIN

Selection of remedial goals is rarely easy. In this case the original level was selected in order for the remedial alternative to be protective of both human health and the environment. In the absence of specific guidance regarding ecological risk, a protective level was chosen from relevant existing guidance. The original level specified was not thought to be much of an issue in terms of remedial cost because the RI results indicated that the contamination was concentrated in hot spots, with relatively abrupt transition to clean areas. Had the additional screening work that was eventually done during the RA phase been performed during the FS instead, a more accurate assessment of the areas of contamination could have been made, avoiding the budgetary surprise that initiated the re-evaluation of the remedial goal. In addition, the screening would have shown that a significant area of only slight contamination existed, which could have helped guide the selection of remedial goals for the original ROD, avoiding the need for an ESD.

SECTION I: SITE INFORMATION

SITE/LOCATION: Groundwater at site 204 (old site F) NSB Bangor, WA

DESCRIPTION: Demil (washout) of ordnance into a 50' dia unlined lagoon

CONTACT: Gerry Reiger, EFA NW, 360 396 0063 DSN 744

TECHNOLOGY: Pump & Treat w/GAC

CONTAMINANTS: RDX, TNT, DNT, Nitrate

CONCENTRATION: 1300 ppb RDX; 460 ppb TNT; 5.23 ppb DNT; 17 ppm Nitrate

ACTION LEVELS: 0.8 ppb RDX in groundwater from applying criteria in State of WA Model Toxics Control Act. RDX is a suspected carcinogen. Remediating RDX to the required limit will capture other contaminates as well.

LEGAL DRIVER: CERCLA, NPL, NCP, FFA,

DECISION DOCUMENT: ROD

SECTION II: EXPERIENCES ENCOUNTERED

Demilitarization of ordnance by washing explosive out of shell casings occurred through the early 70s. Wash water from three buildings went to a small pond that overflowed down a 200 foot ditch. During the 70s & 80s, soil and groundwater contamination was characterized. A plume 3/4 of mile long and up to a 1/2 mile wide has reached a shallow aquifer at a depth of 50 to 100 ft. below ground surface. No contamination has been found in a discontinuous deep aquifer. A fixed price RI/FS was solicited in 1991 to limit firms to those with ordnance experience. FS recommended treatment with ultra violet light/ozone oxidation. NFESC (formerly NCEL) assisted by conducting bench and on-site, pilot treatability studies in 1992-93 financed through the NAVFAC R&D program. NFESC was able to retain expertise of the same RI/FS contractor under a different contract instrument which maintained continuity.

UV/ox was preferred due to complete destruction of contaminant. No one offered regeneration of ordnance contaminated GAC at the time. GAC would have to be landfilled thus transferring contamination. However, UV/ox was untried at necessary flow rates and process by-products had to be identified. Result showed UV to work; cost was slightly below GAC including disposal. At the same time, manufacturers of GAC began to offer return of GAC, having perfected a thermal regeneration system. The UV decision was reversed in 1994 in favor of known effective GAC which now included total contaminate destruction at a lower cost than UV oxidation.

Treated water is reintroduced downgradient of the plume as a contaminant barrier. WA State code requires permits and testing for reinjection since it implies introduction of contaminants. The potable quality water pumped back in the ground is therefore said to be reintroduced to avoid administrative burden of dealing with a "reinjection" system.

Placement of extraction wells has been based on a three dimensional flow model. Sensitivity is such that slight changes in input have indicated large variations in where to place wells. Contractor desire to manipulate the model to try to achieve perfect well placement has to be balanced against the need to stop studying and get on with remediation.

SECTION III: REGULATORY REQUIREMENTS/COMMUNITY INVOLVEMENT

An interim ROD was signed in 1991 calling for UV oxidation. It was a triumph for an innovative technology and the people who explained it to the regulators and public in hearings and TRC meetings. When, for cost reasons, the technology of choice was changed, the Navy had to submit an explanation of significant differences but not a full amendment of the ROD. Since technology and not the total concept was the only change, the formality was not difficult and a final ROD calling for GAC was signed in 1994.

RI/FS risk assessment based the Reasonable Maximum Exposure scenario on drinking the most contaminated well water even though the shallow aquifer is not used for water supply.

SECTION IV: OPTIONS CONSIDERED/COST AVOIDANCE

UV oxidation based on some preliminary work at NOS Indian Head and elsewhere appeared to offer potential for a state-of-the-art solution. An intense scientific and economic study followed, but the UV oxidation could not compete with the cost of the more well known carbon adsorption technology once regeneration was offered. GAC is estimated to be \$1.3M less expensive than UV/ox over a projected 10 to 30 year operation.

SECTION V: WHAT WORKED WELL:

Trying different things until we got it right. A strong partnering and dialog between Navy, regulators and community allowed trying of a new method. The interface with the R&D program, though shaky at times, offered an alternative financing for study and brought more scientific creditability to the overall project. When ROD change needed to be made it was routine because trust had been established.

SECTION VI: IF WE HAD IT TO DO OVER AGAIN

Interim ROD was pushed by EPA and agreed to by Navy before it was certain which way we would go. It's better to wait on ROD until certain, if possible, to save on transaction costs. Many different people were involved in a complex project over some 5 years. A good simple record keeping system would have been helpful.

SECTION I: SITE INFORMATION

SITE/LOCATION: Site 11, PSNS, Bremerton, WA

DESCRIPTION: TPH Contamination for two circa 1915 underground storage tanks (5 million gallon each).

CONTACT: Bill Schrock, EFA NW, 36O-396-0055, DSN 744-0055

TECHNOLOGY: Steam Sparging followed by in-situ bioremediation.

CONTAMINANTS: #5 and #6 Fuel Oil, diesel

CONCENTRATIONS: 40,000 ppm oil; 88,000 ppm diesel

LEGAL DRIVER: CERCLA NPL

DECISION DOCUMENT: Action Memorandum with EE/CA

SECTION II: EXPERIENCES ENCOUNTERED

Site 11 consists of two abandoned 5 million gallon underground storage tanks and one active 2 million gallon above ground storage tank. The tanks were field constructed between 1910 and 1915 in a steep ravine that drains into Puget Sound. During the Site Inspection five monitoring wells were installed that estimated approximately five feet of floating product on the groundwater at a depth of 105 feet bgs.

The state of Washington issued an enforcement order in 1992 requiring the Navy to conduct an RI/FS at the site starting in May 1993. The Navy decided to proceed with a "presumptive" remedy. The Navy presented the existing site information to the RAC contractor, Ebasco Environmental, and requested what technologies appeared to have the greatest likelihood of success. The RAC evaluated the existing information and due to the viscosity of the contaminant and the depth that which it was located, steam sparging presented the greatest potential for success. The Navy took this recommendation and presented it to the regulatory agencies for their buy-in. The Navy packaged the proposal as a demonstration program on a small portion of the site to be conducted under the Navy's removal action authority. The agency buy-in was critical since we wanted to postpone and potentially eliminate the RI/FS process. Agency buy-in was received and the RAC proceeded with the preparation of work plans for the demonstration program and bench scale testing. As part of the demonstration program, nature and extent data are being collected by the use of Vertical Induction Profiling (VIP) that is non-intrusive and provides 3-D results at a fraction of the cost of drilling. The demonstration program is slated for start-up in December 1995.

SECTION III: REGULATORY REQUIREMENTS/COMMUNITY INVOLVEMENT

The state is the lead regulatory agency for this NPL site and are very anxious for cleanup to be conducted rather than studying sites. This made the selling of the concept easier. Conducting the demonstration program as a removal action reduces both the administrative work required and also reduces the amount community involvement activities required. This does not mean the community is ignored, just that mandatory review periods were not necessary. Pending successful completion of the Demonstration Program, a ROD will be written that incorporates the results of the demonstration program, VIP study, and bench scale treatability tests.

SECTION IV: OPTIONS CONSIDERED/COST AVOIDANCE

The Navy and RAC evaluated approximately ten different alternatives for remediation of the site. The RAC previously performed steam sparging at a site in Virginia and California. At the Virginia site, three different alternatives (steam injection, hot water injection, and hot air injection) were evaluated and results of each technology were compared. Steam injection was clearly the best performing alternative.

Although steam sparging will not effectively remove all contamination from the site, it will remove the bulk of the contaminants and bioremediation is being evaluated as a polishing action to achieve final cleanup action levels. Another cost saving aspect was the availability of steam on-site.

SECTION V: WHAT WORKED WELL

The utilization of the RAC to develop the work plans and follow-on construction provided for continuity that would have normally been lacking on a project like this.

Having a clear understanding of what is important to your regulators prior to embarking on a project like this is critical. Our knowledge that the agencies were high on construction verse study enabled us to convince them up front that this was the best way to approach this site.

Conducting the initial phases of the project as a non-time critical removal action enabled the Navy and the RAC to make all decisions concerning the work plan development. Agencies were only given informational copies of the work plan as it was being developed which saved time and resources during review periods.

SECTION VI: IF WE HAD TO DO IT AGAIN

More long term planning up-front would have been useful. The original focus was only on conducting the demonstration project as a removal action and not much planning was considered beyond that. As the project has evolved and the likelihood of success has increased, detailed planning for how to get to the ROD has occurred. If this had been given more careful thought from the beginning, some data that may be critical to the execution of the ROD could have been gathered during the demonstration program.

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