

ENVIRONMENTAL OFFICE  
NAVAL TRAINING CENTER  
33502 DECATUR ROAD, SUITE 120  
SAN DIEGO, CA 92133-1449

RESTORATION ADVISORY BOARD

AGENDA

**DATE:** Tuesday evening, 28 June 1994

**TIME:** 6:30 - 8:30 PM

**LOCATION:** NAVAL TRAINING CENTER, PUBLIC AFFAIRS OFFICER  
(PAO) AUDITORIUM, BUILDING #201  
(Enter NTC Gate 1 at Lytton and Barnett; maps to building will be  
available from guard)

**6:30 -7:00** WELCOME AND INTRODUCTIONS

BRIEF OVERVIEW - Agenda and Meetings Objectives

MINUTES APPROVAL - May 24 and June 14

RAB CHARTER

PROCEDURES FOR COMMENT ON DOCUMENTS

**7:00 -8:15** PROPOSED SITE CLEANUP TASKS AT  
NTC LANDFILL

**8:15- 8:30** QUESTION AND ANSWER/PUBLIC COMMENT PERIOD

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**Subject: RESTORATION ADVISORY BOARD MEETING MINUTES**

The eighth Restoration Advisory Board (RAB) meeting was held on **Tuesday, June 28, 1994**, at the Naval Training Center (NTC), PAO Auditorium #201 from 6:33 until 8:30 PM.

Mr. Phill Dyck, RAB Navy Co-Chair, called the meeting to order at 6:33 PM. The RAB members, Navy project team, and regulators introduced themselves. The evening's agenda included minutes approval, discussion of the RAB Charter and procedures for comment of documents, and a technical presentation.

**Business Items**

- **Approval of Minutes** - It was moved and seconded to approve the minutes from the meeting of May 24, 1994; the motion was carried. It was moved and seconded to approve the minutes of the June 14, 1994, meeting. The motion was carried with one member abstaining.

**RAB Charter** - The revised RAB Charter was provided as a handout. Mr. Jim Durbin, RAB Community Co-Chair, asked that it be looked over and approved for signing, as all the RAB comments had been taken and final changes made. After some time for review, a motion was made to approve the Charter as it appeared; it was seconded and carried. Mr. Durbin thanked his fellow members of the Charter subcommittee, Louie Guassac, Laura Hunter, and Dave Tocki, for their time and effort.

- **Procedures for comment on documents** - Mr. Durbin indicated that as many people should be involved in the process of document review as possible and recommended subcommittees in order to effectively review documents. The RAB has stabilized at about twenty diligent members who regularly attend meetings. Following some discussion and uncertainty about expectations for review comments, Mr. Faiq Aljabi, Environmental Engineer for Southwest Division, gave a brief overview of what constitutes a work plan under the CERCLA process.

A project begins with a draft work plan, a document which guides the work as it proceeds and which is forwarded to regulators for review. After comments are received and approval is given, the draft is finalized. The final work plan is followed and findings of completed work and compiled data are presented in a draft Preliminary Assessment (PA) report. The draft report is forwarded to regulators, and in this case also

to the RAB, for review and comment. A report becomes final when all comments are considered and regulators approve the findings and recommendations. If contamination has been found, work ultimately proceeds to Remedial Action, which follows the same format (draft and final). He also explained that the PA information that was presented to the RAB on June 14, 1994, followed this format and when the RAB receives the document, it will be in the form of a draft PA report.

Procedures for comments and the 30-day review period were revisited. Since the RAB wants the regulators to have RAB comments to review when the regulators receive the documents, it was apparent that the RAB would have only 2 weeks for review. Mr. Durbin reminded the RAB that it may have to spend additional evenings reading documents or in subcommittees.

Mr. Durbin proposed that since the first document for RAB review would be available on July 26, 1994, the next meeting should be a training seminar for document review. Following discussion, the RAB decided that because some RAB members are knowledgeable of such documents and their contents, they should provide the training themselves. RAB member Mr. John Walton agreed to present information at the July 12 RAB meeting addressing contents of a Preliminary Assessment, which is the document the RAB will receive first.

## **PRESENTATION ON PROPOSED SITE CLEANUP TASKS AT NTC LANDFILL SITE**

Mr. Dyck introduced the speaker for the evening, Dr. Bong Kown, Technical Manager for Bechtel's CLEAN II Program. Dr. Kown's role is as technical reviewer on all contract task orders that Bechtel receives from the Navy on the CLEAN II project. Dr. Kown's presentation began with a history of CERCLA and Superfund and was supplemented with overheads and handouts.

In the 1950s environmental problems were not an major public issue. In the late 1960s and early 1970s, discharge of untreated wastewater and air pollution became a nationwide concern; people used to burn their trash in incinerators. In the late 1970s a new environmental concern surfaced in the form of past hazardous waste. During the 1940s, 1950s, and 1960s, hazardous wastes were typically put in the ground and covered over. Love Canal was a prime example of buried hazardous waste problems, as hazardous materials were disposed of in a landfill, covered up, and a housing development was built on top. The inhabitants of this development became very sick. Much of this area is still uninhabited.

In Hackensack, New Jersey, thousands of hazardous waste-filled drums were stored in one area for lack of a better place to put them. These drums caught fire and burned for three days. Had the wind blown toward Manhattan instead of the ocean, a large population would

have been affected. Hundreds of these hazardous storage sites were discovered throughout the country. As a result of this, in 1980 Congress enacted a law to address this problem: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It was to take five years to identify and cleanup all hazardous waste sites in the United States. A fund of \$1.6 billion was set up for the project and was thus nicknamed "Superfund". Unfortunately, by the time the five years were up, it was evident that the problem was much bigger than anyone realized. In 1986 Congress enacted the Superfund Amendments and Reauthorization Act (SARA).

As one of the Superfund requirements, the USEPA promulgated the National Oil and Hazardous Substances Pollution Contingency Plan, or the National Contingency Plan (NCP). The NCP is intended to provide organizational structure and procedures for cleanup of hazardous waste sites. The NCP has 11 subparts. Within those, subpart E: Hazardous Substance Response is the most relevant to tonight's presentation. Subpart E includes §300.410: Removal Site Evaluation, §300.420: Remedial Site Evaluation, §300.430: Remedial Investigation/Feasibility Study (RI/FS) and Selection of Remedy, and §300.435: Remedial Design/Remedial Action (RD/RA).

Under the NCP process there are two ways to clean up hazardous waste sites: removal action response and remedial action response. Remedial action was the common approach during the last 14 years. This remedial action process is complex and long-term.

For remedial action, the NCP requires that it go through PA/SI, RI/FS, ROD, and RD/RA. A Preliminary Assessment (PA) reviews all existing data on a site to determine whether or not a release or suspected release of hazardous materials has occurred. If a release has occurred, a Site Inspection (SI) is conducted and field sampling is done. If the samples show hazardous material contamination, an RI/FS is conducted. This is the phase that is the most time consuming. A hazardous waste site may include threats to health through air emissions, soil contamination, surface water contamination, ground water contamination, etc. An RI/FS requires that *all* health threats be determined and that a range of remedies for each health threat be addressed. The RI/FS phase can take seven years or more. The RI/FS is followed by a Record of Decision (ROD), RD/RA, and Operation and Maintenance (O&M). O&M may include perpetual monitoring.

In summary, remedial action must address all threats, provide permanent and complete remedy, and review comprehensive technology and alternative evaluation. It also requires that a Baseline Risk Assessment and Treatability Study be conducted, and a Field Study Plan (FSP), Quality Assurance Project Plan (QAPP), Investigation-Derived Waste Management Plan (IDWMP), and Health and Safety Plan (H&SP) be developed for the SI and RI. A remedy must be selected by ROD and *all* health threats must be addressed. This process is extremely in-depth, expensive, and time consuming.

On the other hand, removal action is a new approach which can shorten cleanup time and save money while reducing risks to health. Removal Site Evaluation involves three steps: Extended Site Inspection (ESI), Baseline Risk Assessment (BRA), and Engineering Evaluation/Cost Analysis (EE/CA). The NCP requires that this response also begin with the PA/SI. After that, the process continues with the ESI, followed by the BRA, EE/CA, removal design, and removal action.

As opposed to remedial action, removal action may address *part* or all of the threats, allowing for a minimization of health risks more or less immediately. Focused alternative evaluation replaces studying all types of technologies. If a similar site uses a remedy that has proved efficient, it can be employed directly. Where remedial action requires BRA and Treatability Study, removal action *may* include them. Though this may seem like a way to avoid completing cleanup, it really speeds it up. Removing what can be removed immediately and leaving some for later eliminates most of the health risks right away. Overall, removal action is a faster, more efficient form of cleanup.

What the Navy/Bechtel team is proposing is very similar to USEPA's Superfund Accelerated Cleanup Model (SACM) Program for expediting cleanup of hazardous waste sites. The SACM Program divides cleanup response into early and long-term actions. Early actions can last between three to five years, while long-term actions may take over 5 years.

The removal action at the NTC landfill site will involve three major tasks: ESI, BRA, and EE/CA. The ESI collects all information to define the source, nature, and extent of contamination, and will identify the pathways of exposure. The BRA identifies the chemicals of concern (COCs), toxicity levels, exposure levels, and risk characterization. The EE/CA determines the removal objectives and removal alternatives (identification and analysis), e.g., capping the site, removing the contaminants, etc. It includes a comparative analysis of alternatives as well as the recommended and selected removal method.

Dr. Kown provided articles to supplement his presentation: *Early Action and Long-Term Action Under the Superfund Accelerated Model (SACM)*, USEPA, September 1993; *Presumptive Remedy for CERCLA Municipal Landfill Sites, a Quick Reference Fact Sheet* (Draft) EPA, September 1992; and the cover page of a large document entitled, *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA* (Final Revised Draft), Office of Emergency and Remedial Response, USEPA, 26 May 1993. Mr. Dyck said that he would provide this last document for the Information Repository in the near future.

Mr. Dyck thanked Dr. Kown for an informative presentation and adjourned the meeting at 8:30.

# **PRESENTATION TO NTC RESTORATION ADVISORY BOARD**

## **PROPOSED SITE CLEANUP TASKS AT NTC LANDFILL SITE**

- **EXTENDED SITE INSPECTION (ESI)**
- **BASELINE RISK ASSESSMENT (BRA)**
- **ENGINEERING EVALUATION/  
COST ANALYSIS (EE/CA)**

## ACRONYMS/ABBREVIATIONS

AM	Action Memorandum
BRA	Baseline Risk Assessment
CERCLA COC	Comprehensive Environmental Response, Compensation, and Liability Act Chemical of Concern
EE/CA ESI	Engineering Evaluation/Cost Analysis Extended Site Inspection
FSP	Field Study Plan
H&SP	Health and Safety Plan
IDWMP	Investigation-Derived Waste Management Plan
NCP NTC	National Contingency Plan Naval Training Center
O&M	Operation & Maintenance
PA/SI PRP	Preliminary Assessment/Site Inspection Potentially Responsible Party
QAPP	Quality Assurance Project Plan
RAB RD/RA RI/FS ROD	Restoration Advisory Board Remedial Design/Remedial Action Remedial Investigation/Feasibility Study Record of Decision
SACM SARA SI	Superfund Accelerated Cleanup Model Superfund Amendments and Reauthorization Act of 1986 Site Inspection
TS	Treatability Study

# **NTC-RAB PRESENTATION**

**LAW: CERCLA/SARA**

**REGULATION: NCP**

**RESPONSE TYPES: REMEDIAL & REMOVAL**

**PROBLEM/**

**DIFFICULTY: REMEDIAL ACTION**

**NEW APPROACH: REMOVAL ACTION**

**REMOVAL ACTION: ESI, BRA, EE/CA**

**COMPREHENSIVE ENVIRONMENTAL RESPONSE,  
COMPENSATION, AND LIABILITY ACT  
OF 1980 (CERCLA)**

**SUPERFUND AMENDMENTS AND  
REAUTHORIZATION ACT OF 1986 (SARA)**

**“TO IDENTIFY AND CLEANUP  
HAZARDOUS WASTE SITES”**

# **CERCLA/SARA**

- **RELEASE REPORTING REQUIREMENT**
- **RESPONSE AUTHORITIES**
- **NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN (NCP)**

## **ORGANIZATIONAL STRUCTURE AND PROCEDURES FOR SITE CLEANUP UNDER CERCLA/SARA REQUIREMENTS**

- **LIABILITY**
- **PUBLIC PARTICIPATION**
- **CLEANUP STANDARDS**

## **NATIONAL CONTINGENCY PLAN (NCP)**

- **PROVIDE ORGANIZATIONAL STRUCTURE AND PROCEDURES FOR CLEANUP OF HAZARDOUS WASTE SITES**
- **SUBPART E: HAZARDOUS SUBSTANCE RESPONSE**
  - 300.410: REMOVAL SITE EVALUATION**
  - 300.420: REMEDIAL SITE EVALUATION**
  - 300.430: REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) AND SELECTION OF REMEDY**
  - 300.435: REMEDIAL DESIGN/REMEDIAL ACTION (RD/RA)**

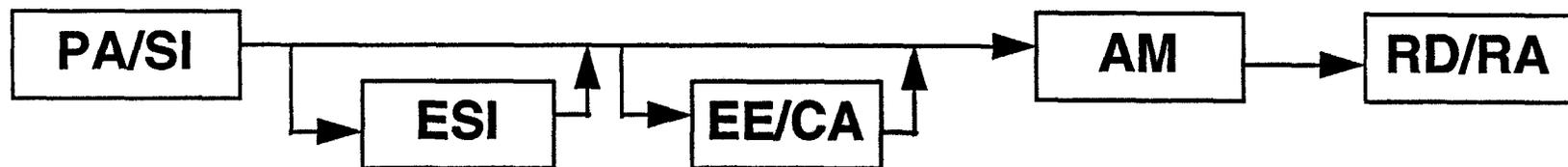
# NCP REQUIREMENTS FOR SITE CLEANUP UNDER CERCLA/SARA

RESPONSE TYPES: REMOVAL ACTION &  
REMEDIAL ACTION

## REMEDIAL ACTION:



## REMOVAL ACTION:



# **NCP REQUIREMENTS FOR REMEDIAL & REMOVAL ACTION**

## **REMEDIAL ACTION**

- ADDRESS ALL THREATS
- PROVIDE PERMANENT/ COMPLETE REMEDY
- COMPREHENSIVE TECHNOLOGY & ALTERNATIVE EVALUATION
- REQUIRE BASELINE RISK ASSESSMENT & TREATABILITY STUDY

## **REMOVAL ACTION**

- ADDRESS PART OR ALL OF THREATS
- MAY MINIMIZE OR ELIMINATE RISK
- FOCUSED ALTERNATIVE EVALUATION
- MAY INCLUDE BRA & TS

# **NCP REQUIREMENTS FOR REMEDIAL & REMOVAL ACTION**

(continued)

## **REMEDIAL ACTION**

- FSP, QAPP, IDWMP, H&SP  
REQUIRED FOR SI AND RI
- REMEDY SELECTION BY ROD
- PA/SI ADDRESS ALL THREATS

## **REMOVAL ACTION**

- FSP, QAPP, IDWMP, H&SP  
REQUIRED FOR SI AND ESI
- REMOVAL METHOD  
RECOMMENDED
- PA/SI MAY ADDRESS PART  
OR ALL OF THREAT

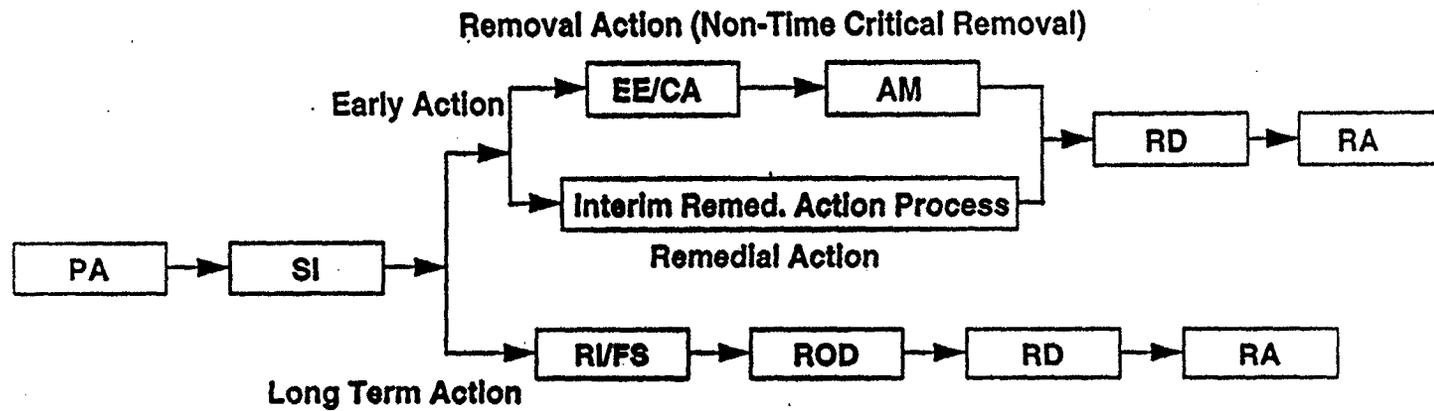
**Remedial Action Process**



**Removal Action Process**



**SACM (Superfund Accelerated Cleanup Model)**



## **EPA SUPERFUND ACCELERATED CLEANUP MODEL (SACM) PROGRAM**

- TO CLEANUP MORE TIMELY AND EFFECTIVELY
- TO EXPEDITE CLEANUP BY DIVIDING RESPONSE INTO EARLY AND LONG-TERM ACTIONS
- EARLY ACTION (3-5 YEARS):
  - TIME-CRITICAL & NON-TIME CRITICAL REMOVAL ACTION
  - INTERIM REMEDIAL ACTION
- LONG-TERM ACTION (OVER 5 YEARS):
  - REMEDIAL ACTION

# **NTC LANDFILL CLEANUP WORK TASKS**

**ESI**

**BASELINE RISK ASSESSMENT**

**EE/CA**

**ESI**

- SITE BACKGROUND
- SOURCE, NATURE, AND EXTENT OF CONTAMINATION
- PATHWAYS

# **NTC LANDFILL CLEANUP WORK TASKS**

(continued)

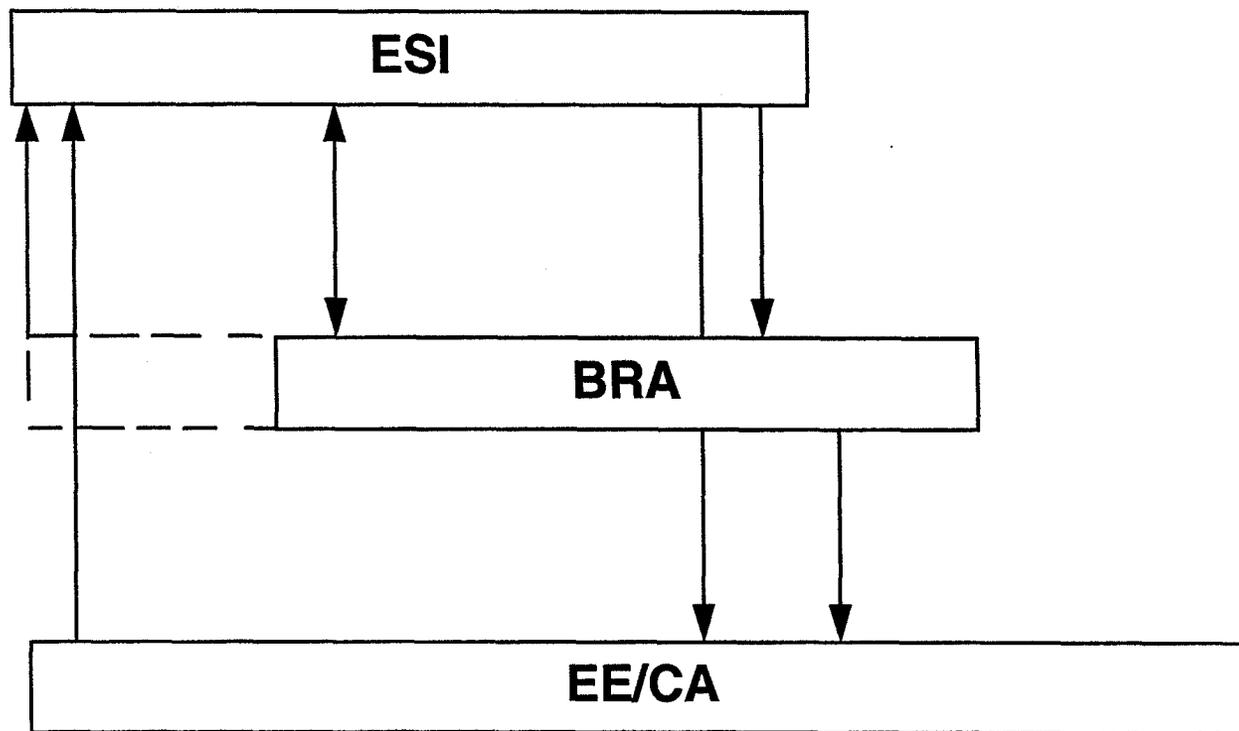
## **RISK ASSESSMENT**

- CHEMICALS OF CONCERN
- TOXICITY
- EXPOSURE
- RISK CHARACTERIZATION

## **EE/CA**

- REMOVAL ACTION OBJECTIVES
- REMOVAL ACTION ALTERNATIVES  
(IDENTIFICATION AND ANALYSIS)
- COMPARATIVE ANALYSIS OF ALTERNATIVES
- ALTERNATIVE RECOMMENDATION

# NTC LANDFILL CLEANUP WORK FLOW





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# Early Action and Long-Term Action Under the Superfund Accelerated Cleanup Model (SACM)

Superfund Revitalization Activity  
Office of Emergency and Remedial Response  
Office of Waste Programs Enforcement

Intermittent Bulletin  
Volume 1 Number 2

The purpose of the Superfund Accelerated Cleanup Model (SACM) is to make hazardous waste cleanups more timely and efficient. This will be accomplished through more focus on the front end of the process and better integration of all Superfund program components. The approach involves:

- A continuous process for assessing site-specific conditions and the need for action.
- Cross-program coordination of response planning.
- Prompt risk reduction through early action (removal or remedial).
- Appropriate cleanup of long-term environmental problems.

SACM will operate within the existing statutory and regulatory structure. Overall Superfund priorities remain the same: deal with the worst problems first, aggressively pursue enforcement opportunities, and involve the public at every stage of the work.

## Early Actions and Long-Term Actions

SACM envisions two types of actions within current removal and remedial authorities, as a means of expediting Superfund cleanups. These actions are classified as "early actions" and "long-term actions." Early actions may achieve prompt risk reduction conducted either under removal authority (emergencies, time-critical and no-time critical removals) or under remedial authority (early or interim remedial actions). Long-term actions are intended to achieve risk reduction through more extensive site remediation activities that fall outside the more limited scope of early actions such as restoration of surface and ground-water resources.

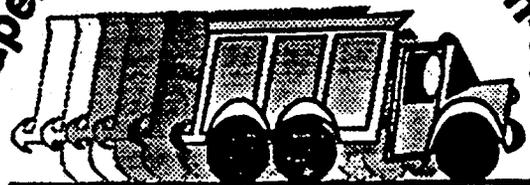
The site strategy should take into consideration all of the response authorities and enforcement tools available to devise an overall plan that ensures community and state involvement, and achieves program goals consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). In situations where an emergency or time-critical response is warranted, established removal mechanisms will continue to be used. (A fundamental tenet of SACM is that the

current effective removal process will not be impeded.) In less compelling situations, non-time-critical removal actions or early remedial actions may be used to accomplish early risk reduction. Long-term actions using remedial authority should be retained for sites requiring extensive source control surface or ground-water remediation or operation and maintenance activities. SACM is expected to result in an increase of early risk reduction activities at both National Priorities List (NPL) and non-NPL sites.

## Early Actions

Early actions are responses performed under removal or remedial authority that eliminate or reduce public health or environmental threats from the release, or potential release, of hazardous substances. These risk reduction activities can be conducted as emergency responses, time-critical or non-time critical removal actions, or as early or interim remedial actions. In some cases, more than one early action, performed under removal and/or remedial authority, may be conducted during the course of mitigating the threat at a site. Site specific circumstances will dictate the most appropriate response action to take. Exemptions from time and dollar limits for Fund-financed removal actions must be justified.

**Superfund Accelerated Clean-up**



*Faster... Cleaner... Safer*

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Issues such as contract ceiling capacities, applicable or relevant and appropriate requirements (ARARs), intramural resources, future remedial actions and state or community involvement should be considered in deciding on the benefits or proceeding with a removal versus a remedial action.

Under SACM, the number of non-time-critical removal actions will increase as greater emphasis is given to early risk reduction. Non-time-critical removals require a more rigorous planning process than time-critical removals. The additional NCP requirements for non-time-critical removal actions (versus time-critical) prior to initiation of on-site activities are:

1. develop and evaluate removal alternatives in an engineering evaluation/cost analysis (EE/CA),
2. publish a notice of availability of the administrative record with a brief description of the EE/CA,
3. Provide not less than a 30-day comment period of the Administrative Record file (with an optional 15-day extension upon request) after completion of the EE/CA,
4. respond to significant comments, and
5. develop a sampling and analysis plan (if applicable).

In addition, non-time-critical removal actions will include an appropriate analysis of risk and will give priority consideration to treatment alternatives. (Guidance for conducting non-time-critical removals will be published in the fall of 1992.) The public participation and removal alternatives analysis requirements for non-time-critical removals will serve to highlight the SACM objectives of accelerating risk reduction while ensuring significant public involvement.

The alternatives evaluation of non-time-critical removal actions, while not as detailed as one in a remedial Feasibility Study, is expected to result in similar remedies and cleanup goals. This evaluation process in both EE/CAs and RI/FSs may be enhanced by the presumptive remedy/technology-based standard initiative now being pilot-tested.

In certain circumstances it may be more appropriate to conduct early actions at NPL sites using remedial rather than removal authority via actions or early remedial actions. This may be true for sites already far down the remedial pipeline, sites outside the scope (technical and/

or financial) or authority of removal actions, or sites where state cost share and O&M requirements are required. These expedited remedial actions can be conducted using several contractual options which include site specific contracts, rapid remedial response provisions of the Emergency and Rapid Response Services (ERRS) (formerly ERCS) contracts, Alternative Remedial Contracting Strategy (ARCS) or accelerated contracting mechanisms accessible through the U.S. Army Corps of Engineers (USACE) or the Bureau of Reclamation.

Some sites that are comprehensively addressed under early actions prior to initiation of the remedial site investigation may not require listing on the NPL as a result of those cleanup activities. It is critical that removal actions conducted at non-NPL sites take into consideration the potential for future NPL listing to ensure consistent goals are achieved, where practicable. Specifically, ARARs compliance, data quality objectives and risk assessment goals have historically differed between removal and remedial programs. Reconciling these differences when conducting early actions is an important step in eliminating the necessity for future response actions after NPL listing.

## Long-Term Actions

Long-term response actions are ones that have high costs and are expected to take more than 3-5 years to complete. The amount of time it takes to implement a remedy may be impacted by the need to do extensive site characterization, or the nature of the remedy required to address the contamination. Such long-term response actions will address risk reduction that may still exist at a site, once immediate threats have been addressed (e.g., through removal actions, early or interim remedial actions, etc.).

The majority of current NPL sites involve some long-term response actions. Most ground-water remediation efforts, many surface water remediation efforts, and most large-scale soil remediation efforts would be expected to take in excess of 3-5 years to complete or be outside the financial scope of a removal action. In addition, remedies that require extensive, ongoing operations and maintenance efforts would be expected to fall into the long-term response category, even though they may have an integrated early action component.

Identification of a remedial activity as long-term response action does not mean that action can or will be deferred. This work can be conducted as an interim or early remedial action using various contracting vehicles. In many cases, a quick start to the long-term response action will be neces-

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sary to prevent site conditions from deteriorating (e.g., containment of a ground-water plume). The initiation of a long-term response action, as an early action, to achieve prompt risk reduction is a key component to the SACM initiative.

### **Response Selection Factors**

The Regional Decision Teams (RDT) are responsible for evaluating possible ways to respond to a site. The RDT should consider several factors in determining the suitability and scope of early versus long-term actions. Some of those factors to be considered are:

- **Timing** — Early actions should generally address discrete pieces of a site that require, or are amenable to, a fairly rapid response. Projects which are expected to take longer than 3-5 years to initiate and complete should generally be conducted as long-term actions using remedial action authority. If the construction can be done quickly, but there is extensive operation and maintenance requirements to ensure the reliability of the response, then this also should be considered a long-term action. The action may, however, have both an early action and a long-term action component.
- **Cost** — There is no maximum dollar cap on the cost of early actions, although Fund-financed removal actions will have to meet applicable 12-month and/or \$2 million statutory exemption criteria. Regions must consult with Headquarters prior to taking an early action using removal authority, which is estimated to cost more than \$10 million, or for any early action that will require funding beyond what the Region has in its allowance. Regions are also strongly urged to discuss with Headquarters any situations which present particularly difficult issues or may be controversial with state or other interested parties.
- **Enforcement** — The "Enforcement First" policy in Superfund should continue to be aggressively pursued under SACM. The Regions should take appropriate enforcement measures consistent with both removal and remedial policy and guidance. This includes, but is not limited to, conducting potentially responsible party (PRP) searches, issuing notice letters, and negotiating with PRPs to conduct an action through the use of administrative orders (unilateral or consent) or consent decrees. The minimum 6-months planning time available prior to initiation of non-time-critical removal actions may allow time for

more comprehensive PRP searches and subsequent negotiated cleanups as compared to time-critical removal actions. An administrative record must be promptly established for each site as required in the NCP.

- **State Involvement** — To the extent that time allows, an early action should be coordinated with the state. Early actions, using removal action authorities, are not intended as a means to avoid meeting state ARARs or remedial cost share requirements. When a state does not make a financial contribution for an extensive Fund-lead non-time-critical removal action, the RDT must determine the urgency of the situation before starting such an action. Response actions taken under remedial action authority will comply with established procedures for state involvement including, securing state assurances for Fund-financed remedial actions.
- **ARARs Compliance** — The NCP requires ARARs to be met during removal actions to the extent "practicable" given the urgency and the scope of the action. The minimum 6-months planning time prior to initiating non-time-critical removal actions will generally allow ARARs to be identified and factored into the decision making process. The extent to which ARARs are complied with during removal actions may have a direct effect on the extent of and need for future remedial actions.
- **Public Involvement** — Early and frequent involvement with the public will be pivotal to the success of expediting cleanups under SACM. All applicable community relations requirements in the NCP must be met at removal and remedial actions. In the process of expediting cleanups, site managers should make sure the public has an opportunity for meaningful input and that their concerns are considered. As community interest and awareness increases, it may be appropriate to conduct additional community relations activities beyond those required in the NCP.
- **Risk Management** — When making risk management decisions for early actions it is important that potential response actions be considered. Cleanup goals often differ between removal and remedial programs. It is important that the RDT be aware of the potential for NPL listing and subsequent remedial actions in order to achieve consistent risk goals, where practical. For example, when performing a source removal to mitigate a direct contact threat at a

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site that also has a ground-water threat, it may be prudent to removal additional soil contaminants consistent with projected ground-water cleanup goals. This could eliminate the need for additional source control actions during future response actions. Furthermore, it could reduce the ongoing release of contaminants to ground water, thereby reducing the time required for ground-water pump and treat activities.

- **Contracting Mechanism** — Available contracting vehicles and capacities will affect the strategy for conducting both early and long-term actions. Contract mechanisms potentially available are ERRS, ARCS, Technical Enforcement Services (TES), USACE, Bureau of Reclamation, site specific contracts (including Pre-Qualified Offerors Procurement Strategy (PQOPS) contracts for incineration and solidification). The time and resources necessary to procure and administer these contracts, and the individual contract capacities, where applicable, are factors to consider when evaluating response options.

- **Data Quality Objectives** — When performing site assessment activities, appropriate data quality objectives should be used for decisions in support of removal and/or remedial actions. Historically, there have been differences in QA/QC requirements and targeted media (i.e., wastes, ground water, soil, etc.) of sampling investigations performed in support of removal actions and remedial actions. As an element of SACM implementation, the RDT should ensure that sampling activities are not unnecessarily duplicated in support of removal and remedial actions. Site assessors may take advantage of lower costs and quicker turn around times of data with reduced QA/QC if an adequate number of samples are also collected that will meet all anticipated data uses. Sample collection and analysis activities per-

formed during removal actions should be coordinated such that the data generated will also support NPL listing and remedial actions, as appropriate.

## Selecting a Response

A primary function of the RDT is to weigh what is known about a site and determine those actions which address the threats in a timely and efficient manner. The RDT should consider all of the response options available, state and community concerns, and the need for future action before initiating a response. The following table shows the type of activities generally considered to be either early actions and/or long-term actions.

Early Action	Either	Long-Term Action
Access Restrictions Source Removals/ Containment Surface Structures and Debris Treatability Studies	Source Remediation Capping/Containment Permanent/Temporary Relocation NAPL Source Extraction Ground Water Plume Containment/Cleanup Alternate Water Supply Property Acquisition	Extensive Source Remediation Restoration: Groundwater Surface Water

## Notice

The policies set out in this fact sheet are not final agency action, but are intended solely as guidance. They are not intended, nor can they be relied upon, to create and rights enforceable by any party in litigation with the United States. EPA officials may decide to follow this guidance provided in this fact sheet, or to act in variance with the guidance based on an analysis of site-specific circumstances. The Agency also reserves the right to change this guidance at any time without public notice.



# Presumptive Remedy for CERCLA Municipal Landfill Sites

Office of Emergency and Remedial Response  
Hazardous Site Control Division 5203G

Quick Reference Fact Sheet

Since Superfund's inception in 1980, the remedial and removal programs have found that certain categories of sites have similar characteristics, such as types of contaminants present, types of disposal practices, or how environmental media are affected. Based on information acquired from evaluating and cleaning up these sites, the Superfund program is undertaking an initiative to develop presumptive remedies to accelerate future cleanups at these types of sites. The presumptive remedy approach is one tool of acceleration within the Superfund Accelerated Cleanup Model (SACM).

Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. The objective of the presumptive remedies initiative is to use the program's past experience to streamline site investigation and speed up selection of cleanup actions. Over time presumptive remedies are expected to ensure consistency in remedy selection and reduce the cost and time required to clean up similar types of sites. Presumptive remedies are expected to be used at all appropriate sites except under unusual site-specific circumstances.

This directive establishes containment as the presumptive remedy for CERCLA municipal landfills. The framework for the presumptive remedy for these sites is presented in a streamlining manual entitled *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites*, February 1991 (OSWER Directive 9355.3-11). This directive highlights and emphasizes the importance of certain streamlining principles related to the scoping (planning) stages of the remedial investigation/feasibility study (RI/FS) that were identified in the manual. The directive also provides clarification of and additional guidance in the following areas: (1) the level of detail appropriate for risk assessment of source areas at municipal landfills and (2) the characterization of hot spots.

## BACKGROUND

Superfund has conducted pilot projects at four municipal landfill sites<sup>1</sup> on the National Priorities List (NPL) to evaluate the effectiveness of the manual *Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites* (hereafter referred to as "the manual") as a streamlining tool and as the framework for the municipal landfill presumptive remedy. Consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (or NCP), EPA's expectation was that containment technologies generally would be appropriate for municipal landfill waste because the volume and heterogeneity of the waste generally make treatment impracticable. The results of the pilots support this expectation and demonstrate that the manual is an effective tool for streamlining the RI/FS process for municipal landfills.

Since the manual's development, the expectation to contain wastes at municipal landfills has evolved into a presumptive remedy for these sites.<sup>2</sup> Implementation of the streamlining principles outlined in the manual at the four pilot sites helped to highlight issues requiring further clarification, such as the degree to which risk assessments can be streamlined for source areas and the characterization and remediation of hot spots. The pilots also demonstrated the value of focusing streamlining efforts at the scoping stage, recognizing that the biggest savings in time and money can be realized if streamlining is incorporated at the beginning of the RI/FS process. Accordingly, this directive addresses those issues identified during the pilots and highlights streamlining opportunities to be considered during the scoping component of the RI/FS.

<sup>1</sup>Municipal landfill sites typically contain a combination of principally municipal and to a lesser extent hazardous wastes.

<sup>2</sup>See EPA Publication 9203.1-02I, SACM Bulletins, *Presumptive Remedies for Municipal Landfill Sites*, April 1992, Vol. 1, No. 1, and February 1993, Vol. 2, No.1, and SACM Bulletin *Presumptive Remedies*, August 1992, Vol.1, No. 3.

Finally, while the primary focus of the municipal landfill manual is on streamlining the RI/FS, Superfund's goal under SACM is to accelerate the entire clean-up process. Other guidance issued under the municipal landfill presumptive remedy initiative identifies design data that may be collected during the RI/FS to streamline the overall response process for these sites (see Publication No. 9355.3-18FS, *Presumptive Remedies: CERCLA Landfill Caps Data Collection Guide*, to be published in October 1993).

## CONTAINMENT AS A PRESUMPTIVE REMEDY

Section 300.430(a)(iii)(B) of the NCP contains the expectation that engineering controls, such as containment, will be used for waste that poses a relatively low long-term threat or where treatment is impracticable. The preamble to the NCP identifies municipal landfills as a type of site where treatment of the waste may be impracticable because of the size and heterogeneity of the contents (55 FR 8704). Waste in CERCLA landfills usually is present in large volumes and is a heterogeneous mixture of municipal waste frequently co-disposed with industrial and/or hazardous waste. Because treatment usually is impracticable, EPA generally considers containment to be the appropriate response action, or the "presumptive remedy," for the source areas of municipal landfill sites.

The presumptive remedy for CERCLA municipal landfill sites relates primarily to containment of the landfill mass and collection and/or treatment of landfill gas. In addition, measures to control landfill leachate, affected ground water at the perimeter of the landfill, and/or upgradient ground-water that is causing saturation of the landfill mass may be implemented as part of the presumptive remedy.

The presumptive remedy does not address exposure pathways outside the source area (landfill), nor does it include the long-term ground-water response action. Additional RI/FS activities, including a risk assessment, will need to be performed, as appropriate, to address those exposure pathways outside the source area. It is expected that RI/FS activities addressing exposure pathways outside the source generally will be conducted concurrently with the streamlined RI/FS for the landfill source presumptive remedy. A response action for exposure pathways outside the source (if any) may be selected together with the presumptive remedy (thereby developing a comprehensive site response), or as an operable unit separate from the presumptive remedy.

Highlight 1 identifies the components of the presumptive remedy. Response actions selected for individual sites will include only those components that are necessary, based on site-specific conditions.

### Highlight 1: Components of the Presumptive Remedy: Source Containment

- Landfill cap;
- Source area ground-water control to contain plume;
- Leachate collection and treatment;
- Landfill gas collection and treatment; and/or
- Institutional controls to supplement engineering controls.

The EPA (or State) site manager will make the initial decision of whether a particular municipal landfill site is suitable for the presumptive remedy or whether a more comprehensive RI/FS is required. Generally, this determination will depend on whether the site is suitable for a streamlined risk evaluation, as described on page 4. The community, state, and potentially responsible parties (PRPs) should be notified that a presumptive remedy is being considered for the site before work on the RI/FS work plan is initiated. The notification may take the form of a fact sheet, a notice in a local newspaper, and/or a public meeting.

Use of the presumptive remedy eliminates the need for the initial identification and screening of alternatives during the feasibility study (FS). Section 300.430(e)(1) of the NCP states that, "... the lead agency shall include an alternatives screening step, when needed, (emphasis added) to select a reasonable number of alternatives for detailed analysis."

EPA conducted an analysis of potentially available technologies for municipal landfills and found that certain technologies are routinely and appropriately screened out on the basis of effectiveness, feasibility, or cost (NCP Section 300.430(e)(7)). (See Appendix A to this directive and "Feasibility Study Analysis for CERCLA Municipal Landfills," September 1993 available at EPA Headquarters and Regional Offices.) Based on this analysis, the universe of alternatives that will be analyzed in detail may be limited to the components of the containment remedy identified in Highlight 1, unless site-specific conditions dictate otherwise or alternatives are considered that were not addressed in the FS analysis. The FS analysis document, together with this directive, must be included in the administrative record for each municipal landfill presumptive remedy site to support elimination of the initial identification and screening of site-specific alternatives. Further detailed and comprehensive

supporting materials (e.g., FS reports included in analysis, technical reports) can be provided by Headquarters, as needed.

While the universe of alternatives to address the landfill source will be limited to those components identified in Highlight 1, potential alternatives that may exist for each component or combinations of components may be evaluated in the detailed analysis. For example, one component of the presumptive remedy is source area ground-water control. If appropriate, this component may be accomplished in a number of ways, including pump and treat, slurry walls, etc. These potential alternatives may then be combined with other components of the presumptive remedy to develop a range of containment alternatives suitable for site-specific conditions. Response alternatives must then be evaluated in detail against the nine criteria identified in Section 300.430(e)(g) of the NCP. The detailed analysis will identify site-specific ARARs and develop costs on the basis of the particular size and volume of the landfill.

## EARLY ACTION AT MUNICIPAL LANDFILLS

EPA has identified the presumptive remedy site categories as good candidates for early action under SACM. At municipal landfills, the upfront knowledge that the source area will be contained may facilitate such early actions as installation of a landfill cap or a ground-water containment system. Depending on the circumstances, early actions may be accomplished using either removal authority (e.g., non-time-critical removal actions) or remedial authority. In some cases, it may be appropriate for an Engineering Evaluation/Cost Analysis to replace part or all of the RI/FS if the source control component will be a non-time-critical removal action. Some factors may affect whether a specific response action would be better accomplished as a removal or remedial action including the size of the action, the associated state cost share, and/or the scope of O&M. A discussion of these factors is contained in *Early Action and Long-term Action Under SACM - Interim Guidance*, Publication No. 9203.1-05I, December 1992.

## SCOPING A STREAMLINED RI/FS UNDER THE PRESUMPTIVE REMEDY FRAMEWORK

The goal of an RI/FS is to provide the information necessary to: (1) adequately characterize the site; (2) define site dynamics; (3) define risks; and (4) develop the response action. As discussed in the following sections, the process for achieving each of these goals can be streamlined for CERCLA municipal landfill sites because of the upfront presumption that landfill contents will be contained. The strategy for streamlining each of these

areas should be developed early (i.e., during the scoping phase of the RI/FS).

### 1. Characterizing the Site

The use of existing data is especially important in conducting a streamlined RI/FS for municipal landfills. Characterization of a landfill's contents is not necessary or appropriate for selecting a response action for these sites except in limited cases; rather, existing data are used to determine whether the containment presumption is appropriate. Subsequent sampling efforts should focus on characterizing areas where contaminant migration is suspected, such as leachate discharge areas or areas where surface water runoff has caused erosion. It is important to note that the decision to characterize hot spots should also be based on existing information, such as reliable anecdotal information, documentation, and/or physical evidence (see page 6).

In those limited cases where no information is available for a site, it may not be advisable to initiate use of the presumptive remedy until some data are collected. For example, if there is extensive migration of contaminants from a site located in an area with several sources, it will be necessary to have some information about the landfill source in order to make an association between on-site and off-site contamination.

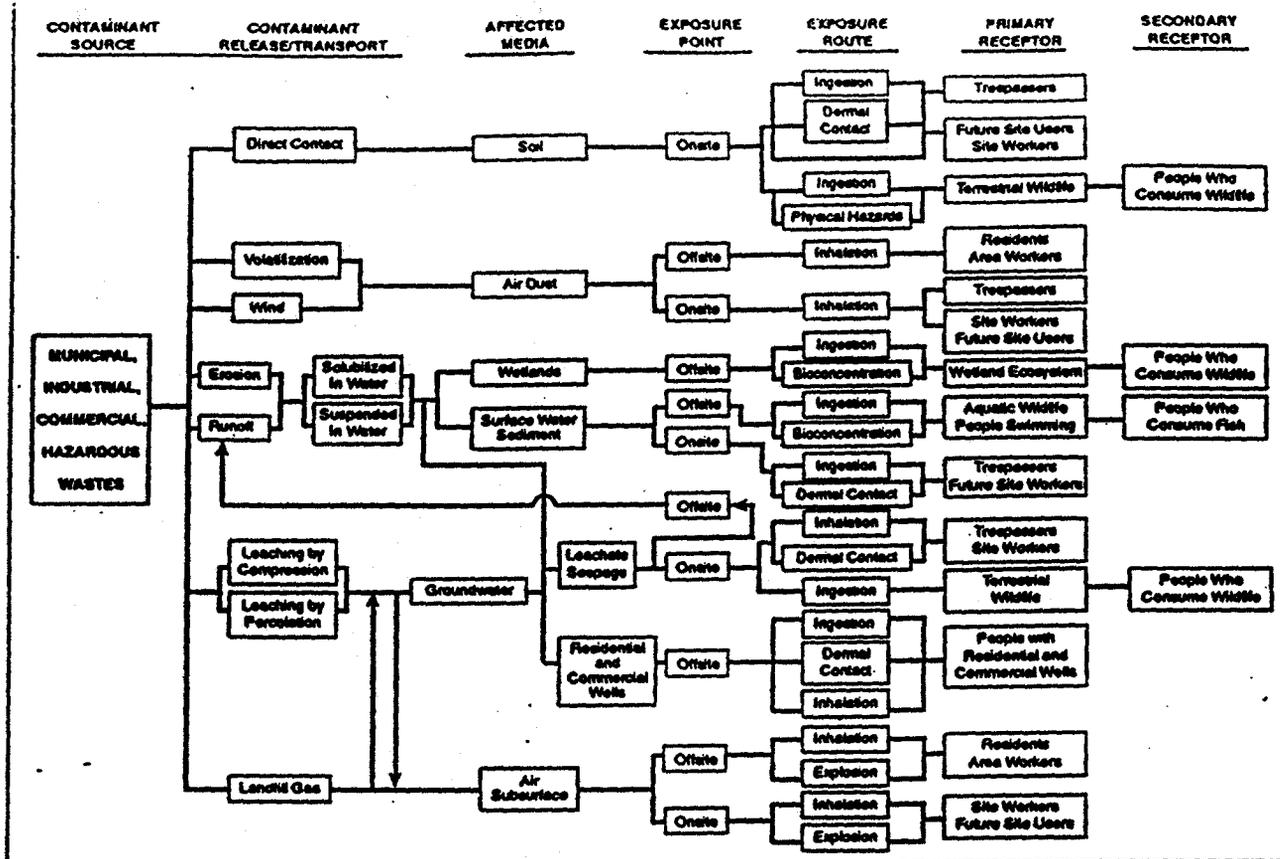
Sources of information of particular interest during scoping include records of previous ownership, state files, closure plans, etc., which may help to determine types and sources of hazardous materials present. In addition, a site visit is appropriate for several reasons, including the verification of existing data, the identification of existing site remediation systems, and to visually characterize wastes (e.g., leachate seeps). Specific information to be collected is provided in Sections 2.1 through 2.4 of the municipal landfill manual.

### 2. Defining Site Dynamics

The collected data are used to develop a conceptual site model, which is the key component of a streamlined RI/FS. The conceptual site model is an effective tool for defining the site dynamics, streamlining the risk evaluation, and developing the response action. Highlight 2 presents a generic conceptual site model for municipal landfills. The model is developed before any RI field activities are conducted, and its purpose is to aid in understanding and describing the site and to present hypotheses regarding:

- The suspected sources and types of contaminants present;
- Contaminant release and transport mechanisms;

## Highlight 2: Generic Conceptual Site Model



- Rate of contaminant release and transport (where possible);
- Affected media;
- Known and potential routes of migration; and
- Known and potential human and environmental receptors.

After the data are evaluated and a site visit is completed, the contaminant release and transport mechanisms relevant to the site should be determined. The key element in developing the conceptual site model is to identify those aspects of the model that require more information to make a decision about response measures. Because containment of the landfill's contents is the presumed response action, the conceptual site model will be of most use in identifying areas beyond the landfill source itself that will require further study, thereby focusing site characterization away from the source area and on areas of potential contaminant migration (e.g., ground water or contaminated sediments).

### 3. Defining Risks

The municipal landfill manual states that a streamlined or limited baseline risk assessment will be sufficient to initiate response action on the most obvious problems at a municipal landfill (e.g., ground water, leachate, landfill contents, and landfill gas). One method for establishing risk using a streamlined approach is to compare contaminant concentration levels (if available) to standards that are potential chemical-specific applicable or relevant and appropriate requirements (ARARs) for the action. The manual states that where established standards for one or more contaminants in a given medium are clearly exceeded, remedial action generally is warranted.<sup>3</sup>

It is important to note, however, that based on site-specific conditions, an active response is not required if ground-water contaminant concentrations exceed chemical-specific standards but the site risk is within the Agency's acceptable risk range ( $10^{-4}$  to  $10^{-6}$ ). For example, if it is determined that the release of

<sup>3</sup>See also OSWER Directive 9355.0-30, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, April 22, 1991, which states that if MCLs or non-zero MCLGs are exceeded, [a response] action generally is warranted.

contaminants from a particular landfill is declining, and concentrations of one or more ground-water contaminants are at or barely exceed chemical-specific standards, the Agency may decide not to implement an active response. Such a decision might be based on the understanding that the landfill is no longer acting as a source of ground-water contamination, and that the landfill does not present an unacceptable risk from any other exposure pathway.

A site generally will not be eligible for a streamlined risk evaluation if ground-water contaminant concentrations do not clearly exceed chemical-specific standards or the Agency's accepted level of risk, or other conditions do not exist that provide a clear justification for action (e.g., direct contact with landfill contents resulting from unstable slopes). Under these circumstances, a quantitative risk assessment that addresses all exposure pathways will be necessary to determine whether action is needed.

Ultimately, it is necessary to demonstrate that the final remedy addresses all pathways and contaminants of concern, not just those that triggered the remedial action. As described in the following sections, the conceptual site model is an effective tool for identifying those pathways and illustrating that they have been addressed by the containment remedy.

#### **Streamlined Risk Evaluation Of The Landfill Source**

Experience from the presumptive remedy pilots supports the usefulness of a streamlined risk evaluation to initiate an early response action under certain circumstances. As a matter of policy, for the source area of municipal landfills, a quantitative risk assessment that considers all chemicals, their potential additive effects, etc., is not necessary to establish a basis for action if ground-water data are available to demonstrate that contaminants clearly exceed established standards or if other conditions exist that provide a clear justification for action.

A quantitative risk assessment also is not necessary to evaluate whether the containment remedy addresses all pathways and contaminants of concern associated with the source. Rather, all potential exposure pathways can be identified using the conceptual site model and compared to the pathways addressed by the containment presumptive remedy. Highlight 3 illustrates that the containment remedy addresses all exposure pathways associated with the source at municipal landfill sites.

Finally, a quantitative risk assessment is not required to determine clean-up levels because the type of cap will be determined by closure ARARs, and ground water that is extracted as a component of the presumptive remedy will be required to meet discharge limits, or other standards for its disposal. Calculation of clean-up levels for ground-water contamination that has migrated away from the source will not be accomplished under the presumptive

### **Highlight 3: Source Contaminant Exposure Pathways Addressed by Presumptive Remedy**

1. Direct contact with soil and/or debris prevented by landfill cap;
2. Exposure to contaminated ground water within the landfill area prevented by ground-water control;
3. Exposure to contaminated leachate prevented by leachate collection and treatment; and
4. Exposure to landfill gas addressed by gas collection and treatment, as appropriate.

remedy, since such contamination will require a conventional investigation and a risk assessment.

Streamlining the risk assessment of the source area eliminates the need for sampling and analysis to support the calculation of current or potential future risk associated with direct contact. It is important to note that because the continued effectiveness of the containment remedy depends on the integrity of the containment system, it is likely that institutional controls will be necessary to restrict future activities at a CERCLA municipal landfill after construction of the cap and associated systems. EPA has thus determined that it is not appropriate or necessary to estimate the risk associated with future residential use of the landfill source, as such use would be incompatible with the need to maintain the integrity of the containment system. (Long-term waste management areas, such as municipal landfills, may be appropriate, however, for recreational or other limited uses on a site-specific basis.) The availability and efficacy of institutional controls should be evaluated in the FS. Decision documents should include measures such as institutional controls to ensure the continued integrity of such containment systems whenever possible.

#### **Areas of Contaminant Migration**

Almost every municipal landfill site has some characteristic that may require additional study, such as leachate discharge to a wetland or significant surface water run-off caused by drainage problems. These migration pathways, as well as ground-water contamination that has migrated away from the source, generally will require characterization and a more comprehensive risk assessment to determine whether action is warranted beyond the source area and, if so, the type of action that is appropriate.

While future residential use of the landfill source area itself is not considered appropriate, the land adjacent to

landfills is frequently used for residential purposes. Therefore, based on site-specific circumstances, it may be appropriate to consider future residential use for ground water and other exposure pathways when assessing risk from areas of contaminant migration.

#### 4. Developing the Response Action

As a first step in developing containment alternatives, response action objectives should be developed on the basis of the pathways identified for action in the conceptual site model. Typically, the primary response action objectives for municipal landfill sites include:

##### Presumptive Remedy

- Preventing direct contact with landfill contents;
- Minimizing infiltration and resulting contaminant leaching to ground water;
- Controlling surface water runoff and erosion;
- Collecting and treating contaminated ground water and leachate to contain the contaminant plume and prevent further migration from source area; and
- Controlling and treating landfill gas.

##### Non-Presumptive Remedy

- Remediating ground water;
- Remediating contaminated surface water and sediments; and
- Remediating contaminated wetland areas.

As discussed in Section 3, "Defining Risks," the containment presumptive remedy accomplishes all but the last three of these objectives by addressing all pathways associated with the source. Therefore, the focus of the RI/FS can be shifted to characterizing the media addressed in the last three objectives (contaminated ground water, surface water and sediments, and wetland areas) and on collecting data to support design of the containment remedy.

#### Treatment of Hot Spots

The decision to characterize and/or treat hot spots is a site-specific judgement that should be based on the consideration of a standard set of factors. Highlight 4 lists questions that should be answered before making

the decision to characterize and/or treat hot spots. The overriding question is whether the combination of the waste's physical and chemical characteristics and volume is such that the integrity of the new containment system will be threatened if the waste is left in place. This question should be answered on the basis of what is known about a site (e.g., from operating records or other reliable information). An answer in the affirmative to all of the questions listed in Highlight 4 would indicate that it is likely that the integrity of the containment system would be threatened, or that excavation and treatment of hot spots would be practicable, and that a significant reduction in risk at the site would occur as a result of treating hot spots. EPA expects that few CERCLA municipal landfills will fall into this category; rather, based on the Agency's experience, the majority of sites are expected to be suitable for containment only, based on the heterogeneity of the waste, the lack of reliable information concerning disposal history, and the problems associated with excavating through refuse.

The volume of industrial and/or hazardous waste co-disposed with municipal waste at CERCLA municipal landfills varies from site to site, as does the amount of information available concerning disposal history. It is impossible to fully characterize, excavate, and/or treat the source area of municipal landfills, so uncertainty about the landfill contents is expected. Uncertainty by itself does not call into question the containment approach. However, containment remedies must be designed to take into account the possibility that hot spots are present in addition to those that have been identified and characterized. The presumptive remedy must be relied upon to contain landfill contents and prevent migration of contaminants. This is accomplished by a combination of measures, such as a landfill cap combined with a leachate collection system. Monitoring will further ensure the continued effectiveness of the remedy.

The following examples illustrate site-specific decision making and show how these factors affect the decision whether to characterize and/or treat hot spots.

#### Examples of Site-Specific Decision Making Concerning Hot Spot Characterization/Treatment

##### Site A

There is anecdotal information that approximately 200 drums of hazardous waste were disposed of at this 70-acre former municipal landfill, but their location and contents are unknown. The remedy includes a landfill cap and ground-water and landfill gas treatment.

A search for and characterization of hot spots is not supported at Site A based on the questions listed in

## Highlight 4: Characterization of Hot Spots

If all of the following questions can be answered in the affirmative, it is likely that characterization and/or treatment of hot spots is warranted:

1. Does evidence exist to indicate the presence and approximate location of waste?
2. Is the hot spot known to be principal threat waste?\*
3. Is the waste in a discrete, accessible part of the landfill?
4. Is the hot spot known to be large enough that its remediation will reduce the threat posed by the overall site but small enough that it is reasonable to consider removal (e.g., 100,000 cubic yards or less)?

\*See *A Guide to Principal Threat and Low Level Threat Wastes*, November 1991, Superfund Publication No. 9380.3-06FS.

Highlight 4: (1) no reliable information exists to indicate the location of the waste; (2) the determination of whether the waste is principal threat waste cannot be made since the physical/chemical characteristics of the wastes are unknown; (3) since the location of the waste is unknown, the determination of whether the waste is in a discrete accessible location cannot be made; (4) in this case, the presence of 200 drums in a 70-acre landfill is not considered to significantly affect the threat posed by the overall site. Rather, the containment system will include measures to ensure its continued effectiveness (e.g., monitoring and/or leachate collection) given the uncertainty associated with the landfill contents and suspected drums.

### Site B

Approximately 35,000 drums, many containing hazardous wastes, were disposed of in two drum disposal units at this privately owned 80-acre inactive landfill, which was licensed to receive general refuse. The site is divided into two operable units. The remedy for Operable Unit 1 (OU 1) is incineration of drummed wastes in the two drum disposal units. The remedy for OU 2 consists of treatment of contaminated ground water and leachate and containment of treatment residuals (from OU 1) and

remaining landfill contents, including passive gas collection and flaring.

Treatment of landfill contents is supported at Site B because all of the questions in Highlight 4 can be answered in the affirmative: (1) existing evidence from previous investigations and sampling conducted by the state (prior to the RI) indicated the presence and approximate location of wastes; (2) the wastes were considered principal threat wastes because they were liquids and (based on sampling) were believed to contain contaminants of concern; (3) the waste is located in discrete accessible parts of the landfill; and (4) the waste volume is large enough that its remediation will significantly reduce the threat posed by the overall site.

## CLOSURE REQUIREMENTS

### Subtitle D

In the absence of Federal Subtitle D closure regulations, State Subtitle D closure requirements generally have governed CERCLA response actions at municipal landfills as applicable or relevant and appropriate requirements (ARARs). New Federal Subtitle D closure and post-closure care regulations will be in effect on October 9, 1993 (56 FR 50978 and 40 CFR 258).<sup>4</sup> State closure requirements that are ARARs and that are more stringent than the Federal requirements must be attained or waived.

The new Federal regulations contain requirements related to construction and maintenance of the final cover, and leachate collection, ground-water monitoring, and gas monitoring systems. The final cover regulations will be applicable requirements for landfills that received household waste after October 9, 1991. EPA expects that the final cover requirements will be applicable to few, if any, CERCLA municipal landfills, since the receipt of household wastes ceased at most CERCLA landfills before October 1991. Rather, the substantive requirements of the new Subtitle D regulations generally will be considered relevant and appropriate requirements for CERCLA response actions that occur after the effective date.

### Subtitle C

RCRA Subtitle C closure requirements may be applicable or relevant and appropriate in certain circumstances. RCRA Subtitle C is applicable if the landfill received waste that is a listed or characteristic waste under RCRA, and:

1. The waste was disposed of after November 19, 1980 (effective date of RCRA), or

<sup>4</sup>An extension of the effective date has been proposed but not finalized at this time.

2. The new response action constitutes disposal under RCRA (i.e., disposal back into the original landfill).<sup>3</sup>

The decision about whether a Subtitle C closure requirement is relevant and appropriate is based on a variety of factors, including the nature of the waste and its hazardous properties, the date on which it was disposed, and the nature of the requirement itself. For more information on RCRA Subtitle C closure requirements, see *RCRA ARARs: Focus on Closure Requirements*, Directive No. 9234.2-04FS, October 1989.

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<sup>3</sup>Note that disposal of only small quantity hazardous waste and household hazardous waste does not make Subtitle C applicable.

**Notice:**

The policies set out in this document are intended solely as guidance to the U.S. Environmental Protection Agency (EPA) personnel; they are not final EPA actions and do not constitute rulemaking. These policies are not intended, nor can they be relied upon, to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided in this document, or to act at variance with the guidance, based on an analysis of specific site circumstances. EPA also reserves the right to change the guidance at any time without public notice.

## APPENDIX A TECHNICAL BASIS FOR PRESUMPTIVE REMEDIES

This Appendix summarizes the analysis that EPA conducted of feasibility study (FS) and Record of Decision (ROD) data from CERCLA municipal landfill sites which led to the establishment of containment as the presumptive remedy for these sites. The objective of the study was to identify those technologies that are consistently included in the remedies selected, those that are consistently screened out, and to identify the basis for their elimination. Results of this analysis support the decision to eliminate the initial technology identification and screening steps on a site-specific basis for this site type. The technical review found that certain technologies are appropriately screened out based on effectiveness, implementability, or excessive costs.

The methodology for this analysis entailed reviewing the technology identification and screening components of the remedy selection process for a representative sample of municipal landfill sites. The number of times each technology was either screened out or selected in each remedy was compiled. A detailed discussion of the methodology used is provided below.

### METHODOLOGY

#### Identification of Sites for Feasibility Study Analysis

Of the 230 municipal landfill sites on the NPL, 149 sites have had a remedy selected for at least one operable unit. Of the 149 sites, 30 were selected for this study on a random basis, or slightly greater than 20 percent. The sites range in size from 8.5 acres to over 200 acres and are located primarily in Regions 1, 2, 3, and 5. This geographical distribution approximates the distribution of municipal landfills on the NPL.

#### Technology Screening and Remedial Alternative Analysis

The FS analysis involved a review of the technology identification and screening phase, including any pre-screening steps, followed by a review of the detailed analysis and comparative analysis phases. Information derived from each review was documented on site-specific data collection forms, which are available for evaluation as part of the Administrative Record for this presumptive remedy directive. The review focused on the landfill source contamination only; ground-water technologies and alternatives were not included in the analysis.

For the screening phase, the full range of technologies considered was listed on the data collection forms, along with the key reasons given for eliminating technologies from further consideration. These reasons were categorized according to the screening criteria: cost, effectiveness, or implementability. The frequency with which specific reasons were given for eliminating a technology from further consideration was then tallied and compiled into a screening phase summary table.

For the detailed analysis and comparative analysis, information on the relative performance of each technology/alternative with respect to the seven NCP criteria was documented on the site-specific data collection forms. The advantages and disadvantages associated with each clean-up option were highlighted. In some cases, a technology was combined with one or more technologies into one or more alternatives. The disadvantages of a technology/alternative were then compiled into a detailed analysis/comparative analysis summary table, under the assumption that these disadvantages contributed to non-selection. All summary tables are available for review as part of the Administrative Record.

**APPENDIX A**  
**TECHNICAL BASIS FOR PRESUMPTIVE REMEDIES (continued)**

**RESULTS**

The information from the technology screening and remedial alternative analyses is provided in Table 1. It demonstrates that containment (the presumptive remedy), was chosen as a component of the selected remedy at all thirty of the sites analyzed. No other technologies or treatments were consistently selected as a remedy or retained for consideration in a remedial alternative. However, at eight of the thirty sites, there were circumstances where technologies were included in the selected remedy to address a site-specific concern, such as principal threat wastes. These technologies are included in the column entitled "Tech. Not Primary Component of Alternative"<sup>1</sup> in Table 1 and include incineration at two sites, waste removal and off-site disposal at two sites, soil vapor extraction at two sites, and bioreclamation at one site.

Leachate collection and gas collection systems were also tracked as part of the detailed analysis and comparison of remedial alternatives. These types of systems generally were not considered as remediation technologies during the screening phases. At fifteen sites, leachate collection was selected as part of the overall containment remedy. At seventeen sites, gas collection systems were selected as part of the overall containment remedy.

This analysis supports the decision to eliminate the initial technology identification and screening step for municipal landfill sites. On a site-specific basis, consideration of remediation technologies may be retained as needed.

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<sup>1</sup> This column title is used for record-keeping purposes only and is not meant to imply that these treatment technologies are not considered important components of the selected remedies.

**TABLE 1 • SUMMARY OF SCREENING AND DETAILED ANALYSIS FOR LANDFILLS**

TECHNOLOGY <sup>2</sup>	# FSs Where Technology Considered					# FSs Where Criterion Contributed To Screening Out <sup>3</sup>					# RODs WHERE CRITERION CONTRIBUTED TO NON-SELECTION							
	# FSs Tech. Passed Screening	# FSs Tech. Screened Out	Cost	Effectiveness	Implement	# RODs Tech. Selected	# RODs Tech. Not Selected	Protect	ARARs	TMY Through Treatment	Long-term Effect.	Short-term Effect.	Cost	Implem.	State Concerns <sup>4</sup>	Community Concerns <sup>4</sup>		
Multi-layer Cap	28	25	3	0	2	2	0	18	7	1	0	0	1	3	5	3	--	--
Clay Cap	16	8	8	0	1	8	0	4	4	2	2	1	2	1	0	1	-	--
Asphalt Cap	17	0	17	0	2	14	5	0	0	0	0	0	0	0	0	0	-	--
Concrete Cap	17	0	17	0	3	14	5	0	0	0	0	0	0	0	0	0	--	--
Soil Cover	16	7	5	4	0	5	1	5	2	1	0	0	0	0	0	0	--	--
Synthetic Cap	13	3	10	0	0	10	1	2	1	1	1	1	1	1	1	1	--	--
Chemical Seal	5	0	5	0	0	4	0	0	0	0	0	0	0	0	0	0	--	--
Slurry Wall	22	5	14	3	2	8	6	2	3	3	2	2	1	2	0	2	-	--
Grout Curtain	18	0	18	0	3	15	9	0	0	0	0	0	0	0	0	0	--	--
Sheet Piling	17	1	16	0	0	13	5	0	1	0	0	0	0	0	0	0	--	--
Grout Injection	8	0	8	0	0	8	2	0	0	0	0	0	0	0	0	0	--	--
Block Displacement	5	0	5	0	0	3	3	0	0	0	0	0	0	0	0	0	--	--
Bottom Sealing	5	0	5	0	0	3	4	0	0	0	0	0	0	0	0	0	--	--

TABLE 1 • SUMMARY OF SCREENING AND DETAILED ANALYSIS FOR LANDFILLS (Continued) <sup>1</sup>

TECHNOLOGY <sup>2</sup>	# FSs Where Technology Considered		# FSs Tech. Passed Screening		Tech. Not Primary Component of Alternative		# FSs Where Criterion Contributed To Screening Out <sup>3</sup>		# RODs Tech. Selected		# RODs Tech. Not Selected		# RODs WHERE CRITERION CONTRIBUTED TO NON-SELECTION					
	# FSs	Cost	Electiveness	Implement	Protect	ARARs	TNY Through Treatment	Long-term Effect.	Short-term Effect.	Cost	Implem.	State Concerns <sup>4</sup>	Community Concerns <sup>4</sup>					
Vibrating Beam	5	0	5	0	0	3	3	0	0	0	0	0	0	0	0	0	--	--
Liners	2	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0	--	--
Offsite Nonhazardous Landfill	3	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	--	--
Offsite RCRA Landfill	17	0	13	4	8	3	12	0	0	0	0	0	0	0	0	0	--	--
Offsite Landfill (unspecified)	9	1	8	0	5	3	5	1	0	0	0	0	0	0	0	0	--	--
Onsite Nonhazardous Landfill	2	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0	--	--
Onsite RCRA Landfill	14	1	11	2	3	2	10	0	1	0	0	0	0	0	0	1	--	--
Onsite Landfill (unspecified)	7	0	6	1	3	3	6	0	0	0	0	0	0	0	0	0	--	--
Bioremediation (unspecified)	13	0	13	0	0	13	1	0	0	0	0	0	0	0	0	0	--	--
Bioremediation Ex-situ	10	0	10	0	0	7	7	0	0	0	0	0	0	0	0	0	--	--
Bioremediation In-situ	15	1	14	0	1	13	7	1	0	0	0	0	0	0	0	0	--	--
Dechlorinator/APEG	6	0	5	1	1	4	2	0	0	0	0	0	0	0	0	0	--	--
Oxidation/Reduction	12	0	12	0	1	8	5	0	0	0	0	0	0	0	0	0	--	--

TABLE 1 • SUMMARY OF SCREENING AND DETAILED ANALYSIS FOR LANDFILLS (Continued)<sup>1</sup>

TECHNOLOGY <sup>2</sup>	# FSs Where Technology Considered					# FSs Where Criteria Contributed To Screening Out <sup>3</sup>			# RODs WHERE CRITERION CONTRIBUTED TO NON-SELECTION									
	# FSs Tech. Passed Screening	# FSs Tech. Screened Out	Tech. Not Primary Component of Alternative	Cost	Effectiveness	Implement	# RODs Tech. Selected	# RODs Tech. Not Selected	Protect	AR/RG	TMY Through Treatment	Long-term Efect.	Short-term Efect.	Cost	Implem.	State <sup>4</sup> Concerns	Community <sup>4</sup> Concerns	
Neutralization	4	0	3	1	0	2	1	0	0	0	0	0	0	0	0	0	-	-
Thermal Destruction (unspecified)	6	0	6	0	0	3	4	0	0	0	0	0	0	0	0	0	--	--
Offsite Incineration (unspecified)	19	2	14	3	9	5	10	1	1	0	0	0	0	1	1	0	--	--
Onsite Incineration (unspecified)	12	0	8	3	5	5	6	0	1	0	0	0	0	1	1	1	--	--
Fluidized Bed	9	0	9	0	5	6	4	0	0	0	0	0	0	0	0	0	--	--
Infrared	8	0	7	1	6	3	3	0	0	0	0	0	0	0	0	0	--	--
Pyrolysis	5	2	3	1	2	2	1	0	1	0	1	0	0	1	1	1	--	--
Multiple Hearth	4	0	4	0	2	2	1	0	0	0	0	0	0	0	0	0	--	--
Rotary Kiln	10	0	9	1	6	5	4	0	0	0	0	0	0	0	0	0	--	--
Vitrification	21	0	21	0	8	15	11	0	0	0	0	0	0	0	0	0	--	--
Low Temperature Thermal Desorp/ Stripping	13	1	11	1	2	9	3	0	1	0	0	0	0	0	1	0	--	--
In-situ Steam Stripping	5	0	5	0	1	4	2	0	0	0	0	0	0	0	0	0	-	--
Soil Flushing	16	2	14	0	2	9	10	0	0	0	0	0	0	0	0	0	--	-

**TABLE 1 • SUMMARY OF SCREENING AND DETAILED ANALYSIS FOR LANDFILLS (Continued)<sup>1</sup>**

TECHNOLOGY <sup>2</sup>	# FSs Where Technology Considered			# FSs Where Criterion Contributed To Screening Out <sup>3</sup>			# FSs Where Criterion Contributed To Screening Out <sup>3</sup>		# RODs Tech. Selected		# RODs Tech. Not Selected		# RODs Where Criterion Contributed To Non-Selection <sup>4</sup>						
	# FSs Passed Screening	Tech. Not Primary Component of Alternative	Cost	Efectiveness	Implement	# RODs Tech. Selected	# RODs Tech. Not Selected	Protect	ARARs	TMY Through Treatment	Long-term Effect.	Short-term Effect.	Cost	Implem.	State Concerns	Community Concerns			
Soil Washing	12	2	9	1	1	8	6	0	0	0	0	0	0	0	0	0	--	--	
Soil Vapor Extraction (SVE)	14	1	11	2	2	9	5	1	0	0	0	0	0	0	0	0	--	--	
Fixation	7	1	5	1	0	4	2	2	0	0	0	0	0	0	0	0	--	--	
Stabilization/Solidification	20	0	19	2	1	13	6	0	0	0	0	0	0	0	0	0	--	--	
Aeration	7	0	7	0	0	5	3	0	0	0	0	0	0	0	0	0	--	--	

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<sup>1</sup> This study was conducted on 30 RODs and their corresponding FSs.  
<sup>2</sup> This does not include the no-action or institutional control only alternatives. No RODs selected either of these as remedies.  
<sup>3</sup> FSs and RODs may contain more than one criterion for screening or non-selection of technology. Also, some FSs did not fully explain the criteria for screening out a technology. Thus, the totals for screening and non-selection criteria are not equal to the number of FSs and RODs considered.  
<sup>4</sup> Information on State and community concerns was not included in this analysis because FSs do not contain this information and RODs generally only reference supporting documentation (i.e., State concurrence letter and responsiveness summary).

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**Final Revised Draft**

**Office of Emergency and Remedial Response  
U.S. Environmental Protection  
Washington, DC 20460**

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