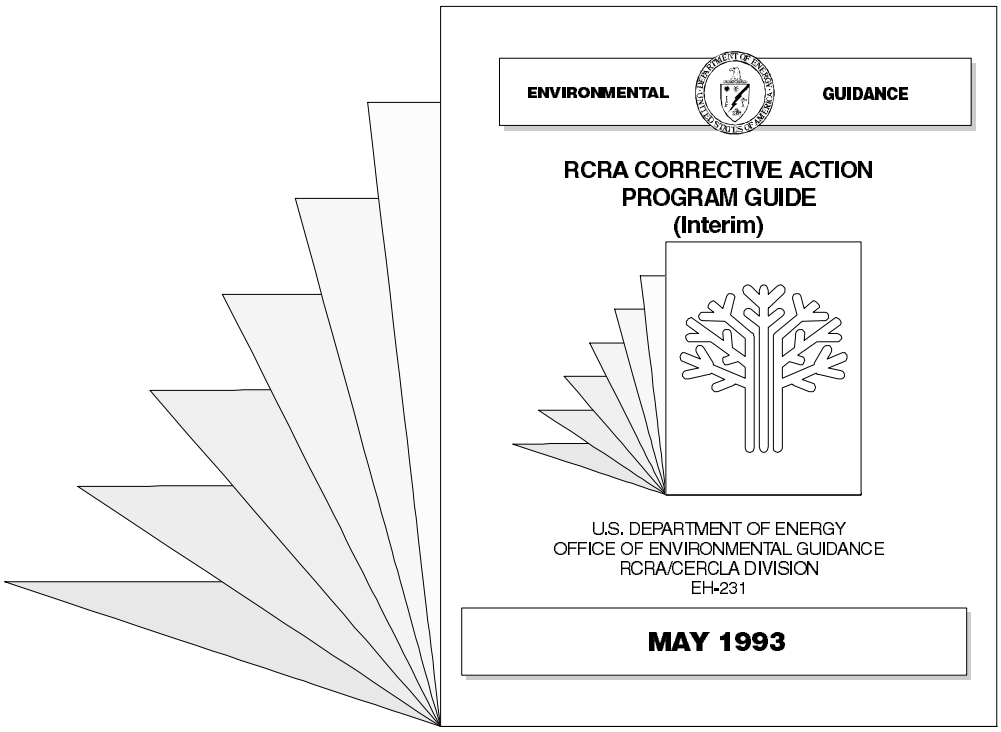
DOE/EH-0323

ENVIRONMENTAL **GUIDANCE**

RCRA CORRRECTIVE ACTION PROGRAM GUIDE (Interim)



U.S. DEPARTMENT OF ENERGY
OFFICE OF ENVIRONMENTAL GUIDANCE
RCRA/CERCLA DIVISION
EH-231

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Resource Conservation and Recovery Act Corrective Action Program Guide
(Interim)

MAY 1993

Prepared by

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENVIRONMENTAL GUIDANCE
RCRA/CERCLA DIVISION
(EH-231)
Washington, D.C.

Technical support by

Halliburton NUS Corp.
&
Argonne National Laboratory

Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

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Executive Summary

The U.S. Department of Energy (DOE) is responsible for compliance with an increasingly complex spectrum of environmental regulations. One of the most complex programs is the corrective action program proposed by the U.S. Environmental Protection Agency (EPA) under the authority of the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWA). The proposed regulations (to be codified as 40 CFR §264 - Subpart S: Corrective Action for Solid Waste Management Units) were published on July 27, 1990 (55 FR 30798).

The proposed Subpart S rule creates a comprehensive program for investigating and remediating releases of hazardous wastes and hazardous waste constituents from solid waste management units (SWMUs) at facilities permitted to treat, store, or dispose of hazardous wastes. This proposed rule directly impacts many DOE facilities which conduct such activities. This guidance document explains the entire RCRA Corrective Action process as outlined by the proposed Subpart S rule, and provides guidance intended to assist those persons responsible for implementing RCRA Corrective Action at DOE facilities.

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List of Acronyms

ACL	Alternate Concentration Limit
AHERA	Asbestos Hazard Emergency Response Act
AOC	Area of Concern
BCPCT	Best Conventional Pollutant Control Technology
BDAT	Best Demonstrated Available Technology
CAA	Clean Air Act
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CPF	Carcinogenic Potency Factor
CQAP	Construction Quality Assurance Plan
CRP	Community Relations Plan
CWA	Clean Water Act
CX	Categorical Exclusion
DCQAP	Data Collection Quality Assurance Plan
DMP	Data Management Plan
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DQOs	Data Quality Objectives
EA	Environmental Assessment
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FFCA	Federal Facility Compliance Agreement
FR	Federal Register
FS	Feasibility Study
FWPCA	Federal Water Pollution Control Act
GACT	Generally Available Control Technologies
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HRS	Hazard Ranking System
HSWA	Hazardous and Solid Waste Amendments
IAG	Inter-Agency Agreement
LDR	Land Disposal Restrictions
MACT	Maximum Achievable Control Technology
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MCS	Media Cleanup Standards
MEI	Maximum Exposed Individual

MSWLF	Municipal Solid Waste Landfill
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutant
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OMB	Office of Management and Budget
O&MP	Operation and Maintenance Plan
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PECMT	Preliminary Evaluation of Corrective Measures Technology
PIP	Public Involvement Plan
PMP	Program Management Plan
PPE	Personal Protective Equipment
POC	Point of Compliance
POTW	Publicly Owned Treatment Works
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RD&D	Research, Development, and Demonstration
RFA	RCRA Facility Assessment
RfD	Reference Dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SDWA	Safe Drinking Water Act
SI	Site Inspection
SWMU	Solid Waste Management Unit
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, or Disposal Facility
UIC	Underground Injection Control
UST	Underground Storage Tank
VSI	Visual Site Inspection

Overview of Corrective Action

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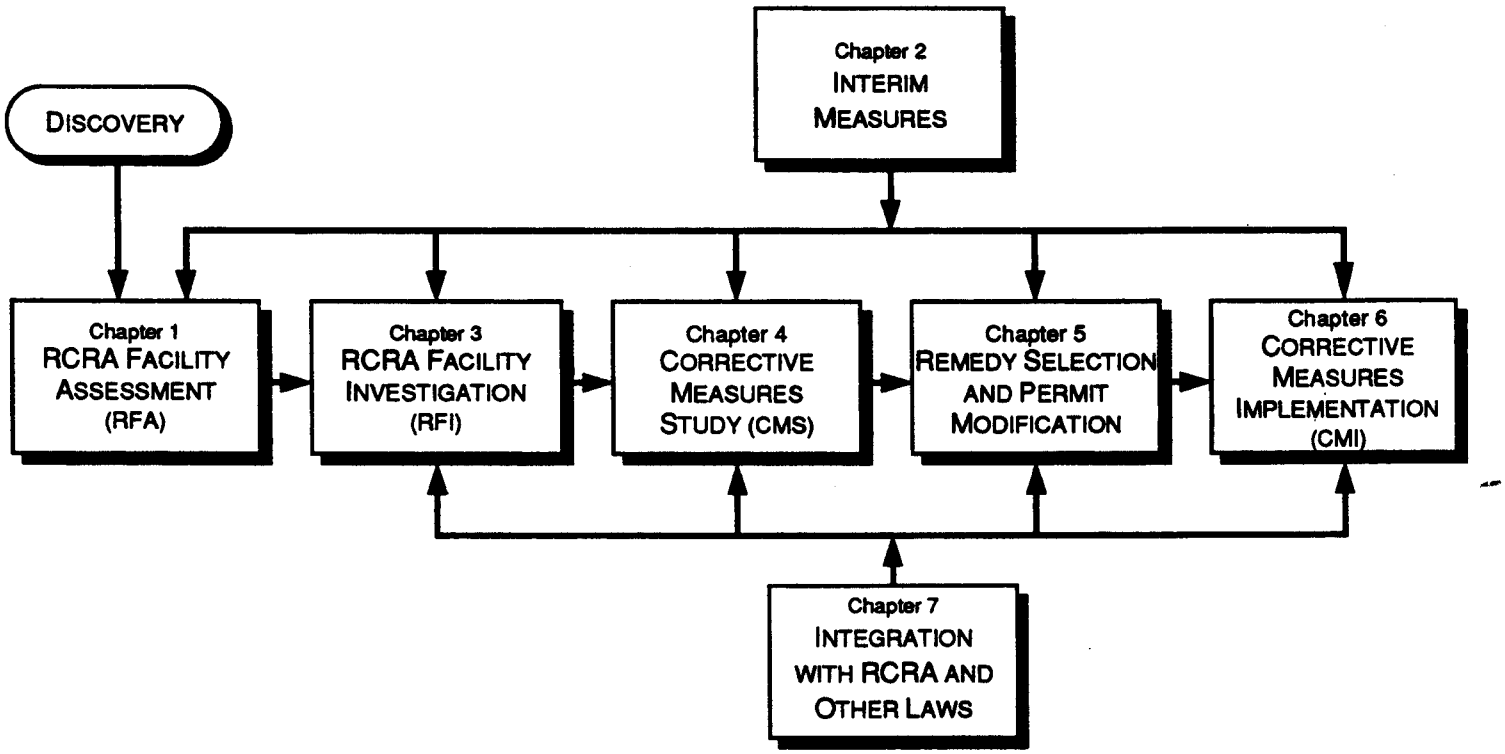
Figure 1
RCRA Subpart S Corrective Action Process



Overview of Corrective Action

Background

The U.S. Department of Energy (DOE) is responsible for complying with an increasingly complex spectrum of hazardous waste management standards and requirements. One of the most complex programs is that prescribed by EPA for addressing releases of hazardous waste or hazardous waste constituents from hazardous waste treatment, storage, or disposal facilities (TSDFs). On July 27, 1990, EPA proposed a comprehensive program for corrective action of contamination resulting from past and present waste management practices at RCRA TSDFs subject to the Resource Conservation and Recovery Act (RCRA). This rule, referred to as the RCRA Corrective Action rule, was proposed under 40 CFR Part 264, Subpart S - *Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities.*

Although EPA proposed the Subpart S regulations in 1990, the requirements were mandated by the Hazardous and Solid Waste Amendments of 1984 (HSWA) (which amended RCRA; see 42 USCA §6901 et seq.), and were effective immediately. EPA therefore began implementation of the program in 1984, and consequently a number of facilities, including DOE operations, are undergoing RCRA Corrective Actions. EPA has informally indicated that the Subpart S proposed rule should be used as an interim guidance until the rule is finalized. Due to the controversial nature of RCRA Corrective Action, EPA is not expected to promulgate the rule before late 1993.

In the interim, thousands of RCRA solid waste management units (SWMUs) will be undergoing corrective actions. Compliance for DOE will be complicated by a number of factors, including evolving and inconsistent EPA/State policy, the CERCLA and NEPA interfaces, the presence of radioactive mixed wastes and radiological hazards, the large number of SWMUs at most facilities, inappropriate corrective measures technologies, Congressional budget limitations, and public scrutiny.

Complicating the situation further are existing requirements for RCRA Corrective Action for regulated units - those hazardous waste management units (a subset of SWMUs) subject to 40 CFR Parts 264 and 265, and Part 270 permit requirements. Corrective action for these units is prescribed under 40 CFR Part 264, Subpart F - *Releases from Solid Waste Management Units*, which primarily addresses releases to groundwater. Subpart F focuses on SWMUs which are regulated units and prescribes a system for detecting releases (detection monitoring), for determining their magnitude and impact (compliance monitoring), and for initiating corrective action, if warranted.

Purpose

The purpose of this guidance document is to explain the corrective action process in order to assist DOE and operation contractor personnel responsible for planning, implementing and overseeing RCRA Corrective Actions. This package is tailored to address the issues facing DOE facilities. Emphasis is placed on RCRA Corrective Action pursuant to Subpart

S, as EPA is expected to propose substantial changes to the Subpart F rule, to make it more consistent with the requirements of Subpart S. However, the relationship of RCRA Subparts F and S is clearly identified within this guidance, as is the process for corrective action outlined under Subpart F. The guidance is not intended to be used alone. Rather, it is to be used in tandem with Federal and State regulations and other more detailed or technically oriented guidance documents. It is also important to point out that EPA expects there may be differences between the Subpart S proposed rule and the final rule, so it will be necessary to consult the final rule (when promulgated) to determine the specific changes that have been made.

Introduction to Corrective Action Under the Proposed Subpart S Rule

Proposed Subpart S Requirements

The 1984 HSWA amendments (Section 3004(u)) require that any permit issued to a treatment, storage or disposal facility after November 8, 1984 address corrective action for releases of hazardous wastes or hazardous waste constituents from any solid waste management unit (SWMU) at the facility. The proposed Subpart S rule (July 27, 1990; 55 FR 30796) would establish requirements for conducting investigations of actual or potential releases at RCRA facilities, evaluating potential corrective measures, and selecting and implementing corrective measures at RCRA facilities. Corrective action beyond the facility boundary is also addressed by HSWA (Section 3004(v)), and may be required where appropriate. **[Update 9/99**: It should be noted that if there is evidence of conditions posing an imminent and substantial endangerment to health or the environment, EPA may choose to issue an order to abate those conditions as quickly as possible under the imminent hazard provisions of Sect. 7003 of RCRA instead of Sects. 3004(u), 3004(v), or 3008(h).**]**

Interim Status Requirements [RCRA §3008(h) Corrective Action Orders]

Section 3008(h) of RCRA provides EPA with the authority to issue administrative orders or bring court action or other measures, as appropriate, when there is or has been a release of hazardous waste or hazardous waste constituents from a RCRA facility operating under interim status. Corrective action, as outlined in the proposed Subpart S rule, may be required under RCRA §3008(h) for generators, including small quantity generators, or for TSD facilities or generators when the facility is operating (prior to receiving a permit) under interim status, is closing or is closed under interim status, has lost interim status, or has failed to properly obtain interim status. Corrective action orders under RCRA §3008(h) may be issued unilaterally by EPA (or the authorized State) or they may be issued as consent agreements between the Federal facility and EPA (or the State). The corrective action process for interim status facilities follows the general requirements for permitted facilities. **[Update 4/99**: It should be noted that if there is evidence of conditions posing an imminent and substantial endangerment to health or the environment, EPA may choose to issue an order to abate those conditions as quickly as possible under the imminent hazard provisions of Sect. 7003 of RCRA instead of Sects. 3004(u), 3004(v), or 3008(h).**]**

Permit Schedule of Compliance

Any corrective action required at a permitted (or soon to be permitted) facility will be incorporated in the facility permit, specifically within the permit schedule of compliance. Corrective action requirements, including plans and reports, will for the most part be implemented through the schedule. Because of the complex and sequential nature of the

corrective action process, it is expected that the permit will be issued prior to completion of corrective action; the schedule of compliance is the implementing tool.

When corrective action is required under a permit, a schedule of compliance will need to be included in that permit, or any subsequent modification to that permit, regardless of whether the facility continues its other operations.

Overview of 40 CFR §264 - Subpart F

40 CFR Part 264 - Subpart F provides a regulatory program to address releases of hazardous wastes and hazardous waste constituents to groundwater from "regulated units". "Regulated units" are defined in 40 CFR §264.90 as surface impoundments, waste piles, land treatment units, and landfills which received hazardous waste after July 28, 1982. This program prescribes a specific approach for detection, characterization, and cleanup of contaminated groundwater from regulated units. Subpart F is a "prospective" program, requiring that monitoring be established to detect contamination and that, if detected, contaminated groundwater be removed or treated in place if or when a groundwater protection standard has been exceeded. EPA is developing a proposal that would restructure the current Subpart F regulations to make them consistent with the key features of Subpart S.

Overview of the Proposed Subpart S Corrective Action Process

The 1984 HSWA established a general process for RCRA Corrective Action programs to follow. A graphic overview of the proposed corrective action rule is provided on page Overview-2. As shown in the diagram, corrective action consists of four main phases plus interim measures. Essentially these phases are:

- RCRA Facility Assessment;
- RCRA Facility Investigation;
- Corrective Measures Study; and
- Corrective Measures Implementation.

Each of the RCRA Corrective Action phases is discussed below and each is addressed in a separate chapter of this document as shown in Figure 1, page Overview - 2.

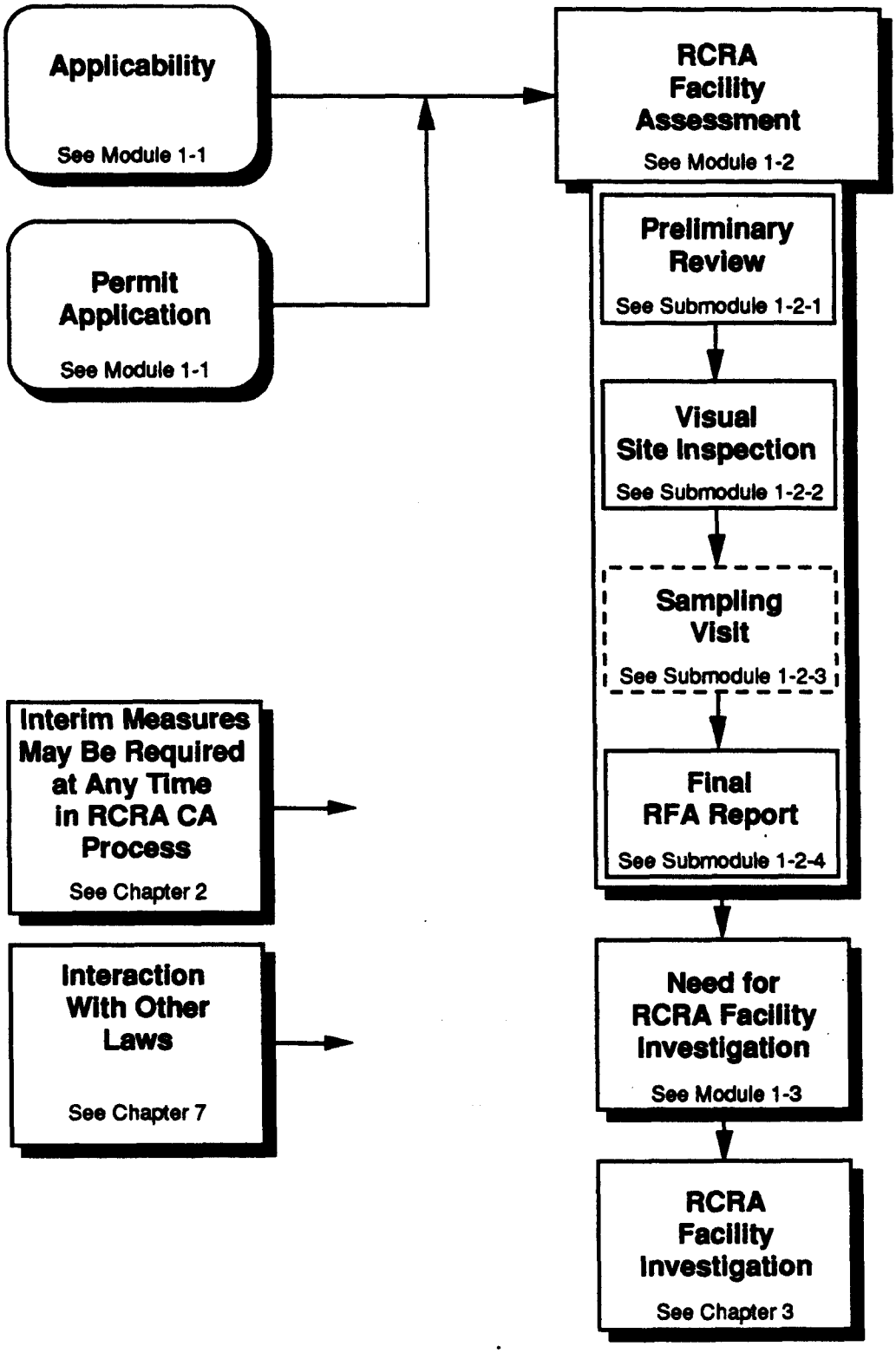


Figure 2
Chapter One: Applicability and the RCRA Facility Assessment (RFA)

Overview of the Chapters

Chapter One: Applicability and the RCRA Facility Assessment (RFA)

The RFA is the first phase of the RCRA Corrective Action process. The RFA serves as a screen, eliminating solid waste management units (SWMUs), environmental media, or entire facilities from further consideration if EPA or the authorized State determines that there is no evidence or likelihood of a release that poses a threat to human health and the environment. The RFA also serves to focus the scope of the follow-on RCRA Facility Investigation (RFI) by identifying those releases or areas that are of the most environmental concern at the facility. The overview graphic for this chapter is provided on Figure 2. This chapter will address the following modules:

Module 1-1 Applicability and Permit Application

The corrective action program is designed to be implemented as part of the permit conditions issued for RCRA treatment, disposal, or storage facilities, or for interim status facilities, through a RCRA §3008(h) order. Corrective actions will be required by modifying existing permits, included as part of new permits, or, for interim status facilities operating before November 8, 1984, as part of court actions or administrative orders. By statute, RCRA Corrective Action does not apply to the following types of activities: land treatment demonstrations, emergency responses of 90 days or less, and research, development, and demonstration (RD&D) permits.

Module 1-2 The RCRA Facility Assessment

The RFA is an initial screening tool conducted by EPA, an authorized State, or by other Federal agencies (including DOE, if DOE authorization to conduct RFAs is incorporated into a Federal Facility Compliance Agreement (FFCA)). The RFA includes a site inspection and a review of records on the facility. Since 1985 the RFA has evolved into a definite process consisting of three interrelated activities: the preliminary review, a visual site inspection (VSI), and if warranted, a sampling visit.

Module 1-3 Need for a RCRA Facility Investigation

If a release is confirmed or suspected by the RFA, EPA can require the DOE facility to conduct an RFI. This module presents the decision-making process to make this determination.

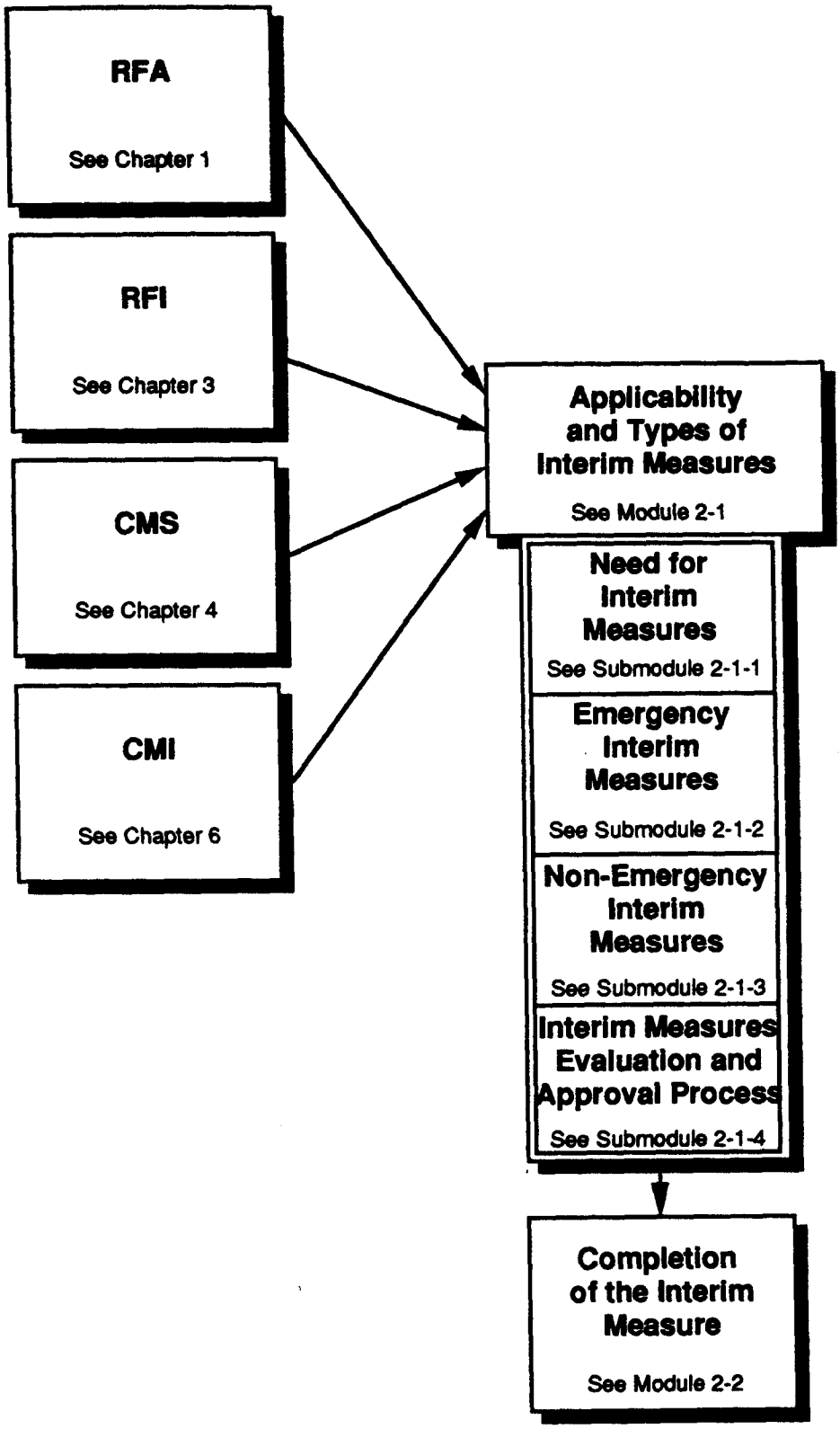


Figure 3
Chapter Two: Interim Measures

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

Chapter Two: Interim Measures and EPA's "Stabilization Initiative"

The need for interim measures should be assessed early in the corrective action process, as well as in subsequent phases as more information on releases and potential remedial solutions becomes known. As proposed, EPA or the authorized State could require the permittee to conduct interim measures at a facility whenever that agency determined that a release from a SWMU poses a threat to human health and the environment. EPA currently intends to use interim measures as a means of obtaining near- to mid-term results in accordance with their "stabilization initiative." This initiative is intended to focus the early corrective action activities on controlling the worst releases first, in an effort to prevent further environmental degradation. These "stabilization" activities will be followed by long-term actions to comprehensively address all releases at the facility. The overview graphic for this chapter is provided on Figure 3. This chapter will address the following modules:

Module 2-1 Applicability and Types of Interim Measures

Interim measures are generally short-term actions responding to immediate threats, such as actual or potential exposure to hazardous wastes or constituents, drinking water contamination, threats of fire and explosion, and other situations posing similar threats. This module will address when interim measures are appropriate and the types of interim measures.

Module 2-2 Completion of the Interim Measure

The DOE facility needs to evaluate the interim measures that were taken at the facility to address the near- to mid-term risks of releases of hazardous wastes or hazardous waste constituents from SWMUs at the facility to determine if the action is complete, and to determine the need for further corrective action. This evaluation must be documented, and if required, submitted to the appropriate DOE or regulatory agency officials for review.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

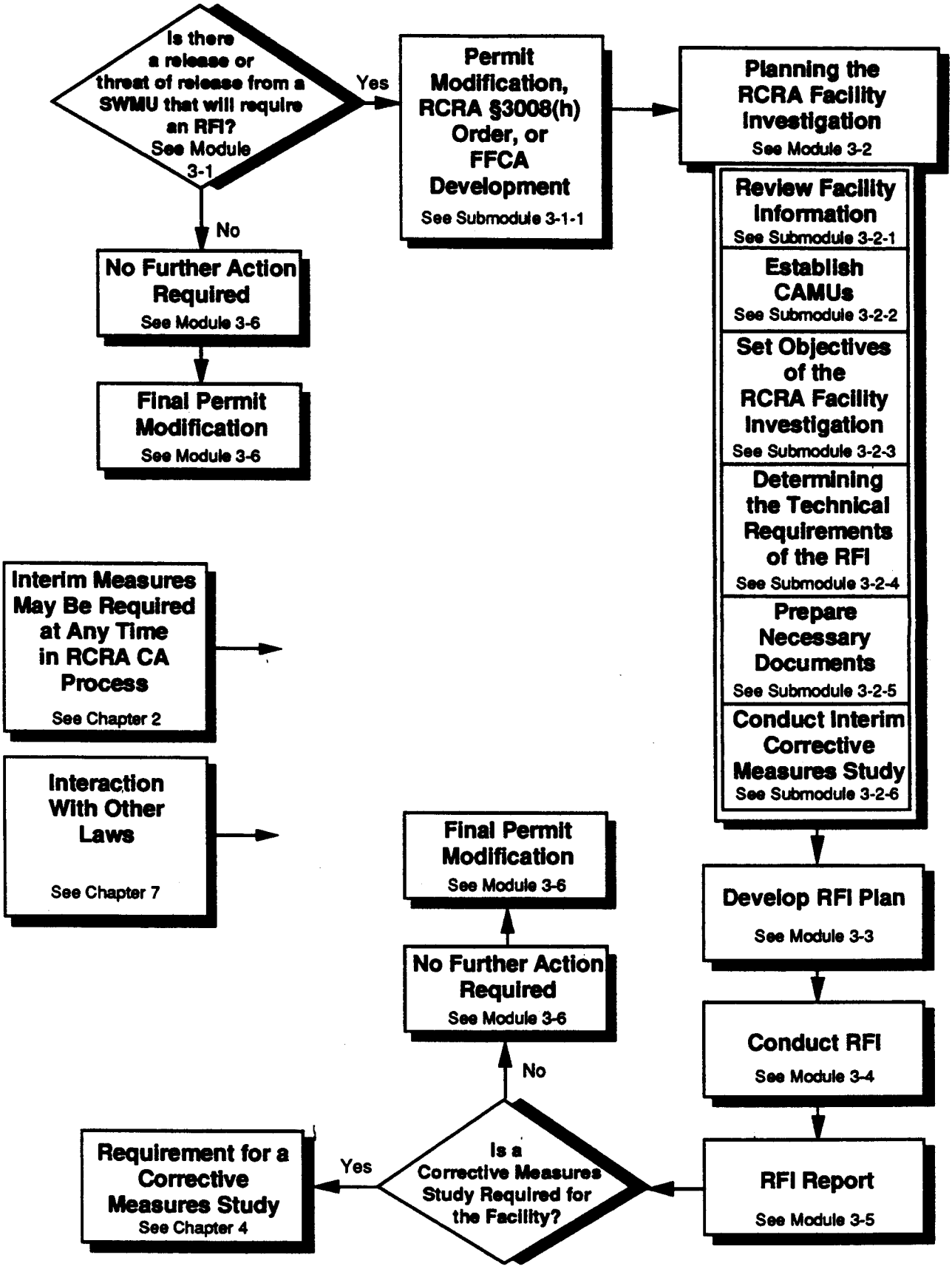


Figure 4
Chapter Three: RCRA Facility Investigation (RFI)

Chapter Three: The RCRA Facility Investigation (RFI)

The RFI is the second phase of the RCRA Corrective Action process. EPA or the authorized State would require an RFI if the RFA indicated that a release of a hazardous waste or hazardous waste constituent from a SWMU was likely to have occurred or to be occurring or, in certain limited circumstances, likely to occur in the future. Requirements for the RFI would be specified by EPA or the authorized State in a schedule of compliance in the facility's permit. The schedule would typically identify the SWMUs and environmental media that required more detailed investigation as well as the types of investigations required.

This chapter will detail the second phase of the corrective action process under Subpart S, and the overview graphic for this chapter is provided on Figure 4. This chapter will address the following modules:

Module 3-1 Requirement for a RCRA Facility Investigation

The RCRA Facility Assessment (RFA) is the first step in the corrective action process. The RFA serves as a screen to eliminate from further investigation those SWMUs that have no release or potential for a release of a hazardous waste or hazardous waste constituent which could pose a threat to human health and the environment.[1] The RFA also serves to focus any further investigations, in particular the RFI, by identifying those releases, potential releases, or areas at a facility posing the greatest environmental concern.

Usually the RFI is required under either a permit schedule of compliance or an enforcement order by the regulatory agency. The regulatory agency will apply the appropriate regulatory authority and develop specific conditions in permits or enforcement orders. The RFI is performed by the facility. These conditions will generally be based on the results of the RFA and will identify specific units or releases needing further investigation.

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[1] In the preamble to the proposed Subpart S rule, EPA states its interpretation that the term "hazardous waste" includes all solid wastes falling under the definition of "hazardous waste" found in RCRA §1004(5). Further, EPA states its position that the term "hazardous waste constituents (or constituents)" includes those substances defined under RCRA §3004(u) and specifically listed in 40 CFR §261 Appendix VIII and 40 CFR §264 Appendix IX.

Module 3-2 Planning the RCRA Facility Investigation

Planning the RFI will involve (1) reviewing all information on the release, the SWMU, interim measures, and the specific requirements of the order, permit, or FFCA, (2) assessing the benefits of establishing CAMUs at the facility, (3) establishing the objectives of the RFI, (4) determining requirements for the studies necessary to meet the objectives of the RFI, (5) preparing necessary documents, and (6) planning any activities required as part of conducting an interim CMS. The success of the RFI depends upon a deliberative effort and attention to detail being applied during the planning process.

Module 3-3 The RCRA Facility Investigation Plan

Conducting an RFI requires the development of the RFI plan. Under the proposed Subpart S rule, submission of an RFI plan is not a mandatory action; however, EPA usually requires that RFI plans be subject to EPA review and approval. The approved plan becomes a part of the facility permit and is subject to the permit schedule of compliance.

The RFI should be planned in phases. Each phase should have established criteria that provide an opportunity for the requirement for an RFI to be terminated if the results of the investigation demonstrate that a release or potential release has not occurred at the facility. This mechanism provides the opportunity to prevent wasting valuable resources on unwarranted investigations.

Module 3-4 Conducting the RCRA Facility Investigation

The actual conduct of the RFI has three elements: (1) implementation of the planned procedures for information gathering and sampling activities, (2) sample analysis and data verification, and (3) periodic progress assessments.

Module 3-5 The RCRA Facility Investigation Report

While the RFI is underway, EPA may require the submission of periodic progress reports. The exact content, format, and schedule for these reports are at the discretion of EPA. Any specific requirements for these progress reports are included in the permit, order, or FFCA.

Upon completion of the RFI, the owner/operator prepares a draft RFI report and a separate document summarizing the report, and submits these documents to EPA for review and approval. The findings of the report are the basis for a "Determination of No Further Action" or for the performance of a CMS, and represent the culmination of all the effort involved in conducting the RFI. The summary is sent to all parties on the facility's mailing list. This mailing list includes people and organizations who have been asked to be notified of the facility's activities. The list is maintained by the permitting agency.

The RFI report must document the process and findings of the investigation, and provide information to support any subsequent decisions. Note that any recommendations are not binding upon EPA. The selection of the next phase of the corrective action process is the responsibility of EPA. After review of the draft RFI report, EPA may require the owner/operator to conduct additional investigations or studies. The final, EPA-approved RFI report becomes the basis for either a Corrective Measures Study (CMS) or a "Determination of No Further Action."

Module 3-6 Determination of No Further Action

The EPA anticipates that at some facilities the releases from SWMUs identified through the RFA (or subsequent investigations) are not a threat to human health and the environment. If the EPA conducted the RFA and discovered no release or threatened release, the facility permit application continues through the normal process. However, if a RCRA §3008(h) order or permit modification (for existing permits) required the owner/operator to conduct the RFA and/or RFI, the owner/operator must request termination of the investigation requirement in the facility schedule of compliance. This requires a Class III permit modification, or rescission of the RCRA §3008(h) order. Permit modification requires negotiation of the modification with EPA, development of a draft permit, a public notice, a comment and response period, a public meeting (if necessary), incorporation of any revisions into the permit modification, and issuance of the final modified permit. For a RCRA §3008(h) order, EPA merely rescinds the order. In either case, the owner/operator is responsible for providing any supporting documentation.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

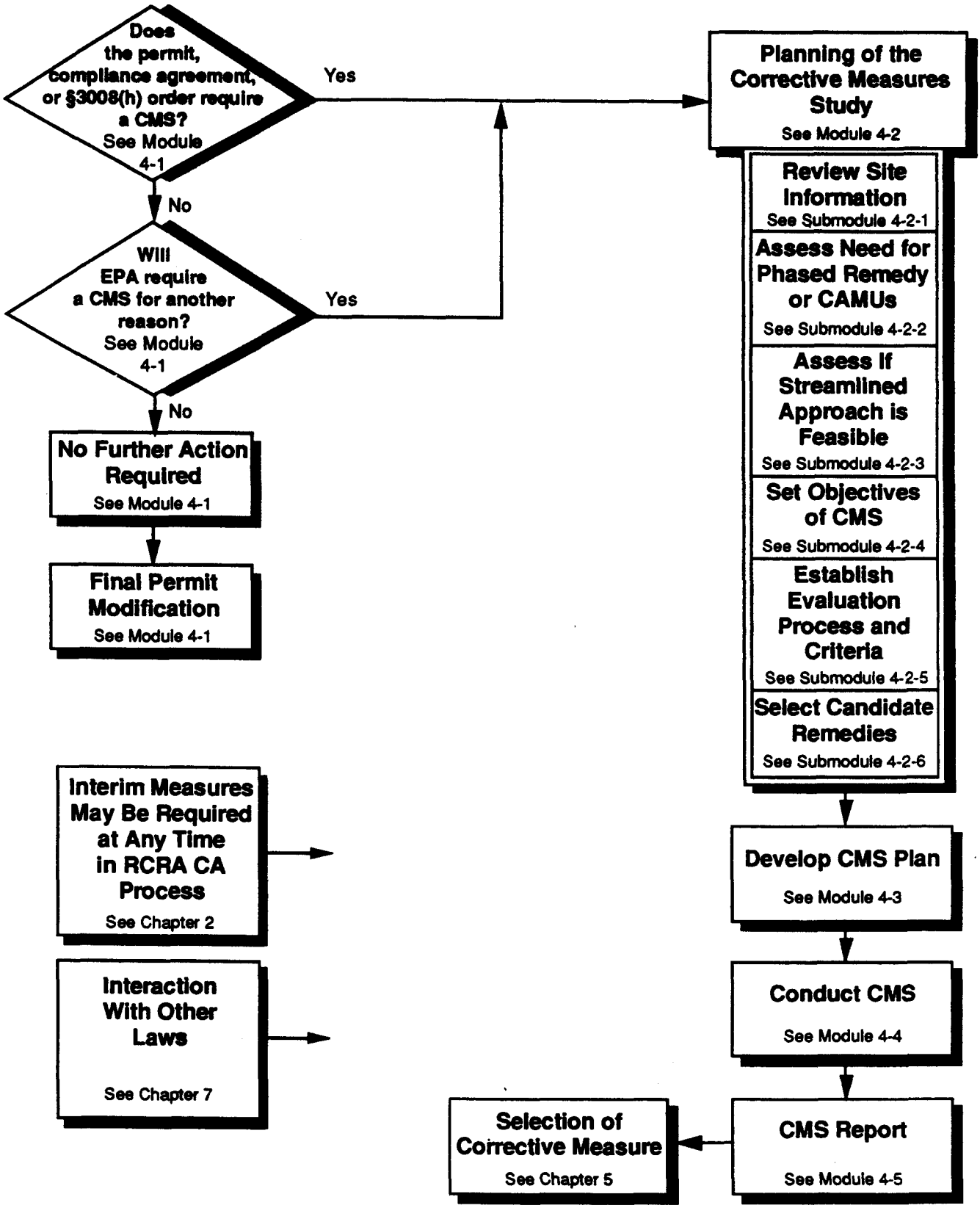

Figure 5
Chapter Four: Corrective Measures Study (CMS)

Chapter Four: The Corrective Measures Study (CMS)

A properly conducted RFI will focus the CMS on units which are sources of releases and the media pathways affected by such releases. The CMS is designed to identify and evaluate potential remedial alternatives for the releases that have been identified at the facility.

This chapter will detail the third phase of the corrective action process under Subpart S. The overview graphic for this chapter is provided on Figure 5. This chapter will address the following modules:

Module 4-1 Requirement for a Corrective Measures Study

There are two mechanisms triggering the requirement for a CMS. The primary mechanism is the discovery that the concentration of a contaminant released from a solid waste management unit (SWMU) exceeds the action level set for that contaminant. Action levels are media-specific health and environment-based contaminant concentrations considered protective of human health and the environment. Action levels are often standards issued under other statutes, such as the Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act.[2] *It must be noted that action levels do not necessarily represent the final concentrations that must be achieved through the implementation of a corrective measure.* Action levels act as a presumptive contaminant concentration level beyond which additional investigations are required, specifically the CMS.

The second mechanism for triggering a CMS allows EPA to require a CMS even when contaminant concentrations are below action levels, but where other considerations, such as impacts to sensitive environments, suggest a need for close evaluation of the need for remediation of the contamination.

Module 4-2 Planning the Corrective Measures Study

There are six principal steps to planning a CMS. These steps are (1) reviewing existing information about the SWMUs at the facility, (2) assessing if a phased remedy or establishment of a corrective action management unit (CAMU) is appropriate based on data collected during the RFI, (3) determining if a streamlined CMS is appropriate, (4) determining the objectives of the CMS, (5) establishing the process and criteria for evaluating the alternatives for the corrective measure, and (6) selecting candidate corrective measures for evaluation. Depending upon DOE, EPA, State, or other requirements or constraints, the sequence of steps may vary.

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[2] Examples of the promulgated standards used as action levels and supplemental mechanisms used to develop action levels are discussed in the proposed Subpart S rule at 55 FR 30814-30820.

In addition, during the planning process the facility should consider any requirements for compliance with other statutes. Examples include requirements for compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Environmental Policy Act (NEPA), the Clean Water Act (CWA), and the Toxic Substances Control Act (TSCA). Areas where integration with other laws should be considered are discussed in this chapter; however, details are provided in Chapter 7.

Module 4-3 The Corrective Measures Study Plan

Conducting a CMS includes the development of the CMS Plan. Under the proposed Subpart S rule, EPA may require: (1) that the plan follow specific criteria, (2) that development of the plan be included in the facility permit schedule of compliance, or (3) that the plan be subject to EPA review and approval. Further, under the proposed rule, a requirement for the submission of a CMS plan is at the discretion of EPA. Plan submission is not a mandatory action. However, if EPA requires submission of a plan, the approved plan becomes a part of the facility permit and is subject to the permit schedule of compliance.

Module 4-4 The Corrective Measures Study

Conducting CMS testing is a two-step process involving: (1) testing the effectiveness of each alternative for the corrective action, and (2) analyzing and evaluating the testing results according to the evaluation process and criteria developed during the planning process and described in the CMS Plan. While this process is usually conducted during the CMS, under the proposed Subpart S rule EPA has the authority to require testing to occur concurrently with the RFI in order to prevent a delay in conducting the corrective measure. Generally, concurrent testing would occur in the form of treatability studies to determine which corrective measure appears most effective in addressing the contamination at the facility.

Module 4-5 The Corrective Measures Study Report

During the conduct of the CMS, EPA (or the State) may require periodic progress reports. Based upon the information in these reports, EPA may change any part of the CMS. Upon completion of the CMS, the owner/operator prepares a draft CMS report and submits the report to EPA for review and approval. The CMS report must discuss how each alternative for the corrective measure satisfies the standards and selection factors.

After review of the draft CMS report, EPA may require the owner/operator to conduct additional investigations or studies of other alternative corrective measures. The final, EPA-approved CMS report becomes the basis for the remedy selection process discussed in Chapter 5. It should also be noted that the owner/operator's preferred corrective measure is not binding upon EPA. The selection of the corrective measure is solely the responsibility of EPA and is based upon a specific procedure and set of criteria discussed in Chapter 5.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

Chapter Five: Remedy Selection and Permit Modification

Based upon the results of the CMS, the facility needs to develop the corrective measure alternative or alternatives based on site characteristics, waste characteristics, and technology limitations. Then each alternative must be evaluated based on the technical, environmental, human health, and institutional concerns. A preliminary corrective measure alternative needs to be recommended using technical, human health, and environmental criteria.

The DOE facility needs to identify the appropriate corrective measures and recommend them to the regulatory agency. These recommendations will be reviewed and the public will be provided with the opportunity to review and comment on the proposed action. The CMS needs to ensure that the proposed measures will be effective in correcting threats posed by the release. The overview graphic for this chapter is provided on Figure 6.

Module 5-1 General Standards and Specific Selection Factors

This module discusses the general performance standards and specific selection criteria for corrective measures. The discussion of these topics relates to the development of the evaluation process and criteria discussed in Chapter 4. Examples of the use of the corrective measures decision criteria are provided and applied in reference to the types of situations at DOE facilities.

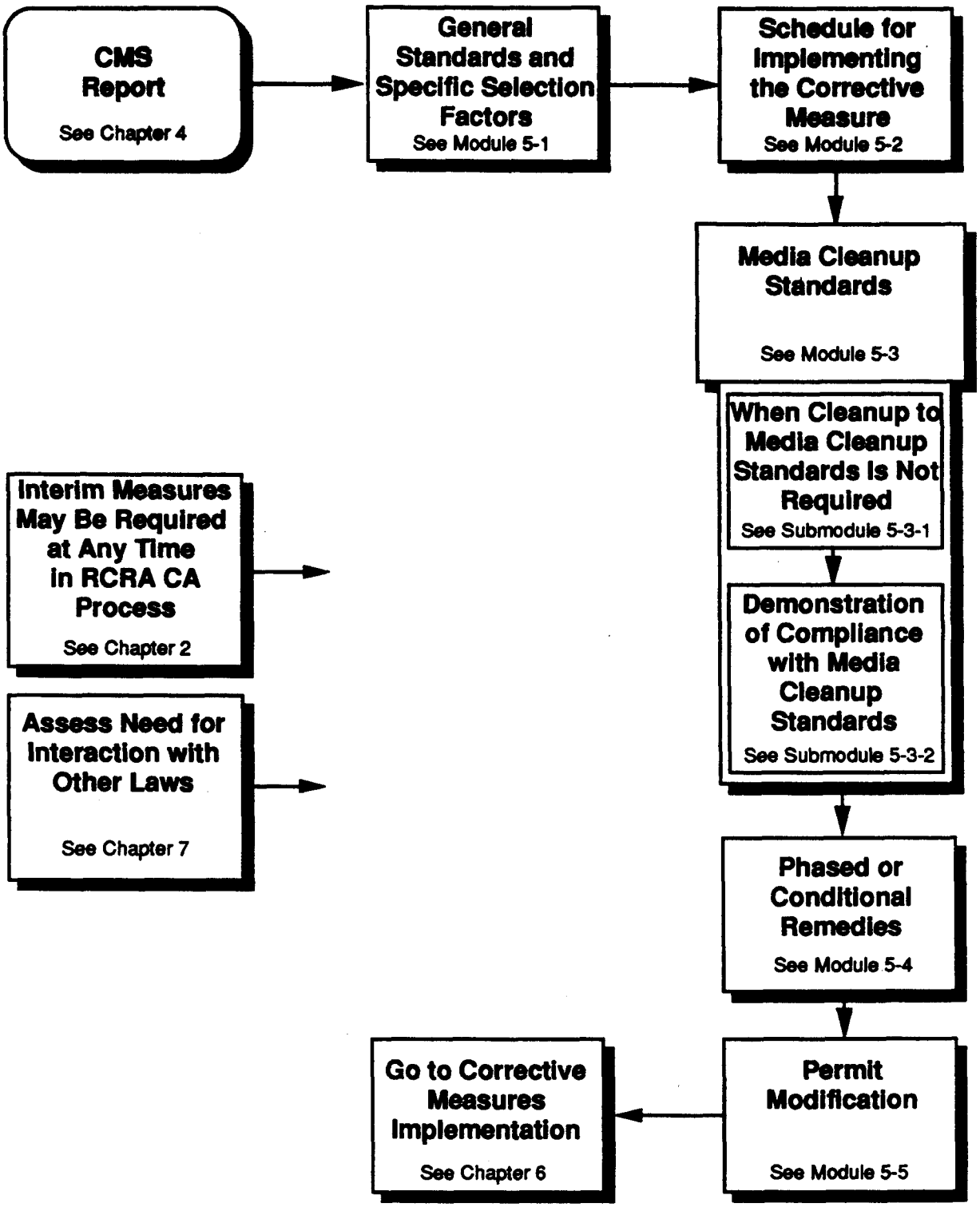


Figure 6
Chapter Five: Selection of Corrective Measures

Module 5-2 Schedule for Implementing the Corrective Measure

This module discusses the development of the schedule for conducting the corrective measure and the use of phased implementation. The discussion of phased implementation will focus on integration of a phased corrective measure with the use of CERCLA operable units at sites with a requirement for compliance with both RCRA and CERCLA.

Module 5-3 Media Cleanup Standards

This module in Chapter 5 will discuss several important topics:

- Development of the actual media cleanup standards;
- The use of other factors in setting these standards;
- When cleanup to MCS is not required; and
- Demonstration of compliance with MCS.

Module 5-4 Phased or Conditional Remedies

This module discusses the use of conditional remedies and the relationship of a conditional remedy to a phased corrective measure. The seven requirements for a conditional remedy will be discussed, as will the implications of each of the conditions on a DOE facility's corrective action program.

Module 5-5 Permit Modification

This module discusses the permit modification process for requiring implementation of a corrective measure. This process follows different procedures from the other permit modifications in the RCRA Corrective Action process, and creates a long-term binding agreement to conduct the corrective measure. The module discusses the process and the implications of the final permit modification upon operations at the facility.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

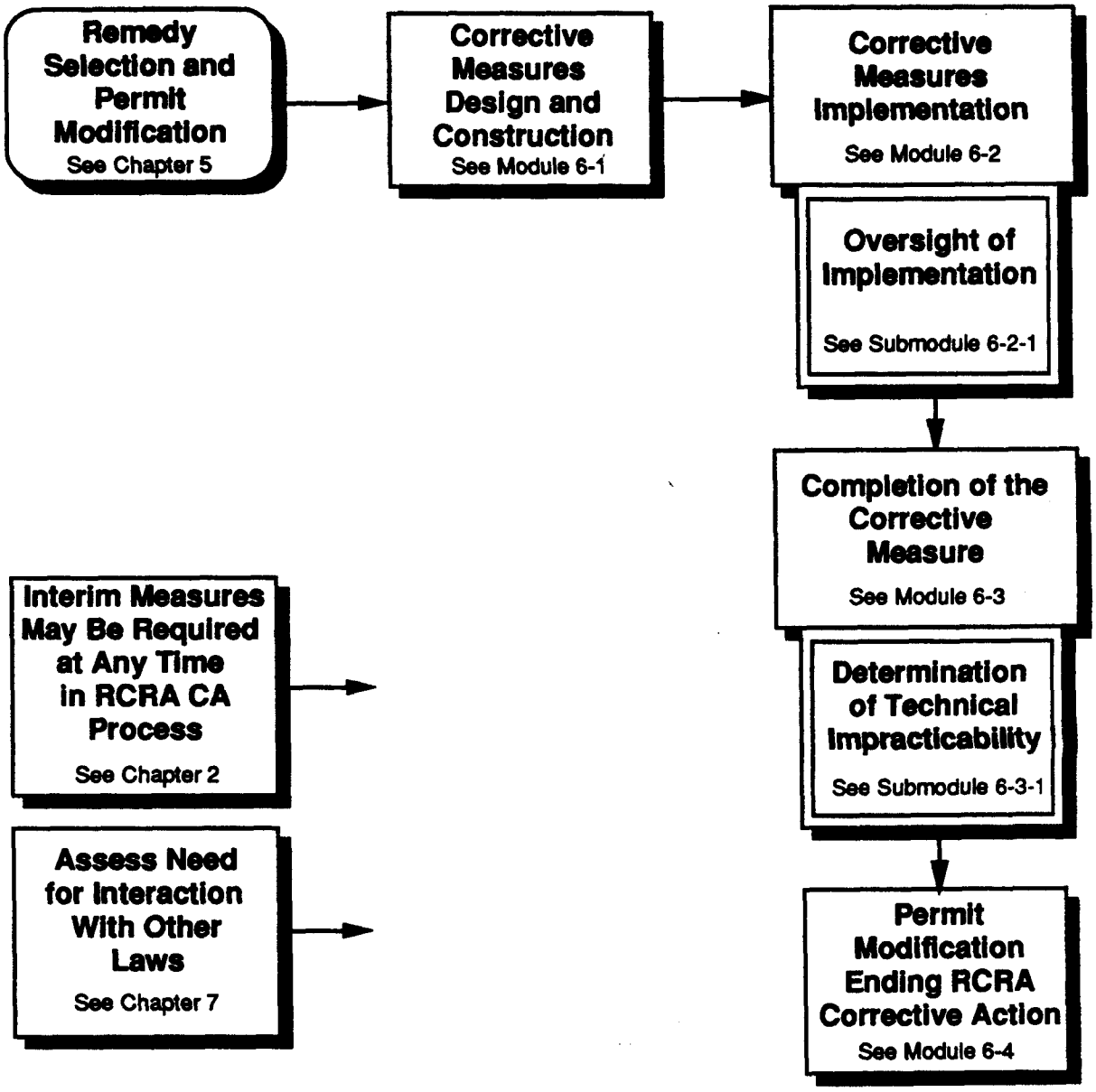


Figure 7
Chapter Six: Corrective Measures Implementation (CMI)

Chapter Six: Corrective Measures Implementation (CMI)

After EPA or the authorized State has approved the corrective measure through the permit modification process, the DOE facility will often be required, in the modified permit/order, to develop a corrective measures design. EPA or the authorized State will approve or modify the design and incorporate it into the schedule of compliance. Three conditions must be met in order to complete corrective measures: (1) all media cleanup standards must be met; (2) all actions required in the permit to address the source or sources of contamination must be satisfied (i.e., implement source controls); and (3) the permittee must comply with procedures specified in the permit for removal or decontamination of units, equipment, devices or structures required to implement the corrective measures.

This chapter will detail the fourth and final phase of the corrective action process under Subpart S, and the overview graphic for this chapter is provided on Figure 7. This chapter will address the following modules:

Module 6-1 Corrective Measures Design and Construction

Under the proposed Subpart S rule, EPA may require the owner/operator to submit a detailed plan, including corrective measures specifications, and complete construction drawings for the corrective measure. Such a requirement usually appears in the facility schedule of compliance in the modified permit or in the Federal Facility Compliance Agreement (FFCA). The proposed Subpart S rule does not provide specific requirements for these plans to implement the corrective measure.

Module 6-2 Corrective Measures Implementation (CMI)

Implementing the corrective measure is a two phase-process. The first phase involves the construction of the corrective measure, and starts once EPA approves the design, specifications, and the construction, quality assurance, and other plans. The second phase of Corrective Measures Implementation (CMI), operation of the corrective measure, begins once construction and acceptance testing are complete.

Module 6-3 Completion of the Corrective Measure

Under the proposed Subpart S rule, a corrective measure is complete when:

- The facility demonstrates compliance with the media cleanup standards (MCS) established in the modified permit;
- All permit requirements for actions addressing the source of the release are satisfied; and
- The facility demonstrates compliance with the procedures specified in the permit for the removal and/or decontamination of all equipment, devices, or structures used in conducting the corrective measure.

In addition to developing a document detailing the specific information supporting the claim that the corrective measure is complete, the facility is required to obtain certification of the completion of the corrective measure from an independent professional(s) skilled in the appropriate discipline(s).

If, after a "reasonable effort" (which includes active efforts to achieve all requirements of the permit) the owner/operator demonstrates the corrective measure is incapable of meeting a given performance standard of the modified permit, then the owner/operator may request a Determination of Technical Impracticability. The Determination of Technical Impracticability represents a finding that remediation of the release is not feasible from a technical standpoint, and such a determination does not represent a discharge of the requirement to conduct RCRA Corrective Action nor does it discharge the owner/operator's obligation for the ultimate cleanup of the facility. EPA reserves the authority to require additional efforts if advances in technology provide a corrective measure capable of remediating the contamination at the facility.

Module 6-4 Permit Modification Ending RCRA Corrective Action

Following documentation and certification of the completed corrective measure, the owner/operator must request a Class III permit modification to end the requirement to conduct RCRA Corrective Action. This type of permit modification requires negotiation of the modification with EPA, development of a draft permit, a public notice, a comment and response period, a public hearing (if necessary), incorporation of any revisions into the permit modification, and issuance of the final modified permit or Federal Facility Compliance Agreement (FFCA). For an Interim status facility, EPA will rescind the RCRA §3008(h) corrective action order and modify the FFCA.

In the preamble to the proposed Subpart S rule, EPA states that the requirement to conduct RCRA Corrective Action ends only upon completion of the corrective measures at all SWMUs at the facility. In the case of completed corrective measures at widely separated SWMUs which are affecting different media, the owner/operator may request a partial release from the RCRA Corrective Action program. In either case, *all* implementation and reporting requirements established in the permit remain in effect until all corrective measures at the facility are complete. Failure to continue required actions such as monitoring or reporting, even if the corrective measure at a SWMU is complete, may represent non-compliance with the terms of the facility permit.

References

This module lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

Chapter Seven: Integration with RCRA and Other Environmental Laws

The last chapter of this document addresses the integration of the proposed corrective action rule with other RCRA requirements and with other laws. This chapter will address the following modules:

Module 7-1 Resource Conservation and Recovery Act (RCRA)

The applicable RCRA requirements include the generator/transporter requirements, waste characterization, Subpart F, waste management and land disposal restrictions, Subtitle D (solid wastes), public participation and community relations, and closure. The overview graphic for this module is provided on Figure 8.

Modules 7-2 to 7-9 Integration With Other Environmental Laws

The other laws include the Occupational Safety and Health Act (OSHA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the National Environmental Policy Act (NEPA), the RCRA Underground Storage Tank Program, the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), the Clean Air Act (CAA), the Toxic Substances Control Act (TSCA), and State laws. The overview graphic for this module is provided on Figure 9.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

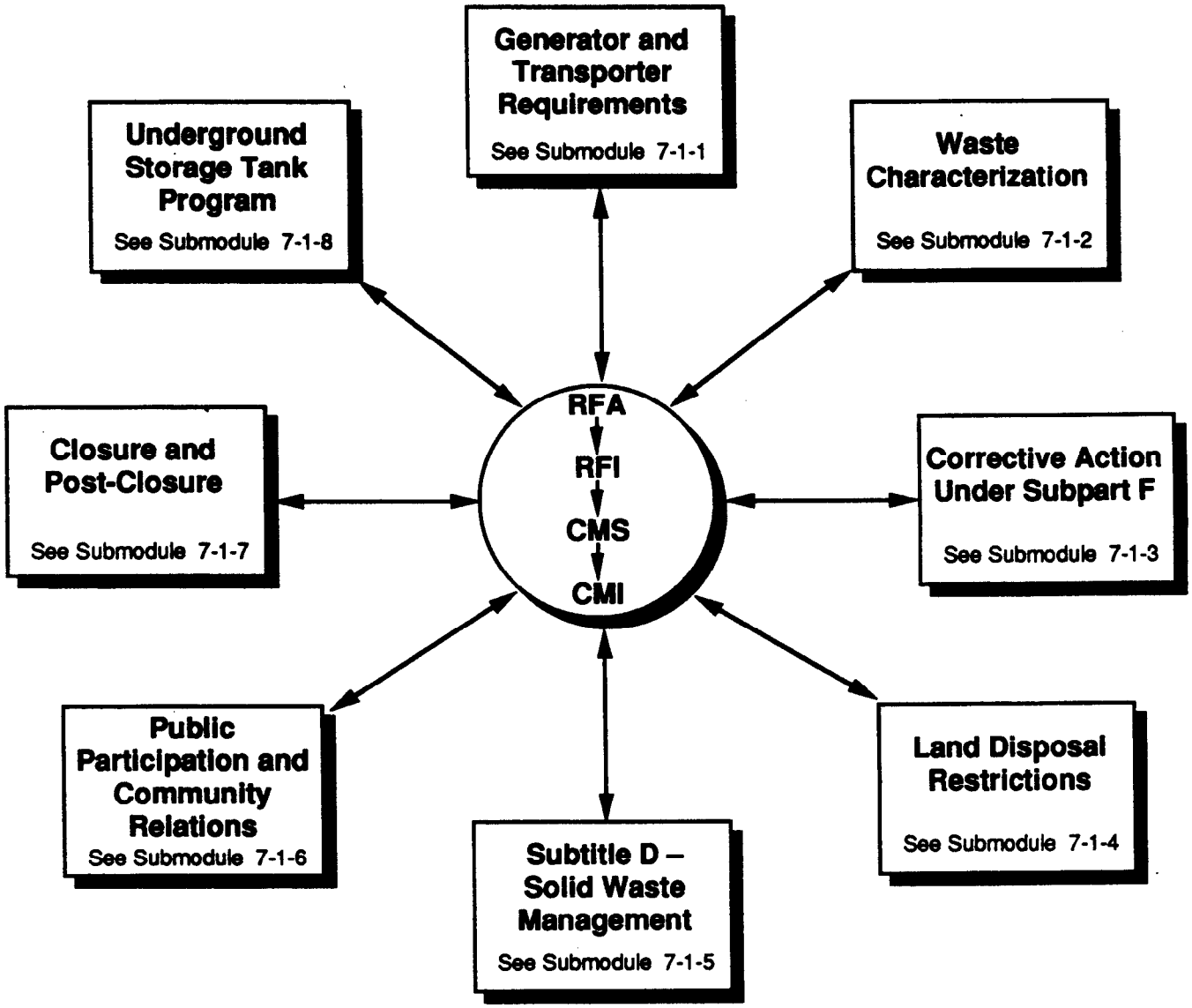


Figure 8
Chapter Seven: Integration with RCRA and Other Environmental Laws
Module 7-1 – Integration with RCRA

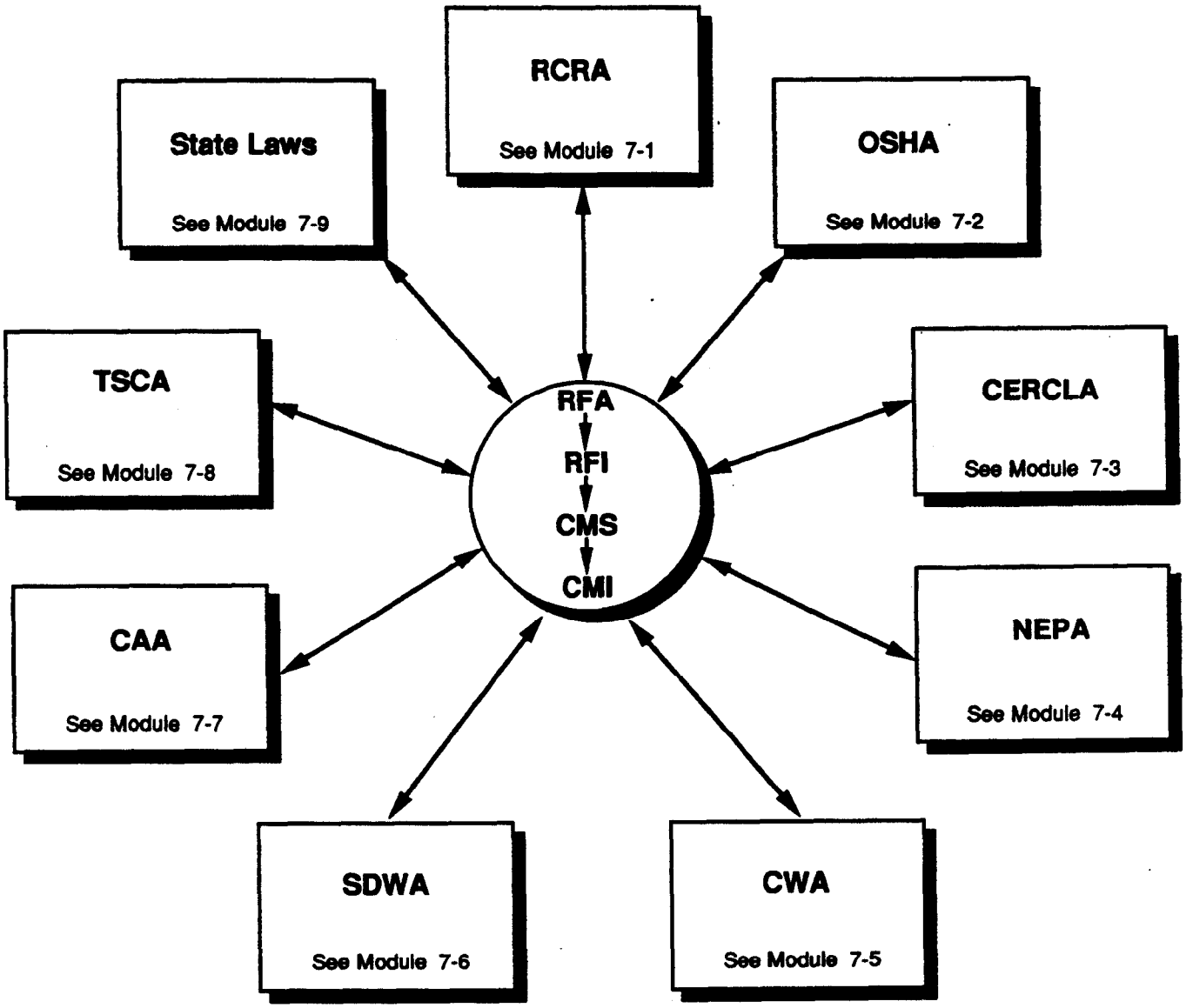


Figure 9
Chapter Seven: Integration with RCRA and Other Environmental Laws
Modules 7-2 to 7-9 – Other Laws

References

Corrective Measures for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities; 55 FR 30796; July 27, 1990

KEY TO THE GRAPHIC APPROACH

Purpose: Environmental requirements facing DOE facilities are often detailed, complex, and subject to change. Graphic (i.e., flowchart) guidance provides thorough and accurate guidance on environmental topics in an easily understandable format. This guidance document uses diagrams, flowcharts, and supplemental text.

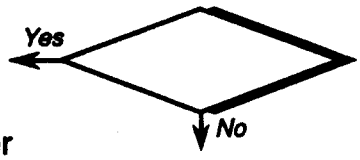
Structure: This guidance document subdivides regulatory definitions into modules. Each module addresses a key portion of the regulations. Each module consists of the following elements:

- A diagram showing how the module corresponds to the regulatory issues addressed in the other modules,
- Flowcharts presenting a decision process for applying the subject regulations, and
- On the pages opposite flowcharts, text providing supplemental information.

Flowchart Symbols: The following symbols have been used in the flowcharts in this document:

- Headings, to label sections of the flowchart and associated supplemental text;
- Ovals, labeled "Start," representing the beginning of a flowchart;

- Diamonds, presenting the decision process;



- Step Numbers, to allow cross-referencing to other steps in the flowchart and between the flowchart and the supplemental text;

Step 1

- Dashed-Line Rectangles, containing "continued on," "continued from," or "go to" statements; and

- Solid-Line Rectangles, presenting results of the decision-making process.

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Chapter 1

Applicability and the RCRA Facility Assessment

Introduction . . . . . 1 - 3
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Module 1-2: The RCRA Facility Assessment . . . . . 1 - 17
Submodule 1-2-1: Preliminary Review . . . . . 1 - 19
Submodule 1-2-2: The Visual Site Inspection . . . . . 1 - 27
Submodule 1-2-3: The Sampling Visit . . . . . 1 - 31
Submodule 1-2-4: The Final RFA Report . . . . . 1 - 37
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Introduction

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) include three provisions that give the Environmental Protection Agency (EPA) authority to require corrective action for releases of hazardous wastes and hazardous waste constituents into the environment:

- RCRA §3004(u) applies to facilities seeking or subject to RCRA permits and requires that the permit address releases from solid waste management units (SWMUs). The proposed Subpart S rule establishes the procedures and technical requirements for implementing corrective action under RCRA §3004 (u).

- RCRA §3004(v) provides authority to require facilities seeking or subject to a RCRA permit to address releases that have migrated beyond the facility boundary.

- RCRA §3008(h) provides for the use of enforcement orders whenever there is or has been a release of a hazardous waste or hazardous waste constituent from an interim status RCRA facility.

[Update 9/99: It should be noted that if there is evidence of conditions posing an imminent and substantial endangerment to health or the environment, EPA may choose to issue an order to abate those conditions as quickly as possible under the imminent hazard provisions of Sect. 7003 of RCRA instead of Sects. 3004(u), 3004(v), or 3008(h).**]**

EPA or the authorized State can use these authorities to require facilities to identify, investigate, and address releases of hazardous waste or hazardous waste constituents from SWMUs at RCRA facilities. It is important to define the terms hazardous waste, hazardous waste constituent, release, and solid waste management unit in order to better understand the broad scope of the RCRA Corrective Action authorities. These definitions are defined in the proposed Subpart S rule (40 CFR §264.501):

- **Hazardous waste** refers to waste defined as hazardous under RCRA §1004(5), including listed wastes and characteristic wastes, and applies to wastes designated as hazardous by either EPA or the State.

- **Hazardous waste constituent** is any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix IX of 40 CFR Part 264. The term, as applied to RCRA Corrective Action, is broader than the definition under 40 CFR Part 260.10. In the proposed Subpart S rule use of the term, "hazardous waste constituents" includes the groundwater monitoring parameters that are listed in the Part 264 Appendix IX list, even if they are not also listed in Part 261 Appendix VIII, EPA's list of hazardous waste constituents.

- **Release** means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous waste constituents) into the environment (including the abandonment or discarding of barrels, containers,

and other closed receptacles containing hazardous wastes or hazardous waste constituents).

- **Solid waste management unit (SWMU)** is any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. SWMUs include any area at a facility at which solid wastes have been routinely and systematically released. A SWMU does not include accidental spills, releases from production processes, feedstock storage, or product storage areas (unless these releases can be shown to be "routine and systematic"), or raw material or product storage areas. The term SWMU, however, may apply to materials that are being stored prior to recycling. Even if they are not solid wastes, such materials can contain hazardous waste constituents. The EPA refers to units used to manage materials that are to be recycled as Areas of Concern (AOCs) rather than SWMUs. Nevertheless, an AOC can be addressed under RCRA Corrective Action. The term SWMU as used throughout this document is also meant to encompass AOCs.

The term SWMU applies to units that manage solid wastes as well as to units that manage hazardous wastes (See Table 1-1). Hazardous waste management units, such as incinerators or landfills, are also identified as SWMUs. There is, however, an important distinction between SWMUs that manage hazardous waste and those that manage solid waste. Releases to groundwater from regulated hazardous waste management units (a subset of all SWMUs) are addressed through RCRA Subpart F Corrective Action requirements. Sections 3004(u) and (v) of RCRA (codified in 40 CFR 264.101) require corrective action for releases to groundwater and other media (e.g., soil, surface water) from *any* SWMU (used to manage either solid or hazardous waste) at a treatment, storage or disposal facility that is seeking or subject to a RCRA permit. Releases to groundwater from units that do not manage hazardous waste or hazardous waste constituents are addressed through RCRA Corrective Action.

RCRA Corrective Action has been proposed under 40 CFR Part 264, Subpart S, and EPA has indicated that this proposed rule should be used as guidance until Subpart S is finalized. Proposed Subpart S requirements differ substantially from existing Subpart F regulations. The most striking difference is that Subpart S addresses releases to all environmental media, not just groundwater. Further, for facilities with groundwater contamination, Subpart S establishes more stringent cleanup requirements than does Subpart F. EPA is expected to propose changes to RCRA Subpart F that would make it more consistent with RCRA Subpart S; however, these rules have not yet been proposed. Releases to groundwater from RCRA hazardous waste management units will continue to be addressed under Subpart F requirements; however, when EPA proposes and finalizes changes to Subpart F, they can be expected to be more comprehensive and consistent with Subpart S.

Table 1-1
Classification of Units

SWMUs	May Be SWMUs	Not SWMUs
Regulated Units (surface impoundments, waste piles, landfills, and land treatment units)	Recurrent spills or non-tank leakage	One-time spills
Tanks	Accidental spills that appear to have a pattern	Non-systematic leakage from product storage tanks
Container Storage areas	Tie-ins to domestic sewer systems	Passive leaks or spills
Incinerators	Storm water retention basins	Military firing range impact areas
Injector wells	Units containing materials to be recycled	Accidental releases (for example a fire) that release materials to air
Wastewater treatment units	Units not containing solid waste, but containing hazardous waste constituents	Point source discharges of wastes permitted under another authority
Waste recycling units	Mounds from moving earth	
Physical, biological, or chemical treatment units		
Routine and systematic releases		
Industrial process servers		
Open or closed drainage ditches		
Industrial waste sumps		

As stated previously, EPA has developed a four-phase program for implementing RCRA Corrective Action: the RCRA Facility Assessment (RFA), the RCRA Facility Investigation (RFI), the Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI). Each phase consists of a number of steps. The number of steps required and the complexity of corrective action permit conditions or other enforcement actions may vary depending on the extent and severity of releases at a treatment, storage, or disposal facility (TSDF). EPA can also require that a facility take interim measures to mitigate the effects of a release in an immediate timeframe, whenever necessary to protect human health and the environment (see Chapter 2). [Update 9/99: Note that EPA may choose to to issue an order to abate conditions of imminent hazard as quickly as possible under the imminent hazard provisions of Section 7003 of RCRA.]

The RFA is the first phase of the RCRA Corrective Action process, and is conducted for facilities seeking a RCRA permit, for facilities operating or closing under interim status, and in some cases for facilities with a history of noncompliance, and for generators of solid or hazardous waste that are not seeking permits or do not have interim status. The RFA is typically conducted by EPA or an authorized State to identify SWMUs and determine the

likelihood of whether they have the potential for a past or present release of hazardous waste or constituents to the environment. However, in some instances EPA has given DOE the authority to perform the RFA at DOE facilities, typically through an Inter-Agency Agreement (IAG) or Federal Facility Compliance Agreement (FFCA).

When EPA conducts an RFA at a DOE facility, the facility should be an active participant in the RFA process. It is during the RFA that a list of SWMUs for the facility is compiled and the potential for release is determined. Therefore, it is important to clearly explain the processes and waste management practices at the facility to minimize misidentification of units as SWMUs. Effective communication can have a significant impact on the number of SWMUs EPA identifies for further investigation.

This chapter outlines how facilities become subject to RCRA Corrective Action, what is considered for each of the steps in the RFA, and how conclusions are reached so that when an RFA is conducted, the DOE facility is better prepared to perform or oversee the conduct of the RFA. The RFA process is discussed only briefly in the preamble of the proposed Subpart S rule. The 1986 EPA RFA Guidance has been consulted and used extensively while preparing this chapter.

The major objectives of the RFA are to:

- Identify SWMUs and collect existing information on potential, past or present releases, and

- Identify releases or suspected releases needing further investigation.

The overview graphic for this chapter is provided on the next page. This chapter will address the following modules.

Chapter 1 Overview Graphic

Module 1-1 Applicability and Permit Application

The corrective action program is designed to be implemented as part of the permit conditions issued for RCRA treatment, disposal, or storage facilities or through RCRA §3008(h) orders. Corrective actions may be required when modifying existing permits, included as part of new permits, or, for interim status facilities operating before November 8, 1984, as part of court actions or administrative orders. By statute, RCRA Corrective Action does not apply to the following types of activities: land treatment demonstrations, emergency responses of 90 days or less, and research, development, and demonstration (RD&D) programs (see proposed 40 CFR §264.500 (f)).

Module 1-2 The RCRA Facility Assessment (RFA)

The RFA is an initial screening tool conducted by EPA (or by other Federal agencies including DOE if incorporated into the Inter-Agency Agreements) that includes a site inspection and a review of records on the facility. Since 1985, the RFA has evolved into a definitive process consisting of three interrelated activities: the preliminary review, a visual site inspection (VSI), and, if warranted, a sampling visit.

Module 1-3 Need for a RCRA Facility Investigation (RFI)

If the RFA determines there is an actual or potential release of hazardous wastes or hazardous waste constituents from a SWMU which poses a threat to human health or the environment, an RFI is usually required. If insufficient information is collected to definitively support either a recommendation for an RFI or a determination that no further action is required, the facility should request that additional studies (such as a sampling visit) be conducted before agreeing to conduct an RFI. Such confirmational studies will help to screen out those SWMUs not posing a threat to human health or the environment and allow the facility to focus resources on investigations and corrective action at those SWMUs that are posing a threat.

References

This lists the specific references that were used to develop this chapter as well as other references that may provide useful guidance.

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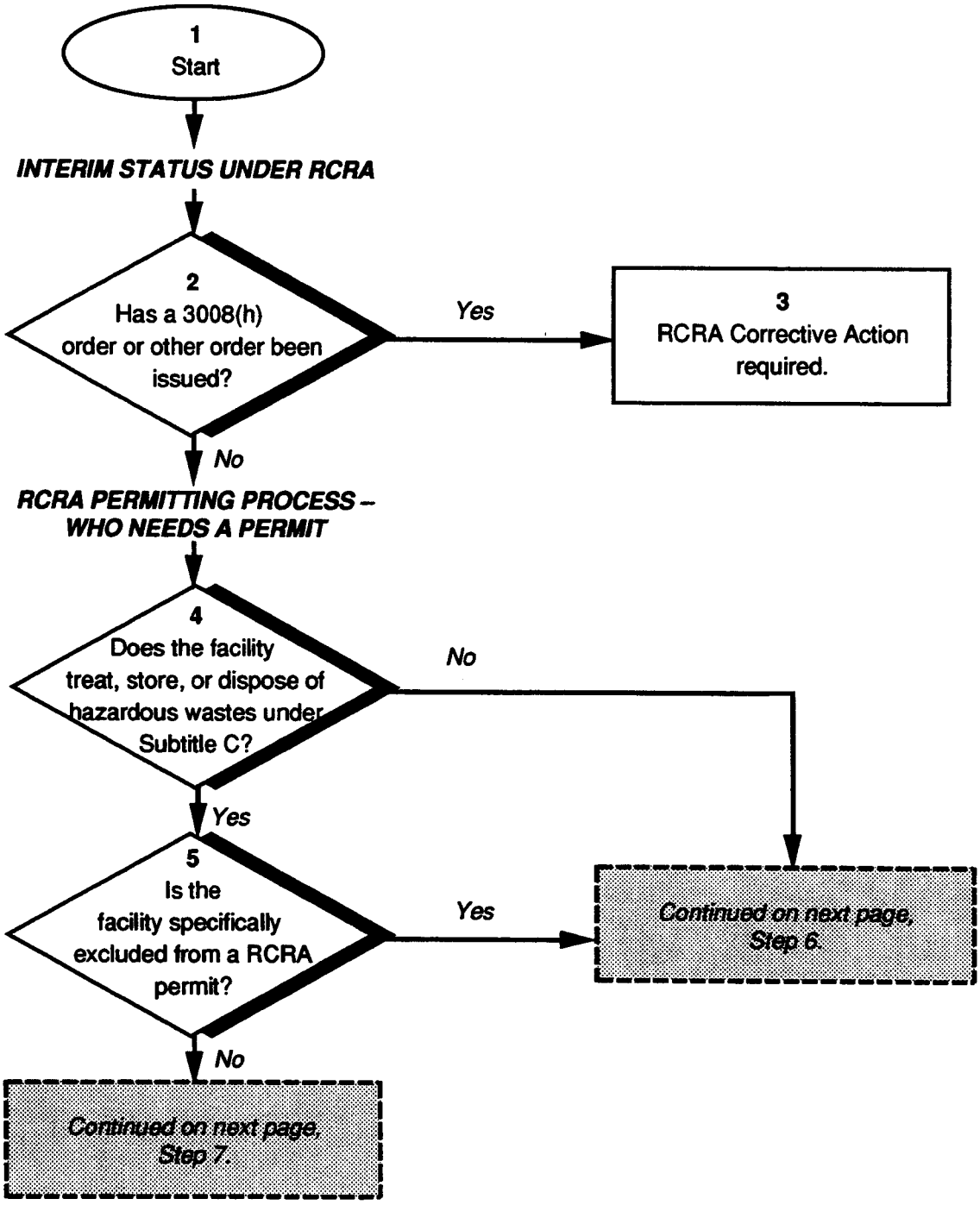
Module 1-1: Applicability and Permit Application



Module 1-1: Applicability and Permit Application

This module discusses (1) determining the need for a RCRA Facility Assessment (RFA) and (2) the mechanism for establishing the requirements for an RFA.

Step 1 Start.

Interim Status Under RCRA

Step 2 Section 3008(h) authorizes EPA to impose corrective action or other necessary measures through an enforcement order, whenever there is or has been a release of hazardous waste or constituents from an interim status RCRA facility. Administrative orders may also be directed to facilities that generate solid hazardous waste but do not require a RCRA permit.

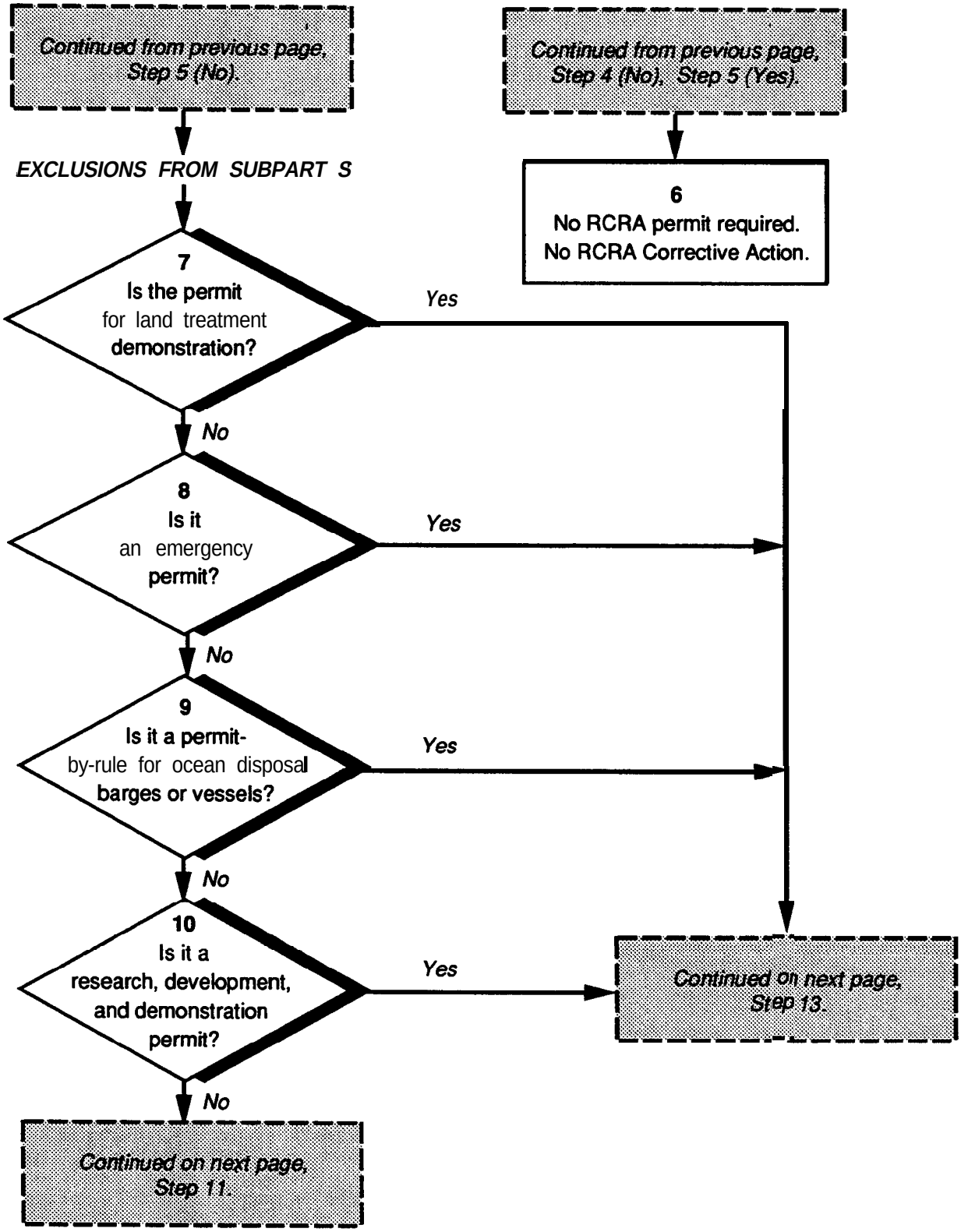
Step 3 If required by an order, the facility must initiate RCRA Corrective Action.

RCRA Permitting Process — Who Needs a Permit

Step 4 Any facility that treats, stores or disposes of solid wastes considered hazardous under RCRA must apply for a RCRA permit (40 CFR §264.1(b)). RCRA permits can be issued by EPA or a State authorized to administer the permits program. In order for a State to be authorized, the State program should be fully equivalent to the Federal program. As of the latest update (January, 1993) 16 States were authorized for RCRA Corrective Action (see Module 7-9). This guidance does not attempt to define solid and hazardous waste and refers the reader to the DOE graphic guidance entitled *The Definition of Solid and Hazardous Waste Under RCRA* (1992).

Step 5 Only in a very limited number of circumstances can a person treat, store, or dispose of hazardous waste without a permit (40 CFR §264.1(g)):

- Generators storing waste onsite for less than 90 days;
- Small quantity generators who store waste onsite less than 180 days;
- Farmers disposing of their own (hazardous) pesticides onsite;
- Owners or operators of totally enclosed treatment facilities, wastewater treatment units (tanks) and elementary neutralization units;
- Transporters storing manifested wastes at a transfer facility less than 10 days;
- Persons engaged in containment activities during an immediate response to an emergency;
- Owners or operators of solid waste disposal facilities handling only conditionally exempt small quantity generator waste; and
- Persons engaged in Superfund onsite cleanups and RCRA Section 7003 cleanups.


Continued from previous page, Step 5 (No).
Continued from previous page, Step 4 (No), Step 5 (Yes).
EXCLUSIONS FROM SUBPART S
6
No RCRA permit required.
No RCRA Corrective Action.
7
Is the permit for land treatment demonstration?
Yes
No
8
Is it an emergency permit?
Yes
No
9
Is it a permit-by-rule for ocean disposal barges or vessels?
Yes
No
10
Is it a research, development, and demonstration permit?
Yes
Continued on next page, Step 13.
No
Continued on next page, Step 11.

Step 6 RCRA Corrective Action does not apply to generators or transporters who do not treat, store, or dispose of hazardous waste. It should be noted, however, that EPA or the authorized State has the discretion to compel RCRA Corrective Action at these facilities through administrative orders.

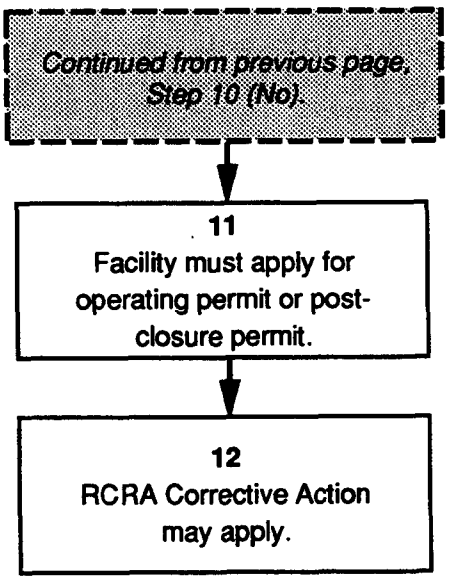
Exclusions from Subpart S

Step 7 RCRA Corrective Action does not apply to RCRA permits for land treatment demonstrations. EPA issues land treatment demonstration permits for the purpose of allowing an owner or operator to meet the land treatment demonstration requirements under 40 CFR Section 264.272. This permit may be issued either as a treatment or disposal permit covering only field test or laboratory analyses, or as a two-phased facility permit covering the field tests, or laboratory analyses and design, construction, operation and maintenance of the land treatment unit (40 CFR §270.63).

Step 8 RCRA Corrective Action does not apply to emergency permits. Emergency permits are issued in potentially dangerous situations for 90 days or less. However if the facility is required to continue to operate beyond the allowable time limit, a full operating permit would be required and the facility would be subject to Subpart S requirements (40 CFR §270.61).

Step 9 RCRA Corrective Action does not apply to permits-by-rule for ocean disposal barges or vessels. Ocean disposal barges or vessels are regulated primarily by the Marine Protection, Research and Sanctuaries Act (MPRSA) (40 CFR §270.60(a)).

Step 10 RCRA Corrective Action does not apply to RD&D permits (40 CFR §270.65). EPA may issue an RD&D permit for any hazardous waste treatment facility which proposes to utilize an innovative and experimental hazardous waste treatment technology or process for which permit standards for such experimental activities have not been promulgated under 40 CFR Parts 264 or 266.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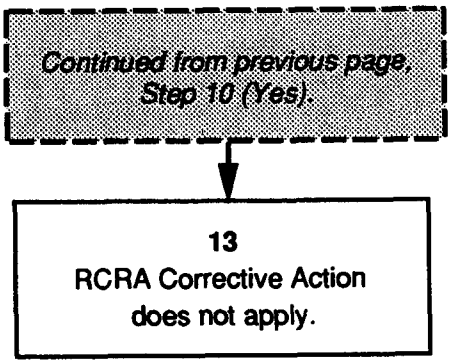
11
Facility must apply for operating permit or post-closure permit.
12
RCRA Corrective Action may apply.


Continued from previous page, Step 10 (Yes).
13
RCRA Corrective Action does not apply.

Step 11 RCRA Corrective Action requirements can apply. The facility is seeking one of several permits:

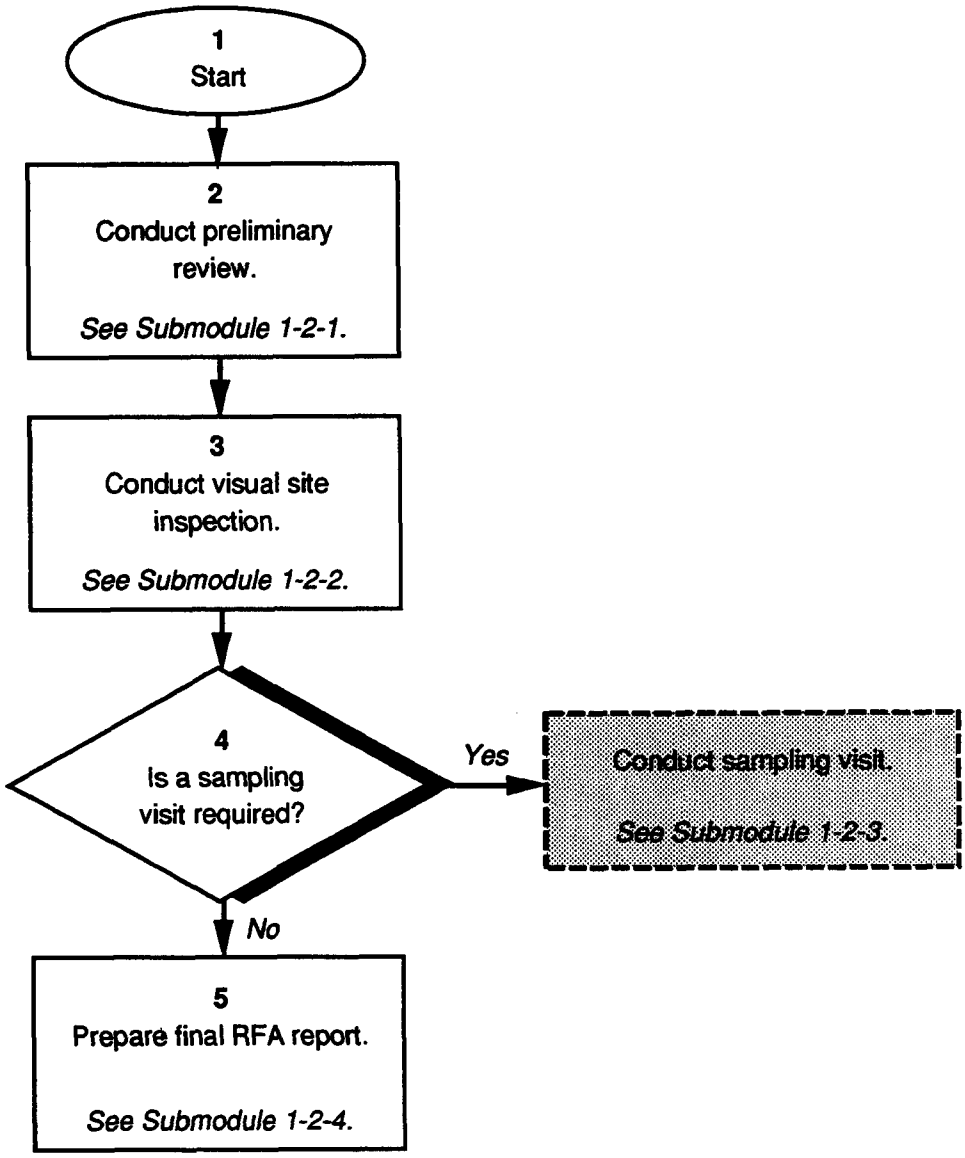
- **TSD permits**: The most common RCRA permits are issued for treatment, storage, or disposal units. The units include containers, tank systems, surface impoundments, waste piles, land treatment units, landfills, incinerators, and miscellaneous units.

- **Post-closure permit**: Land disposal facilities that leave wastes in place when they close such facilities must obtain a post-closure permit, specifying the requirements for proper post-closure.

Step 12 If required by an enforcement order or through a permit, the facility must initiate RCRA Corrective Action. Whether required by an order or a permit condition, the RCRA Corrective Action process may be divided into four steps: RFA, RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI).

Step 13 RCRA Corrective Action does not apply.

Module 1-2: The RCRA Facility Assessment



Module 1-2: The RCRA Facility Assessment

This module introduces the steps of the RCRA Facility Assessment (RFA). Each phase of the RFA is discussed in detail in the submodules of this section.

Step 1 **Start.**

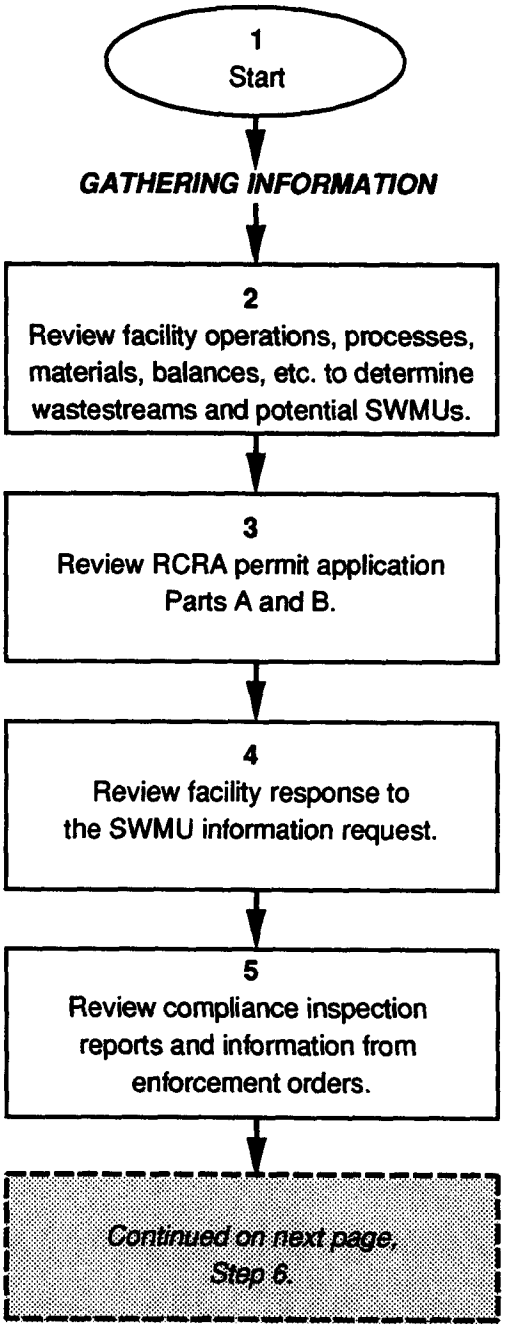
Step 2 The first phase of the RFA is the preliminary review. The preliminary review is an examination of existing information about a facility. The information gathered during the preliminary review is used to focus the following steps (See Submodule 1-2-1).

Step 3 The second phase of the RFA is the visual site inspection (VSI). During the VSI, investigators examine the solid waste management units (SWMUs) at the facility for evidence of releases or potential releases of hazardous waste or hazardous waste constituents (see Submodule 1-2-2).

Step 4 The third phase of the RFA is the sampling visit. Typically EPA does not conduct sampling as part of an RFA; however, it is usually in the facility's best interest to conduct sampling at any SWMU with an actual or potential for releasing hazardous wastes or hazardous waste constituents. Such sampling will confirm if there is an actual release, and may prevent conducting an RFI at SWMUs where a release has not occurred (see Submodule 1-2-3).

Step 5 The final phase of the RFA is preparation of the RFA report. Often the RFA report must follow a format specified by EPA (see Submodule 1-2-4).

Submodule 1-2-1: Preliminary Review



Submodule 1-2-1: Preliminary Review

This submodule describes how to conduct a preliminary review, the first step in the RCRA Facility Assessment (RFA) process. The preliminary review has two primary purposes: (1) to gather and evaluate existing information on facilities in order to identify and characterize potential releases; and (2) to focus the activities to be conducted in the second and third steps of the RFA, the visual site inspection (VSI) and the sampling visit.

Step 1 **Start.** The preliminary review is typically done by EPA or the authorized State. However, in some instances EPA has given DOE the authority to perform the RFA at DOE facilities. This authority is typically granted through a FFCA between EPA or an authorized State and DOE.

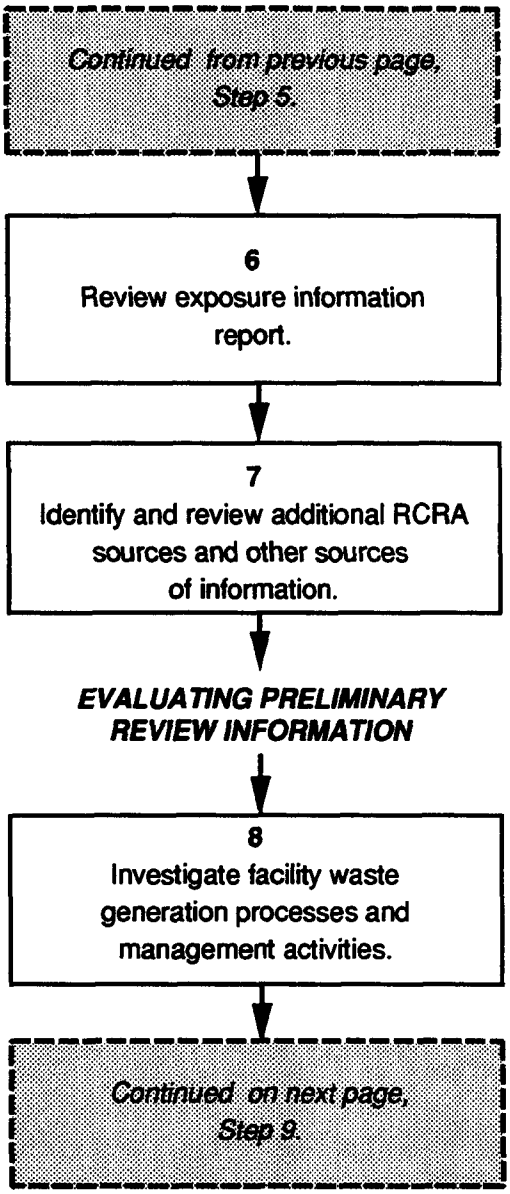
Gathering Information

Step 2 The first step in a preliminary review should be a detailed review of facility operations. Review of processes such as manufacturing allows analyses of raw material inputs, products generated, and wastestreams. This information will allow the investigator to focus on wastes and waste management practices. This information is valuable both in determining the SWMUs associated with each wastestream and in locating areas where routine and systematic releases may be occurring.

Step 3 The Part A and B permit applications and closure plans are important data sources of information for the RFA. These are developed to support permitting or closure of regulated units (which are also defined as SWMUs), and they also usually contain information on other areas of the facility relevant to the RFA. Part A permit applications provide information on the wastes being treated, stored, and/or disposed of in the regulated units at a facility. The Part A will often provide a scale drawing showing the location of all past treatment, storage, or disposal areas which can be useful in identifying SWMUs and other areas of concern (AOCs). The Part B permit application typically includes a characterization of RCRA wastes at the facility, floodplain and topographic maps, and contingency plans which may identify temporary waste management units. If the permit application is for a land disposal unit, it may contain detailed data on the environmental setting, especially with respect to the hydrogeology of the area.

Step 4 EPA will usually request that the facility develop and submit a list of, and provide descriptions for, all SWMUs at the facility for use by the team conducting the RFA.

Step 5 RCRA inspection reports often provide information on facility waste generation and handling practices, old and new waste management units, and prior releases at the facility.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6
Review exposure information report.
7
Identify and review additional RCRA sources and other sources of information.
EVALUATING PRELIMINARY REVIEW INFORMATION
8
Investigate facility waste generation processes and management activities.
Continued on next page, Step 9.

Step 6 Only facilities seeking permits for landfills and surface impoundments are required to submit Exposure Information Reports. These reports can be useful in identifying pollutant migration pathways from the facility and potential exposure points, and may also discuss the likelihood of human exposure to hazardous waste constituents.

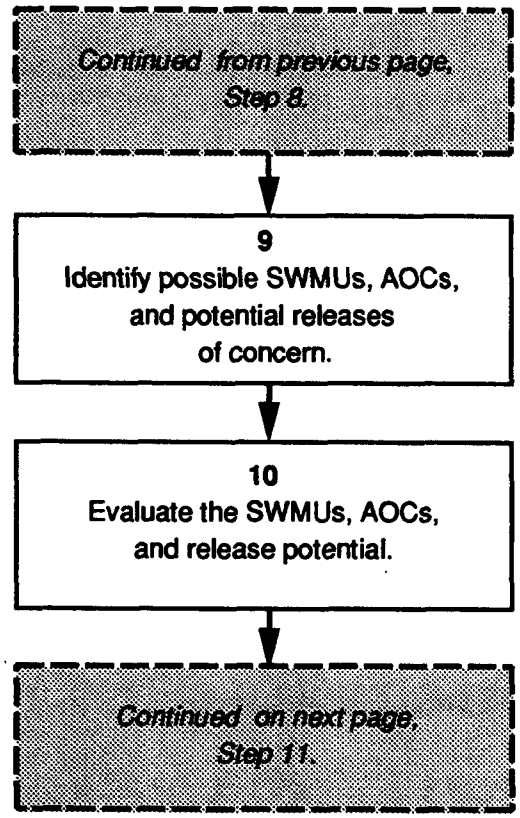
Step 7 Other RCRA sources include:

- **Biennial Report:** Provides a description and the quantities of each hazardous waste received during the previous year and the method of treatment, storage, or disposal for each waste.
- **Groundwater Monitoring Data:** Required under 40 CFR §264 Subpart F for permitted land-based units, or 40 CFR §265 for interim status land-based units.
- **Operating Log**: This provides a map displaying the location and quantities of wastes disposed of throughout the facility. It also provides reports of all incidents that required implementation of the Facility Contingency Plan.
- **RCRA Waste Manifest**: Provides details on all wastes received or shipped from the facility after November 18, 1980.

Other sources can provide useful information for evaluating the likelihood of releases at a facility. These include the NPDES and CAA permits and permit applications, CERCLA PA/SI Reports, HRS Documentation, CERCLA RI/FS Studies, CERCLA 103(c) Notifications, TSCA inspections, OSHA inspections, NPDES inspections, aerial photographs, and underground storage tank notification forms.

Evaluating Preliminary Review Information

Step 8 When evaluating how SWMUs and other areas of the facility have been used to handle waste and how they relate to the facility's overall waste management system, it is important to understand the facility's overall waste generation and management activities.


Continued from previous page, Step 8.
9
Identify possible SWMUs, AOCs, and potential releases of concern.
10
Evaluate the SWMUs, AOCs, and release potential.
Continued on next page, Step 11.

Step 9 Once all the reference materials have been gathered and an understanding of the facility's overall waste generation and management activities has been gained, the identification of SWMUs and potential sources of a release begins.
A SWMU is defined as:

> *Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.*

SWMUs include traditional RCRA units such as landfills, surface impoundments, land treatment areas, tanks, container storage areas, waste piles and miscellaneous units. It also includes those units that have traditionally been excluded from RCRA controls, such as temporary accumulation areas, transfer stations, waste recycling units, injection wells, areas contaminated by routine and systematic releases, and ditches or process sewer lines. For clarification purposes, in the preamble to the proposed Subpart S rule, EPA states that it does not consider leakage from product storage areas, one-time spills of hazardous wastes, or military firing range impact areas as SWMUs.

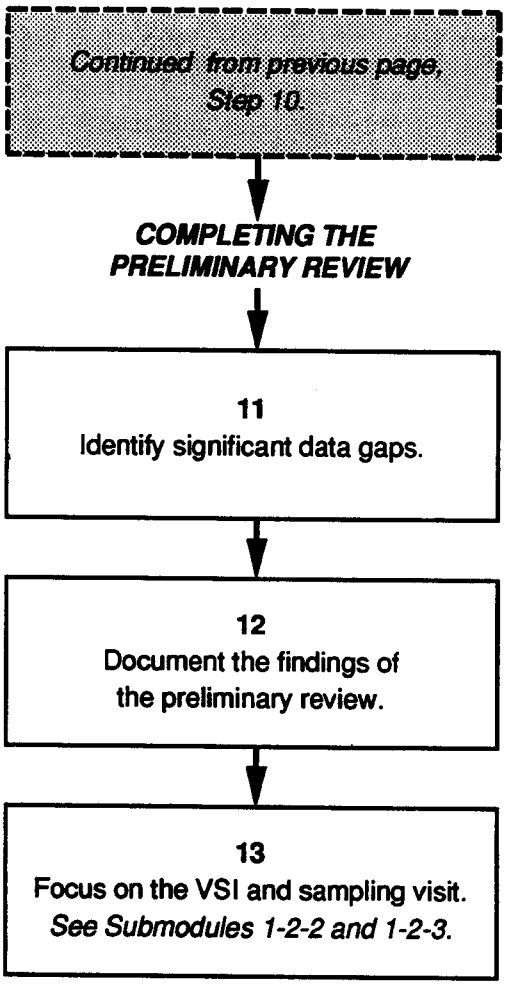
An area of concern (AOC) is defined as:

> *Any area of a suspected release that is not associated with a SWMU (e.g., releases from production areas, or releases from units used to manage materials which are recycled).*

While the proposed Subpart S rule does not specifically address corrective action at AOCs, under the "Omnibus Provisions" of RCRA §3005(c) or the Imminent Hazard provisions of RCRA §7003, EPA can require an owner/operator to conduct investigations and cleanup of releases or potential releases of hazardous waste or hazardous waste constituents from AOCs or other units not classified as SWMUs.

Step 10 Once the wastestreams and associated SWMUs have been identified, the potential for SWMU releases is characterized. The RFA Guidance developed by EPA has identified five components that should be considered in evaluating the release potential of a particular SWMU. They include the unit characteristics, waste characteristics, pollutant migration pathways, evidence of release, and exposure potential. The kinds of information to be considered in these five categories are described briefly below.

- **Unit Characteristics** - Evaluate information on the design, liners, age, construction, location, and method of closure.
- **Waste Characteristics** - Review historical information on the types, volumes, and characteristics of wastes handled.
- **Pollutant Migration Pathways** - Review site hydrogeology, surface water runoff pathways, prevailing winds, locations of rivers, and other pathways.
- **Evidence of Release** - Review historical sampling data, reports of release, citizen complaints, and other information.
- **Exposure Potential** - Locate drinking water wells, uses of nearby surface water, potential for subsurface gas migration.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COMPLETING THE PRELIMINARY REVIEW
11
Identify significant data gaps.
12
Document the findings of the preliminary review.
13
Focus on the VSI and sampling visit.
See Submodules 1-2-2 and 1-2-3.

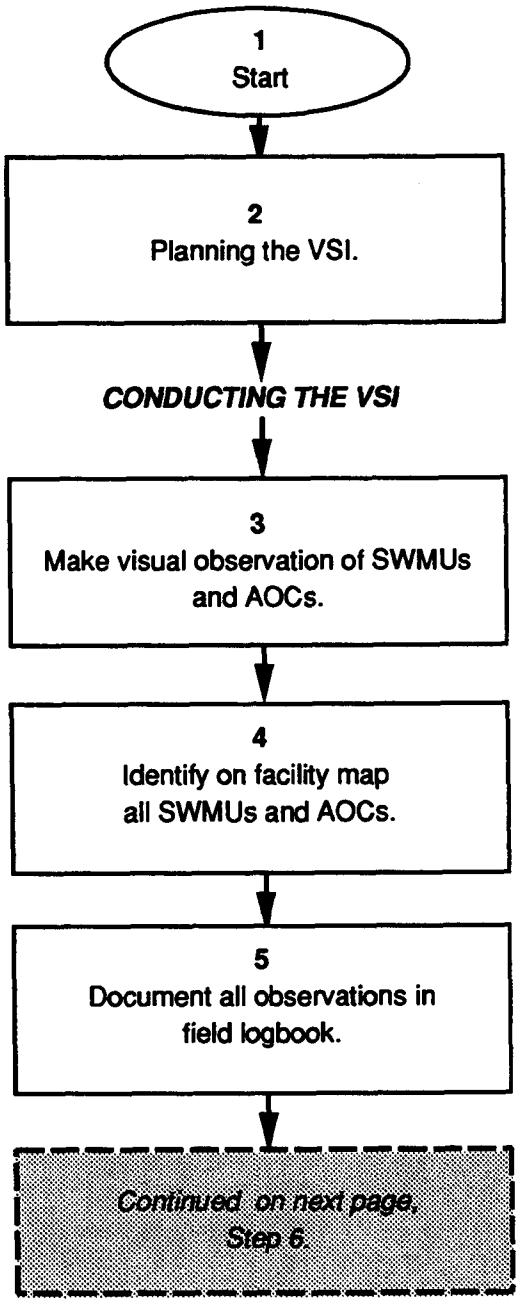
Completing the Preliminary Review

Step 11 The next step is to identify data gaps. These data gaps are the focus of further RFA activities.

Step 12 At the end of the preliminary review, the list of SWMUs should be identified.

Step 13 The primary purpose of the preliminary review is to focus the investigator to the VSI and the sampling visit. See Submodule 1-2-2 for information on the VSI and Submodule 1-2-3 for information on the sampling visit.

Submodule 1-2-2: Visual Site Inspection



Submodule 1-2-2: The Visual Site Inspection

This submodule discusses the visual site inspection (VSI), which is the second step of the RCRA Facility Assessment (RFA) process for identifying releases at RCRA facilities in the corrective action process. The major purposes of the VSI include: (1) visually inspecting the entire facility for evidence that releases of hazardous wastes or constituents have occurred and identifying additional areas of concern (AOCs); (2) ensuring that all the solid waste management units (SWMUs) and AOCs have been identified; (3) filling data gaps identified in the preliminary review; and (4) focusing recommendations concerning the need for a sampling visit, interim measures, and RCRA Facility Investigation (RFI), or no further action at a facility.

Step 1 **Start.** The VSI is typically conducted by EPA. However, DOE does have authority to perform its own RFA/VSI. If EPA is conducting the VSI, the DOE facility needs to be prepared by being completely familiar with all solid and hazardous waste management activities at the facility and be an active participant. That is, the DOE facility contact needs to clearly explain the waste management activities at the facility.

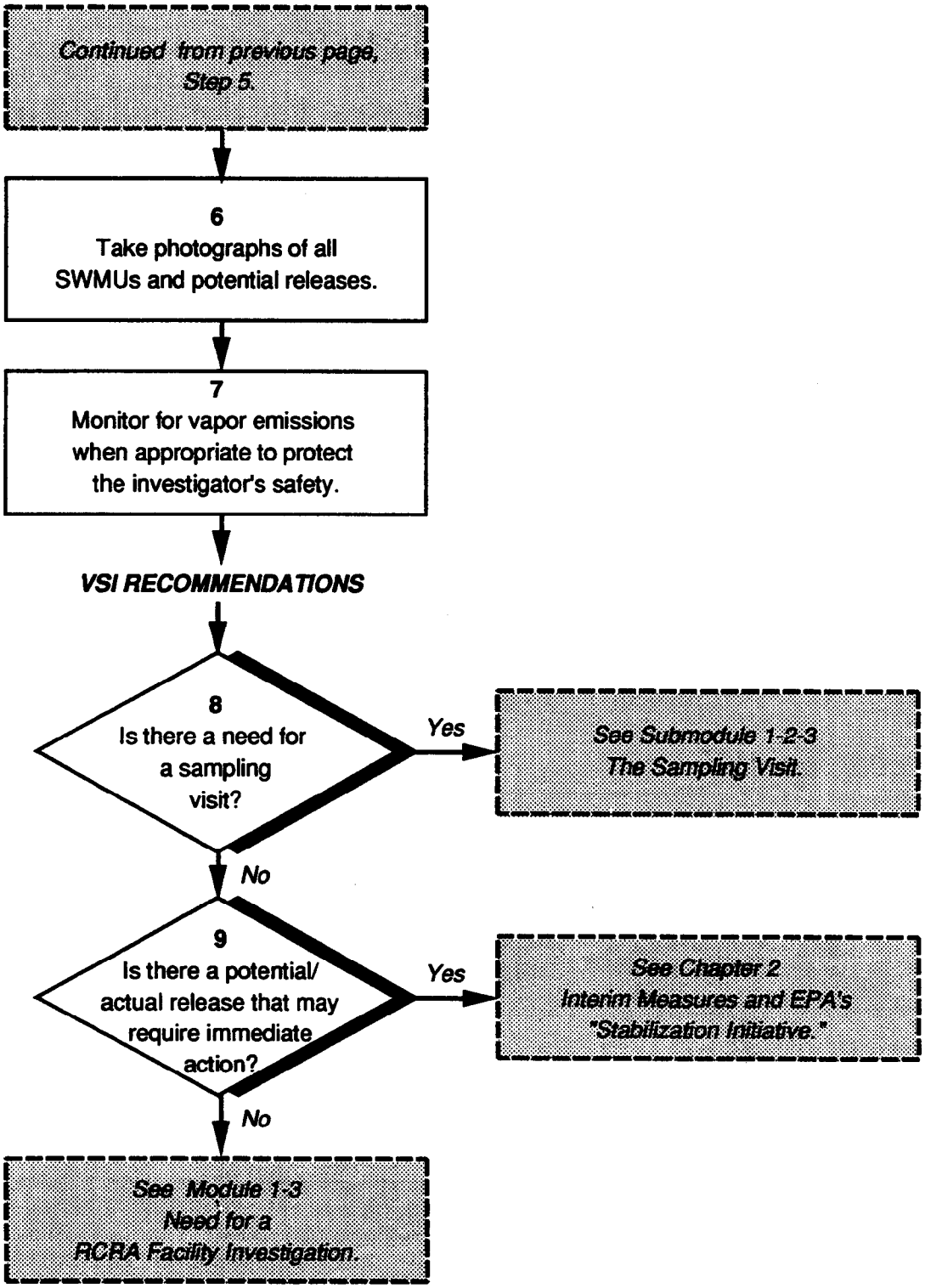
Step 2 The VSI is a relatively simple procedure and should not require a great deal of time to plan and execute. The preliminary review (see Submodule 1-2-1) provides most of the information needed to prepare for conducting the VSI. Any investigator who did not participate in the preliminary review should become thoroughly familiar with the results of the file search. Also a site safety plan outlining the need for personal safety devices should be developed and implemented prior to conducting the VSI.

Conducting the VSI

Step 3 During the VSI the investigator needs to make visual observations of SWMUs and AOCs at the facility. SWMUs or AOCs identified through the preliminary review should be examined, as well as additional SWMUs or AOCs that are identified during the VSI. The investigator should obtain information on each SWMU and AOC regarding the potential for release based on the following five categories: unit characteristics, waste characteristics, pollutant migration pathways, evidence of release, and exposure potential.

Step 4 All the SWMUs and AOCs need to be identified on a facility map. The RFA guidance does not recommend a scale.

Step 5 All field activities must follow standard practices for field operations. For example, the field logbook should be bound and waterproof, and information should be recorded in waterproof ink. The entries into the logbook should be chronological. The information recorded in the logbook should include everything from entry to exit, and include information such as the weather conditions, time, interview information, field observations, photo log, sampling locations, and any other field records or measurements.


Continued from previous page, Step 5.
6
Take photographs of all SWMUs and potential releases.
7
Monitor for vapor emissions when appropriate to protect the investigator's safety.
VSI RECOMMENDATIONS
8
Is there a need for a sampling visit?
Yes
See Submodule 1-2-3 The Sampling Visit.
No
9
Is there a potential/ actual release that may require immediate action?
Yes
See Chapter 2 Interim Measures and EPA's "Stabilization Initiative."
No
See Module 1-3 Need for a RCRA Facility Investigation.

Step 6 During the VSI several different types of pictures should be taken, including an overview of the facility, an overview of each individual unit, photos showing the condition and release controls for each unit, any visible evidence of a release, and the environmental setting. Photos should include objects for scale and all photos should be recorded in the logbook.

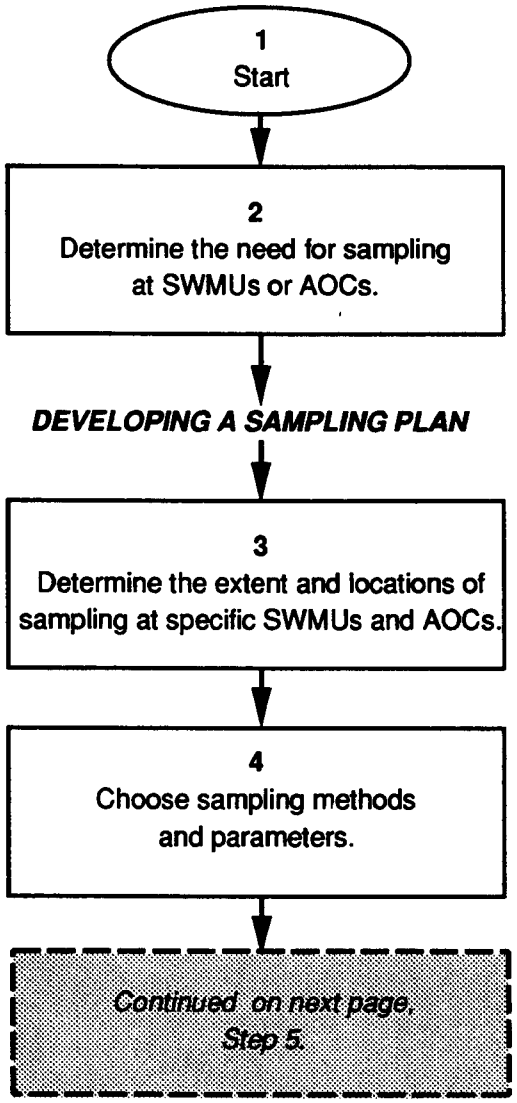
Step 7 In some circumstances it may be necessary to monitor for vapor emissions or radiation hazards to protect the investigator's safety. For example, in situations where the investigator, after conversations with the site personnel, identifies that there are organic gases and vapors, it may be useful to take an organic vapor analyzer onsite during the VSI.

VSI Recommendations

Step 8 Following the preliminary review and the VSI, some units will require sampling to support a determination of release potential. The sampling visit is an optional activity in the RFA. Sampling is commonly conducted when the existing information is not sufficient to support a release determination. The sampling visit is addressed in Module 1-2-3.

Step 9 The investigator can recommend implementation of interim measures any time during the RFA, although he/she may not have sufficient information prior to the VSI to make this recommendation. Interim measures are conducted at the facility whenever there may be a significant risk of immediate exposure resulting from releases at the facility, when action is required to prevent a release from occurring, or in situations where further release migration may result in exposure of human populations or sensitive ecosystems. Interim measures are addressed in Chapter 2.

Submodule 1-2-3: Sampling Visit



Submodule 1-2-3: The Sampling Visit

This submodule discusses the sampling visit which is the third step of the RCRA Facility Assessment (RFA) process. The sampling visit focuses on collecting additional sampling information to fill data gaps that remain upon completion of the preliminary review and the VSI to enable the investigator to make release determinations in the RFA.

Step 1 **Start.**

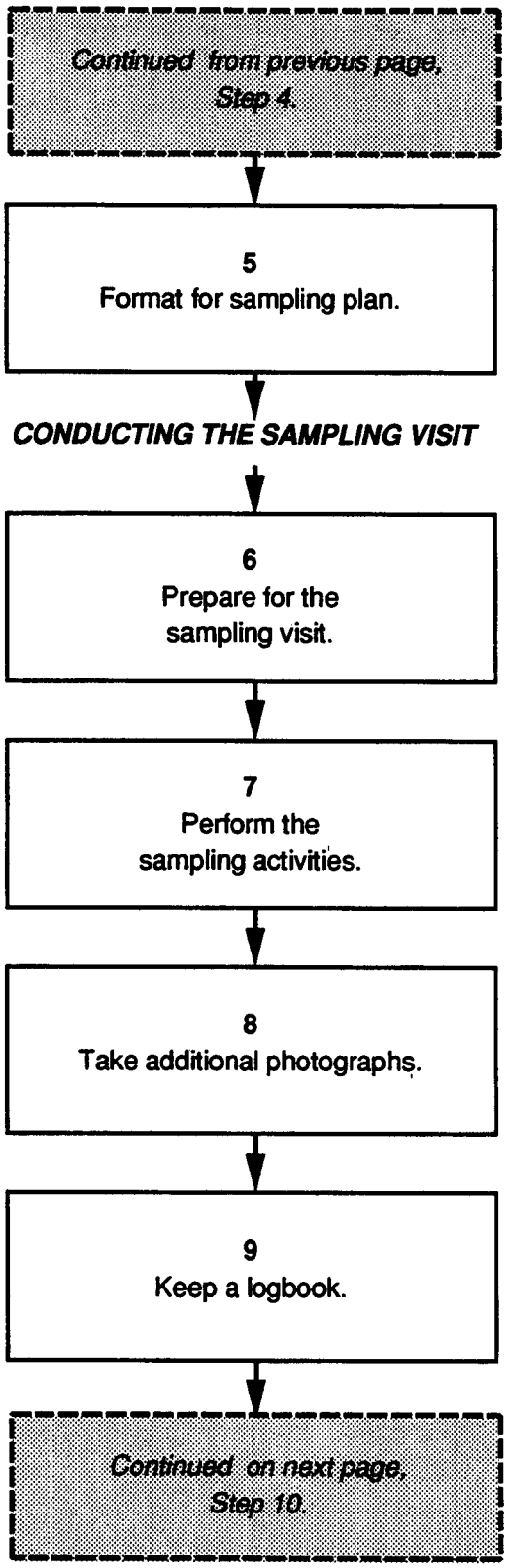
Step 2 The sampling visit is an optional activity in the RFA. The need for additional sampling of potential releases of concern will vary on a case-by-case basis, and the investigator should rely upon best professional judgment in determining when it will be appropriate. Sampling is commonly conducted when the existing information is not sufficient to support a definitive determination that a release has occurred or is occurring.

Developing a Sampling Plan

Step 3 The extent of sampling activities will vary on a case-by-case basis. The investigator may decide to recommend sampling in these situations:

- To collect additional information to support a determination that a solid waste management unit (SWMU) or facility does not require a RCRA Facility Investigation (RFI);
- To collect additional information when the investigator is unsure whether a release has occurred; and
- To collect additional information to confirm a determination of release and to compel an owner/operator to begin an RFI.

Step 4 The sampling plan will be the primary document directing the collection of additional information in the sampling visit. The sampling plan should specify the methods and parameters that will be used at each sampling location at the facility. It should also specify the number of samples to be taken at each sampling point and QA/QC procedures to be employed.


Continued from previous page, Step 4.
5
Format for sampling plan.
CONDUCTING THE SAMPLING VISIT
6
Prepare for the sampling visit.
7
Perform the sampling activities.
8
Take additional photographs.
9
Keep a logbook.
Continued on next page, Step 10.

Step 5 The RFA Guidance developed by EPA recommends that the sampling plan include information on the following:

- **Field operation** - The sampling plan should discuss the sequence for conducting the field activities.
- **Sampling locations/rationale** - The sampling plan should identify the location of each sample as precisely as possible.
- **Analytical requirements** - The sampling plan should discuss the technique and level of detection that will be used to analyze each sample.
- **Sample handling** - Sample preservation and other handling practices should be described.
- **Quality assurance/quality control** - The plan should identify the number and type of quality assurance samples, or spikes that will be taken.
- **Equipment decontamination** - The sampling plan should identify the reagent and any special procedures associated with equipment decontamination.
- **Chain of custody** - All samples collected must be maintained under chain of custody procedures.

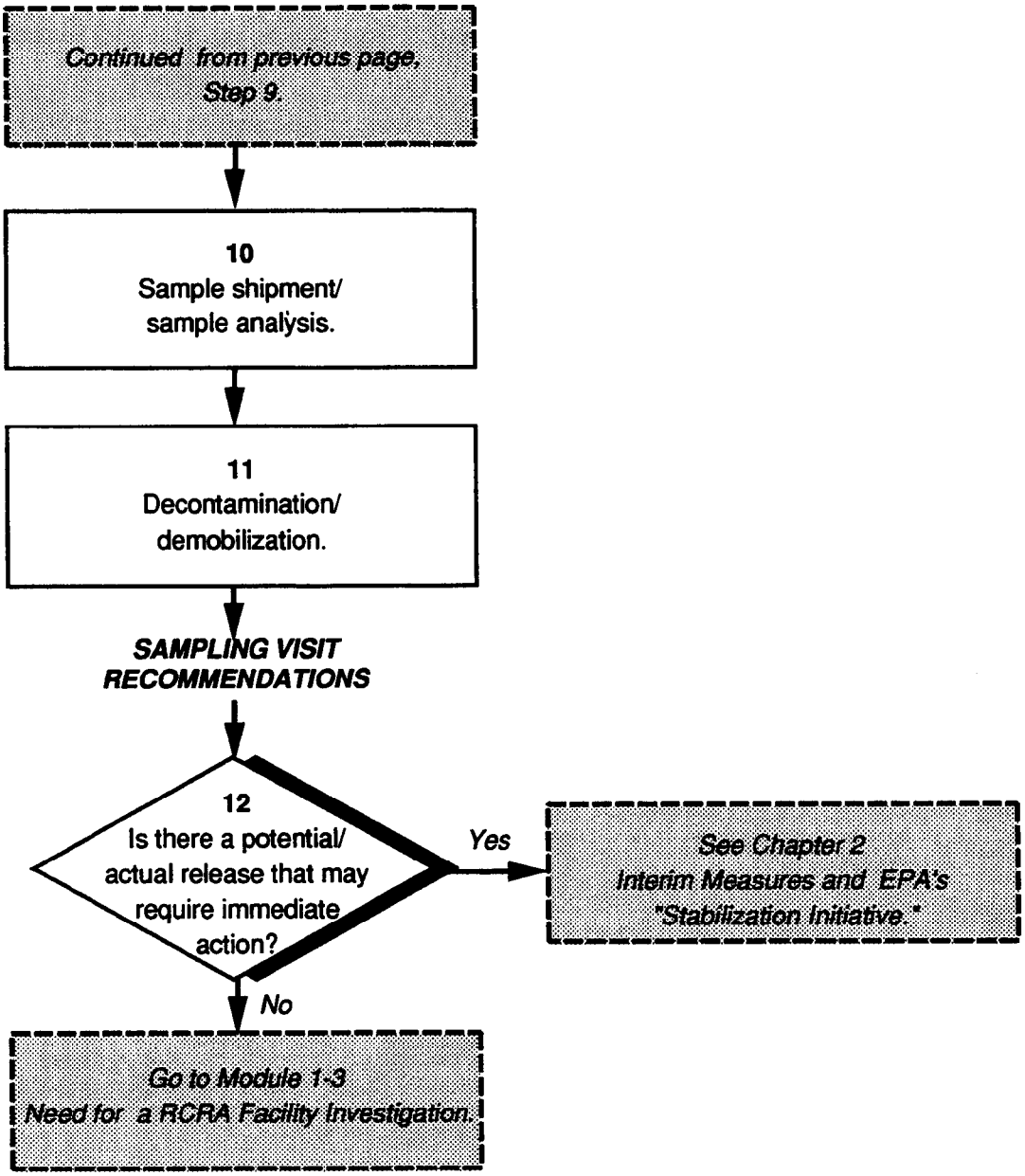
Conducting the Sampling Visit

Step 6 Prior to conducting the sampling visit the investigator should prepare a health and safety plan (HASP), meeting the requirements of 29 CFR §1910.120, and determine the need for, and, if appropriate, develop a public involvement plan (PIP). If DOE conducts the sampling, these plans should include provisions for EPA or authorized State oversight.

Step 7 The investigator should follow the sampling plan during the sampling visit. The sampling plan should describe all the sampling locations, methods, and procedures to be followed. If it is necessary to diverge from the sampling plan, changes should be documented carefully. For safety reasons, during the sample collection continuous monitoring for vapor emissions or radiation hazards is required. It is important to document the sequence of sampling activities, the procedures and instruments used, and describe the samples taken.

Step 8 Photographs should be taken to document the conditions of the facility and procedures used in the sampling visit.

Step 9 The field logbook should be bound and waterproof. Information (data) should be recorded in waterproof ink. The information recorded in the logbook should include: all instruments used during the fieldwork with unique identification numbers (i.e., manufacturer, model, model number, serial number); weather conditions; results of field measurements, instrument readings, well measurements, locations; location and time of each sample; and factual descriptions of structures and features.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10
Sample shipment/ sample analysis.
11
Decontamination/ demobilization.
SAMPLING VISIT RECOMMENDATIONS
12
Is there a potential/ actual release that may require immediate action?
Yes
See Chapter 2 Interim Measures and EPA's "Stabilization Initiative."
No
Go to Module 1-3 Need for a RCRA Facility Investigation.

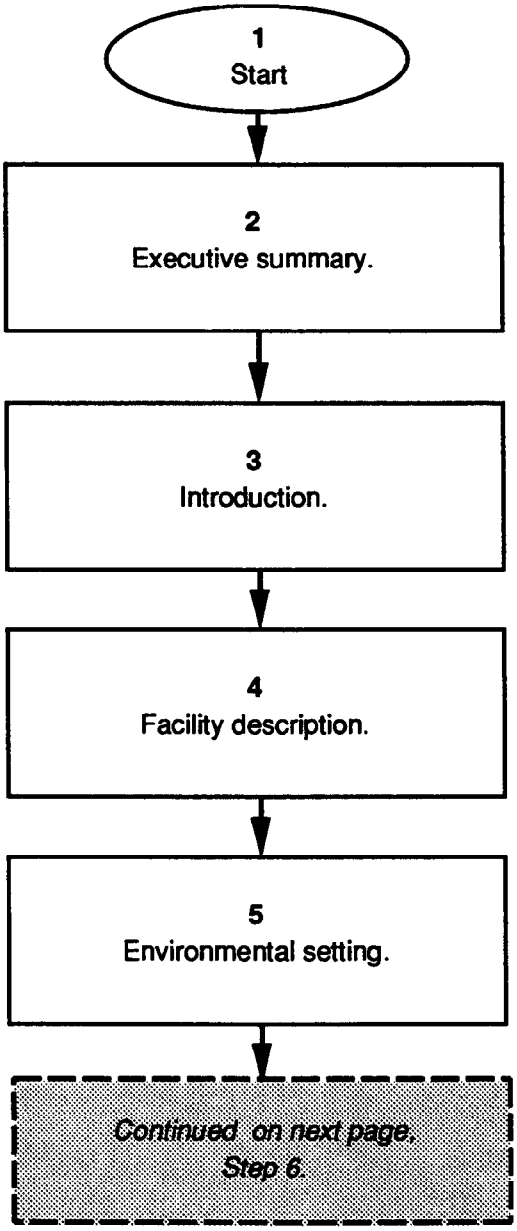
Step 10 After completion of the onsite sampling visit, all samples and chain-of-custody forms should be sent to the laboratory with EPA-approved procedures for analysis.

Step 11 Sampling and other field equipment should be decontaminated between samples. All equipment as well as the field sampling team should be decontaminated following the sampling visit.

Sampling Visit Recommendations

Step 12 The investigator can recommend implementation of interim measures anytime during the RFA, although he/she may not have sufficient information prior to the VSI to make this recommendation. Interim measures are conducted at the facility whenever there may be a significant risk of immediate exposure resulting from releases at the facility. Interim measures are addressed in Chapter 2 of this guidance.

Submodule 1-2-4: The Final RFA Report



Submodule 1-2-4: The Final RFA Report

This submodule presents an outline of an ideal RCRA Facility Assessment (RFA) report. It is intended to illustrate the important components that should be addressed in any RFA report. However, the facility should determine if there are specific format requirements, as each EPA region and many of the authorized States have specific formats for RFA reports.

Step 1 **Start.**

Step 2 The *Executive Summary* section includes:

- A summary of the scope and limitations of the report;
- A brief description of the type of activities conducted at the facility, including a list of SWMUs and other areas of concern (AOCs); and
- A summary of conclusions and further actions.

Step 3 The *Introduction* is a short summary that describes:

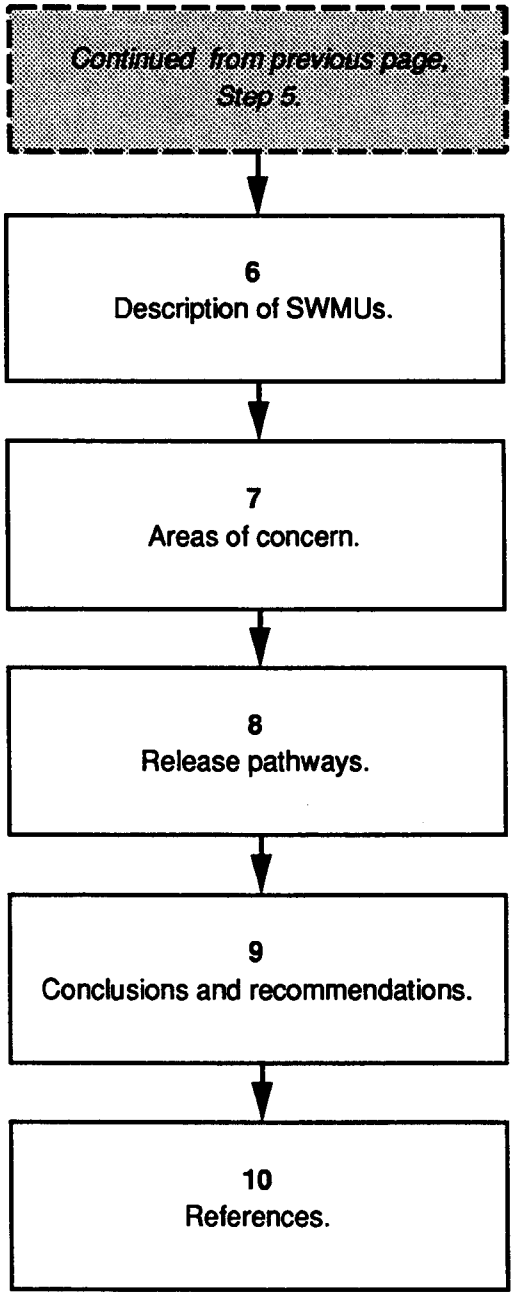
- The purpose and scope of the RFA in general and of the report in particular; and
- The general categories of information reviewed in preparation of the document and the sources of information.

Step 4 The *Facility Description* section provides an overview of the facility processes and waste management activities. It should contain the following elements (at a minimum):

- Site location;
- Historical and current operations;
- Summary of wastes handled; and
- Identification of SWMUs.

Step 5 The *Environmental Setting* section provides an overview of the site conditions at the facility that are not associated with particular SWMUs. It should include (at a minimum) information on:

- Land use;
- Climate;
- Topography and surface water;
- Geology and groundwater; and
- Human and environmental receptors.


Continued from previous page, Step 5.
6
Description of SWMUs.
7
Areas of concern.
8
Release pathways.
9
Conclusions and recommendations.
10
References.

Step 6 In the *Description of SWMUs* section, all pertinent unit-specific information should be addressed. The following should be included for each SWMU:

- Unit description;
- Dates of operation;
- Permitted activities;
- Wastes managed;
- Release controls;
- History of releases; and
- Release potential to soil/groundwater, surface water, air and subsurface gas.

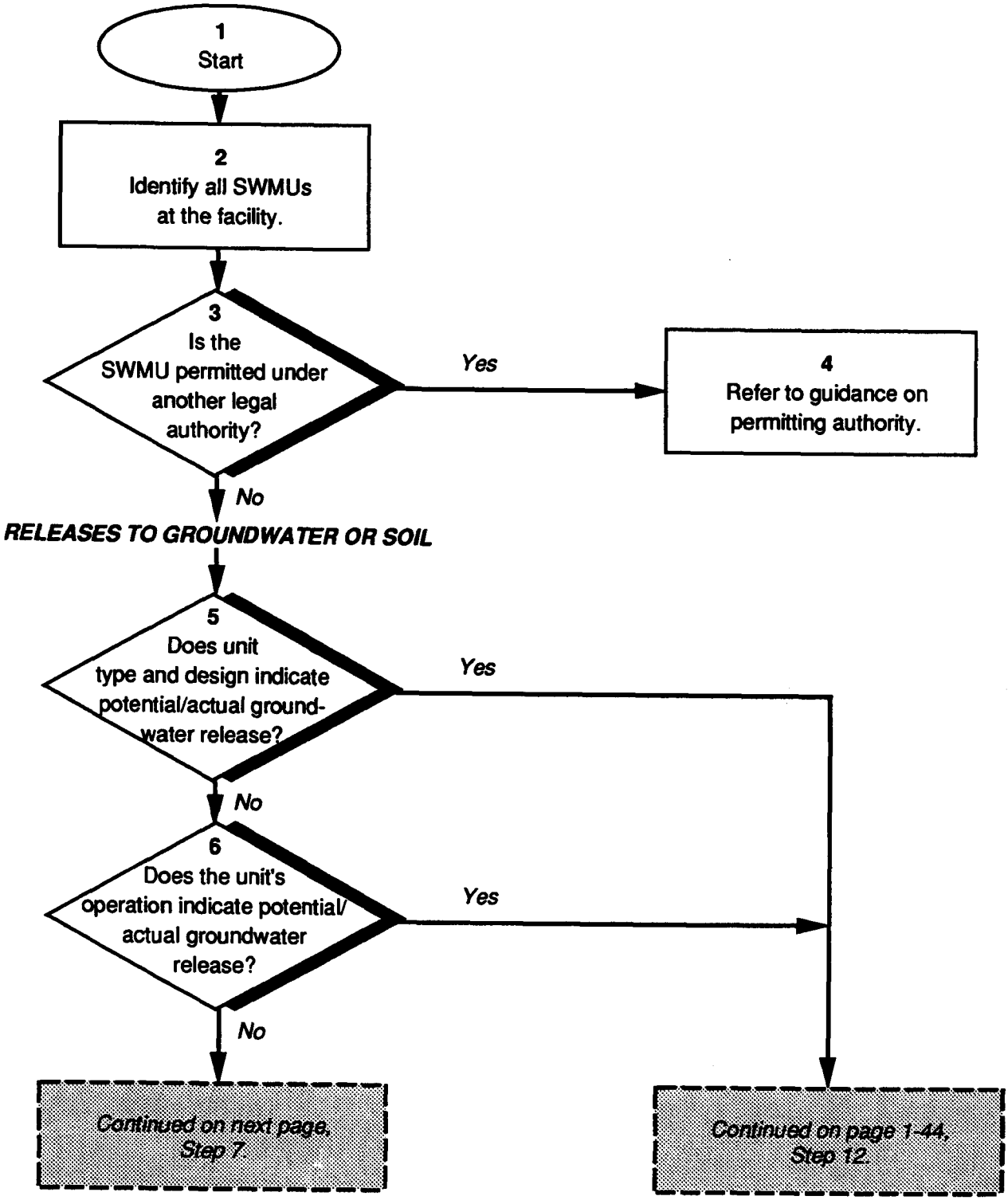
Step 7 The section describing *Areas of Concern* provides a summary of any suspected releases that are not associated with SWMUs (i.e., releases from production areas and spills). It should also include any evidence of contamination from unknown sources.

Step 8 The section on *Release Pathways* should include an evaluation of the potential/actual releases with respect to soil, groundwater, surface water and sediments, air, and the generation of subsurface gas.

Step 9 The section *Conclusions and Recommendations* should be presented in a manner that demonstrates the rationale behind the determination. The Conclusions and Recommendations must be supported by information presented in the individual unit summary section. The further actions discussion must be consistent with the conclusions.

Step 10 The list of *References* should include all the documents used in the preparation of the report.

Module 1-3: Need for a RCRA Facility Investigation



Module 1-3: Need for a RCRA Facility Investigation

This module discusses determining the need for a RCRA Facility Investigation (RFI). (See 55 FR 30806).

Step 1 **Start.**

Step 2 All the solid waste management units (SWMUs) need to be identified. Only releases from SWMUs fall under the definition of release under the proposed Subpart S rule.

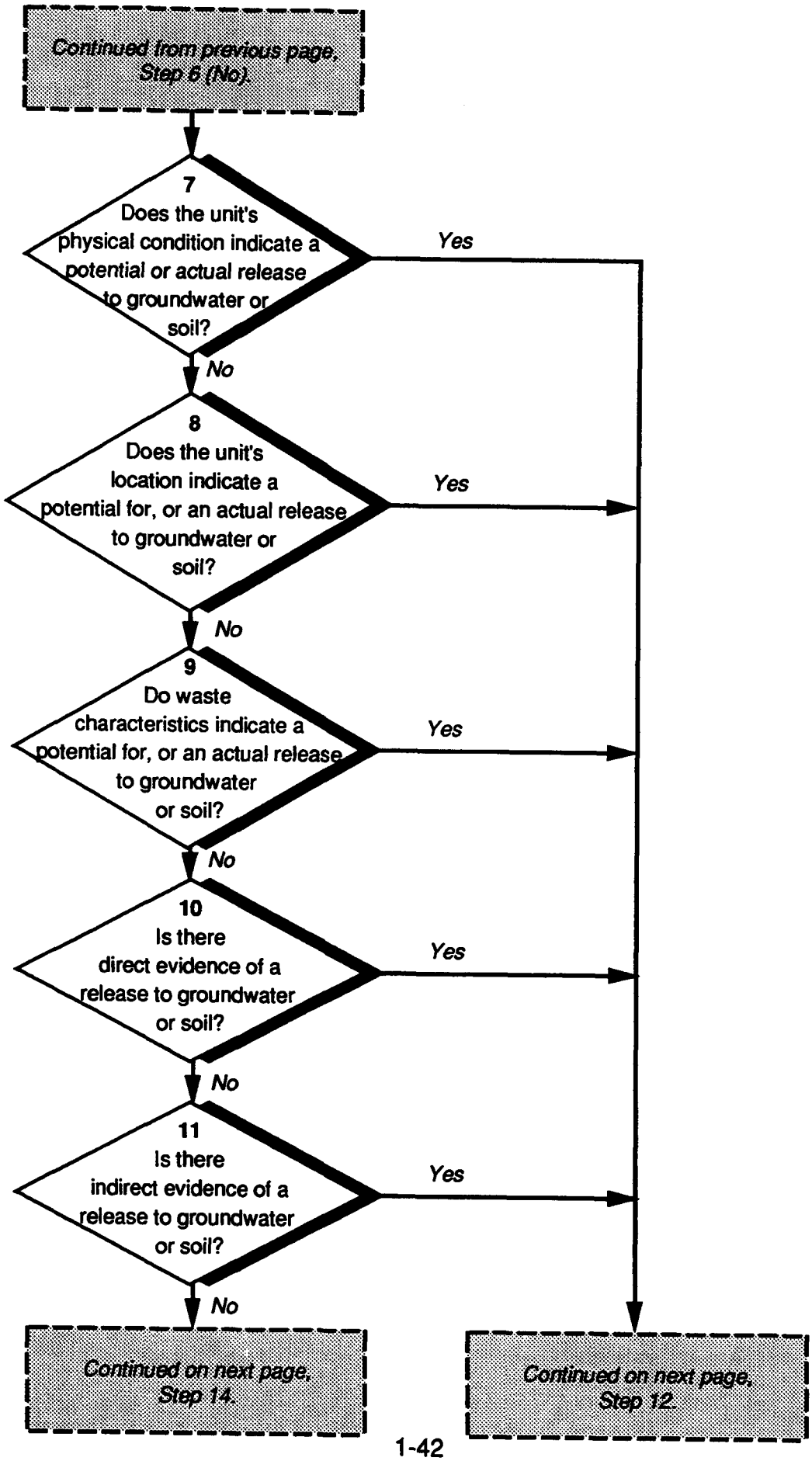
Step 3 Determine if another legal authority regulates the release from the SWMU. For example, determine if the release is permitted under the Clean Air or Clean Water Acts, or if another cleanup authority applies (e.g., TSCA for PCB spills).

Step 4 In cases where problems associated with permitted releases are found, the regulatory agency will refer such releases to the appropriate permitting authorities. For example, a release to surface water in excess of the limits in the facility's NPDES permit will be referred to the EPA or authorized State. However, in cases where action is not taken under another authority, EPA intends to use Subpart S to address the release. This is particularly true in cases where a permitted outfall leads to extensive surface water sediment contamination.

Releases to Groundwater or Soil

Step 5 The design and operating characteristics of a SWMU will determine to a great extent its potential for releasing hazardous waste constituents to groundwater. The general potential for groundwater/soil contamination from any unit depends upon the unit's nature and function. This concept is reflected in the RCRA hazardous waste regulations. For example, groundwater monitoring is required for land-based units, which have significant potential for groundwater releases, but not for container storage areas. The investigator should evaluate the characteristics of the unit or group of units at a facility to determine the potential for release of hazardous waste or hazardous waste constituents to groundwater. The evaluation of the unit's design should focus on the following: capacity and dimensions of the unit; materials and construction of a unit; the presence or absence of any engineered features designed to prevent releases; and the adequacy of such features.

Step 6 The SWMUs's operational history needs to be evaluated for information that indicates a release to groundwater may have occurred. Operational factors that influence the likelihood of releases to groundwater/soil include: age, operational status, and the operating procedures of the unit.


Continued from previous page, Step 6 (No).
7
Does the unit's physical condition indicate a potential or actual release to groundwater or soil?
Yes
No
8
Does the unit's location indicate a potential for, or an actual release to groundwater or soil?
Yes
No
9
Do waste characteristics indicate a potential for, or an actual release to groundwater or soil?
Yes
No
10
Is there direct evidence of a release to groundwater or soil?
Yes
No
11
Is there indirect evidence of a release to groundwater or soil?
Yes
No
Continued on next page, Step 14.
Continued on next page, Step 12.

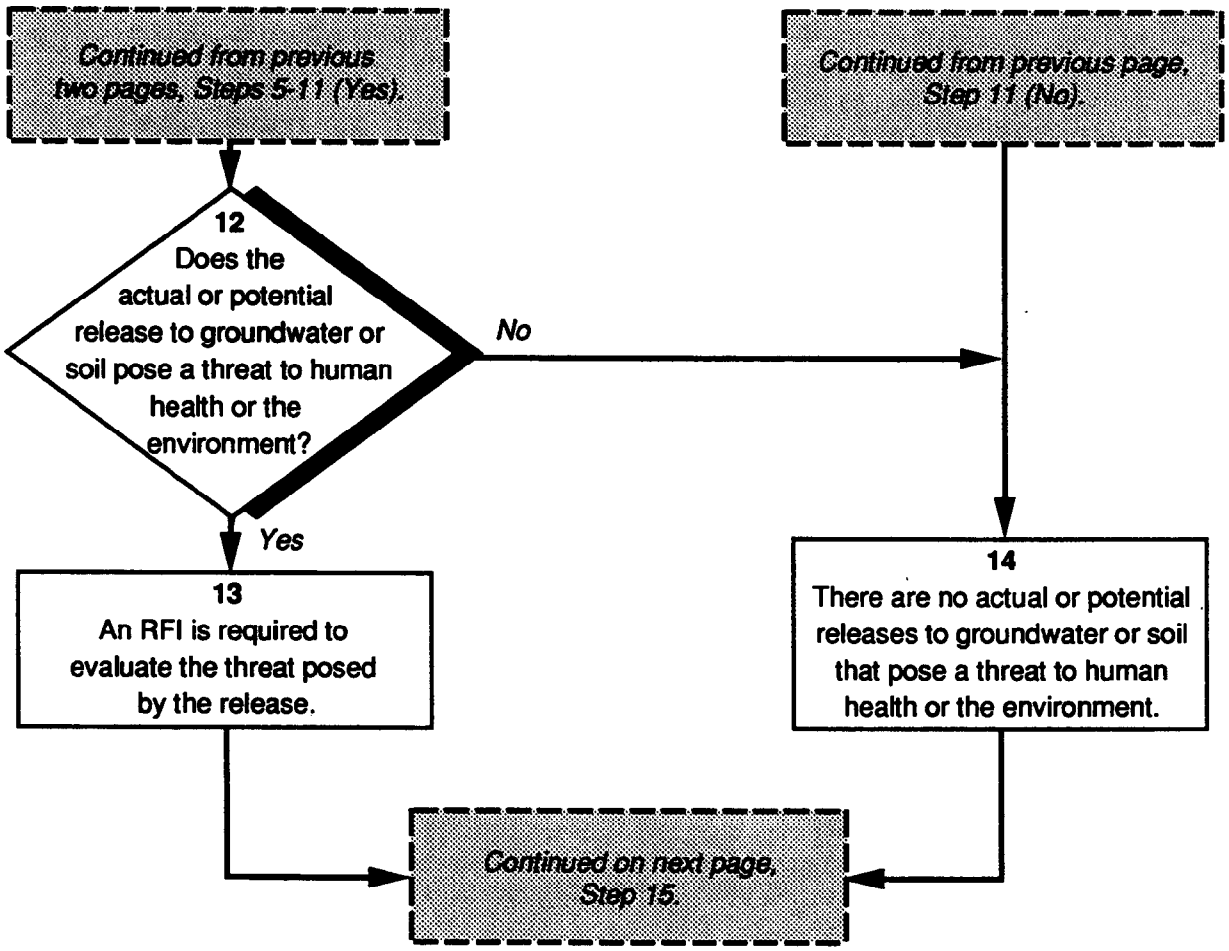
Step 7 The physical condition of the SWMU needs to be examined for indications that a release has occurred. The physical condition of the unit can indicate the potential for release. Physical signs of deterioration include, but are not limited to, lack of structural integrity, rusting, cracking of dikes or berms, deteriorating liners, or lack of adequate capacity.

Step 8 Location of the SWMU is also a factor that needs to be considered when assessing the potential for release. The evaluation should focus on the following: soil permeability; distance from the unit or area to the uppermost aquifer; direction and characteristics of groundwater flow (e.g., whether the rate of groundwater flow inhibits migration of a release); and facility location with respect to areas that recharge surface water.

Step 9 There are several technical factors that need to be considered when identifying waste characteristics relevant to groundwater/soil releases. For example, the tendency for different hazardous waste constituents to migrate from a given unit or area, through the unsaturated zone, and into the groundwater will depend upon several factors, including: the amount of waste, the physical state and amount of waste, the physical and chemical properties of the hazardous waste constituents, and the geologic materials of the underlying strata.

Step 10 The investigator needs to evaluate all available sources of information to identify evidence of releases to groundwater/soil. Sources of information may include groundwater or soil sampling data and official reports of prior releases.

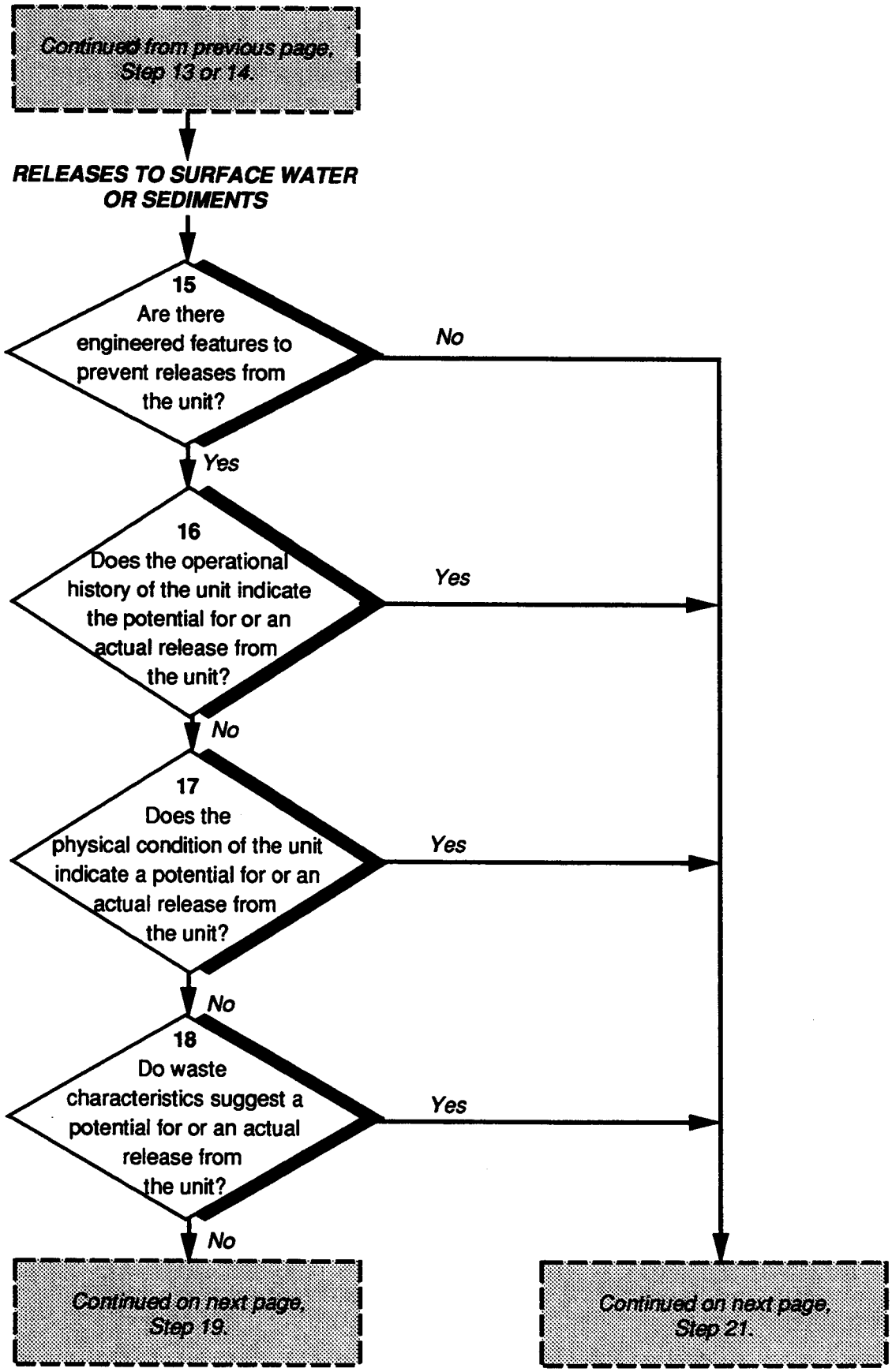
Step 11 Indirect evidence of a release from the facility or a specific unit at the facility will usually entail information on general groundwater contamination. When the investigator identifies indirect evidence of a SWMU release of this type, it may be necessary to determine which SWMUs are likely to have released the relevant constituents by evaluating the pollutant migration pathways and the waste characteristics. The investigator needs to evaluate all indirect evidence of a release from the facility or a specific unit. Examples include available data on results of soil gas monitoring, electromagnetic conductivity surveys and visual evidence, such as discolored soils, of release observed during the VSI. This verification study is different from the sampling visit discussed in Submodule 1-2-3.


Continued from previous two pages, Steps 5-11 (Yes).
Continued from previous page, Step 11 (No).
12
Does the actual or potential release to groundwater or soil pose a threat to human health or the environment?
No
Yes
13
An RFI is required to evaluate the threat posed by the release.
14
There are no actual or potential releases to groundwater or soil that pose a threat to human health or the environment.
Continued on next page, Step 15.

Step 12 If there is an actual release or the potential for a release to groundwater, the potential for that release to affect human health or the environment must be evaluated. Available information should be evaluated to determine the location, number, and characteristics of potential receptors that could be affected by groundwater releases at the facility. These receptors include human populations, animal populations, and sensitive environments. If the release poses no threat to human health and the environment, an RFI typically will not be required at that unit. But if the RFA shows there is such a threat, EPA usually will require the facility to conduct an RFI to determine the extent of that threat.

Step 13 If there is a potential for release or a confirmed release to groundwater or soil that poses a threat to human health or the environment, there is a need for an RFI. Confirming the presence of a release will often be the initial phase of a follow-on RFI. However, some EPA regions require the facility to conduct verification studies. This verification study is different from the sampling visit discussed in Submodule 1-2-3 and is conducted to determine if there is actually a release from the unit. The verification study is intended to prevent a facility from having to conduct unwarranted RFIs. A verification study is usually more complex than a sampling visit, but not as complex as the RFI. Refer to Chapter 3 for information on the conduct of an RFI, but continue with this evaluation to determine if other media may be affected.

Step 14 If this step is reached, there are no actual or potential releases to groundwater or soil that pose a threat to human health or the environment. Therefore, an RFI to address these media is not likely to be required. Proceed to the next step to determine if other media are affected.


Continued from previous page, Step 13 or 14.
RELEASES TO SURFACE WATER OR SEDIMENTS
15
Are there engineered features to prevent releases from the unit?
No
Yes
16
Does the operational history of the unit indicate the potential for or an actual release from the unit?
Yes
No
17
Does the physical condition of the unit indicate a potential for or an actual release from the unit?
Yes
No
18
Do waste characteristics suggest a potential for or an actual release from the unit?
Yes
No
Continued on next page, Step 19.
Continued on next page, Step 21.

Releases to Surface Water or Sediments

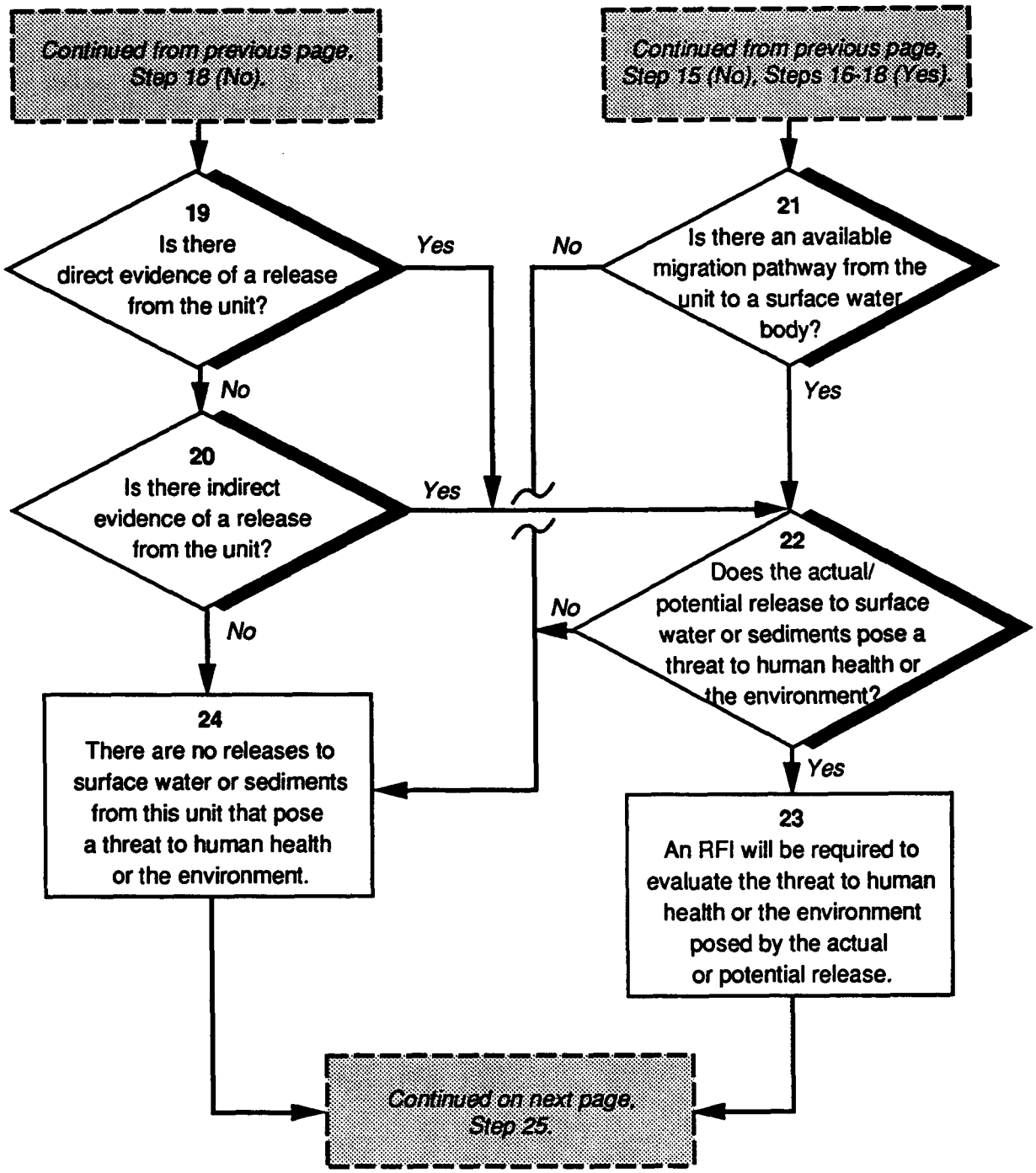
Step 15 The investigator should determine whether the SWMU has engineered features, such as a berm, a secondary containment system, or a liner, that are designed to prevent releases to surface water from the unit. If these features exist, they need to be evaluated to determine whether they are adequate to prevent releases to surface water bodies. Surface water bodies include all naturally occurring, perennial water bodies, (streams, rivers, ponds, lakes, and oceans), as well as man-made bodies (such as ditches) which perennially flow to other surface water. In areas with less than 20 inches mean annual precipitation, intermittently flowing waters and continuous intermittently flowing streams and ditches are also considered surface water bodies.

Step 16 Operational factors that influence the likelihood of releases to surface water include:

- **Age of the unit:** Units that have been operating for long periods of time are generally more likely to have releases than new units.
- **Operational status:** In some cases the operating status of a unit (e.g., closed, inactive) may have an effect on the relative likelihood of release.
- **Operating procedures:** Maintenance and inspections records should indicate whether a unit is likely to release its contents. Units that are inspected regularly and properly maintained are less likely to have releases than units that have been poorly maintained.

Step 17 The physical condition of the unit can indicate the potential for release to surface water. Physical signs of deterioration include lack of structural integrity, rusting, cracking, deteriorating liners, or other signs of physical deterioration.

Step 18 There are several waste-specific factors that need to be considered when identifying waste characteristics relevant to surface water releases. These include the amount of waste, the physical state of the waste, and the physical and chemical properties of the hazardous waste constituents.


Continued from previous page, Step 18 (No).
Continued from previous page, Step 15 (No), Steps 16-18 (Yes).
19
Is there direct evidence of a release from the unit?
Yes
No
21
Is there an available migration pathway from the unit to a surface water body?
No
Yes
20
Is there indirect evidence of a release from the unit?
Yes
No
22
Does the actual/ potential release to surface water or sediments pose a threat to human health or the environment?
No
Yes
24
There are no releases to surface water or sediments from this unit that pose a threat to human health or the environment.
23
An RFI will be required to evaluate the threat to human health or the environment posed by the actual or potential release.
Continued on next page, Step 25.

Step 19 The investigator needs to evaluate all available sources of information to identify evidence of releases to surface water or sediments. Sources of information may include sampling data, official reports of prior releases and contaminated run-off observed during the VSI.

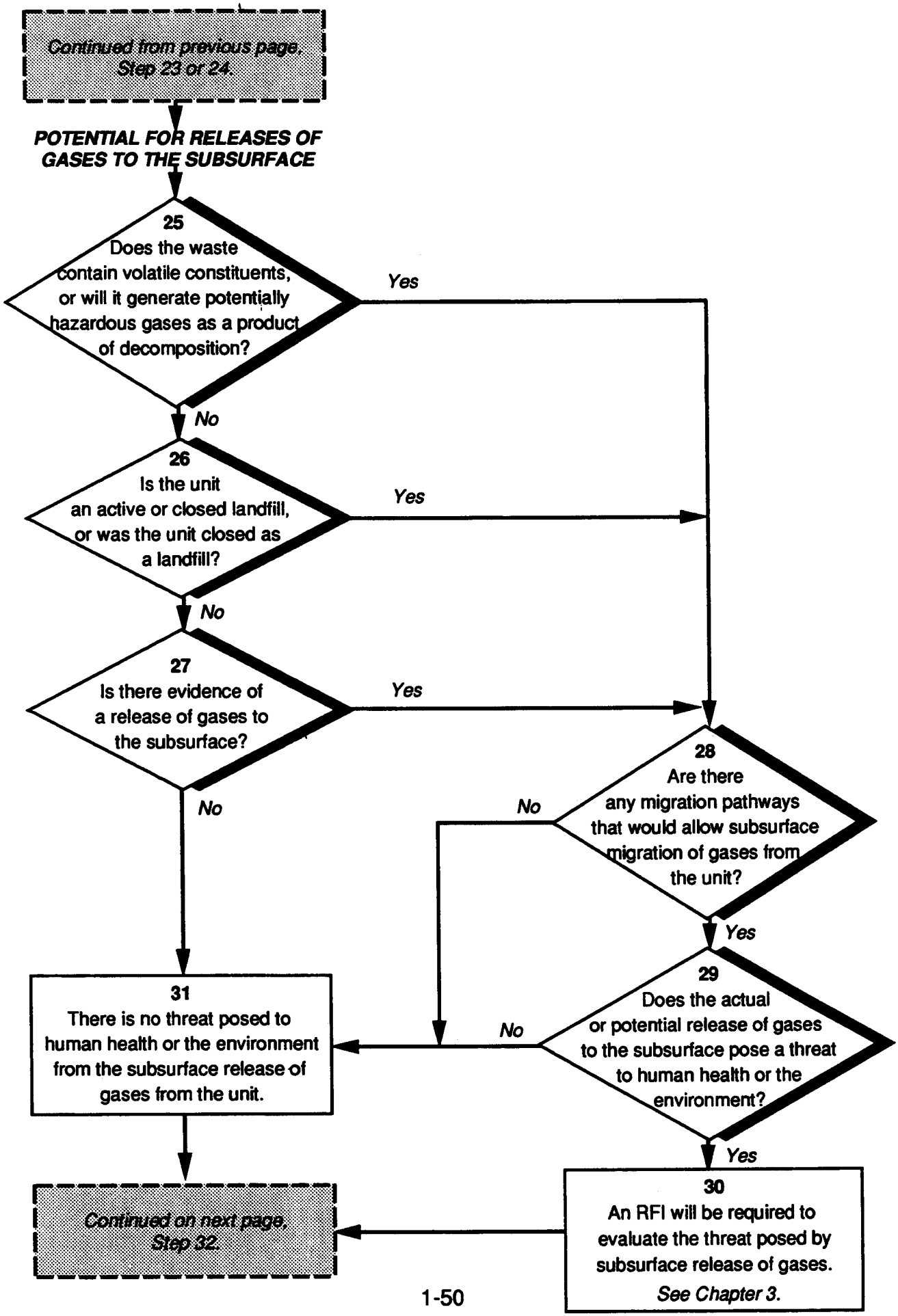
Step 20 The investigator needs to evaluate all indirect evidence of release from the facility or a specific unit. Examples include discolored soil, standing water, or dead vegetation along drainage pathways leading from the unit.

Step 21 The investigator should evaluate all available information pertaining to the surface water drainage pathway at a facility to determine the pollutant migration pathways. The investigator should identify any drainage pathway(s) leading from the unit of concern to surface water. Topographic maps provide information on the slope of the intervening terrain between the units of concern and downgradient surface water, which is useful in determining the route run-off follows to surface water. These maps are also useful in locating surface water. Possible intermedia transfer should also be considered from soil and groundwater contamination to affect the surface water pathway.

Step 22 If there is an actual release or the potential for a release to surface water or sediments, the potential for that release to affect human health or the environment must be evaluated. Available information should be evaluated to determine the location, number, and characteristics of potential receptors that could be affected by groundwater releases at the facility. These receptors include human populations, animal populations, and sensitive environments. If the release poses no threat to human health and the environment, an RFI typically will not be required at that unit. But if the RFA shows there is any such threat, EPA usually will require the facility to conduct an RFI to determine the extent of that threat.

Step 23 If there is a potential for release or a confirmed release to surface water or sediments that poses a threat to human health or the environment, there is a need for an RFI. Confirming the presence of a release will often be the initial phase of a follow-on RFI. However, some EPA regions require the facility to conduct verification studies. This verification study is different from the sampling visit discussed in Submodule 1-2-3 and is conducted to determine if there is actually a release from the unit. The verification study is intended to prevent a facility from having to conduct unwarranted RFIs. A verification study is usually more complex than a sampling visit, but not as complex as the RFI. Refer to Chapter 3 for information on the conduct of an RFI, but continue with this evaluation to determine if other media may be affected.

Step 24 If this step is reached, there are no actual or potential releases to surface water or sediments that pose a threat to human health or the environment. Therefore, an RFI to address these media is not likely to be required. Proceed to the next step to determine if other media are affected.


Continued from previous page. Step 23 or 24.
POTENTIAL FOR RELEASES OF GASES TO THE SUBSURFACE
25
Does the waste contain volatile constituents, or will it generate potentially hazardous gases as a product of decomposition?
Yes
No
26
Is the unit an active or closed landfill, or was the unit closed as a landfill?
Yes
No
27
Is there evidence of a release of gases to the subsurface?
Yes
No
28
Are there any migration pathways that would allow subsurface migration of gases from the unit?
No
Yes
29
Does the actual or potential release of gases to the subsurface pose a threat to human health or the environment?
No
Yes
31
There is no threat posed to human health or the environment from the subsurface release of gases from the unit.
30
An RFI will be required to evaluate the threat posed by subsurface release of gases. See Chapter 3.
Continued on next page, Step 32.

Potential for Releases of Gases to the Subsurface

Step 25 The wastes in a unit should be characterized to determine the potential for generating gases, such as methane or H_2S, as a result of decomposition, or if there is a potential for the release of volatile organic compounds (VOCs). Conventional solid waste refuse and biological sludges are the primary waste types that generate methane gas. EPA's primary concern is to determine if subsurface gas releases could reach explosive levels in onsite and offsite buildings.

Step 26 The design and operating characteristics of a unit will determine its potential for releasing gases to the subsurface. Active and closed landfills and other units, such as waste piles or surface impoundments, that have been closed as landfills are likely to generate gases that could be released to the subsurface.

Step 27 The investigator should examine any available sources of information to determine if hazardous gases are generated, and if such gases have migrated from the facility.

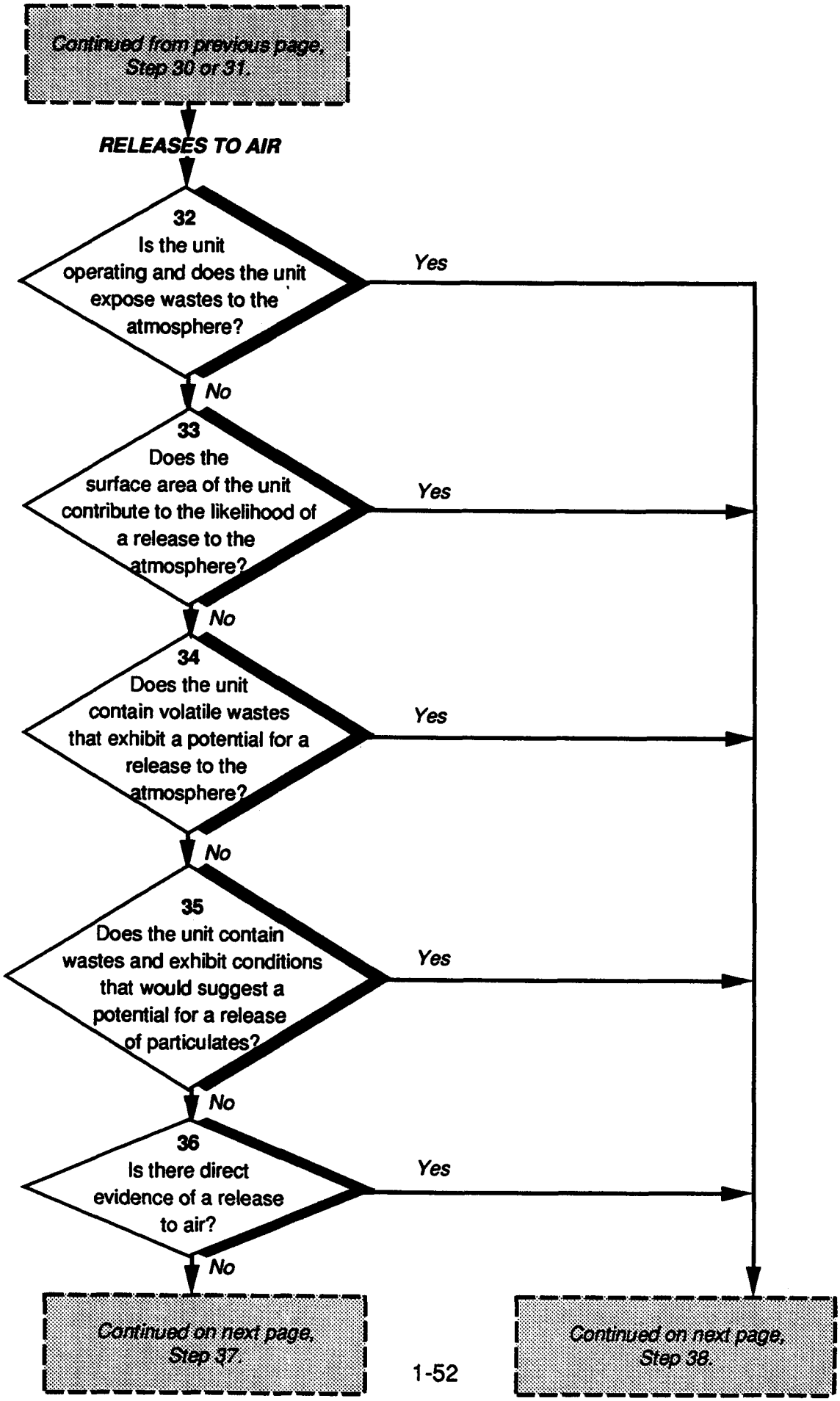
Step 28 All potential migration pathways for subsurface gases should be evaluated. Factors that affect the migration of subsurface gas include:

- Vadose zone characteristics and the impact of these characteristics on subsurface gas migration;
- Natural barriers and conduits; and
- Engineered barriers and conduits.

Step 29 If there is an actual release or the potential for a release of gases to the subsurface, the potential for that release to affect human health or the environment must be evaluated. Available information should be evaluated to determine the location, number, and characteristics of potential receptors that could be affected by groundwater releases at the facility. These receptors include human populations, animal populations, and sensitive environments. If the release poses no threat to human health and the environment, an RFI typically will not be required at that unit. But if the RFA shows there is any such threat, EPA usually will require the facility to conduct an RFI to determine the extent of that threat.

Step 30 If there is a potential for release or a confirmed release of gases to the subsurface that poses a threat to human health or the environment, there is a need for an RFI. Confirming the presence of a release will often be the initial phase of a follow-on RFI. However, some EPA regions require the facility to conduct a verification study. This verification study is different from the sampling visit discussed in Submodule 1-2-3 and is conducted to determine if there is actually a release from the unit. The verification study is intended to prevent a facility from having to conduct unwarranted RFIs. Refer to Chapter 3 for information on the conduct of an RFI, but continue with this evaluation to determine if other media may be affected.

Step 31 If this step is reached there are no actual or potential releases of gases to the subsurface that pose a threat to human health or the environment. Therefore, an RFI to address this medium is not likely to be required. Proceed to the next step to determine if other media are affected.


Continued from previous page, Step 30 or 31.
RELEASES TO AIR
32
Is the unit operating and does the unit expose wastes to the atmosphere?
Yes
No
33
Does the surface area of the unit contribute to the likelihood of a release to the atmosphere?
Yes
No
34
Does the unit contain volatile wastes that exhibit a potential for a release to the atmosphere?
Yes
No
35
Does the unit contain wastes and exhibit conditions that would suggest a potential for a release of particulates?
Yes
No
36
Is there direct evidence of a release to air?
Yes
No
Continued on next page, Step 37.
Continued on next page, Step 38.

Releases to Air

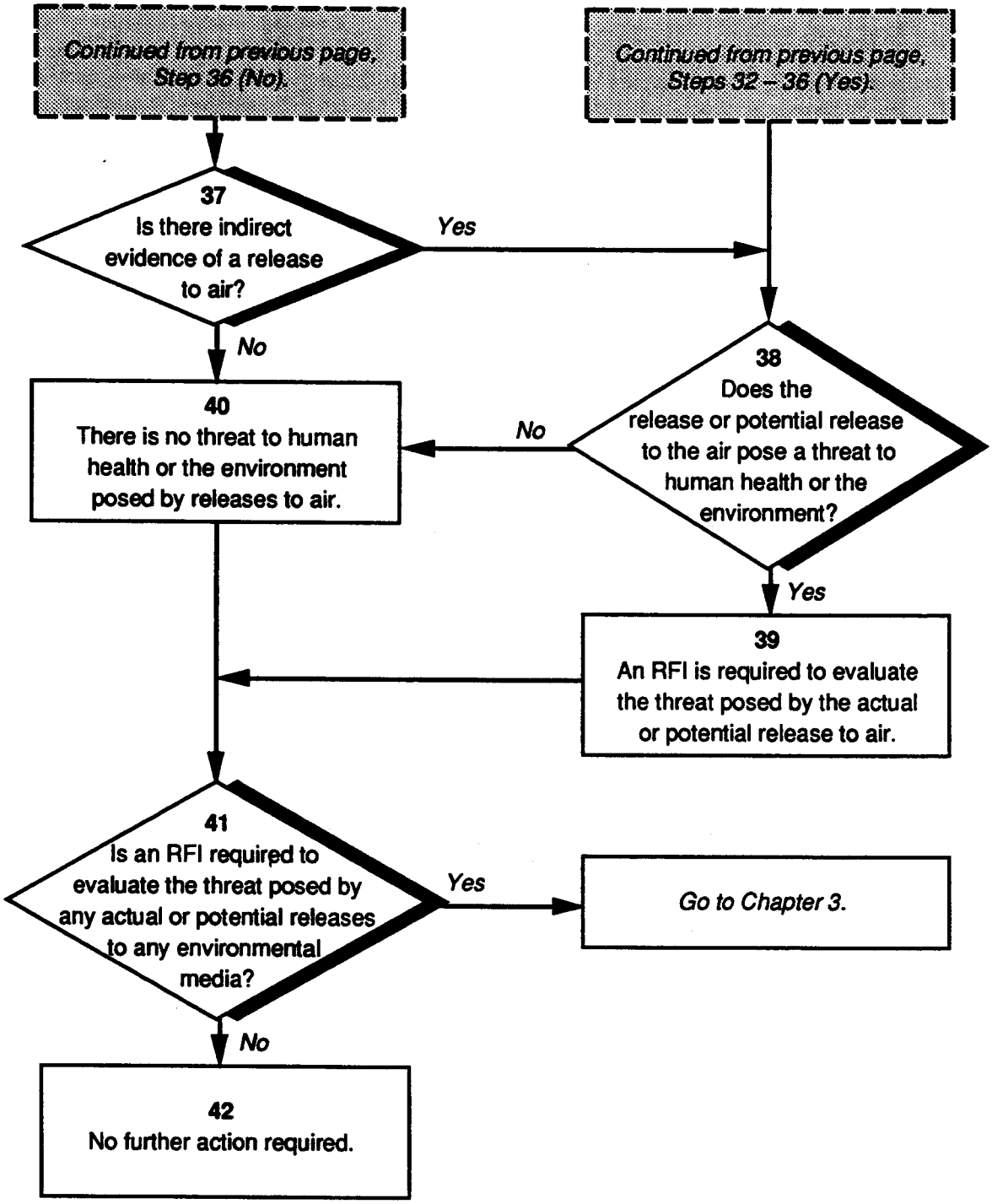
Step 32 In general, units in which active treatment of wastes containing volatile organic compounds is occurring have the greatest potential for air releases. Specifically, those units in which the wastes are in direct contact with the atmosphere, such as a surface impoundment or open tank system, have a greater potential for releases to air than closed systems, such as a continuous loop tank system. However, emissions sources (whether permitted or not) associated with a manufacturing process could release hazardous waste or hazardous waste constituents to the air and cause intermedia transfer via settling, fallout, or washdown.

Step 33 The surface area of the unit, the design of the unit (including any emission controls), local meteorological conditions, and the physical characteristics (e.g., boiling point, vapor pressure) of the wastes are factors which control the rate at which contaminants can be released. In general, a large surface area, high temperatures and wind speeds, and a low boiling point or high vapor pressure lead to an increase in the release rate of contaminants to air.

Step 34 Only certain hazardous waste constituents have a significant potential for air releases. The two types of emissions of greatest concern are volatiles and particulates. Volatile constituents of concern for air releases include organic vapors and volatile metals. EPA's Office of Air Quality Planning and Standards has compiled a list of hazardous chemical compounds of greatest concern with respect to vapor phase air releases. The parameters most important when assessing volatilization of a constituent include the following: water solubility, vapor pressure, octanol/water partition coefficient, partial pressure, Henry's Law constant and Raoult's Law.

Step 35 The second emission of concern is particulates. Particulate emissions from SWMUs can contain organic material, heavy metals or both. The likelihood of particulate releases at hazardous waste management facilities is generally associated with landfills, land treatment units and/or waste piles. The primary mechanism for generating particulate releases at hazardous waste facilities is wind erosion. In general, the unit's location will affect the potential for wind to erode the wastes managed in the unit.

Step 36 Direct evidence of air releases will include air sampling/monitoring data associated with the SWMU and visual evidence of VOCs or particulate release.


Continued from previous page, Step 36 (No).
Continued from previous page, Steps 32 – 36 (Yes).
37
Is there indirect evidence of a release to air?
Yes
No
38
Does the release or potential release to the air pose a threat to human health or the environment?
No
Yes
40
There is no threat to human health or the environment posed by releases to air.
39
An RFI is required to evaluate the threat posed by the actual or potential release to air.
41
Is an RFI required to evaluate the threat posed by any actual or potential releases to any environmental media?
Yes
Go to Chapter 3.
No
42
No further action required.

Step 37 Indirect evidence of release includes evidence of contamination around the facility that may have resulted from an air release, onsite air monitoring data gathered under the OSHA program, records of citizen complaints associated with the facility concerning odors, headaches, nausea, or other health effects.

Step 38 If there is an actual release or the potential for a release to air, the potential for that release to affect human health or the environment must be evaluated. Available information should be evaluated to determine the location, number, and characteristics of potential receptors that could be affected by air releases at the facility. These receptors include human populations, animal populations, and sensitive environments. If the release poses no threat to human health and the environment, an RFI typically will not be required at that unit. But if the RFA shows there is any such threat, EPA usually will require the facility to conduct an RFI to determine the extent of that threat.

Step 39 If there is a potential for release or a confirmed release to air that poses a threat to human health or the environment, there is a need for an RFI. Confirming the presence of a release will often be the initial phase of a follow-on RFI. However, some EPA regions require the facility to conduct a verification study. This verification study is different from the sampling visit discussed in Submodule 1-2-3 and is conducted to determine if there is actually a release from the unit. The verification study is intended to prevent a facility from having to conduct unwarranted RFIs. Refer to Chapter 3 for information on the conduct of an RFI, but continue with this evaluation to determine if other media may be affected.

Step 40 If this step is reached, there are no actual or potential releases of gases to the subsurface that pose a threat to human health or the environment. Therefore, an RFI to address this medium is not likely to be required.

Step 41 If a threat to human health or the environment has been posed by actual or potential releases to any environmental media (e.g., groundwater or soil; surface water and sediments; subsurface gas releases; or releases to the atmosphere) from any SWMU or AOC at the facility, an RFI is typically required. If no actual or potential releases which pose a threat to human health or the environment have been identified, proceed to the next step.

Step 42 If this step is reached, the RFA did not identify any actual or potential releases that pose a threat to human health or the environment. No further action will be required at the facility at this time. However, if information becomes available suggesting that an actual or potential release is posing a threat, EPA can revise this determination and require the facility to conduct additional investigations to evaluate that threat. If EPA conducted the RFA, and the facility has not yet received its operating permit, the permit will continue through the normal process for issuance of a RCRA permit.

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References

Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (Proposed Rule)
55 FR 30798, Friday, July 27, 1990

Guidance on Public Involvement in the RCRA Permitting Program
OSWER Directive No. 9500.00/A
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Implementation of RCRA Facility Assessments
OSWER Directive No. 9502.04
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RCRA Corrective Action Interim Measures Guidance (Interim Final)
OSWER Directive 9902.4
June 1988

RCRA Corrective Actions at Federal Facilities
OSWER Directive No. 9502.02
April 1986

RCRA Facility Assessment Guidance
PB-87-1-7769
OSWER Directive 9502.00-05
October 1986

RCRA Facility Investigation Guidance (Four-Volume Set) (Final)
OSWER Directive No. 9502.00-6C
OSW:530/SW-89-031
May 1989

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Chapter 2

Interim Measures and EPA's "Stabilization Initiative"

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

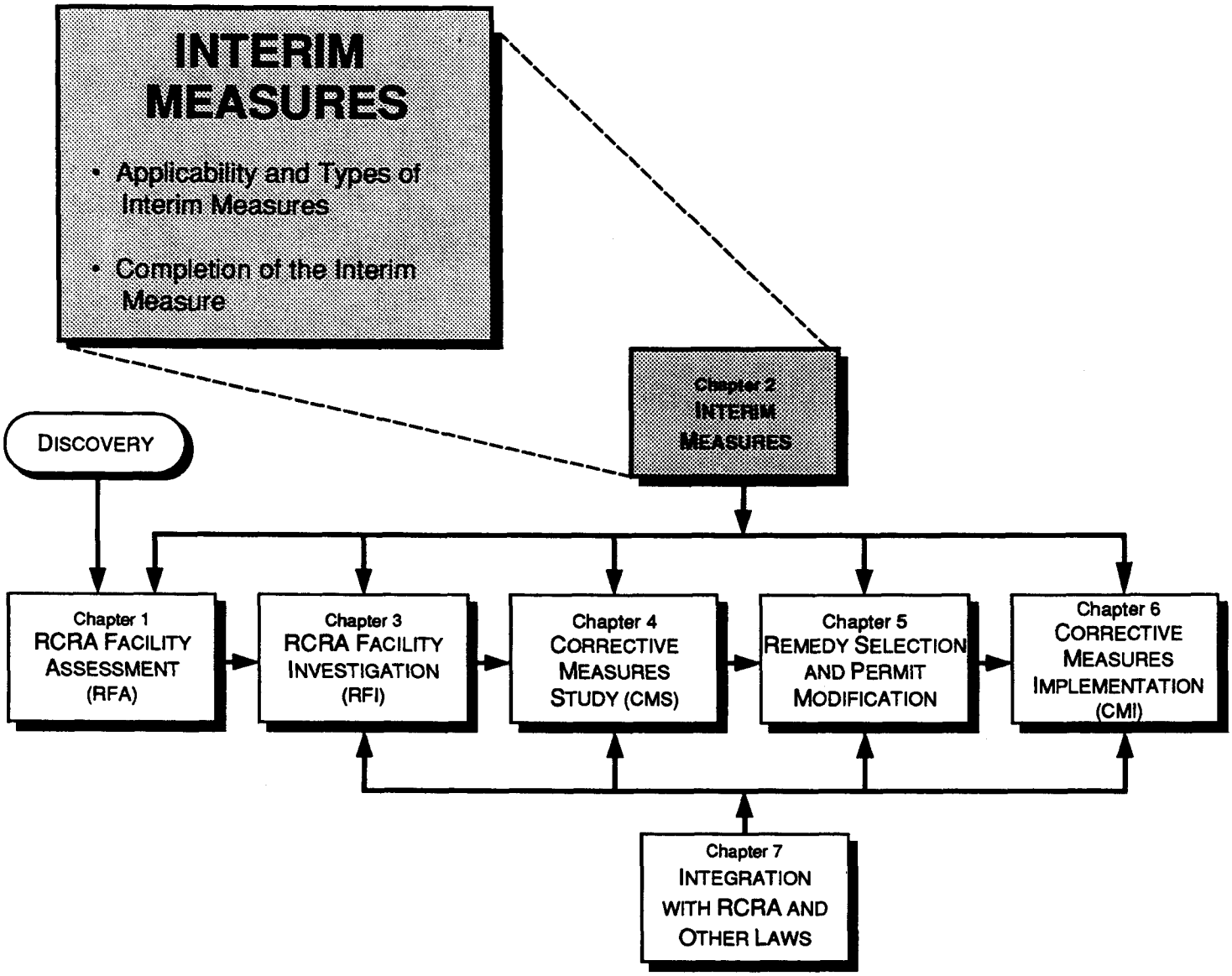
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

Section 264.540 of proposed Subpart S rule allows the EPA Regional Administrator (or the authorized State) to require interim measures at any time during the corrective action process. EPA has had the authority to order action since the 1984 HSWA amendments were enacted. Interim measures can be required even though Subpart S is not a final rule.

In the preamble to the proposed Subpart S rule, EPA makes a distinction between the applicability of Subpart S to "one-time spills" and releases from solid waste management units (SWMUs). In this discussion, EPA states that contamination resulting from a "one-time spill" (such as an overturned truck) will not be considered a SWMU for purposes of corrective action. However, EPA apparently will require interim measures (and other corrective action activities) if a one-time spill occurs at any location which could be considered a SWMU. The key to the distinction appears to be the relationship of the release to a definable unit. Facilities should clearly identify any "one-time spills" that are not associated with a definable unit to EPA during the RFA (see 55 FR 30809).

Interim measures under RCRA can be compared to "removals" under CERCLA. The primary differences between the RCRA program and the CERCLA program are that: (1) under RCRA, there is an active owner/operator maintaining control over the facility, whereas CERCLA removals are usually conducted at abandoned sites where there is no active owner or operator; and (2) CERCLA authority is broader in scope than RCRA authority. The two programs are similar in that both are used at sites where immediate action to minimize the hazard posed by the site is required. In the case of RCRA interim measures, these actions would occur in a timeframe shorter than that which could be expected if the normal corrective action process were allowed to progress. Using interim measures to achieve near- to midterm results at corrective action sites is the goal of EPA's "stabilization initiative."

Under the "stabilization initiative," interim measures would be used to address the worst releases at a facility first, in an effort to control or abate threats to human health or the environment and to prevent or minimize the further spread of contamination while a long-term solution is developed and implemented. These "stabilization" activities can be implemented by the facility either at the direction of the EPA Regional Administrator or on a voluntary basis. If a facility elects to conduct a voluntary "stabilization" action, it must be recognized that while EPA may provide minimal oversight of a voluntary action, these voluntary actions do not release the facility from RCRA liability, and EPA retains the right to require any additional activities deemed necessary by the EPA Regional Administrator.

Many waste management units at DOE facilities that are defined as SWMUs under RCRA are also being addressed through CERCLA authorities, primarily as National Priorities List (NPL) sites. CERCLA authorities have been applicable to DOE facilities since the early 1980s. Although these same facilities are subject to corrective action under RCRA authorities, and to interim measures if deemed appropriate, many removal actions have already occurred at these units. Usually an FFCA is developed to specify which authority,

RCRA or CERCLA, is to be applied at a given unit, and to ensure that all compliance requirements are clearly defined.

Interim measures can be classified as emergency and non-emergency actions. In the first case, interim measures could be deemed immediately necessary, with after-the-fact notification of regulatory authorities. While such emergency actions should be taken in concert with a facility's RCRA contingency plan, and exclusive of RCRA Corrective Action authorities, it is nevertheless possible that interim measures could be applied on an emergency basis. For the latter case, interim measures would be prescribed by EPA (or under State authority) through the RCRA permit, a RCRA §3008(h) corrective action order, or an order under RCRA §7003 or under a Federal Facility Compliance Agreement (FFCA)[3]. In such cases, the EPA Regional Administrator would order the action to be conducted immediately, and a permit modification or order would be issued later, providing DOE only limited, after-the-fact opportunity to negotiate applicable requirements.

When a release of hazardous waste or hazardous waste constituents from a SWMU is discovered, an interim measure may be deemed necessary based on the following considerations:

- Actual or potential exposure of nearby human populations or environmental populations to hazardous wastes or constituents;
- Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Presence of hazardous wastes or constituents in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release;
- Presence of high concentrations of hazardous wastes or constituents in soils at or near the surface that may migrate readily to receptors, or to which the public may be inadvertently or unknowingly exposed;
- Weather conditions that may cause the release or migration of hazardous wastes or constituents;
- Threat of fire or explosion; or
- Other actual or imminent threats to human health or the environment.

The requirement for an interim measure is partly dependent on how imminent the threat is in combination with how soon the Corrective Measures Implementation (CMI) phase, a result of the normal RCRA Corrective Action process (i.e., RFA, RFI, CMS, CMI), will occur. Frequent informal communication between the DOE facility and the regulatory

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[3] The term "Federal Facility Compliance Agreement (FFCA)" used in this document includes all forms of agreements between agencies, unless the use of a more specific term (such as a CERCLA §120(e)(2) Interagency Agreement) is necessary.

agency can facilitate the integration of the interim measures process with the long-term corrective action process.

If a threat exists, in keeping with EPA's "stabilization initiative," interim measures should be considered and, if appropriate, performed by the facility within the period before implementation of the corrective measure. Interim measures can stop a problem before it occurs or gets worse, but should not, to the extent possible, interfere with the corrective measure likely to be selected for that SWMU. As an example, if drums are releasing waste or constituents and that release is contaminating an area of soil, the drums could be overpacked or moved to a location where the leakage will be contained. Preventing migration of contaminants from the contaminated soil by capping the area with concrete, however, may interfere with the possible future corrective measure of removing (and subsequently treating or disposing of) underlying soil. In all cases, proposed interim measures should be evaluated to ensure that they will not interfere with possible future corrective measures that may be applied.

The need for an interim measure can be identified by the authorized regulatory agency or DOE. It is likely, however, that whoever is performing the RFA will make that discovery. EPA (or the State) can, and in some cases is likely to, delegate the responsibility for performing the RFA to DOE, which would then have the responsibility to initiate the interim measures process. Examples of interim measures are shown in Table 2-1. It should be noted that the need for interim measures can be identified during the RFI, CMS, or even CMI.

If an interim measure will be performed under non-emergency conditions, a work plan will generally be developed in accordance with permit or 3008(h) Order conditions. The work plan will contain objectives, a detailed discussion of the specific activities to be conducted, a health and safety plan, a data collection quality assurance plan (DCQAP) (if required), and, if appropriate, a public involvement plan (PIP). Depending on the complexity of the interim measure, the work plan may also contain an investigations program, design program, and construction quality assurance plan. At each step along the way, from work plan submittal through implementation, the regulatory agency will receive progress reports from the facility. Informal communication is expected and anticipated because of the interactive character of the interim measures process and corrective action in general.

TABLE 2-1
EXAMPLES OF INTERIM MEASURES**

Soils ● Sampling/Analysis/Disposal ● Run-off/Run-on Control (Diversion or Collection Devices) ● Temporary Cap/Cover	**Containers** ● Overpack/Redrum ● Construct Storage Area/Move to Storage Area ● Segregation ● Sampling and Analysis ● Treatment, Storage and/or Disposal ● Temporary Cover
Groundwater ● Delineation/Verification of Gross Contamination ● Sampling and Analysis ● Interceptor Trench/Sump/Subsurface Drain ● Pump and Treat ● In-situ Treatment ● Temporary Cap/Cover	**Tanks** ● Overflow/Secondary Containment ● Leak Detection/Repair/Partial or Complete Removal
Surface Water Release (Point and Non-Point) ● Overflow/Underflow Dams ● Filter Fences ● Run-off/Run-on Control (Diversion or Collection Devices) ● Regrading/Revegetation ● Sample and Analyze Surface Waters and Sediments or Point Source Discharges	**Surface Impoundments** ● Reduce Head ● Remove Free Liquids and or Highly Mobile Wastes ● Stabilize/Repair Side Walls, Dikes or Liner(s) ● Provide Temporary Cover ● Run-off/Run-on Control (Diversion of Collection Devices) ● Sample and Analysis to Document the Concentration of Constituents Left in Place When a Surface Impoundment Handling Characteristic Wastes Is Clean Closed ● Interim Groundwater Measures (See Groundwater Section)
Gas Migration Control ● Barriers, Collection, Treatment, or Monitoring ● Evacuation (Buildings)	**Landfills** ● Run-off/Run-on Control (Diversion or Collection Devices) ● Reduce Head on Liner and/or in Leachate Collection System ● Inspect Leachate Collection/Removal System or French Drain ● Repair Leachate Collection/Removal System or French Drain ● Temporary Cap ● Waste Removal (See Soils Section) ● Interim Groundwater Measures (See Groundwater Section)

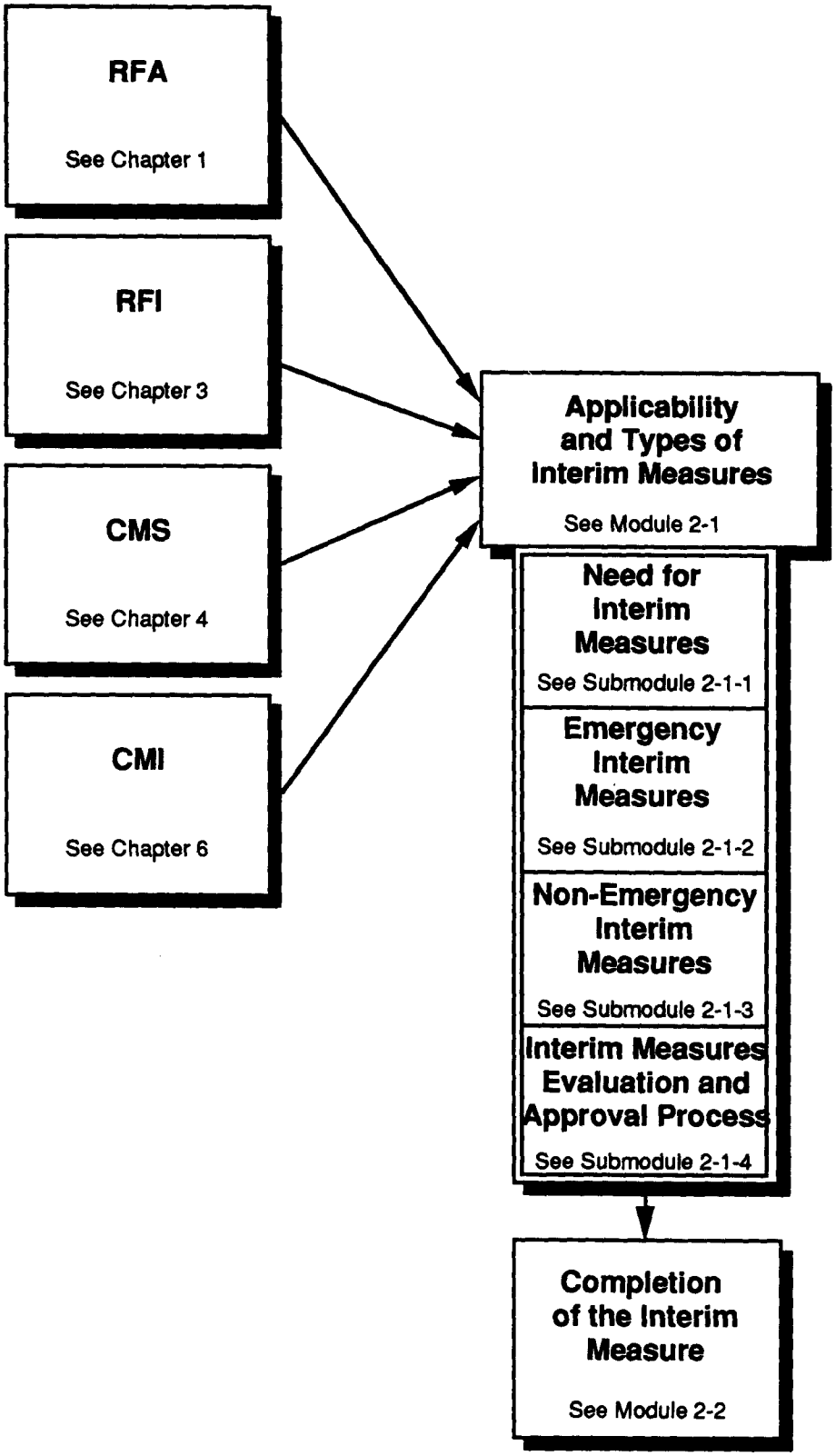
TABLE 2-1 (continued)
EXAMPLES OF INTERIM MEASURES**

Particulate Emissions ● Truck Wash (Decontamination Unit) ● Revegetation ● Application of Dust Suppressant	**Waste Piles** ● Run-off/Run-on Control (Diversion to Collection Devices) ● Temporary Cover ● Waste Removal (See Soils Section) ● Interim Groundwater Measures (See Groundwater Section)
Other Types of Actions ● Fencing to Prevent Direct Contact ● Extend Contamination Studies to Off-site Areas if Permission Is Obtained as Required Under Section §3004(v) ● Alternate Water Supply to Replace Contaminated Drinking Water ● Temporary Relocation of Exposed Population ● Temporary or Permanent Injunction ● Suspend or Revoke Authorization to Operate Under Interim Status	

** From the RCRA Facility Investigation Guidance

Completion of the interim measure is documented as part of the larger corrective action process. In some cases the completion of the interim measure implementation may coincide with the initiation of the corrective measures implementation (following the Corrective Measures Study (CMS)). The interim measure that is applied could later be incorporated into the corrective measure selected as a result of the CMS. If this case can be foreseen, it may be appropriate to recategorize the interim measure as a corrective measure, and incorporate it into the corrective measures implementation. This last case would typically apply only to a non-emergency interim measure. A non-emergency interim measure could also be elected for early implementation if funds are available. Early implementation may also be desired if public perception of the facility would be improved.

The interim measure process is further illustrated in the following overview graphic diagram and in the modules found on the pages following.



Chapter Two: Interim Measures

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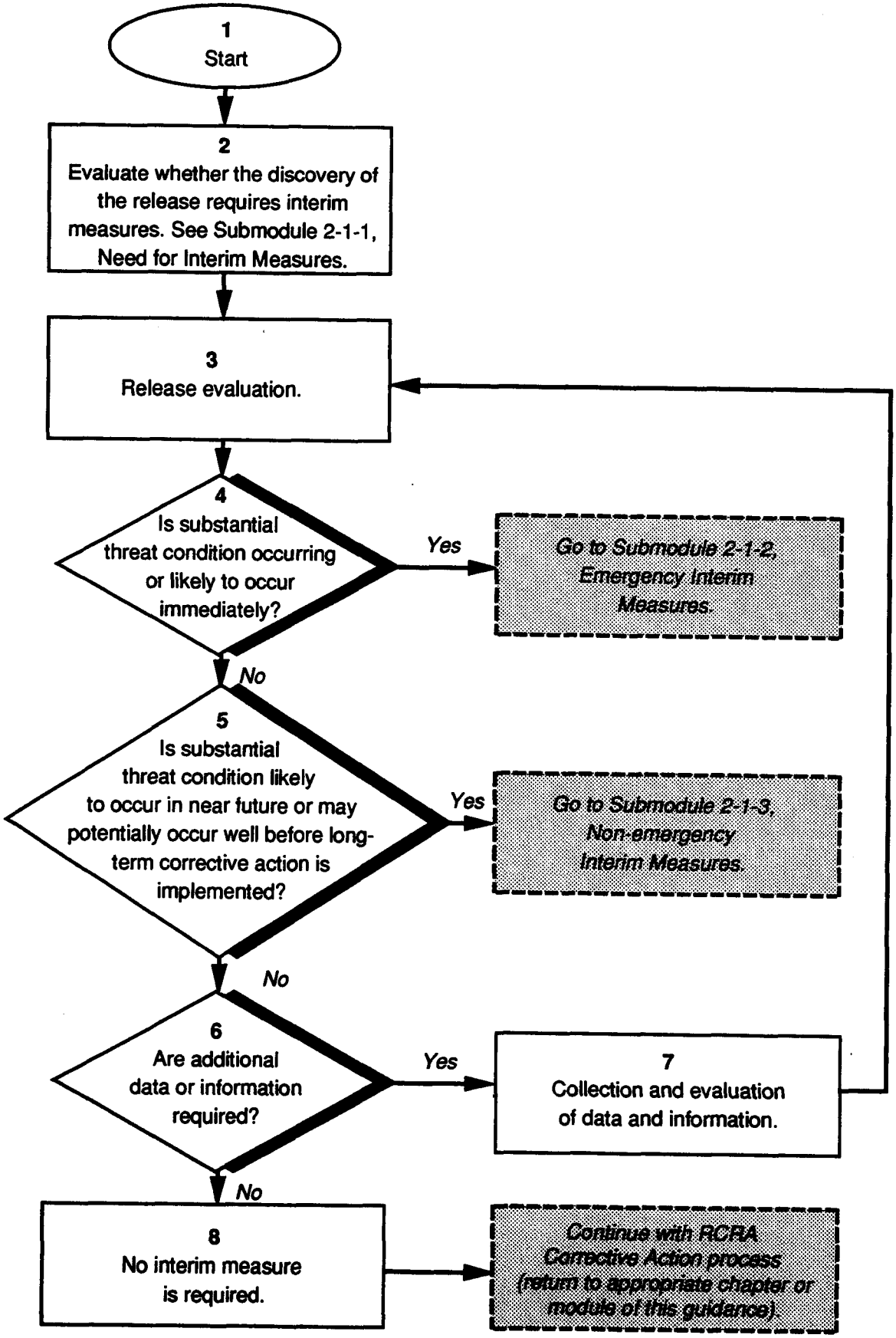
Module 2-1: Applicability and Types of Interim Measures



Module 2-1: Applicability and Types of Interim Measures

Step 1 **Start.**

Step 2 Discovery of a potential release or situation at a SWMU that may require interim measures is most likely to occur during the RCRA Facility Assessment (RFA), though it may occur at any time before or during the corrective action process. During the RFA, and particularly the visual site inspection (VSI), the authorized regulatory agency (or DOE, if authorized through an FFCA), will walk over the site to identify SWMUs and AOCs. The need for interim measures is often identified through this process although it can be identified at any time (see Submodule 2-1-1 for additional information).

Step 3 A release evaluation involves determining which type of interim measure may be appropriate. The evaluation includes determining whether or not there is actual or potential for endangerment to human health or the environment as a result of a potential or actual release. In other cases, a release, as such, may not be involved. An emergency condition such as a high potential for fire or explosion may exist, in which case the interim measure applied would be designed to prevent a release from occurring.

Step 4 If exposure is occurring (or suspected to be occurring), and the threat is immediate or there is a high potential for release, then emergency interim measures are appropriate.

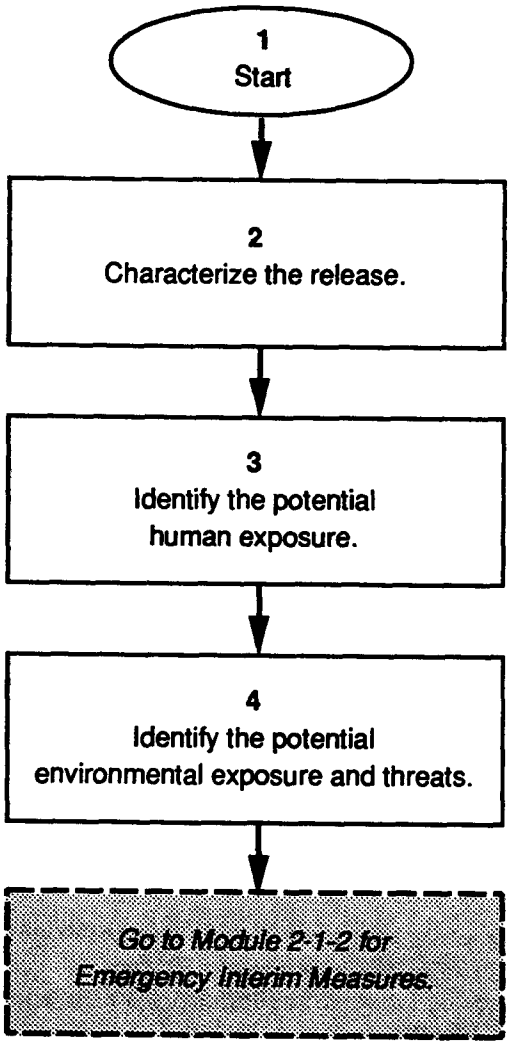
Step 5 If the threat is not immediate, but nevertheless substantial, then a non-emergency interim measure is appropriate. This type of interim measure would be appropriate in situations where action is needed to reduce exposure, the threat of exposure, or further contaminant migration, within a timeframe well before the RFI or CMS.

Step 6 If a determination cannot be made at this time on the need for interim measures or the type of interim measure to be applied, then more information is needed.

Step 7 Environmental sampling, along with other closer examination of the unit and/or available data, can provide enough information to reevaluate the release and/or potential receptors to determine whether interim measures are appropriate, and if applicable, the type of interim measure.

Step 8 Interim measures may not be appropriate if enough information has been collected to determine that the release or potential release will not pose a threat to human health or the environment before long-term corrective action may be implemented.

Submodule 2-1-1: Need for Interim Measures



Submodule 2-1-1: Need for Interim Measures

EPA or the facility must assess the need for an interim measure. Several considerations, such as actual or potential exposure or the threat posed by a release, will be assessed and form the basis for justifying any interim measure. (40 CFR §264.540(b))

Step 1 **Start.**

Step 2 The release needs to be characterized and several factors need to be considered, including:

- The nature of the source (e.g., amount, or location);
- The hazardous waste constituents at the source;
- The known pathways through which the contamination is migrating or may migrate;
- The extent of the contamination; and
- The projected fate and transport of the contaminants.

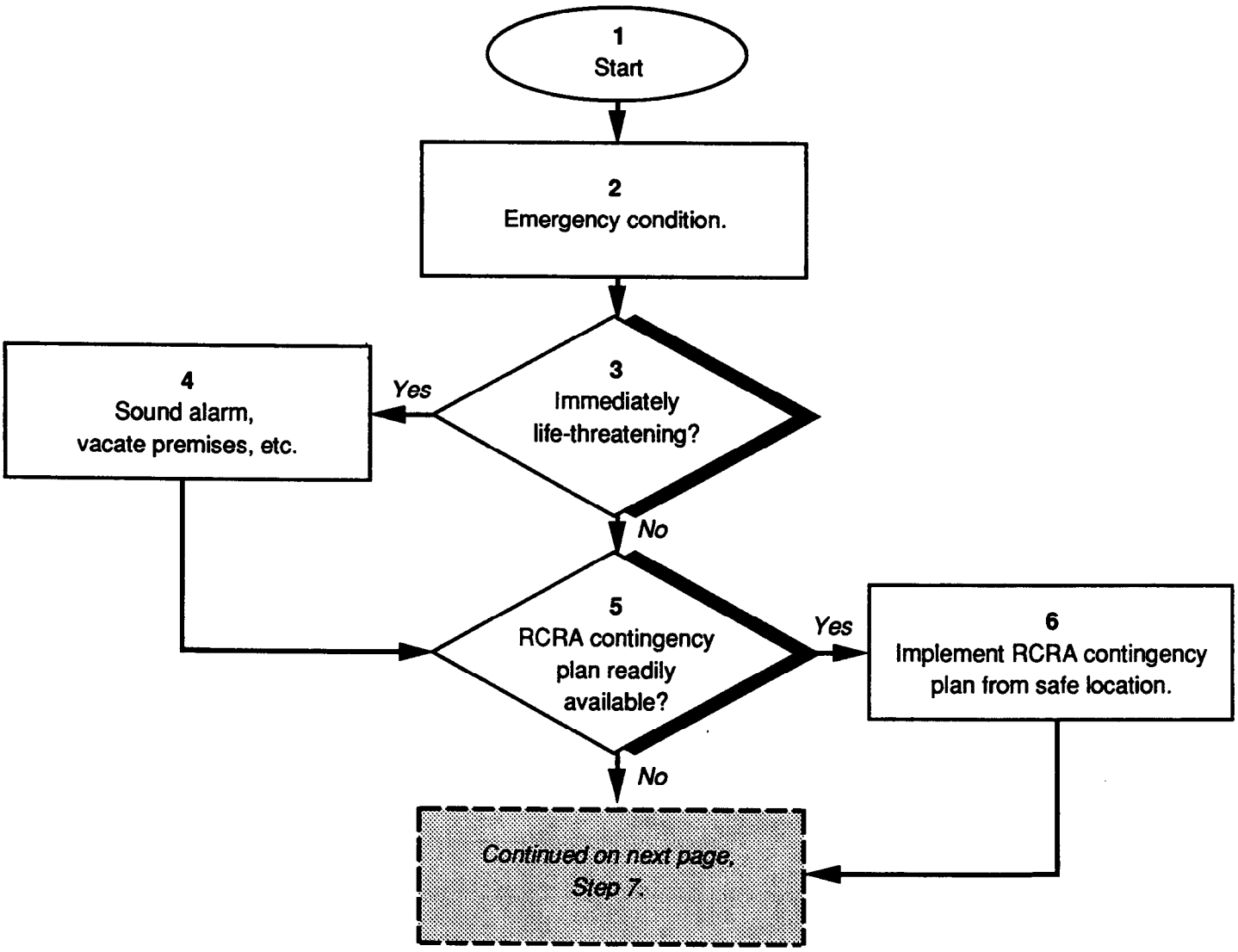
Step 3 Evaluate the potential for human exposure based on such considerations as:

- Exposure pathway (e.g., air fire/explosion, groundwater, surface water, direct contact, ingestion);
- Location and demographics of the populations potentially at risk from exposure (e.g., residential areas, schools, drinking water supplies, sole source aquifer near vital ecology or protected natural resource; potential effects of human exposure (short- and long-term);
- Confirmed human exposure; and
- Effects of response delay.

Step 4 The potential environmental exposure and threats need to be evaluated. The factors to be considered include:

- The media that have been or may be contaminated (e.g., groundwater, air, surface water);
- Short-term and long-term effects on the environment resulting from the release;
- Possible natural resource and environmental effects (terrestrial; aquatic organisms; aquifers whether or not used for drinking water purposes);
- Known or projected ecological effects;
- Projected long-term effects;
- Effects of long-term delay; and
- How any interim measure will contribute to the final remedy at the facility.

Submodule 2-1-2: Emergency Interim Measures



Submodule 2-1-2: Emergency Interim Measures

Step 1 **Start.**

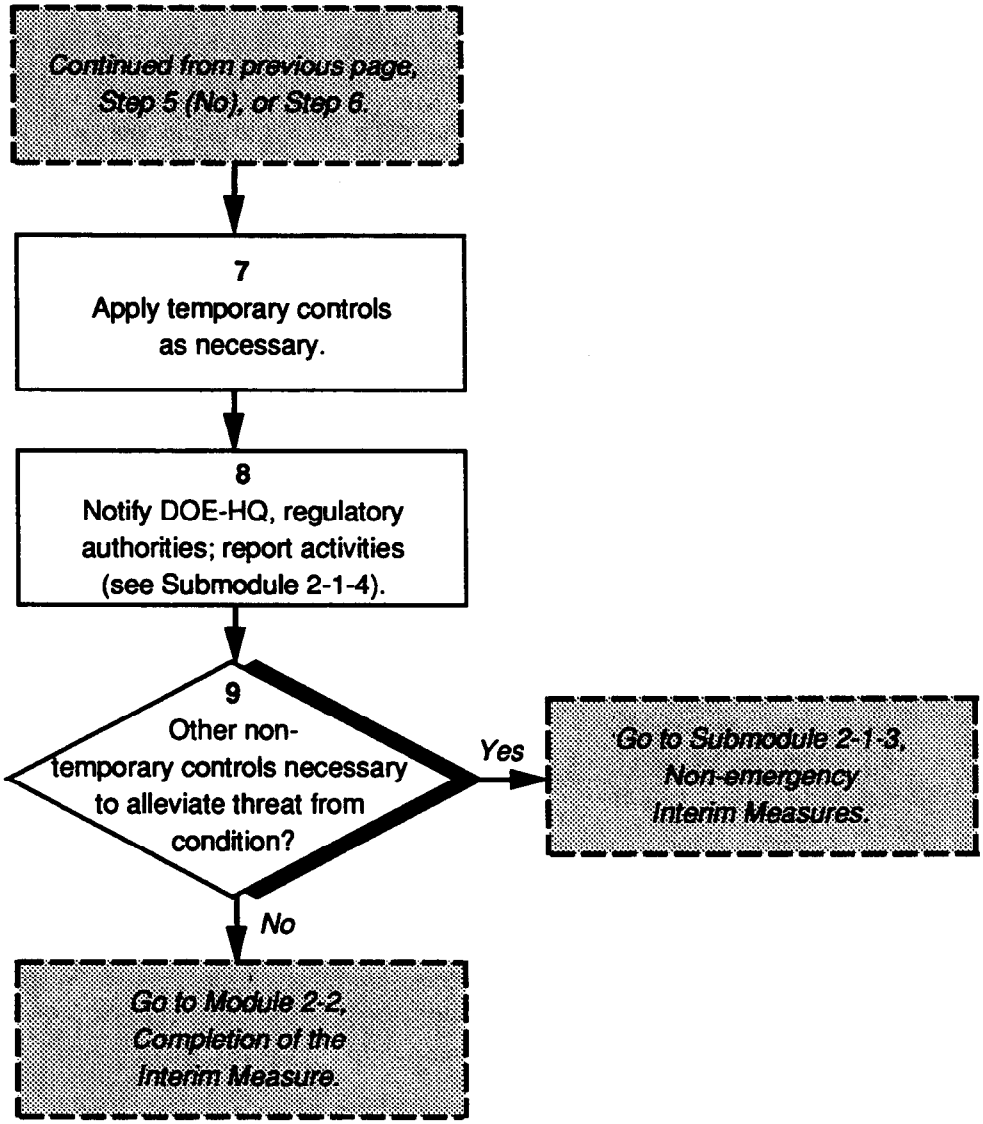
Step 2 An emergency condition is a situation that requires immediate action due to present or imminent threat to human health and the environment posed by a release or potential release of a hazardous waste or hazardous waste constituent from a solid waste management unit (SWMU). Unlike non-emergency interim measures, there will generally be no time to develop a work plan because of the unforeseen nature of this condition.
[Updated 9/99: Note: Please see RCRA Section 7003 and EPA's document, *Guidance on the use of Section 7003 of RCRA*.]

Step 3 Loss of human life is likely to occur from fires, explosions, and toxic gas emissions. Temperature threshold and gas monitors can indicate a life threatening condition, but personal observation of heat, flames, or fumes may indicate that an emergency situation exists.

Step 4 These conditions require physical separation from the immediate danger and warning others as soon as possible. Actions to prevent the release from occurring if possible, or to mitigate the effects of a release, should be evaluated against personal safety concerns.

Step 5 When loss of human life is not likely to occur, or when following alarm and evacuation procedures, if appropriate, the RCRA contingency plan should be located if readily available. The contingency plan is an action plan for emergency situations required under 40 CFR Part 264 Subpart D.

Step 6 If the RCRA contingency plan is readily available, it will specify the emergency coordinator who is responsible for directing response measures and how to contact them. Those who will be most instrumental in correcting the immediate problem should be contacted first, such as the fire department or emergency response teams. Other facility-specific procedures should be followed as specified in the contingency plan as long as personal safety is ensured. It should be noted that while the contingency plan may not provide specific directions for responding to emergencies related to all the SWMUs at a facility, it will contain general information (e.g., the name of the facility emergency coordinator, telephone numbers) valuable when conducting an emergency interim measure.

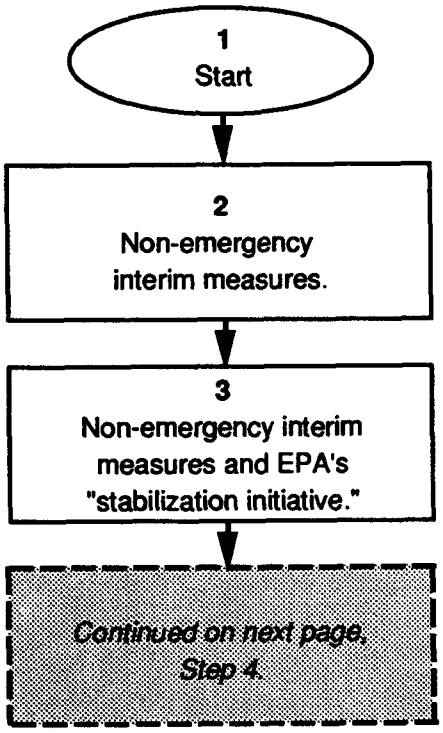

Continued from previous page, Step 5 (No), or Step 6.
7
Apply temporary controls as necessary.
8
Notify DOE-HQ, regulatory authorities; report activities (see Submodule 2-1-4).
9
Other non-temporary controls necessary to alleviate threat from condition?
Yes
Go to Submodule 2-1-3, Non-emergency Interim Measures.
No
Go to Module 2-2, Completion of the Interim Measure.

Step 7 Temporary or interim controls may then be used to mitigate the emergency. Examples for immediately life threatening conditions include having the fire department extinguish a fire, or locking or blocking off an area that has toxic fumes. For conditions that are not immediately life threatening, examples of temporary controls include blotting spills from leaking drums to keep drains from receiving wastes, repairing breached containment structures, or stopping machines or processes that may exacerbate the problem. All such temporary measures must be taken in strict compliance with health and safety procedures. Any controls used should, to the extent possible, contribute to the implementation of a corrective measure at the unit.

Step 8 Notification of the appropriate DOE and regulatory agency officials should occur as soon as possible. Although the authorized regulatory agency should be notified as soon as possible regarding the emergency condition and temporary controls to be applied, it may not be possible to provide this notification until after the fact. A follow-up report should be submitted as soon as possible and should include the conditions that caused the emergency, what was done to mitigate any release, what the present condition is, and additional steps that have been, or are being taken, to prevent recurrence of the emergency conditions. Recommendations for possible further action should be included.

Step 9 The emergency may have brought to light other problems, or may have caused releases and resulting environmental or other damage. These problems may require other non-emergency interim measures and/or long-term (non-emergency) corrective measures.

Submodule 2-1-3: Non-emergency Interim Measures



Submodule 2-1-3: Non-emergency Interim Measures

Step 1 Start.

Step 2

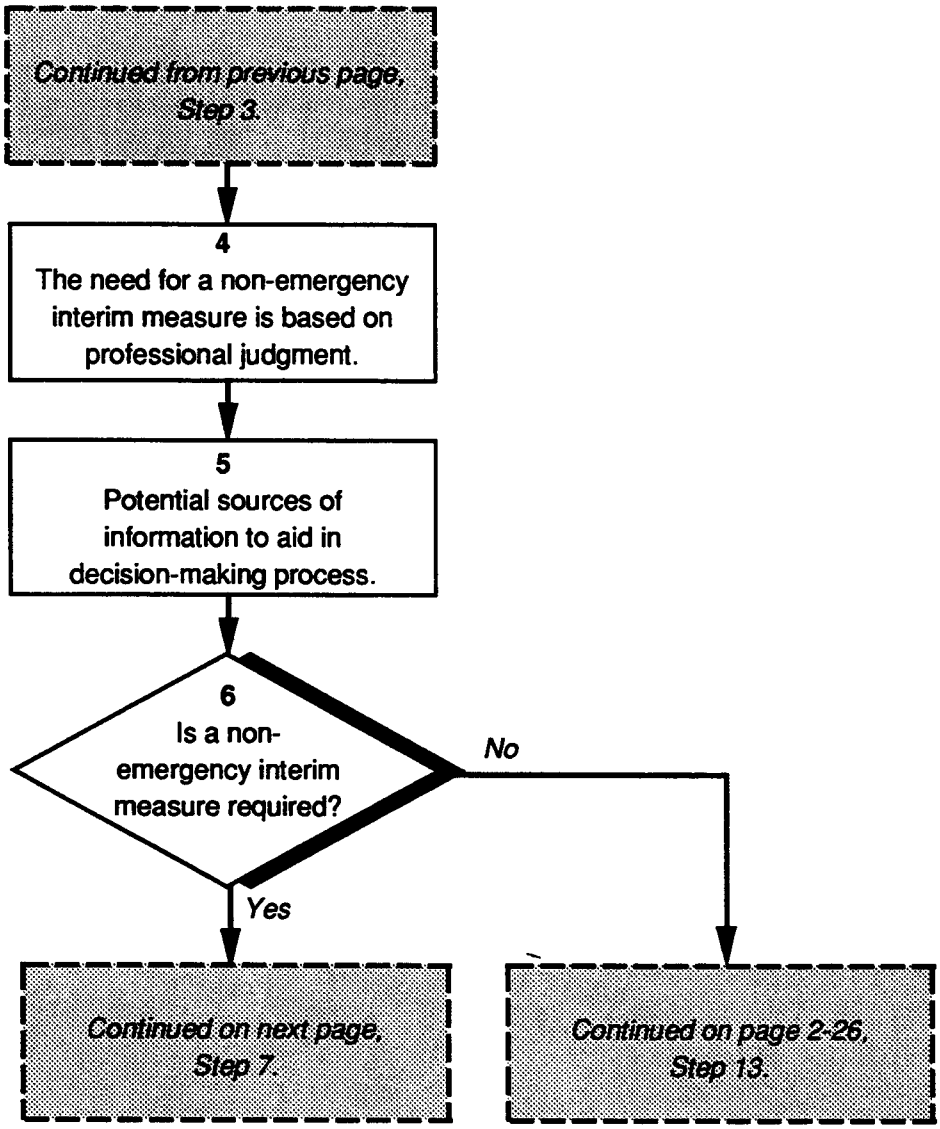
Non-emergency interim measures are used in those situations that do not require immediate action but will likely require action within a time frame prior to the implementation of the longer term corrective measures. A key consideration when assessing the need for a non-emergency interim measure is to ensure that the action will, to the extent possible, contribute to any final corrective measure selected for the unit.

Step 3

The use of non-emergency interim measures to achieve near- and mid-term solutions to releases of hazardous wastes or hazardous waste constituents from SWMUs is the basis of EPA's "stabilization initiative." As stated in the October 25, 1991, EPA memorandum from Sylvia Lowrance and Bruce Diamond to the EPA Regional Waste Management Division Directors (a copy is provided at the end of this chapter):

> *The overall goal of stabilization is to, as situations warrant, control or abate threats to human health and/or the environment from releases at RCRA facilities, and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.… Interim measures are the corrective action activities used to achieve the goal of stabilization.…*

The "stabilization initiative" stems from a suggestion made in the EPA document *The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study* (1990). This recommendation was that EPA's Corrective Action Program should readjust its program emphasis to focus on use of interim measures to achieve near-term environmental results at facilities with the most serious problems. In particular, EPA believes that while "stabilization" will not be appropriate in all circumstances, there should be a (to quote the above-mentioned EPA memorandum) "bias" toward implementing interim measures to quickly address actual exposures or minimize the spread of contamination.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4
The need for a non-emergency interim measure is based on professional judgment.
5
Potential sources of information to aid in decision-making process.
6
Is a non-emergency interim measure required?
No
Yes
Continued on next page, Step 7.
Continued on page 2-26, Step 13.

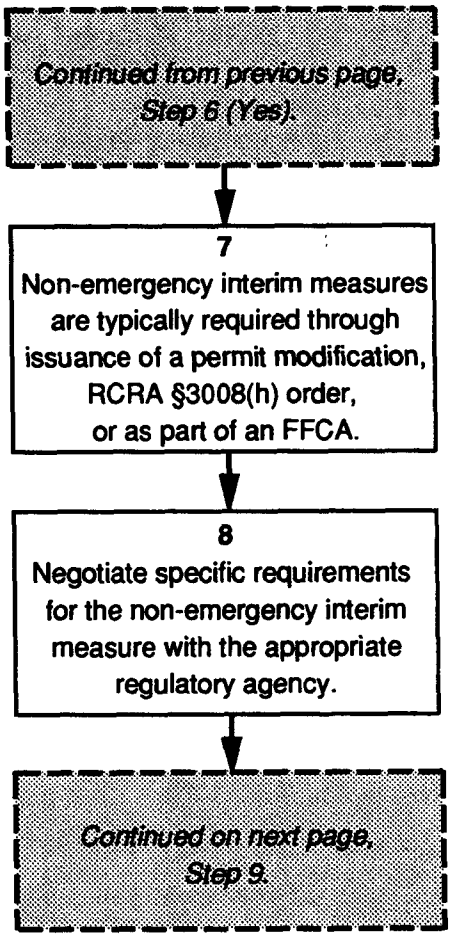
Step 4 The need for a non-emergency interim measure is largely a matter of professional judgment. For example, in a situation where action is required in order to prevent a release from migrating offsite, a non-emergency interim measure would be required if information indicated that offsite migration could occur in a period of several weeks up to (potentially) as long as 2 to 3 years. Alternatively, it would be more appropriate to complete the RFI and CMS, and then implement a long-term corrective measure if information indicated that the delay would not increase the risk posed to human health or the environment or if offsite migration would not occur prior to implementation of the final corrective measure.

As another example, if funding is available immediately but might not be available later in the corrective action process, it could be appropriate to implement a non-emergency interim measure rather than wait for selection of the long-term corrective measure. Also, if the facility has been experiencing public scrutiny, a non-emergency interim measure may help to allay the public's concerns about the consequences of delays in the corrective action process.

Step 5 Some sources of information that may help determine if there is a need for a non-emergency interim measure include:

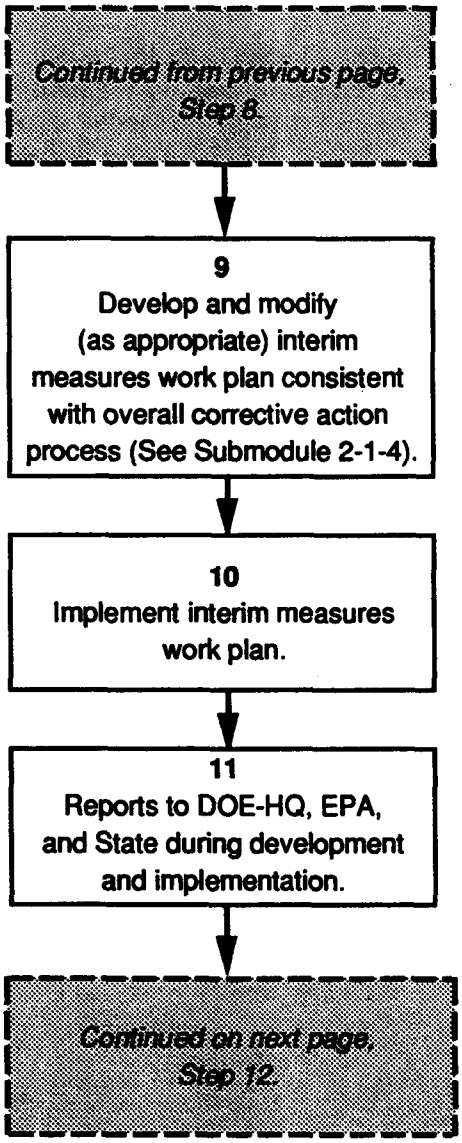
- Facility environmental audit or inspection reports (e.g., "Tiger Team" reports, "self-assessment" reports);
- RCRA Facility Assessment (RFA) report;
- RCRA Facility Investigation (RFI) report;
- RCRA Part A and Part B permit applications;
- Notice of significant increase;
- Responses to RCRA §3007 information requests;
- Information obtained through RCRA §3013 orders;
- Notifications required by CERCLA §103 or RCRA §3016 submittals;
- Information-gathering activities conducted under CERCLA §104; or
- Information from the general public that has been corroborated.

Step 6 DOE-HQ and the regulatory agency may have already been aware of the need for non-emergency interim measures as a result of the reporting process, other assessments, or after an emergency interim measure was implemented. One of the requirements of notification that an emergency interim measure is needed is to determine the need for a non-emergency interim measure. Generally, DOE would be informed by the regulatory agency of the need for a non-emergency interim measure through a permit modification or a RCRA 3008(h) corrective action order (following the RFA, for example). In other cases, DOE may become aware of a situation that could require non-emergency interim measures, and in this case should notify the authorized regulatory agency of the situation. If a non-emergency interim measure is required, go to Step 7. If not, go to Step 13.


Continued from previous page, Step 6 (Yes).
7
Non-emergency interim measures are typically required through issuance of a permit modification, RCRA §3008(h) order, or as part of an FFCA.
8
Negotiate specific requirements for the non-emergency interim measure with the appropriate regulatory agency.
Continued on next page, Step 9.

Step 7 The non-emergency interim measure, if required, will be identified in the facility's RCRA permit, in a 3008(h) corrective action order, or may be specified in a FFCA or IAG. If there is an emergency situation, or if the conditions at the facility require immediate response, DOE should act expeditiously to implement any measures necessary to protect human health and the environment, even if prior EPA approval has not been secured. For non-emergency interim measures DOE should consider seeking approval of the EPA Regional Administrator prior to implementing the measure as a means of preventing disputes from arising.

Step 8 Informal negotiation or discussion between the facility, DOE-HQ, and the regulatory agency should result in a consensus on the need for or type of interim measure required. This discussion usually occurs following the performance of the RCRA Facility Assessment and prior to the drafting of a formal RCRA permit or corrective action (RCRA §3008(h)) order (or FFCA) that would require interim measures. Resulting requirements for non-emergency interim measures will be outlined in the draft permit or corrective action order, and should be negotiated prior to dissemination for public review and comment. Prior knowledge of impending requirements is also essential for ensuring that adequate funds are in place to implement interim measures. Although DOE would have the opportunity to comment on the draft permit or order once issued, it would be best to work with EPA in developing mutually acceptable requirements.


Continued from previous page, Step 8.
9
Develop and modify (as appropriate) interim measures work plan consistent with overall corrective action process (See Submodule 2-1-4).
10
Implement interim measures work plan.
11
Reports to DOE-HQ, EPA, and State during development and implementation.
Continued on next page, Step 12.

Step 9 The final RCRA permit or order (or FFCA) will require the development of a detailed work plan for the implementation of the interim measure. Since the regulatory agency needs to approve the plan, soliciting informal input from the regulatory agency will help facilitate the work plan development process. The work plan should include the following at a minimum:

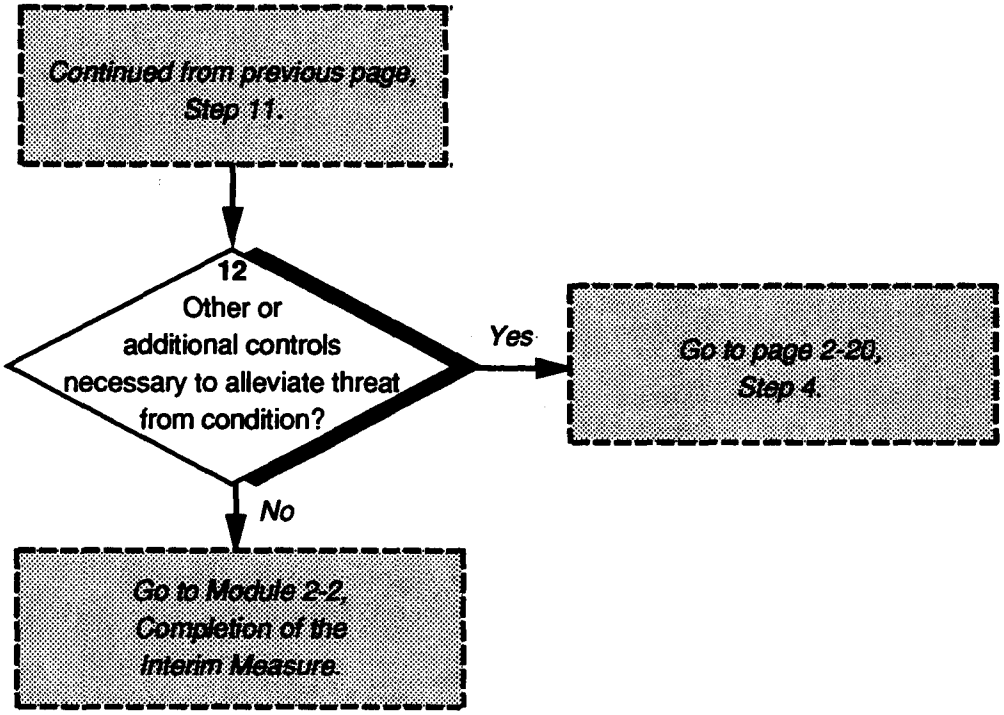
- Interim measures objectives;
- Health and safety plan; and
- Public involvement plan.

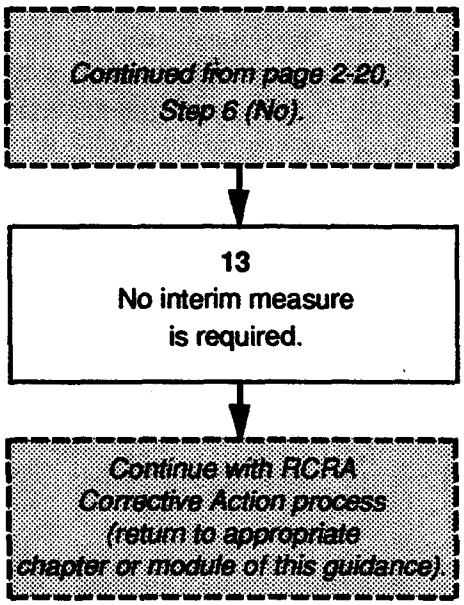
As appropriate, the interim measures work plan may also include the following:

- Interim measures investigation program;
  - Data collection quality assurance plan,
  - Data management plan,
- Interim measures design program;
  - Design plans and specifications,
  - Operation and maintenance plan,
  - Project schedule,
  - Final design documents,
- Interim measures construction quality assurance plan;
  - Construction quality assurance objectives,
  - Inspection activities,
  - Sampling requirements,
  - Documentation.

Step 10 DOE would then follow the work plan as approved, but where actual conditions vary it may be necessary to make revisions. DOE-HQ and the regulatory agency should be involved in any revisions, and some may require official approval. Revisions with regulatory implications might need EPA (or State) approval, whereas revisions with policy implications might need regulatory agency and/or DOE-HQ approval.

Step 11 Whether revisions to the work plan are needed or not, every action during the development and implementation of the interim measure should be reported to the authorized regulatory agency involved. Official reports submitted to the regulatory agency become public information (to the extent that confidential business or national security information is not involved) so sufficient detail to fully characterize the interim measure process is essential. Generally, the RCRA permit, Order, or FFCA will specify reporting requirements. These will consist of interim progress reports (e.g., monthly) as well as a final report, and may also involve certification (e.g., by an independent qualified party) that interim measures have been completed as required.

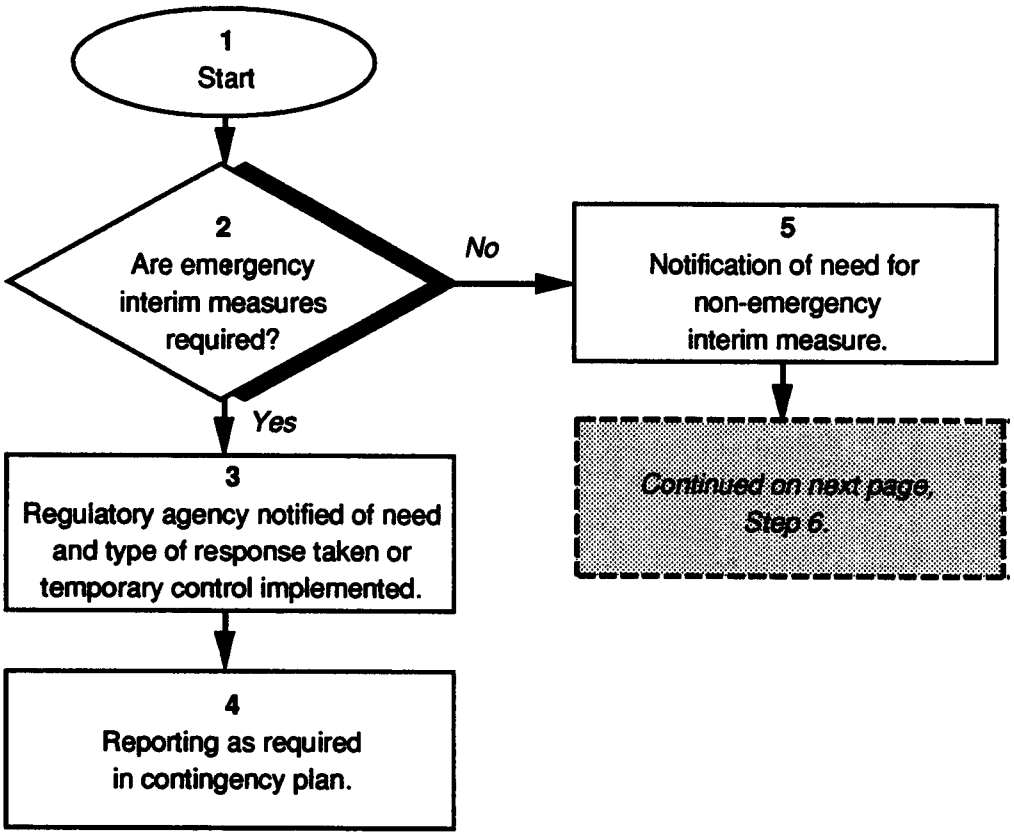

Continued from previous page, Step 11.
12
Other or additional controls necessary to alleviate threat from condition?
Yes
Go to page 2-20, Step 4.
No
Go to Module 2-2, Completion of the Interim Measure.


Continued from page 2-20, Step 6 (No).
13
No interim measure is required.
Continue with RCRA Corrective Action process (return to appropriate chapter or module of this guidance).

Step 12 If, as a result of implementing the interim measure, there appears to be a need for additional interim measures, then the process begins again with notification of DOE-HQ and regulatory authorities. If no additional interim measures are needed, then the interim measures process needs to be completed as described in Module 2-2.

Step 13 As a result of analyzing the site conditions, the regulatory agency may ultimately decide that no interim measure is needed at this time. This may be due to rethinking of a perceived problem or recategorization of a non-emergency condition to be addressed as part of the long-term corrective measures.

Submodule 2-1-4: Interim Measures Evaluation and Approval Process



Submodule 2-1-4: Interim Measures Evaluation and Approval Process

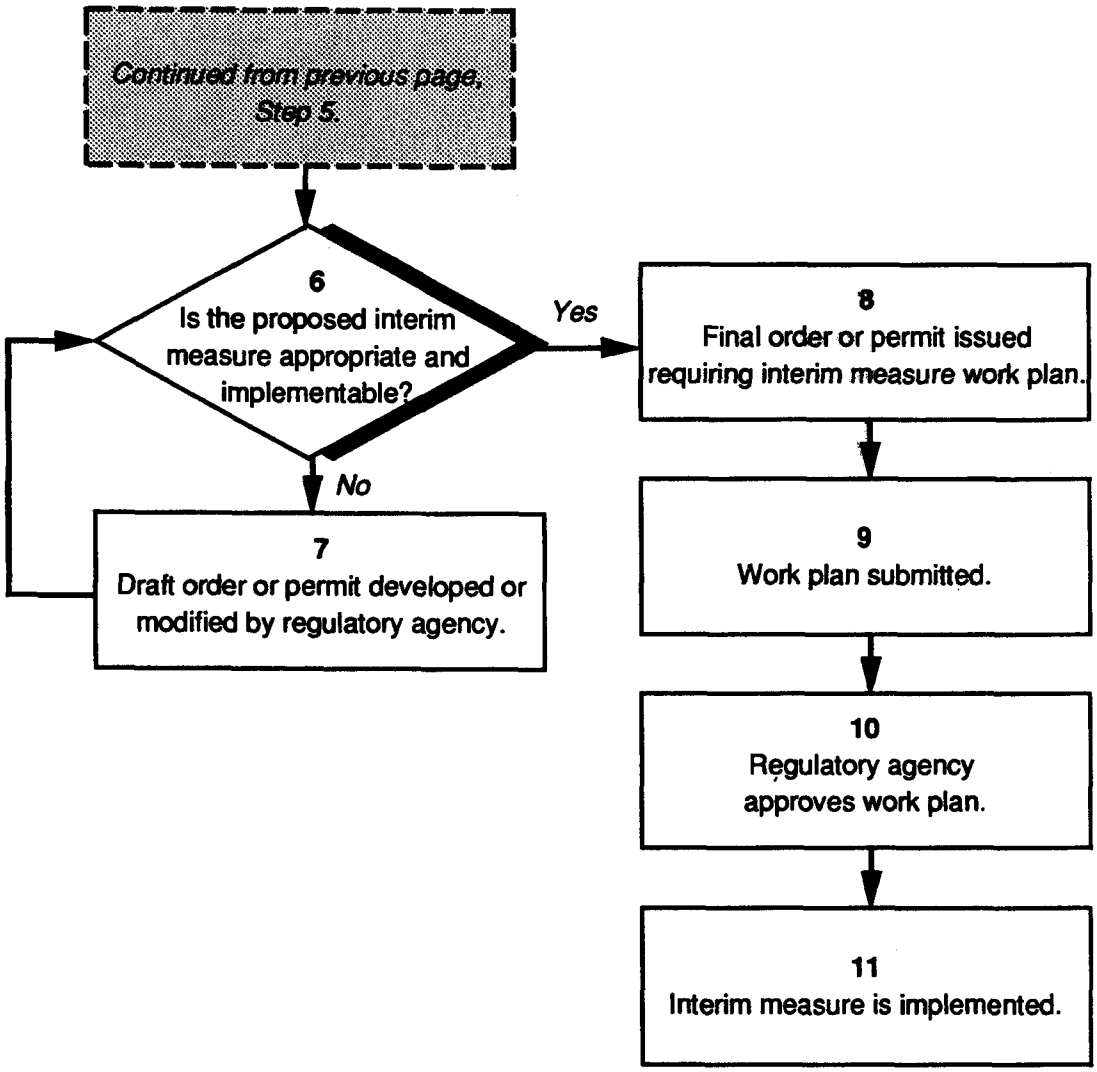
Step 1 **Start.**

Step 2 [Updated 9/99: It should be noted that if there is evidence of conditions posing an imminent and substantial endangerment to health or the environment, EPA may choose to issue an order to abate those conditions as quickly as possible under the imminent hazard provisions of Sect. 7003 of RCRA instead of Sects. 3004(u), 3004(v), or 3008(h).] Emergency interim measures are perceived to be a temporary control taken to correct a situation that poses an immediate potential or actual threat to human health or the environment. No time would have been available to obtain prior approval or to develop a work plan before taking action. If a contingency plan was available, it would have been implemented before or after the temporary control, depending on the immediacy and magnitude of the threat. It should be noted that the contingency plan may not address some perceived interim measures such as discovery of a routine or systematic release, but the plan will provide valuable information (e.g., the name of the facility emergency coordinator) useful in conducting emergency interim measures.

Step 3 Notification of all details regarding the action taken should be made to the regulatory agency as soon as possible following the incident. Non- emergency interim measures that may be needed as a result of the emergency condition (in addition to any temporary controls) should be proposed at this time.

Step 4 Actions taken and results accomplished should be documented. Due to the nature of emergency interim measures, no evaluation or prior approval by regulatory agencies can usually be sought.

Step 5 As indicated in Submodule 2-1-2, the regulatory agency will generally determine the need for interim measures as a result of the RFA (although interim measures may be identified at any time during the corrective action process). The regulatory agency will generally notify the facility that interim measures seem appropriate, and the nature of such measures. During the time that the regulatory agency is developing the permit modification or order, DOE should offer comments and assistance to the regulatory agency. This action may help to ensure that requirements to be outlined in the order or permit will be acceptable and appropriate. Acceptability should be evaluated in terms of efficiency and effectiveness, compatibility with any long-term corrective measures that may be anticipated, and funding constraints.


Continued from previous page, Step 5.
6
Is the proposed interim measure appropriate and implementable?
Yes
No
7
Draft order or permit developed or modified by regulatory agency.
8
Final order or permit issued requiring interim measure work plan.
9
Work plan submitted.
10
Regulatory agency approves work plan.
11
Interim measure is implemented.

Step 6 Formal notification that non-emergency interim measures are required will be provided in the facility's RCRA permit, a RCRA §3008(h) corrective action order, or FFCA or IAG. The notification will become a public document and, in some cases, the public may be granted an opportunity to comment on the requirements for the interim measure.

Step 7 After the proposed interim measure has been drafted and comments are solicited by the regulatory agency, DOE should evaluate whether formal comments should be submitted. Factors to be considered are the same as those discussed above, and include the efficiency and effectiveness of the interim measure, whether it will be commensurate with long-term corrective measures, and what funds will be available to implement it.

If an inappropriate interim measure is required, the facility should prepare a detailed discussion of their concerns and submitted these concerns in writing to the EPA Regional Administrator.

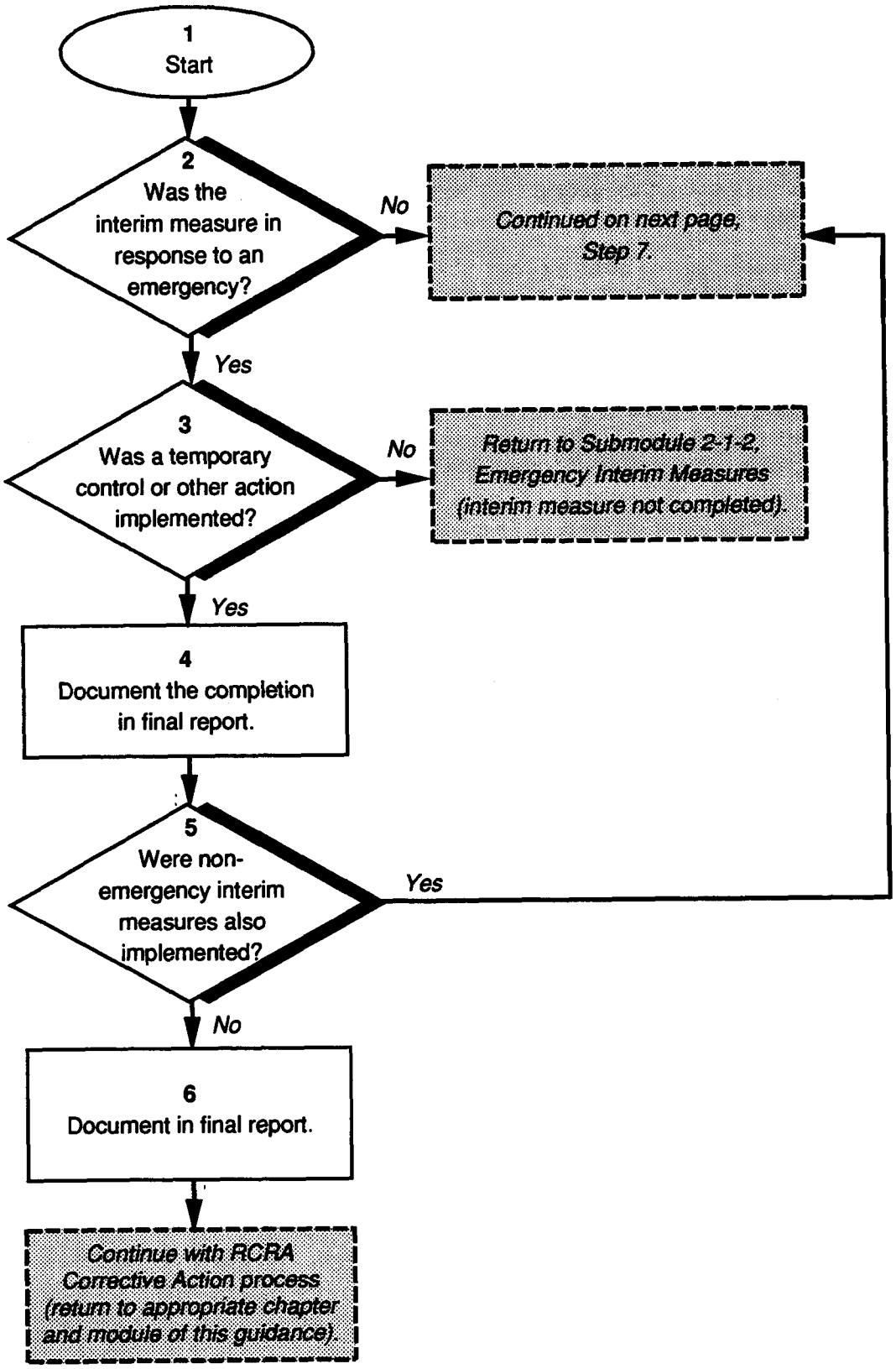
Step 8 Following review of the permit or order by DOE, any public comment period that was required, and any negotiations that have ensued, the authorized regulatory agency may need to revise the proposed interim measure requirements. If no revisions are required, the facility will begin development of a detailed work plan.

Step 9 Development of the draft work plan will address the components identified in Submodule 2-1-3, Step 9. The draft work plan (if required) is then submitted to the regulatory agency for review and comment. If revisions are required, a revised work plan that addresses the comments will need to be developed.

Step 10 The final work plan is likely to be approved quickly because, it is to be hoped, the regulatory agency and DOE will be in agreement over the specific requirements.

Step 11 When approval is received by DOE, the interim measure must be initiated pursuant to the work plan. Progress reports will be submitted to the regulatory agency during and at the completion of implementation.

Module 2-2: Completion of the Interim Measure



Module 2-2: Completion of the Interim Measure

Step 1 **Start.**

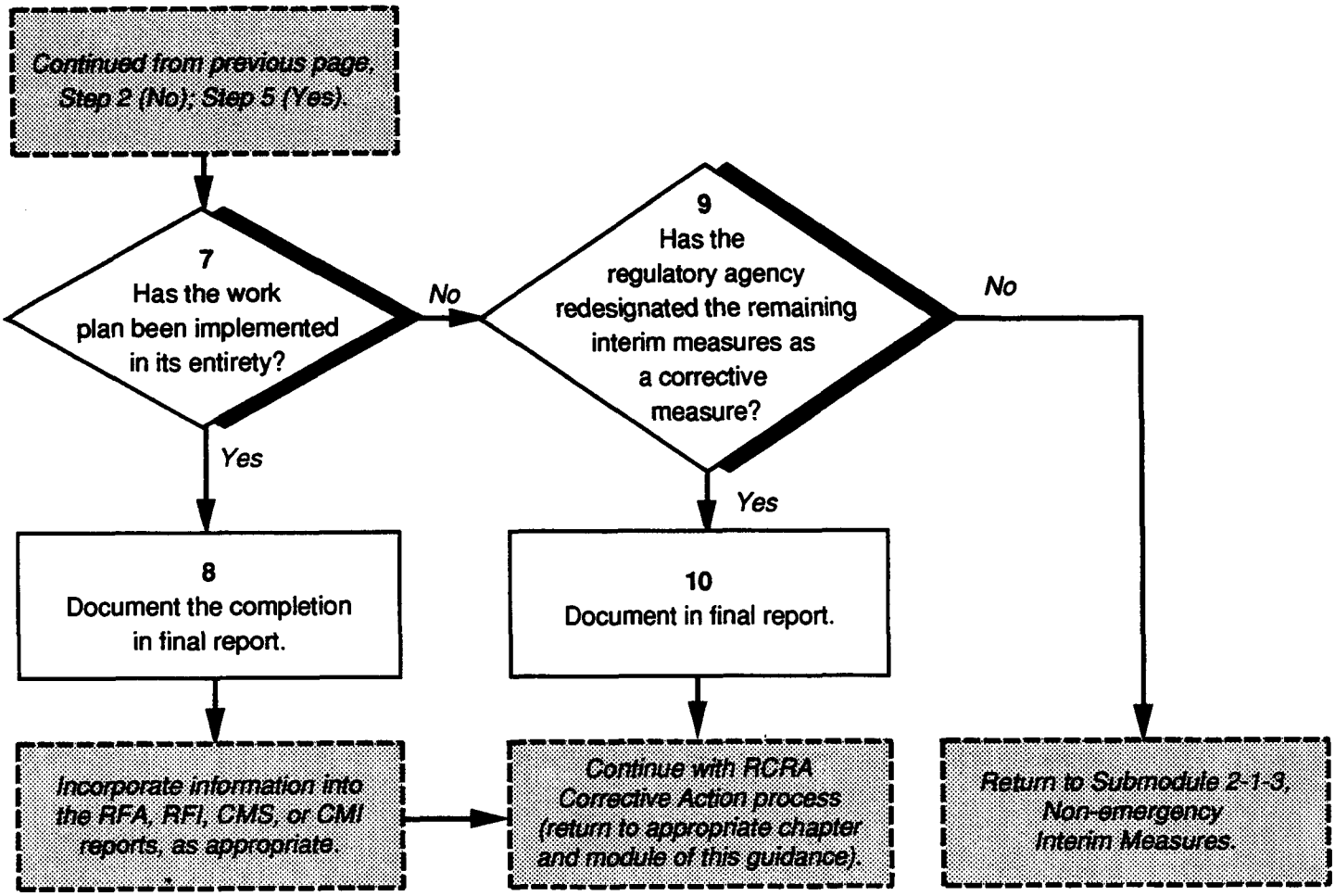
Step 2 If a response was made as the result of an emergency, there would have been no time to obtain prior approval or develop a work plan. Such a response could have been the sounding of an alarm because of a fire, for example. In a non-emergency situation, a work plan would have been developed and approved by the regulatory agency before any response was made, as required in a permit or corrective action order.

Step 3 If a temporary control or other action was not implemented, the interim measure was not completed. An example of a completed interim measure would be construction of a berm to prevent migration of a threatened release of liquids that contain hazardous wastes or hazardous waste constituents.

Step 4 When the temporary control is implemented, the interim measure is complete. This is documented in a final report to the regulatory agency and DOE-HQ.

Step 5 As a result of the completion of the emergency interim measure, the need for non-emergency interim measures may also have been identified, and (after work plan approval) implementation begun.

Step 6 If the need for non-emergency interim measures was not identified, this is also reported in the final report to the regulatory agency and the appropriate DOE officials.


Continued from previous page. Step 2 (No); Step 5 (Yes).
7
Has the work plan been implemented in its entirety?
No
9
Has the regulatory agency redesignated the remaining interim measures as a corrective measure?
No
Yes
Yes
8
Document the completion in final report.
10
Document in final report.
Incorporate information into the RFA, RFI, CMS, or CMI reports, as appropriate.
Continue with RCRA Corrective Action process (return to appropriate chapter and module of this guidance).
Return to Submodule 2-1-3, Non-emergency Interim Measures.

Step 7 For non-emergency interim measures to be complete, the final work plan (and any modifications) as approved by the regulatory agency must be fully implemented. For example, if an objective in an interim measure work plan was to reduce a detected constituent in surface water to a specific concentration, and monitoring following implementation of the interim measure revealed that the concentration was too high, then the interim measures work plan requirements would not have been completely implemented.

Step 8 When the work plan has been fully implemented, the interim measure is complete. This is documented in a final report to the regulatory agency and DOE-HQ. The permit or order may also require certification by an independent qualified technical engineer.

Step 9 If the interim measures work plan has not been fully implemented, the regulatory agency may redesignate the remaining interim measure implementation to the corrective action process because corrective measures implementation has begun or will soon begin. Since the interim measures work plan was developed to be consistent with the overall corrective action process, the conversion from interim measure to long-term corrective measure should be uncomplicated. If the regulatory agency has not redesignated the remaining interim measure implementation, then the interim measure process is not complete and must continue according to the work plan.

Step 10 If the remaining interim measure implementation has been redesignated to the RCRA Corrective Action process, this information is documented in a final report to the regulatory agency and the appropriate DOE officials.

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Module 2-3: EPA Memorandum on "Stabilization"

This is a reproduced copy of this document.

MEMORANDUM

SUBJECT: Managing the Corrective Action Program for Environmental Results: The RCRA Facility Stabilization Effort

FROM: Sylvia K. Lowrance, Director
Office of Solid Waste

Bruce Diamond, Director
Office of Waste Programs Enforcement

TO: Regions I-X RCRA Waste Management Division Directors

The purpose of this memo is two-fold. First, we are transmitting to you some important guidance documents that have been developed to ease the implementation of the RCRA facility stabilization effort. Second, and perhaps more importantly, we wanted to take this opportunity to ask for your help and personal involvement in making the stabilization effort a reality. Fully embracing this effort means adjusting our Program's philosophy by placing increased emphasis on taking actions at many facilities to prevent situations from getting worse. We need your help in transmitting this message down through the ranks and in identifying and overcoming obstacles to success.

When the RCRA Implementation Study (RIS) was issued in July, 1990, it suggested that the RCRA Corrective Action Program needed to adjust its longtime program emphasis. In essence, the RIS recommended that we adopt as our program strategy more frequent use of interim actions to achieve near term environmental results at facilities with the most serious problems. While final cleanup is still the long term goal for the corrective action program, this strategy emphasizes the importance of controlling releases and stabilizing sites to prevent the further spread of contamination as the first phase of corrective action. Stabilization of RCRA facilities means that we take whatever action is necessary at as many facilities as possible to address actual exposures (imminent risks) and to prevent the further spread of contamination. Although we recognize that stabilization actions will not always be appropriate or possible, we should demonstrate a "bias" for stabilization actions in the way we manage corrective action at RCRA facilities. We need your full support and dedication to this effort for it to be successful.

Over the course of the past year, Headquarters and the Regions have worked hard to take this recommendation and pave the road to implementation. The FY92 RCRA Implementation Plan (RIP) identifies stabilization activities as an area of national program emphasis and outlines the STARS measures associated with evaluating facilities for stabilization actions, and with implementing those measures. Further, this memo includes as attachments several guidance documents and a proposed checklist for completing stabilization actions. We hope that you will find this guidance, which was developed with a great deal of regional involvement, helpful as you begin implementing this important initiative.

Thank you for your efforts and your continuing support.

Attachments

RCRA STABILIZATION STRATEGY

Goals

One of the major recommendations of the RCRA Implementation Study (RIS) calls for the RCRA Corrective Action Program to adopt as a program management goal the "stabilization" of RCRA facilities as soon as possible. Over the next several years, the Agency and the States will begin implementing a major initiative to achieve this goal. This strategy paper is intended to:

- Explain the concept of facility stabilization; and
- Discuss the basic data needs to make decisions concerning facility stabilization and future guidance development in this area.

The overall goal of stabilization is to, as situations warrant, control or abate threats to human health and/or the environment from releases at RCRA facilities, and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

Implementing the stabilization strategy will yield substantial benefits for the corrective action program. Focusing resources in the near term on stabilizing environmental problems, rather than pursuing final, comprehensive remedies at all facilities, should enable the Agency and States to control the most serious environmental problems at a larger number of facilities, more quickly. Furthermore, by imposing such expeditious controls, the extent and incidence of continued environmental degradation from existing releases should be significantly reduced. However, if a stabilization measure is found to be inconsistent with the final remedy or the waste or site conditions, it should be modified or not be imposed.

Process

To a large extent, this stabilization effort builds on work that has been ongoing in EPA Regions and States. Although stabilization is a new RCRA strategy, it will not create a new regulatory or administrative process. Stabilization measures will be implemented through the existing process described in the proposed RCRA Corrective Action rule, and in the EPA guidance document on interim measures. Interim measures are the corrective action activities used to achieve the goal of stabilization. Regions have already required a large number of facility owners/operators to undertake interim measures to address obvious environmental problems, particularly where actual or imminent exposure of human or environmental populations has been identified. Interim measures, as discussed in the proposed corrective action rule and in the EPA guidance document on interim measures, may be conducted at a facility whenever the Agency determines that a release, or threat of a release, poses a threat to human health or the environment. These releases may be actual, imminent, or potential, and pose a threat to such receptors as human populations, animals, ecosystems, and/or drinking water.

Along with interim measures, other RCRA remedial approaches (e.g., conditional remedies and voluntary actions by owner/operators) will also be used to achieve stabilization. These remedial approaches are intended to phase-in over time and, therefore, may include stabilization activities to control the migration of wastes onsite and to expedite cleanup or releases that have migrated beyond the facility boundary. Voluntary corrective actions may be conducted at RCRA facilities that wish to initiate stabilization activities rather than wait for EPA to begin actively pursuing corrective action at the facility. Voluntary activities, however, do not release owners/operators from RCRA liability or exempt them from future Agency action, if necessary.

While this stabilization effort builds upon ongoing activities, the significant change is that the national program is adopting the philosophy that overall there are increased environmental benefits associated with taking stabilization actions at more facilities in the near to mid-term, prior to pursuing final, comprehensive remedies at most facilities. However, RCRA Facility Investigation (RFIs) will continue, albeit at a slower pace, at many facilities since they are necessary for the ultimate cleanup of a facility.

By implementing stabilization measures at a facility, the Agency may be able to limit active oversight of the facility while addressing other high priority facilities; in other circumstances stabilization could simply be a milestone within a continuing remediation process. There may also be cases where a stabilization measure could be technically effective enough to serve as a final remedy for a particular release (e.g., when stabilization achieves final clean-up levels). Consideration of the stabilization measure as a final remedy would be based upon evaluation of performance monitoring data collected after the measure was implemented. In addition, public participation should be a part of any stabilization action that is viewed as the potential final remedy for the facility.

Procedurally, it is expected that stabilization will typically involve an evaluation of RCRA Facility Assessment (RFA) information to identify the need for stabilization techniques. Subsequent information gathering during the RFI should be focused to support technical decisions regarding the stabilization approach chosen, and implementing the technical "fix." Although public participation should be a part of a stabilization action that serves as the final remedy, interim measures that are part of a permit or order do not necessarily have to be public noticed at the time the measure is implemented.

The initiation of the stabilization "process" will be primarily a function of the overall priority of the facility, as determined by the national corrective action prioritization protocol. The Agency will assign the highest priority to those facilities that are determined to pose actual or imminent exposure threats to human populations or environmental receptors. Regions and States can also impose stabilization measures at middle and low priority facilities after appropriate actions have been taken to stabilize releases at high priority facilities.

Technical Considerations

Stabilization is a new program philosophy and should not be confused with measures that were historically considered stabilization technologies. Many of the stabilization technologies had the goals of immobilizing wastes and included solidification, vitrification, and other immobilization techniques. Although these technologies may be effective as stabilization measures in certain situations, this effort is broader and includes other source control measures along with measures that will mitigate the further spread of contamination. Measures to stabilize releases or other environmental problems could include the installation of a large-scale pump and treat system combined with treatment and/or containment-based source control actions. In addition, exposure controls, such as fences, other access controls, or provision of alternative water supplies, may also be required to mitigate actual or imminent exposure to health threats.

Stabilization may be appropriate for a facility under any of the following conditions:

- There are releases at the facility which pose actual or imminent exposure threats to humans or ecosystems at levels of concern;

- There are releases that, if not addressed expeditiously, will result in further significant contamination of environmental media in the near to mid-term (e.g., 5-10 years); or

- The site characteristics suggest that the site may be amenable to measures designed to control or abate imminent threats or prevent or minimize the further spread of contamination.

Information needed to answer these questions may be available after the RFA has been completed, especially data on imminent threats. However, in many situations data on the fate and transport of hazardous waste constituents will not be available until the RFI is underway or completed. Given that the selection of an appropriate stabilization measure is dependent upon the collection of sufficient site/unit characterization data, the Agency suggests that data needed to make decisions on stabilization be gathered up-front in the RFI process. Figure 1 briefly outlines some key decision points for selecting stabilization measures.

Stabilization measures should be applied to address releases to all environmental media. Technical limitations of remedial efforts (such as restoring contaminated ground water to drinking water quality), and lack of detailed information on contaminants and releases (such as with air releases), further underline the need to focus remedial efforts on preventing the further spread of existing contamination problems, as well as preventing new contamination from occurring.

The timing, process, and technical approach to stabilizing facilities will vary widely, and will be highly [dependent] on a variety of site-specific factors. These factors could include:

- Environmental significance (i.e., priority) of the facility;

- Immediacy of exposure threats;
- Types of contaminants and volumes of releases;
- Technical complexity of remediation;
- Site hydrology, or other media-specific characteristics; and

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decisions for stabilization will also vary greatly. Obvious removal-type situations might often be done more or less immediately, without extensive studies; while ground-water contamination in a complex hydrogeologic setting could require extensive investigations before an effective stabilization remedy could be chosen.

The Office of Solid Waste and Emergency Response (OSWER) is developing guidance that specifies the types of environmental problems which should be the focus of stabilization actions. The guidance will specify technical approaches to accelerate data-gathering to support decisions on appropriate stabilization measures, and describe phasing the RFI process to gather the necessary data to make decisions regarding stabilization. Draft guidance should be available in the fall, 1991.

The OSWER is also working closely with the Office of Research and Development, Center for Environmental Research Information (ORD-CERI) to produce guidance on stabilization technologies and case studies of successful implementation of stabilization technologies. Several actual examples of stabilization technologies that have to be[en] implemented at RCRA facilities will be used as case studies for discussion the appropriateness of certain technologies. In addition, the technical guidance document will cover data needs, performance criteria, and environmental conditions. This document should also be available in the fall, 1991.

References

Corrective Action During Interim Status
OSWER Directive No. 9481.09-84
July 1984

Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (Proposed Rule)
55 FR 30798, Friday, July 27, 1990

Corrective Action: Technologies and Applications (Seminar Publication)
EPA/625/4-89/020
September 1989

Handbook: Stabilization Technologies for RCRA Corrective Actions
EPA/625/6-91/026
August 1991

Managing the Corrective Action Program for Environmental Results: The RCRA Facility Stabilization Effort
EPA Memorandum from Sylvia Lowrance and Bruce Diamond to EPA Regional RCRA Waste Management Division Directors
October 25, 1991

Preparation of RCRA Contingency Plans
DOE/EH-0274
EGD (RCRA)-004/0892
July 1992

RCRA Corrective Action Interim Measures Guidance (Interim Final)
OSWER Directive No. 9902.4
June 1988

RCRA Corrective Action Plan (Interim Final)
OSWER Directive No. 9902.3
June 1988

RCRA Facility Assessment Guidance
PB-87-1-7769
OSWER Directive No. 9502.00-05
October 1986

RCRA Facility Investigation Guidance (Four-Volume Set) (Final)
OSWER Directive No. 9502.00-6C
OSW:530/SW-89-031
May 1989

The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study
EPA/530-SW-90-069
July 1990

Chapter 3

The RCRA Facility Investigation

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

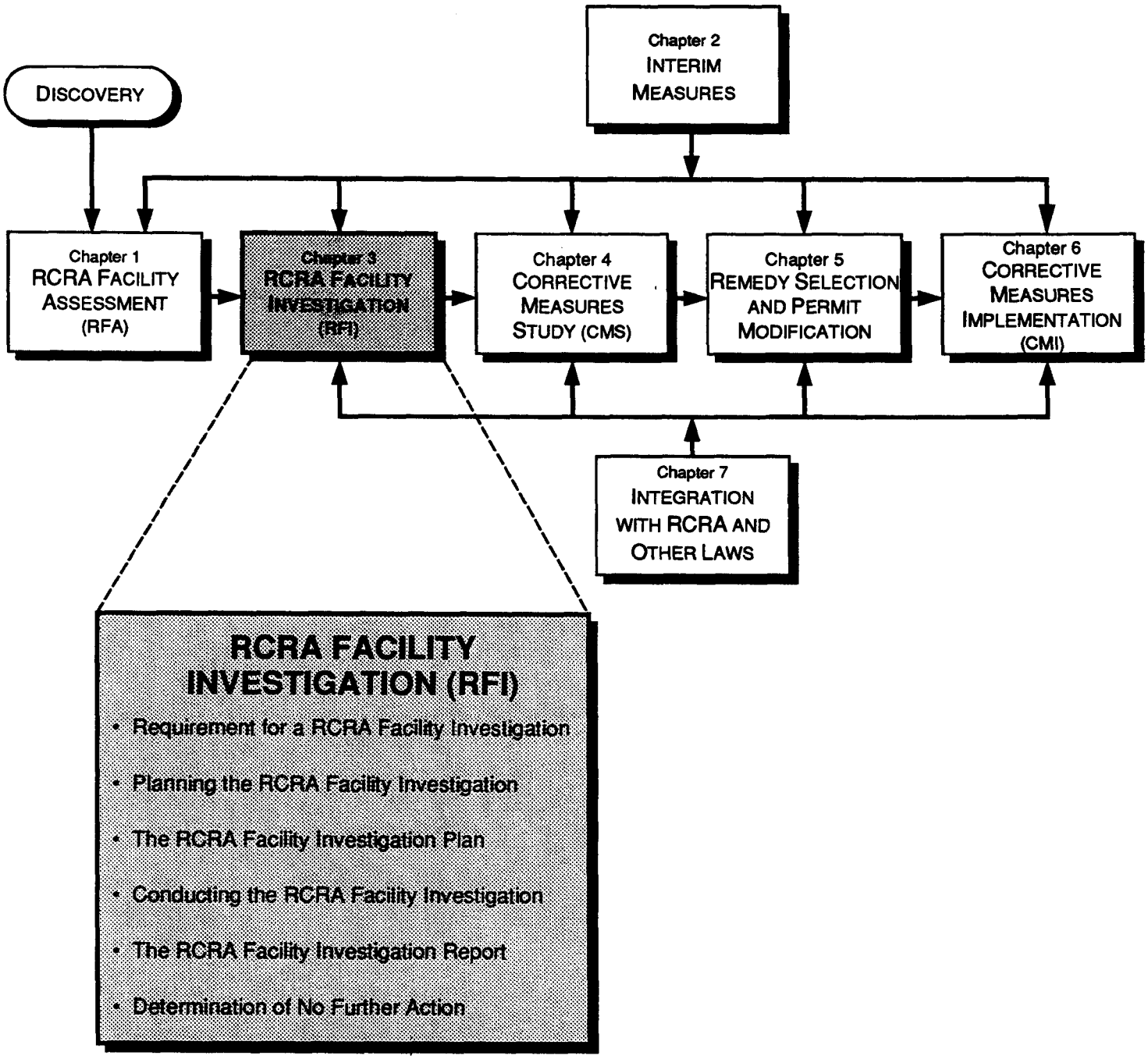
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

Sections 264.510 through 264.513 of the proposed Subpart S rule detail the procedural and substantive requirements for all RCRA remedial investigations conducted as part of the RCRA Corrective Action process. This includes the RCRA Facility Investigation (RFI). Similar to a Remedial Investigation (RI) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the RFI is the second step in the RCRA Corrective Action process. The objective of the RFI is the characterization of actual or potential releases from solid waste management units (SWMUs).

Many areas of the proposed Subpart S rule are unclear as to their meaning or scope. In these areas, the meaning of the language of the proposed rule is interpreted on the basis of "best professional judgment." Further, the presentation sequence in this chapter is not in the exact sequence as presented in the proposed rule or in the EPA RFI guidance. This guidance is not a rigid structure for conducting an RFI. Thus, for any number of reasons, the RFI process may vary from the sequence as presented; however, this guidance discusses the key elements.

For the sake of clarity, the term "EPA" includes those States authorized by EPA to implement a RCRA Corrective Action program in lieu of EPA implementation. The proposed Subpart S rule also uses the terms "plan" and "work plan" interchangeably. For clarity, the term "plan" has been used exclusively in this document.

A general discussion of each module shown in the overview graphic on the next page follows.

Module 3-1 Requirement for a RCRA Facility Investigation

The RCRA Facility Assessment (RFA) is the first step in the corrective action process. The RFA serves as a screen to eliminate from further investigation those SWMUs that have no release or potential for a release which could pose a threat to human health and the environment.[4] The RFA also serves to focus any further investigations, in particular the RFI, by identifying those releases, potential releases, or areas at a facility posing the greatest environmental concern.

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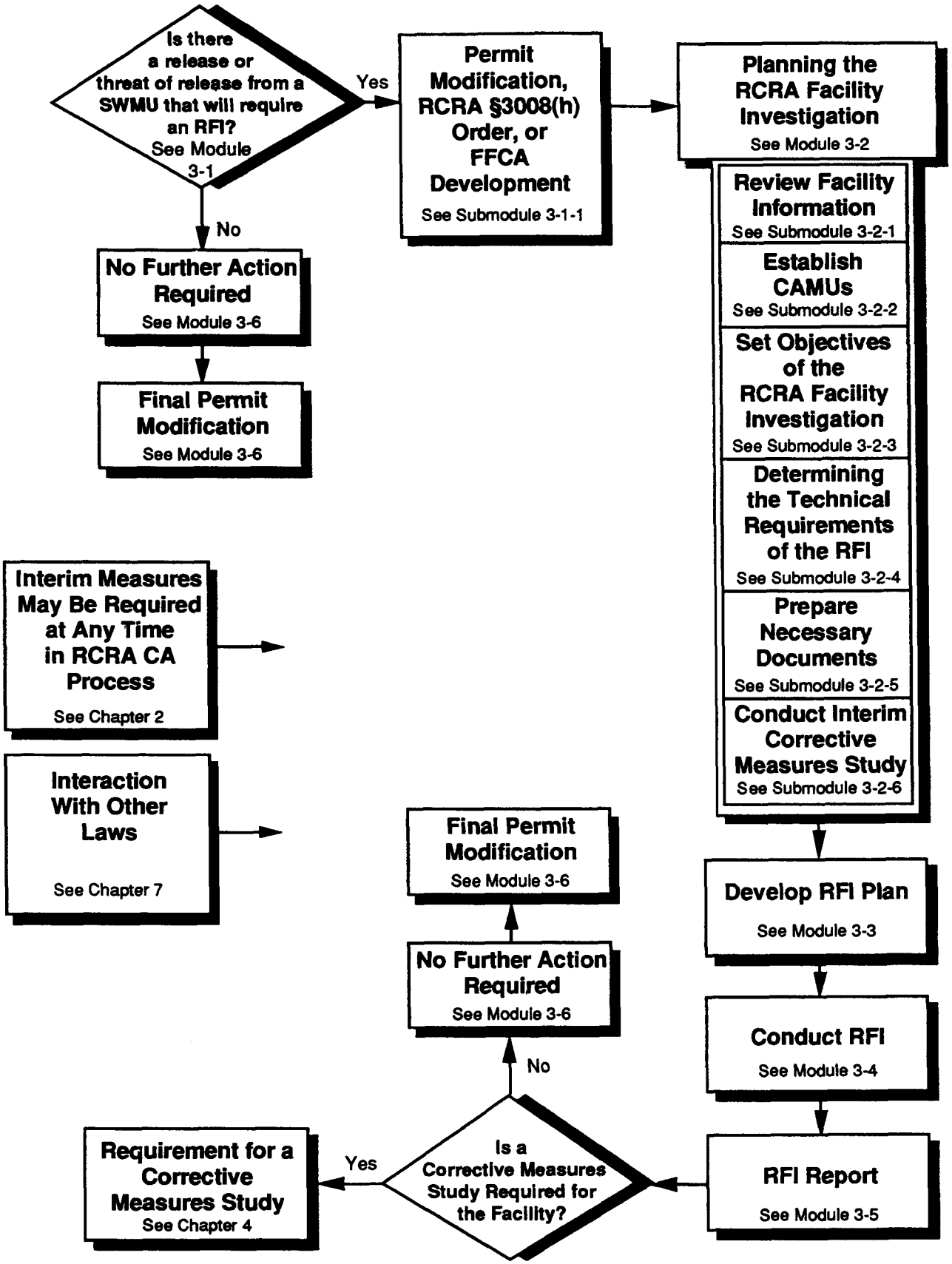
[4] The term "hazardous waste" also includes constituents of hazardous waste. In the preamble to the proposed Subpart S rule, EPA states its interpretation that the term "hazardous waste" includes all wastes falling under the definition of "hazardous waste" found in RCRA §1004(5). Further, EPA states its position that the term "hazardous waste constituents (or constituents)" includes those substances defined under RCRA §3004(u) and specifically listed in 40 CFR §261 Appendix VIII and 40 CFR §264 Appendix IX.



Chapter Three: RCRA Facility Investigation (RFI)

Submodule 3-1-1 Establishing the Requirement for a RCRA Facility Investigation

Once the identification of an actual or potential release occurs, the EPA will notify the owner/operator (in this case DOE) of the requirement for conducting an RFI. A binding requirement for conducting an RFI is created through a RCRA §3008(h) enforcement order (for interim status facilities) or permit conditions (for corrective action under RCRA §3004(u) or (v)). In the case of a requirement for an RFI under the terms of a RCRA permit, the permit issuance or modification process requires a public participation element. No public participation is necessary if a RCRA §3008(h) order is the vehicle for the RFI requirement; however, EPA may elect to include public participation in this process as well.

In addition, considering the special relationship between EPA and DOE as Executive Branch agencies, the agencies often execute a Federal Facility Compliance Agreement (FFCA) or some other form of Inter-Agency Agreement.[5] The use of an FFCA is common when coordinating a RCRA Corrective Action with a concurrent response under other legal authorities.

Before executing the order, permit, or FFCA, DOE and EPA must negotiate the specific terms of the agreement. An important issue to discuss with EPA is the conduct of sampling to confirm if there has been an actual release. Often, EPA will not conduct sampling as part of the RFA. Conducting such confirmational sampling prior to the issuance of the permit, order, or FFCA which establishes the requirement for an RFI at the SWMU in question is in DOE's best interest. Through confirmational sampling DOE may be able to eliminate areas where there is no actual or potential release, and thus may be able to avoid the additional burden associated with conducting an RFI. Other examples of specific terms for discussion and negotiation include prioritizing investigations of releases or suspected releases, schedules for the RFI, designation of areas as corrective action management units (CAMUs), setting action levels, establishing sampling points, establishing criteria for terminating the need for an RFI, and settling agency policy issues.

During the process of developing the permit, order, or FFCA, the DOE facility should consider any requirements for compliance with other statutes. Examples include requirements for compliance with CERCLA, the National Environmental Policy Act (NEPA), and the Atomic Energy Act (AEA). This will be extremely important for those DOE facilities with a requirement for both RCRA Corrective Actions and CERCLA response actions involving a facility or site that is listed on the National Priorities List (NPL). EPA proposes to use Inter-Agency Agreements under CERCLA §120(e)(2) as the vehicle for coordinating and explicitly defining the procedural and technical requirements for combined RCRA and CERCLA compliance activities. This blends very well with established DOE policy for

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[5] The term "Federal Facility Compliance Agreement (FFCA)" used in this document includes all forms of agreements between agencies, unless the use of a more specific term (such as a CERCLA §120(e)(2) Interagency Agreement) is necessary.

combined RCRA and CERCLA compliance as outlined in DOE Order 5400.4. Specifically Section 7(c) of 5400.4 states:

> *In some instances, corrective action carried out under other authorities, such as RCRA §3004(u) or RCRA §3008(h) . . . may satisfy CERCLA requirements . . . . In these instances, DOE needs to ensure that these corrective actions are not inconsistent with the NCP. . . . One efficient means of accomplishing this is through the use of IAGs and FFAs to establish which authority will be used.*

The DOE facility should document any legal or policy requirements for integrating the RFI with action under other legal authorities, and provide this document to EPA.[6]

Examples of specific requirements often included in the order, permit, or FFCA for an RFI include:

- Verification of potential releases identified during the RFA;
- Development of an RFI plan (which may include activities normally conducted during the Corrective Measures Study (CMS), such as treatability studies);
- A requirement for an interim CMS;
- Provisions defining the requirements for compliance with other legal authorities;
- Submission of periodic progress reports and a final RFI report;
- A schedule for conducting the RFI; and
- Media-specific action levels for each contaminant suspected or known to be present at the facility.

Once EPA and DOE have agreed on all aspects of the permit, order, or FFCA, and any public participation requirements are complete, EPA issues the final order or permit, and the RFI process begins.

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[6] A detailed discussion of the integration of the RCRA Corrective Action process with other elements of RCRA as well as other environmental statutes is found in Chapter 7 of this document.

Module 3-2 Planning the RCRA Facility Investigation

Planning the RFI will involve: (1) reviewing all information on the release, the SWMU, interim measures, and the specific requirements of the order, permit, or FFCA, (2) assessing the benefits of establishing CAMUs at the facility, (3) establishing the objectives of the RFI, (4) determining requirements for the studies necessary to meet the objectives of the RFI, (5) preparing necessary documents, and (6) planning any activities required as part of conducting an interim CMS. The success of the RFI depends upon the deliberative effort and attention to detail applied during the planning process.

Submodule 3-2-1 Review of Facility Information

The first phase of conducting the RFI is to collect and review all available information on the release, the SWMU, and the facility. Sources of information for this review include the permit, order, or FFCA for the facility, reports of releases, reports of facility operations (e.g., reports filed under RCRA §3016 or CERCLA §120(c)), the RFA report, interim measures reports, and reports of investigations or remedial activities conducted under other legal authorities. Recognizing that these reports may not offer specific information on each of these areas, the documents should be reviewed for information on:

- Waste characteristics, including identity, physical, chemical, and toxicological properties, and estimated or known quantity or concentration of hazardous wastes and hazardous waste constituents released;
- Environmental setting, including information on geology, hydrogeology, topography, population demographics, and relation of the SWMU to other SWMUs at the facility, and the relationship of the facility to the surrounding area;
- Any documented evaluation of the risks posed to human health and the environment by the release;
- Actions (including interim measures) taken at the facility to control or minimize the threat posed by the release;
- The terms and requirements of the permit, order, or FFCA;
- Current conditions and operations (including operations permitted under other legal authority) at the facility.

An owner/operator should prepare a document summarizing the results of this review process for use as a reference during the planning process, and for inclusion in the final RFI report.

Submodule 3-2-2 Establishing Corrective Action Management Units

The second step of the planning process is to evaluate the potential benefits of establishing CAMUs.

Under the proposed Subpart S rule, EPA has the authority to designate an area of broad, contiguous contamination as a CAMU. The use of CAMUs permits consolidation of several SWMUs into one single unit for conducting corrective action. The identification of a CAMU usually takes place after completing the RFA. Based upon the review of information about the site, the owner/operator should propose any appropriate areas as CAMUs. The primary benefit of using a CAMU to address large areas of contamination (usually the result of releases from several SWMUs) at a facility is that land-based treatment and disposal of contaminated materials from within the CAMU is not subject to either land disposal restrictions or minimum technology requirements.

Submodule 3-2-3 Setting the Objectives of the RCRA Facility Investigation

An important step in planning the RFI is establishing the objectives of the investigation. Of particular importance are the data quality objectives (DQOs) for the investigation. DQOs are qualitative and quantitative statements which identify the types, quantity, quality, and process of collecting data during the RFI. The development of DQOs is specific to the facility, the SWMU, or the CAMU under investigation. However, some elements of the DQOs developed for one phase of the corrective action may be applicable to other phases. For example, development of a list of acceptable analytical methods for use during the RFI is both possible and practical.

Another objective for the RFI is promotion of public participation in the RCRA Corrective Action process.

Other objectives developed during the planning process may include adherence to schedules for the RFI, the acceptable degree of risk posed to workers engaged in the RFI, or general policy statements. Setting objectives not only provides direction for the planning and conduct of the RFI; clearly defined objectives also provide a valuable tool for assessing the progress of the RFI.

Submodule 3-2-4 Determining the Technical Requirements of the RCRA Facility Investigation

There are three basic categories of technical requirements for an RFI. The first category, the general technical requirements for the RFI, arises from available information on the nature and extent of the release, the affected media, and any requirements of the permit, order, or FFCA. The second category is the specific technical requirements for collection and analysis of environmental samples. These requirements are defined by the objectives (especially the DQOs) for the investigation. The third category is technical requirements arising from applicable statutory or regulatory requirements. All three categories may apply in an investigation.

For example, if a release from a SWMU impacts groundwater, the RCRA §3008(h) order usually includes a general technical requirement for assessing groundwater quality. To accomplish this requires installation of monitoring wells meeting specific standards for construction, and the collection and analysis of samples according to acceptable scientific practices. These represent specific technical requirements. Under the proposed rule, 40 CFR §261 Appendix VIII and 40 CFR §264 Appendix IX specify the compounds for which analysis is conducted as part of the groundwater quality assessment and constitute a regulatory technical requirement.

The owner/operator should develop a document listing the technical requirements for the RFI. This document is useful in other elements of the planning process, preparation of the RFI plan, contracting, and preparing the RFI report.

Submodule 3-2-5 Preparing Necessary Documents

Achieving compliance with the proposed Subpart S rule requires developing several plans, including a data collection quality assurance plan (DCQAP), a data management plan (DMP), a health and safety plan (HASP), and a public involvement plan (PIP).

A DCQAP is a document which presents in specific terms the data collection strategy, sampling procedures and sample collection points, field measurements procedures, and sample analysis procedures designed to achieve adequate data quality. A DMP is a document that details the procedures and format for tracking and presenting data and results of analyses. A HASP, a legal requirement under 29 CFR §1910.120, details the operational and institutional guidelines for ensuring the health and safety of employees engaged in any RCRA Corrective Action where there is a possibility of employee exposure. The PIP is a document which outlines the procedures for disseminating to the public information on the results of the investigation.

While a DCQAP, DMP, HASP, and PIP are not specifically required by the proposed Subpart S rule, EPA guidance on conducting RFIs suggests these documents, and the RFI plan will require discussion of most of the elements of these documents. Further, developing these documents represents a "best management practice," and as such is a strong recommendation for developing these documents as part of the planning process.

Submodule 3-2-6 Conducting an Interim Corrective Measures Study

While the proposed Subpart S rule indicates a CMS will usually follow completion of the RFI, EPA has the authority to require an interim CMS. In the preamble to the proposed rule, EPA indicates that an interim CMS will be used to prevent delays in advancing through the corrective action process. An example of a situation where EPA will require an interim CMS is a facility where confirmed releases have occurred over a long period and where wastes in those SWMUs are toxic and highly mobile. If EPA requires an interim CMS, the studies should be limited to small-scale evaluations of the effectiveness of a remedial technology. Any detailed evaluation of the alternatives for the corrective measure

should be postponed and conducted during the CMS. For further information on conducting a CMS, see Chapter 4 of this document.

Module 3-3 The RCRA Facility Investigation Plan

Conducting an RFI requires the development of an RFI plan. Under the proposed Subpart S rule, submission of an RFI plan is not a mandatory action; however, EPA usually requires that RFI plans be subject to EPA review and approval. The approved plan becomes a part of the facility permit and is subject to the permit schedule of compliance. An RFI plan requires discussion of:

- Current conditions at the facility;
- The general approach and scope of the investigation;
- Specific information on the technical requirements and analytical methods acceptable for use during the investigation;
- The quality assurance procedures for assessing the accuracy of data collected during the investigation;
- The data management procedures, including a format for documenting the analytical results of the RFI; and
- The format for the final RFI report.

The RFI should be planned in phases. Each phase should have established criteria that provide an opportunity for the requirement for an RFI to be terminated if the results of the investigation demonstrate a release has not occurred at the facility or that there is minimal or no potential for any future release. This mechanism provides the opportunity to prevent wasting valuable resources on unwarranted investigations.

Module 3-4 Conducting the RCRA Facility Investigation

The actual performance of the RFI has three elements: (1) implementation of the planned procedures for information gathering and sampling activities, (2) sample analysis and data verification, and (3) periodic progress assessments.

The first element, information gathering and sample collection activities, is a matter of implementing the field measurement and sampling activities. This involves such activities as installation of monitoring wells, collecting soil, water, or air samples, collection of information on the surrounding community, and waste characterization. The second element, sample analysis and data validation, is largely a process of implementing the data collection quality assurance plan (DCQAP) and data management plan (DMP).

The third element, periodic progress review, involves review of the collected data, evaluation of the success and problems encountered during the investigation, and assessing if the investigation is fulfilling the objectives set for the study. If the review finds implementation problems, or if the data collected reveal an unanticipated source or type of contamination, revisit the investigation planning process and RFI plan to determine their adequacy. The findings of these reviews should be documented for use in preparing both periodic reports and the final RFI report.

Module 3-5 The RCRA Facility Investigation Report

While the RFI is underway, EPA may require the submission of periodic progress reports. The exact content, format, and schedule for these reports are at the discretion of EPA. Any specific requirements for these progress reports will be included in the permit, order, or Federal Facility Compliance Agreement (FFCA).

Upon completion of the RFI, the owner/operator prepares a draft RFI report and a separate document summarizing the report and submits these documents to EPA for review and approval. The findings of the report are the basis for a "Determination of No Further Action" or for the conduct of a CMS, and represent the culmination of all the effort involved in conducting the RFI. The summary is sent to all parties on the facility's mailing list.

The RFI report must document the process and findings of the investigation and provide information to support any subsequent decisions. The elements of an RFI report are:

- A brief discussion of the facility history;
- Current facility conditions, including the terms of the permit, order, or FFCA;
- A discussion of the general approach to the investigation;
- A discussion of the objectives of the investigation, and an assessment of the success in achieving each objective;
- Identification and discussion of the general, specific, and technical requirements of the RFI;
- A discussion of the quality assurance, quality control, and data management procedures utilized during the investigation;
- Presentation and discussion of the findings of the investigation;
- Comparison of actual contamination levels to action levels;
- A discussion of significant problems encountered during the RFI; and
- Recommendations for subsequent action.

Note that any recommendations are not binding upon EPA. The selection of the next phase of the corrective action process is the responsibility of EPA. After review of the draft RFI report, EPA may require the owner/operator to conduct additional investigations or studies. The final, EPA-approved RFI report becomes the basis for either a Corrective Measures Study (CMS) or a "Determination of No Further Action."

Module 3-6 Determination of No Further Action

The EPA anticipates that at some facilitates the releases or SWMUs identified through the RFA (or subsequent investigations) are not a threat to human health and the environment. If EPA conducted the RFA and discovered no release or threatened release, the facility permit application continues through the normal process. However, if a RCRA §3008(h) order or permit modification (for existing permits) required the owner/operator to conduct the RFA and/or RFI, the owner/operator must request termination of the investigation requirement in the facility schedule of compliance. This requires a Class III permit modification or rescission of the RCRA §3008(h) order. Permit modification requires negotiation of the modification with the EPA, development of a draft permit, a public notice, a comment and response period, a public meeting (if necessary), incorporation of any revisions into the permit modification, and issuance of the final modified permit. For a RCRA §3008(h) order, EPA merely rescinds the order. In either case, the owner/operator is responsible for providing any supporting documentation.

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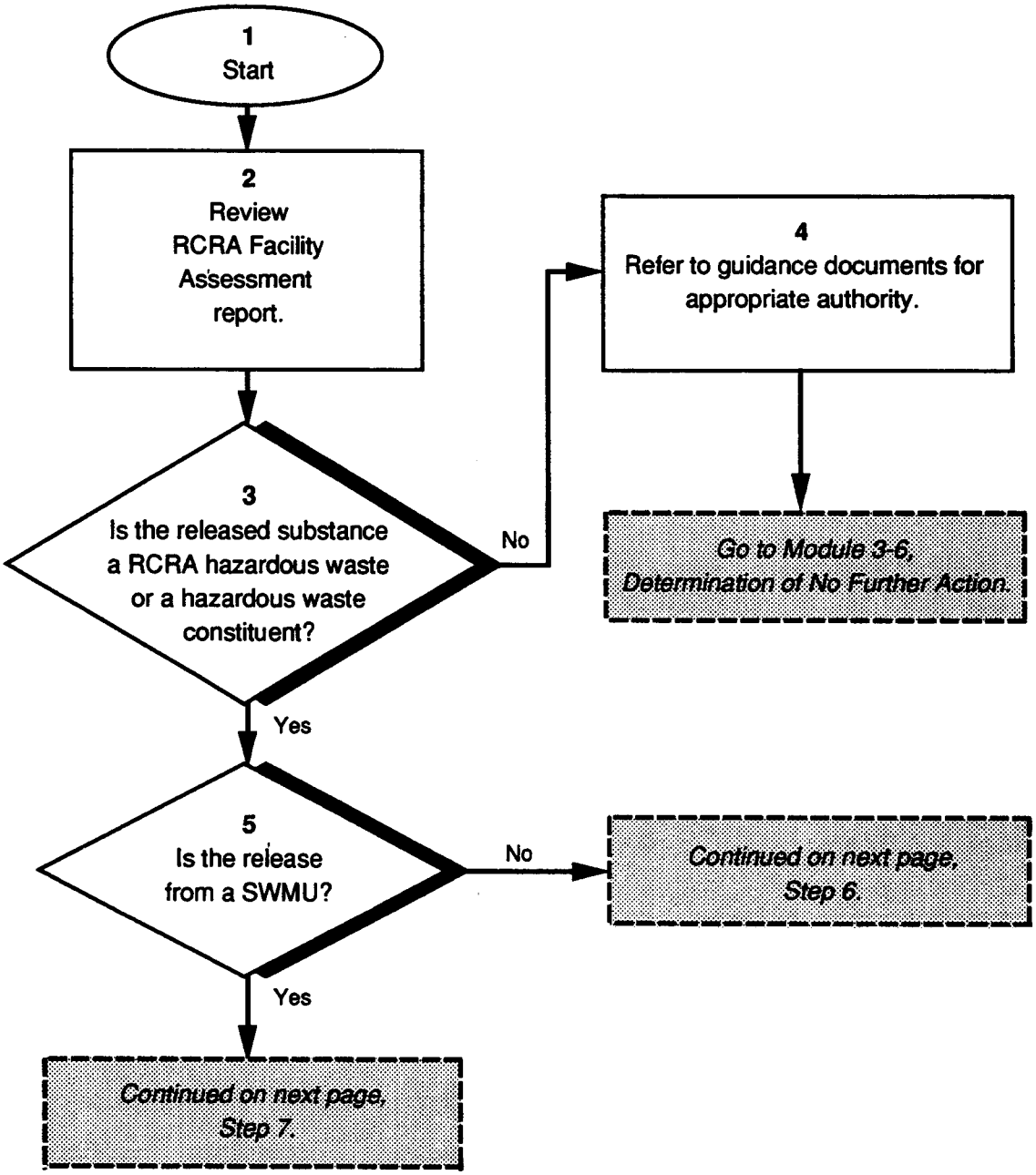
Module 3-1: Requirement for a RCRA Facility Investigation



Module 3-1: Requirement for a RCRA Facility Investigation

This module will discuss (1) determining the need for a RCRA Facility Investigation (RFI) and (2) the mechanism for establishing the requirements for a RCRA Facility Investigation (RFI), including the need for permit modifications, additional RCRA §3008(h) orders, and Federal Facility Compliance Agreements (FFCAs).

Step 1 **Start.**

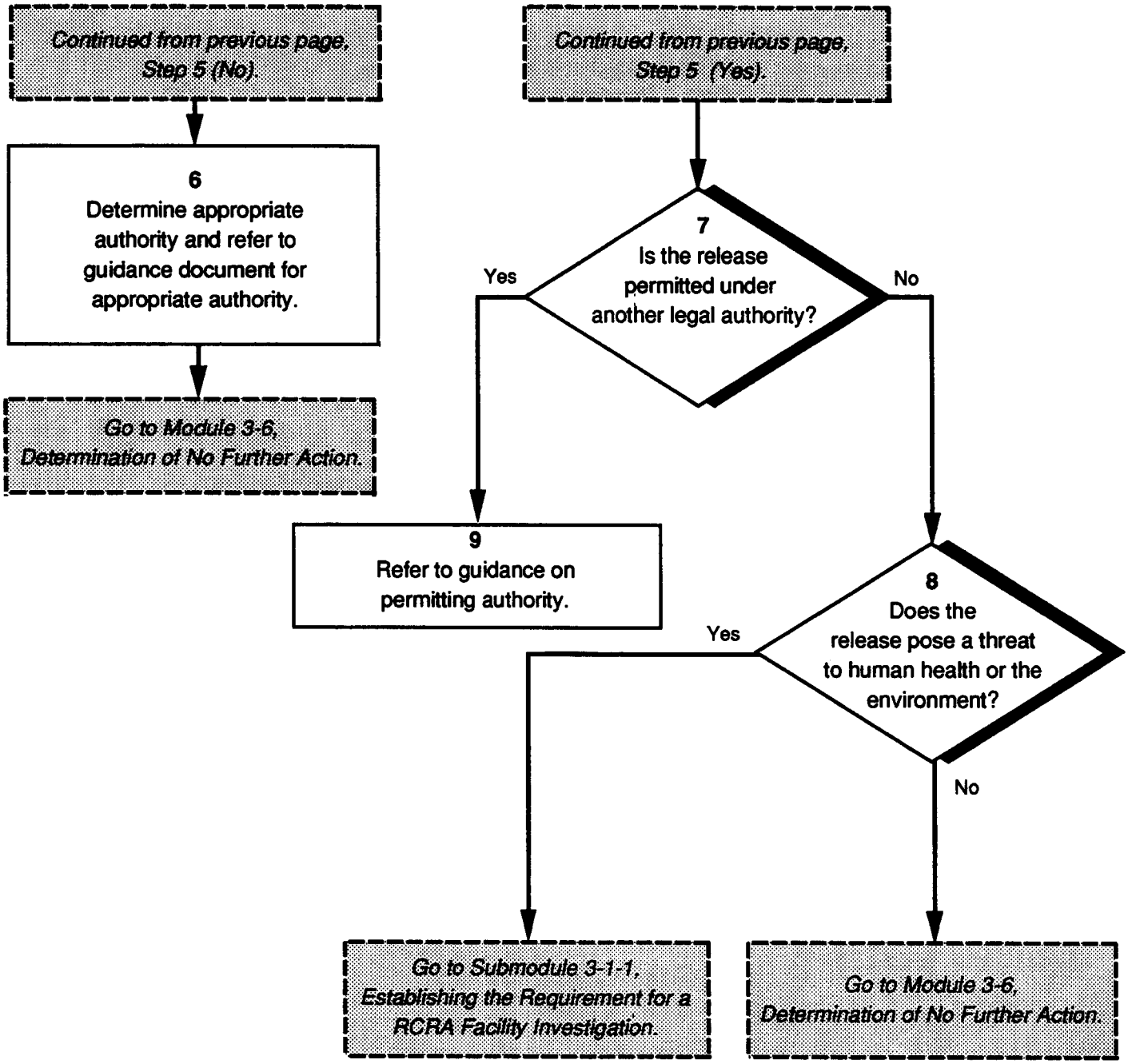
Step 2 Identification of a release or potential release from a solid waste management unit (SWMU) occurs during the RCRA Facility Assessment (RFA). Review the information in the RFA to determine the applicability of the RCRA Corrective Action authority.

Step 3 Determine if the substance released is a hazardous waste or hazardous waste constituent. The definition of release under the proposed Subpart S rule includes only releases of hazardous wastes and hazardous wastes constituents. (Proposed 40 CFR §264.500(b))

Step 4 Releases of substances not classified as hazardous waste or hazardous waste constituents do not fall under the RCRA Corrective Action authority, but may fall under other response authorities such as the Toxic Substances Control Act (TSCA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Refer to other DOE guidance documents (such as the graphic guidance entitled *Regulated Underground Storage Tanks (1991)* to determine the correct response under the appropriate legal authority. (55 FR 30808)

In any case, if the substance is not a hazardous waste or hazardous waste constituent, there is justification for a "Determination of No Further Action" under RCRA Corrective Action authority. (Proposed 40 CFR §264.514)

Step 5 Only releases from SWMUs fall under the definition of release under the proposed Subpart S rule. Determine if the release is from a unit defined as a SWMU (see Submodule 1-2-1 for additional information). (Proposed 40 CFR §264.501)


Continued from previous page, Step 5 (No).
Continued from previous page, Step 5 (Yes).
6
Determine appropriate authority and refer to guidance document for appropriate authority.
7
Is the release permitted under another legal authority?
Yes
No
Go to Module 3-6, Determination of No Further Action.
9
Refer to guidance on permitting authority.
8
Does the release pose a threat to human health or the environment?
Yes
No
Go to Submodule 3-1-1, Establishing the Requirement for a RCRA Facility Investigation.
Go to Module 3-6, Determination of No Further Action.

Step 6 If the unit is not a SWMU, determine if the unit or area falls under another regulatory authority, such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Clean Water Act (CWA). Refer to other DOE guidance documents to determine the correct response under the appropriate legal authority.

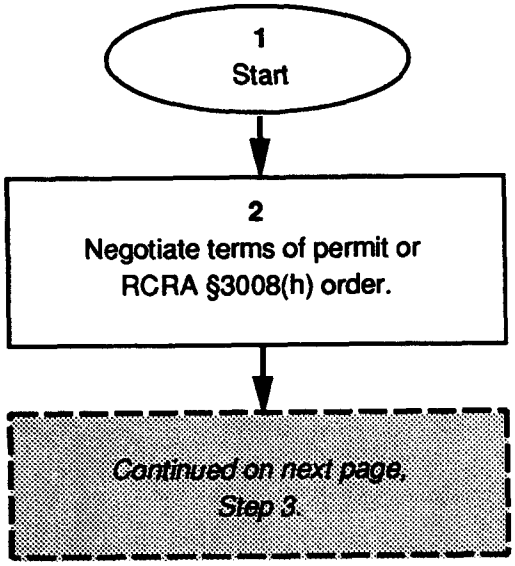
In any case, if the release is not from a SWMU, there is adequate justification for a "Determination of No Further Action" under RCRA Corrective Action authority.

Step 7 Determine if another legal authority regulates the release from the SWMU. If no other authority applies, then an RFI will be required for that SWMU. (55 FR 30808)

Step 8 If the release does not pose a threat to human health or the environment, additional investigations or implementation of an interim or corrective measure is not necessarily required. The facility should always review the findings of the RFA to determine if identified releases pose a current or future threat. If sufficient information to make this judgment is unavailable, the facility should request that confirmational investigations be performed as part of the RFA to provide data sufficient to make such a determination. The point of such negotiations is to prevent a facility from wasting valuable resources conducting an RFI at SWMUs which do not pose a threat to human health or the environment, while focusing resources on conducting investigations and interim or corrective measures at those units that pose or may pose a threat.

Step 9 In the preamble to the proposed rule, the stated EPA plan for response to a permitted release from a SWMU (i.e., a discharge to surface waters under a National Pollution Discharge Elimination System (NPDES) permit) is to address problems through the permit, rather than under RCRA (55 FR 30808). Refer to other DOE guidance documents to determine the correct response under the appropriate legal authority.

Submodule 3-1-1: Establishing the Requirement for a RCRA Facility Investigation



Submodule 3-1-1: Establishing the Requirement for a RCRA Facility Investigation

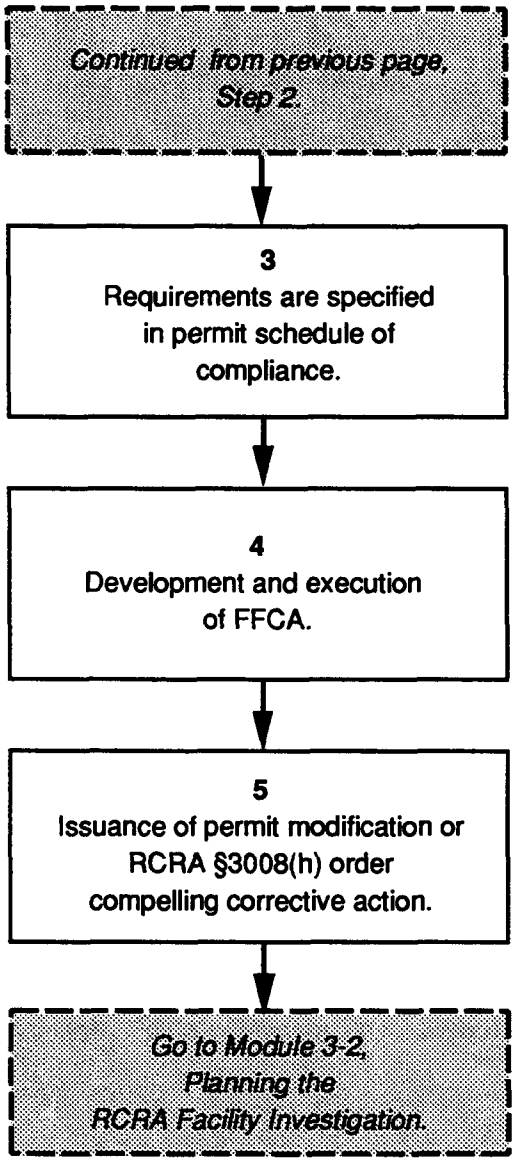
This submodule will discuss (1) the issuance of a RCRA §3008(h) order or permit modification to compel a RCRA Facility Investigation (RFI) and (2) the requirements for developing and executing a Federal Facility Compliance Agreement (FFCA) or an Inter-Agency Agreement (IAG) under CERCLA §120(e)(2).

Step 1 Start.

Step 2

Once the necessity of an RFI is determined, the DOE and EPA should negotiate the terms of the permit modification or RCRA §3008(h) order for conducting the RFI. Examples of issues for negotiation are:

- Verification of potential releases identified during the RFA;
- The scope of the investigation;
- Requirements for the RFI plan and submission of periodic reports;
- Setting action levels;
- The schedule for conducting the RFI;
- The priority for investigations of releases or suspected releases;
- The location of sampling points and the types of samples required;
- Designation of corrective action management units (CAMUs);
- Any requirements for an interim Corrective Measures Study (CMS);
- Provisions defining any requirements for compliance with other legal authorities; and
- Agency policy issues.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3
Requirements are specified in permit schedule of compliance.
4
Development and execution of FFCA.
5
Issuance of permit modification or RCRA §3008(h) order compelling corrective action.
Go to Module 3-2, Planning the RCRA Facility Investigation.

Step 3 The requirements for the RFI will be specified by EPA and the permit schedule of compliance for the facility. This schedule will specify the SWMUs and the environmental media requiring detailed investigation, establish action levels, and may require submission of an RFI plan and periodic progress reports. (Proposed 40 CFR §264.500(c))

Step 4 Due to the special legal relationship between DOE and EPA as Executive Branch agencies, in addition to the terms of the permit or RCRA §3008(h) order the agencies often enter into an FFCA or some other form of Inter-Agency Agreement. The use of an FFCA is common when coordinating a RCRA Corrective Action with a concurrent response under other legal authorities such as CERCLA. Additional information on the special relationship between Executive Branch agencies and FFCAs can be found in the EPA document *Federal Facilities Compliance Strategy* (1988).

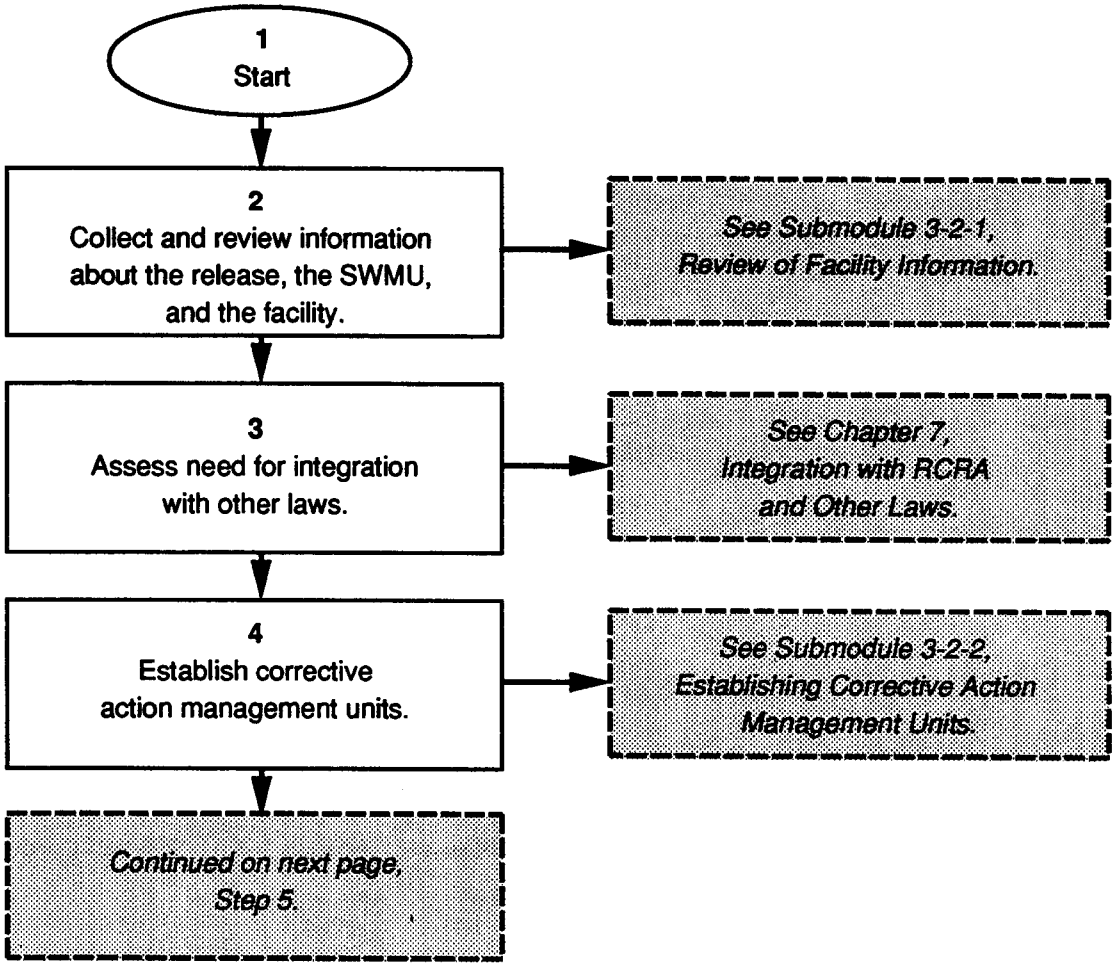
Step 5 Development of a RCRA §3008(h) order to compel an RFI may, at the discretion of EPA, include a public participation element. In any case, final issuance of the RCRA §3008(h) order is a unilateral action on the part of EPA.

Unless the permit contains a provision to compel an RFI, a Class III permit modification is required to authorize the conduct of an RFI. A Class III permit modification requires:

- Notification of all parties on the facility mailing list and the appropriate State and local governmental entities of the proposed change;
- Publication of a newspaper notice of the request, including an announcement of a 60-day comment period and the date, time, and location of an informational public meeting;
- A 60-day comment period;
- An informational public meeting on the request; and
- Placing a copy of the proposed modification and supporting documents in a publicly accessible location near the facility.

The requirements for Class III permit modifications are found at 40 CFR §270.42(c).

Module 3-2: Planning the RCRA Facility Investigation



Module 3-2: Planning the RCRA Facility Investigation

This module addresses the most important phase of conducting a RCRA Facility Investigation (RFI) — planning. The success and cost effectiveness of the RFI depend directly on the effectiveness of the planning process.

Step 1 Start.

Step 2

Collect and review all available information about the solid waste management unit (SWMU) and the potential or confirmed release from that SWMU. Information sources include:

- Reports of releases;
- Reports of facility operations filed under the requirements of RCRA §3016, CERCLA §103(c), and CERCLA §120(c);
- Interim measures reports;
- The RCRA Facility Assessment (RFA) report; and
- The RCRA §3008(h) order, permit, or Federal Facility Compliance Agreement (FFCA) compelling corrective action.

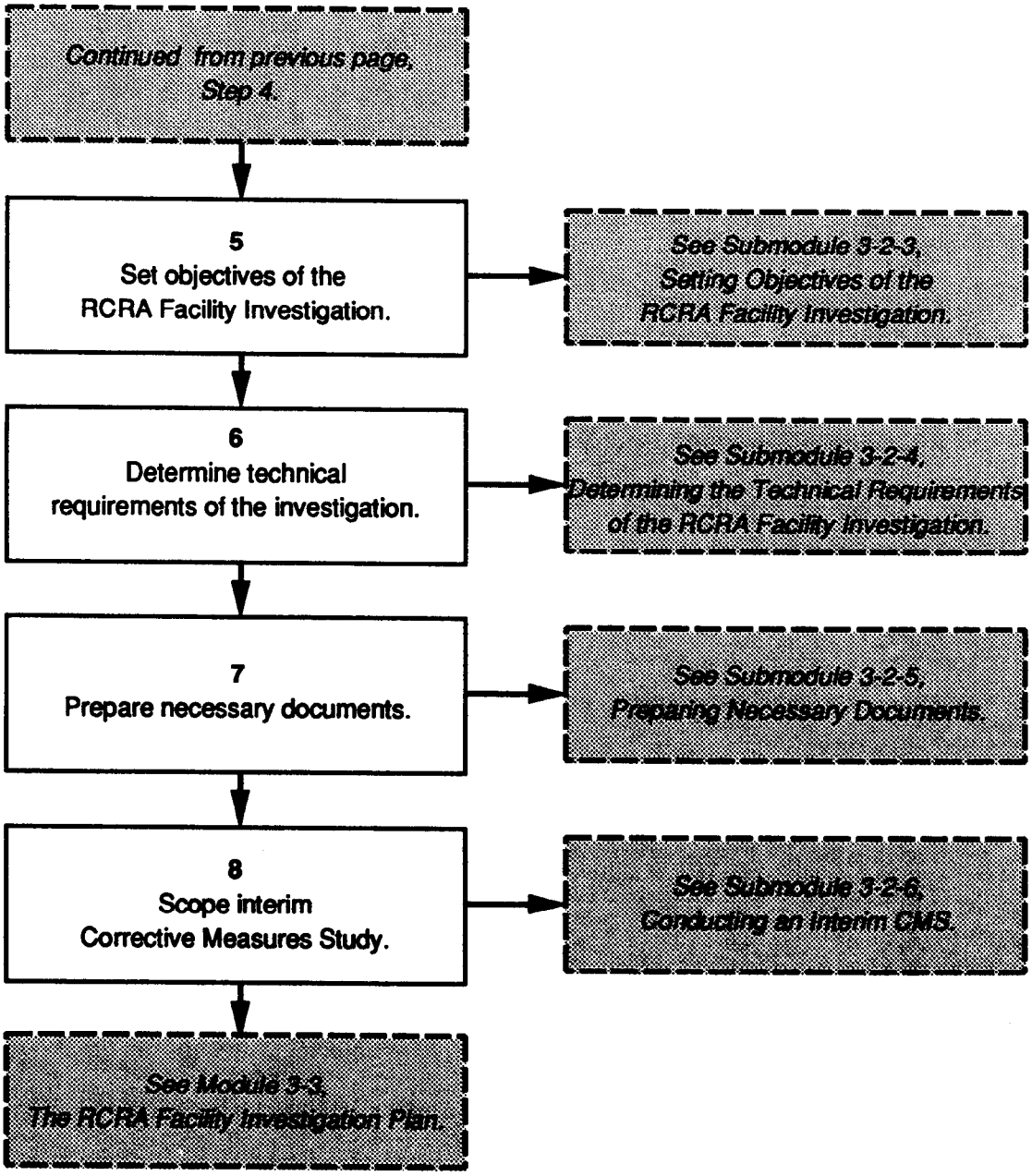
See Submodule 3-2-1 for details on information required for this step.

Step 3

Assess the need for integration of the RFI with actions taken under other statutes. Examples would include the need for an Environmental Assessment or Environmental Impact Statement required under the National Environmental Policy Act (NEPA) or integration with a Remedial Investigation/Feasibility Study (RI/FS) conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). See Chapter 7 for information on the integration of RCRA Corrective Action with other laws.

Step 4

Determine the benefits of establishing corrective action management units (CAMUs) at the facility. See Submodule 3-2-2 for information on establishing CAMUs. (Proposed 40 CFR §264.551(c))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5
Set objectives of the RCRA Facility Investigation.
See Submodule 3-2-3, Setting Objectives of the RCRA Facility Investigation.
6
Determine technical requirements of the investigation.
See Submodule 3-2-4, Determining the Technical Requirements of the RCRA Facility Investigation.
7
Prepare necessary documents.
See Submodule 3-2-5, Preparing Necessary Documents.
8
Scope interim Corrective Measures Study.
See Submodule 3-2-6, Conducting an Interim CMS.
See Module 3-3, The RCRA Facility Investigation Plan.

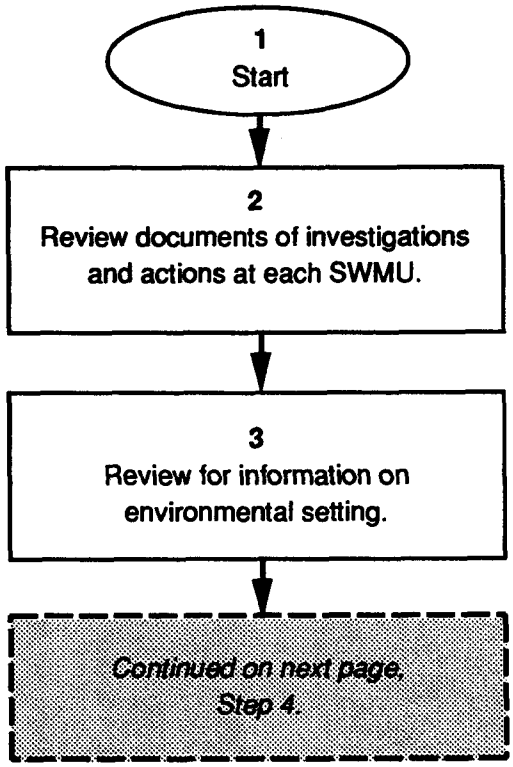
Step 5 Set the objectives of the RFI. This will include developing data quality objectives (DQOs) for the investigation. See Submodule 3-2-3 for a discussion of RFI objectives. (Proposed 40 CFR §264.512(a)(3))

Step 6 Determine the technical requirements of the RFI. This process will include review of the requirements of the order, permit, or FFCA, assessing specific technical requirements for the investigation, such as monitoring well design and construction, and assessing technical requirements based upon specific statutory and regulatory requirements. See Submodule 3-2-4 for a discussion of typical technical requirements for an RFI. (Proposed 40 CFR §264.511)

Step 7 Prepare any necessary documents, such as a data collection quality assurance plan (DCQAP), data management plan (DMP), or health and safety plan (HASP) for the RFI. See Submodule 3-2-5 for more information. (Proposed 40 CFR §264.512)

Step 8 Review the permit, order, and FFCA to determine if there is a requirement for conducting an interim Corrective Measures Study (CMS). If it is required, the interim CMS will be conducted using a streamlined version of the CMS process described in Chapter 4. (55 FR 30814)

Submodule 3-2-1: Review of Facility Information



Submodule 3-2-1: Review of Facility Information

The review of information about the facility and the solid waste management unit (SWMU) collected during previous investigations provides information useful in planning the RCRA Facility Investigation (RFI). This submodule addresses this review process.

Step 1 Start.

Step 2

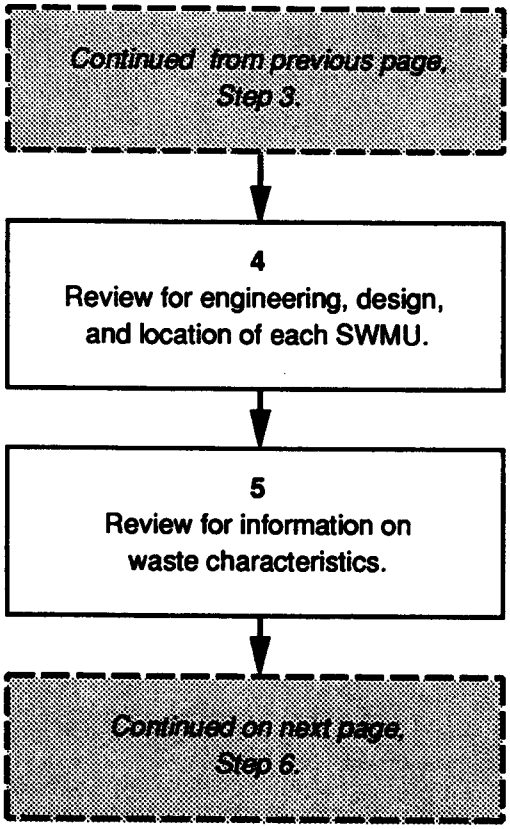
Obtain copies of all documents concerning investigations and actions taken at the facility that focused on the potential or confirmed release from the SWMU under investigation. Documents which are necessary to this step of the RFI include:

- The RCRA Facility Assessment (RFA) report;
- Interim measures reports;
- Notices of releases;
- Archival information concerning past releases and remediation efforts;
- Exposure information reports required under RCRA §3019; and
- The facility permit, RCRA §3008(h) order, and Federal Facility Compliance Agreement (FFCA).

Step 3

Review each document for information on the environmental setting of the facility, including information such as:

- Groundwater — depth to the uppermost aquifer, known aquifer characteristics, groundwater quality, local groundwater use, and other hydrogeological information.
- Surface water — overland distance to nearest surface water body, location of wetlands, surface water quality, local surface water uses, and other surface water information.
- Air — local and regional air quality, prevailing winds, typical meteorological conditions, and other factors.
- Soil — known information on type, chemical composition, and other characteristics.

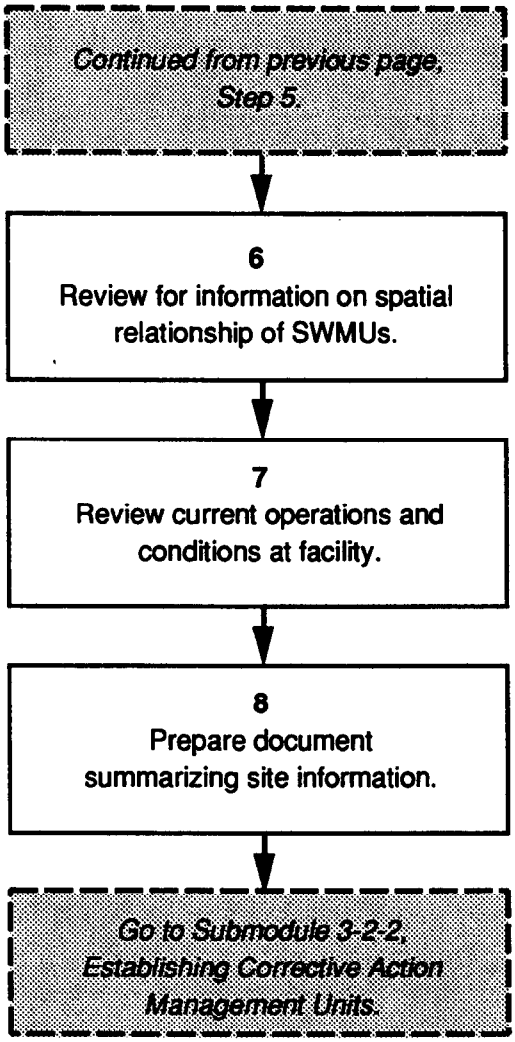

Continued from previous page, Step 3.
4
Review for engineering, design, and location of each SWMU.
5
Review for information on waste characteristics.
Continued on next page, Step 6.

Step 4 Review each document (from Step 2) for information on the engineering, design, and location of SWMUs to determine which media can be affected:

- Groundwater — location of the SWMU (inside or outside), secondary containment systems, leachate collection systems, land-based unit, or other information;
- Surface water and surface water sediments — location of the SWMU (inside or outside), secondary containment systems, and other information;
- Air — open or closed system, venting mechanisms, and other information;
- Soil — the location of the SWMU (inside building with concrete floors or outside over open ground), are there secondary containment systems, is the unit land-based (e.g., a waste pile or landfill), the type of soil (e.g., sand, clay); and
- Subsurface gas — land-based unit, landfill, and other information.

Step 5 Review each document for information on the characteristics of the wastes managed at each SWMU, including:

- Identity of the hazardous waste and hazardous waste constituents;
- Physical, chemical, and toxicological (acute, chronic, and carcinogenic potential) properties of confirmed contaminants;
- Quantity, including an estimate of the quantity and concentration of hazardous waste released or threatening to be released to the environment;
- The quality of the data that quantify the concentration of the hazardous wastes or hazardous waste constituents, with particular attention to the level of analytical precision required to support a data user's needs;
- Estimated or known areal extent of confirmed contamination;
- Media impacted by confirmed contamination; and
- Permitted waste treatment or disposal options (e.g., land disposal restrictions).


Continued from previous page, Step 5.
6
Review for information on spatial relationship of SWMUs.
7
Review current operations and conditions at facility.
8
Prepare document summarizing site information.
Go to Submodule 3-2-2, Establishing Corrective Action Management Units.

Step 6 Review each document for information on the relationship of the SWMU to other parts of the facility, and the relationship of the facility to the surrounding area, including information on:

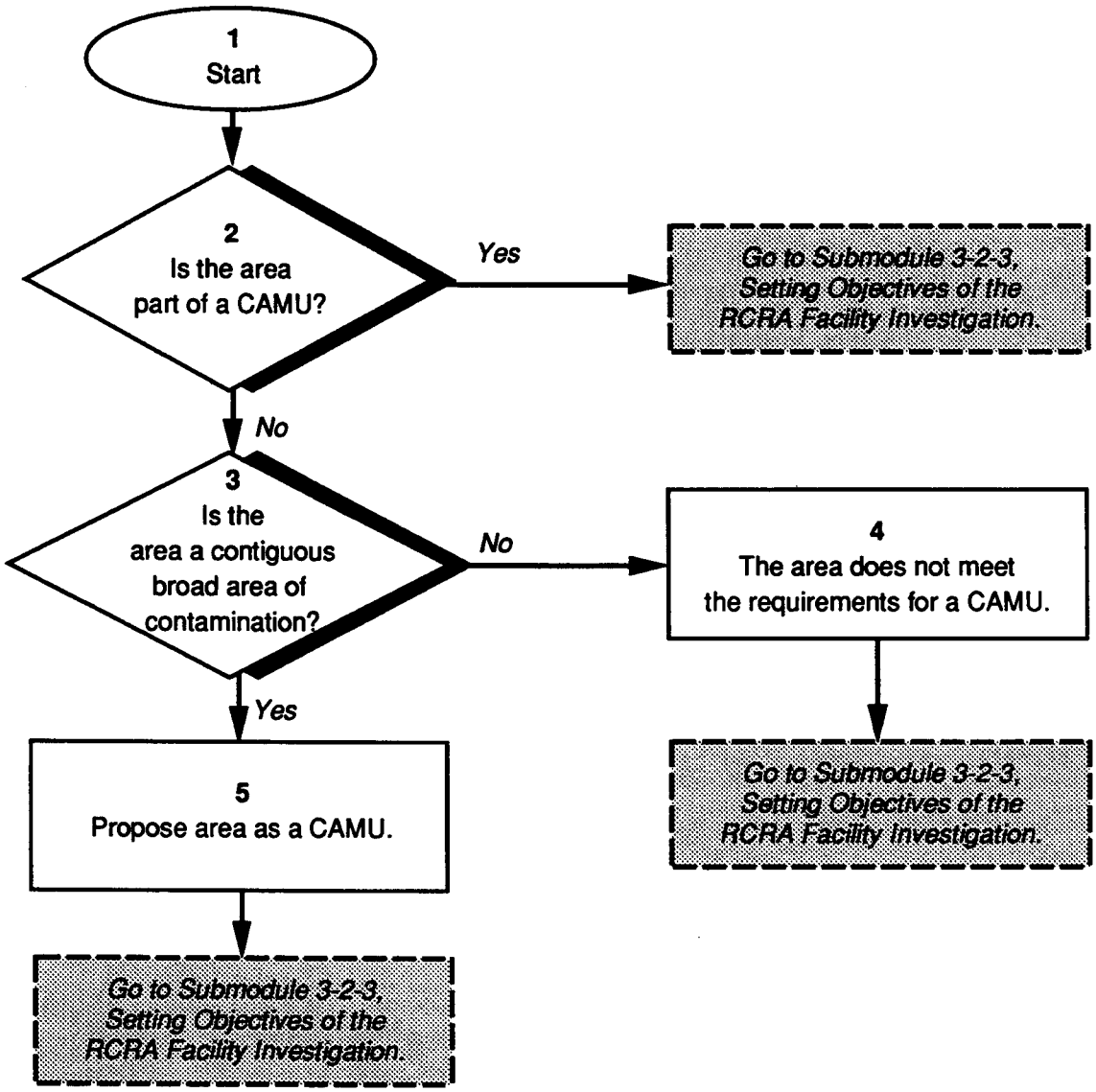
- Other releases at the facility that might be impacting the same area as the SWMU under investigation;
- Population demographics;
- Sensitive environments that may be impacted by the release;
- Permitted waste treatment or disposal occurring at other SWMUs at the facility; and
- Corrective action activities currently underway at other SWMUs at the facility.

Step 7 Review each document for information about current operations and conditions at the facility including:

- Types of waste treatment or disposal permitted at the facility, including waste treatment processes regulated under other statutes (e.g., water treatment facilities, injection wells);
- Interim measures taken at the SWMU; and
- Investigations conducted under other authorities at the facility.

Step 8 Prepare a document summarizing the findings of this review. This document will be used as a reference throughout the RFI process and will be incorporated into the RFI plan and RFI report.

Submodule 3-2-2: Establishing Corrective Action Management Units



Submodule 3-2-2: Establishing Corrective Action Management Units

During the planning of, and even during the actual conduct of, the RCRA Facility Investigation (RFI), the owner/operator should evaluate the potential benefits of establishing corrective action management units (CAMUs) at the facility. This option allows the owner/operator to combine efforts at several solid waste management units (SWMUs) into one CAMU. This submodule will address the use of CAMUs. (Proposed 40 CFR §264.551(c) and 55 FR 30843-30844)

Step 1 **Start.**

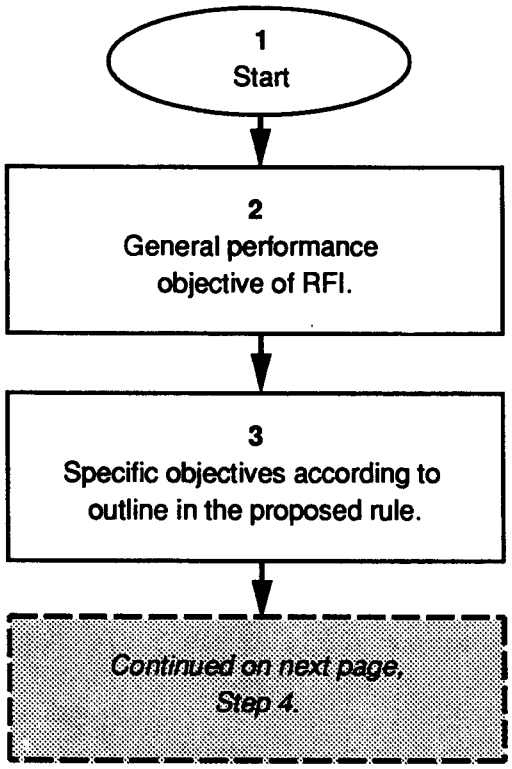
Step 2 From the information collected during the review of investigations at the facility, determine if the area under consideration is part of a CAMU. The designation of an area as a CAMU allows the movement of hazardous waste within the unit during remediation without triggering either the land disposal restrictions or the minimum technology requirements for a new or lateral expansion of a unit. This is the primary advantage of designating a broad area of contamination as a CAMU. Another advantage is CAMUs may allow consolidation of sampling points (see 55 FR 30844).

Step 3 If the area represents a contiguous, broad area of contamination (which may also include within its perimeter one or more land-based SWMUs), the area may qualify as a CAMU. Examples of SWMUs eligible for inclusion in a CAMU are soils surrounding a land-based unit (such as a leaking surface impoundment or landfill). Areas not eligible for inclusion in a CAMU include all non-land-based units such as incinerators or tank systems. However, CAMU boundaries may not extend beyond contaminated areas. For example, two contaminated areas that are separated by virgin soil are not to be designated as one CAMU. (Proposed 40 CFR §264.501)

Step 4 If the SWMUs to be consolidated are not contiguous, or if they contain non-land-based units, CAMU designation may not be allowed. (55 FR 30843)

Step 5 Contact EPA and propose the area as a CAMU. Only EPA is authorized to designate an area as a CAMU. The EPA decision relies on assessment of the extent and nature of the contamination, location of existing SWMUs within the contaminated area, and the remedial objectives established for the entire facility.

Submodule 3-2-3: Setting the Objectives of the RCRA Facility Investigation



Submodule 3-2-3: Setting the Objectives of the RCRA Facility Investigation

This submodule discusses the process of setting the objectives for the RCRA Facility Investigation (RFI). Defined objectives provide not only an excellent planning tool but also a means of evaluating the progress of the RFI.

Step 1 Start.

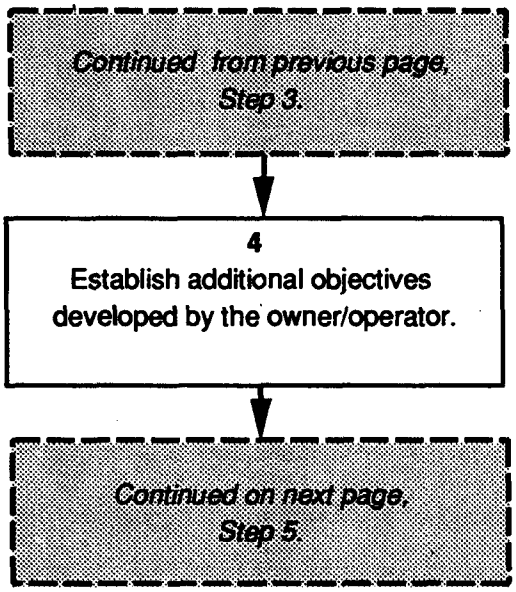
Step 2

The general performance objective of the RFI is to characterize the nature, extent, direction, rate, movement, and concentration of releases as required by EPA. This analysis forms the basis for conducting the Corrective Measures Study (CMS) or a "Determination of No Further Action." (Proposed 40 CFR §264.511(a))

Step 3

Achieving the general RFI objective involves fulfilling several lesser objectives. These objectives arise from the proposed Subpart S rule, and may also be included in the terms of the permit, order, or Federal Facility Compliance Agreement (FFCA). The specific objectives for the RFI (these are also the elements of the investigation that must be reported to the EPA Regional Administrator) are:

- Characterization of the environmental setting of the facility;
- Characterization of the SWMU(s);
- Description of the human and environmental receptors that are, have been, or may be exposed to the release;
- Collection of information used to characterize the risk posed by the release;
- Extrapolation of future contaminant migration;
- Laboratory, bench-scale, or pilot-scale tests or studies to determine the feasibility or effectiveness of treatment or other technologies which may be appropriate in implementing remedies at the facility; and
- Statistical analysis and interpretation of data collected during the investigation.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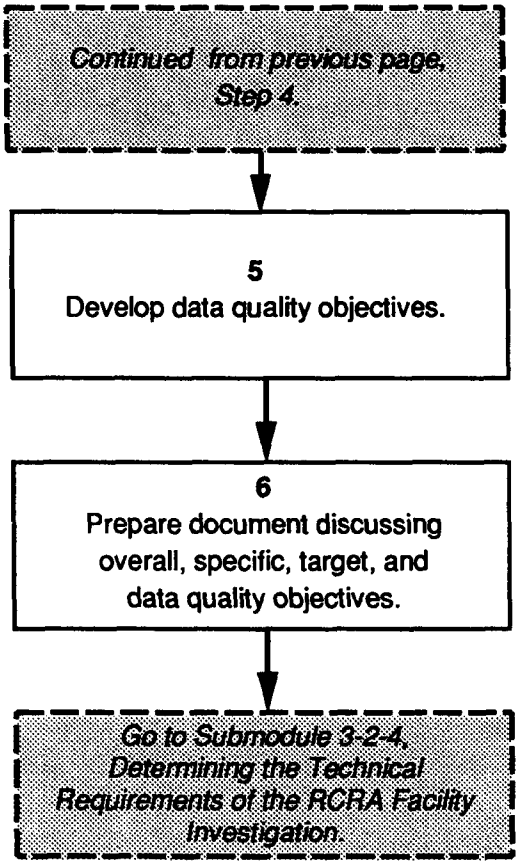
4
Establish additional objectives developed by the owner/operator.
Continued on next page, Step 5.

Step 4 In addition to the objectives required by the proposed Subpart S rule, the owner/operator will need to define other objectives for the investigation. Some examples of these objectives are:

- Ensuring the RFI provides the information necessary for the decision making process regarding additional investigations at the SWMU;
- Completing the RFI within an established time frame;
- Minimizing delays in the RFI process;
- Minimizing the effort expended studying pathways or targets not impacted by the release;
- Establishing data quality objectives for the investigation; and
- Promoting community involvement in the RCRA Corrective Action process through implementation of a public involvement plan.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5
Develop data quality objectives.
6
Prepare document discussing overall, specific, target, and data quality objectives.
Go to Submodule 3-2-4, Determining the Technical Requirements of the RCRA Facility Investigation.

Step 5 Data quality objectives (DQOs) are used to ensure that all data collection efforts will provide sufficient data at a specified quality level to support the RFI. The process of developing DQOs has three phases: (1) identification of the types of decisions the data supports; (2) identifying data uses and needs; and (3) designing the data collection program. At the end of the DQO development process, the owner/operator should prepare a document outlining:

- Data collection strategy;
- Sample collection strategy;
- Standards for field measurements;
- Sample analysis; and
- Data management.

Detailed information on the development of DQOs can be found in these EPA documents:

RCRA Corrective Action Plan (Interim Final)
EPA Document No. EPA/530-SW-88-028
OSWER Directive 9902.3
June 1988

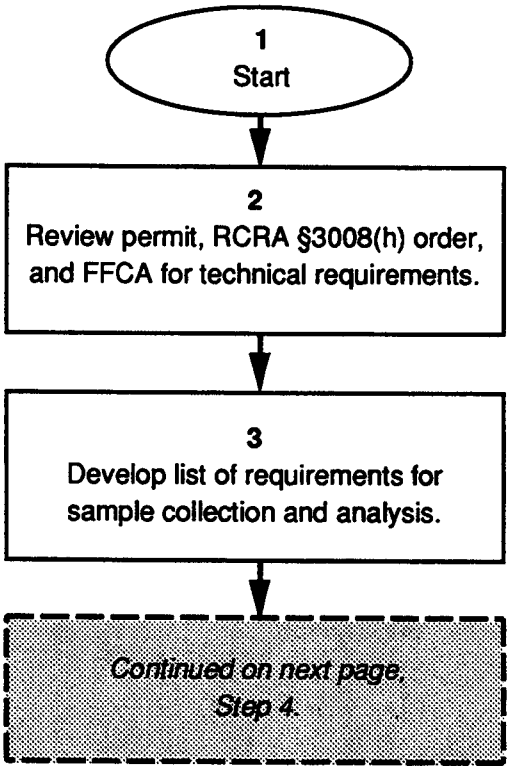
Data Quality Objectives for Remedial Response Activities
EPA Document EPA/540/G-87/003
OSWER Directive No. 9355.0-7B
1987

Interim Guidelines and Specification for Developing Quality Assurance Project Plans
EPA Document QAMS-005/80
1980

RCRA Facility Investigation (RFI) Guidance
EPA Document OSW:530/SW-89-031
OSWER Directive No. 9502.00-6C
May 1989

Step 6 Prepare a document detailing the objectives set for the RFI. This document will be used in developing the RFI plan and the RFI report.

Submodule 3-2-4: Determining the Technical Requirements of the RCRA Facility Investigation



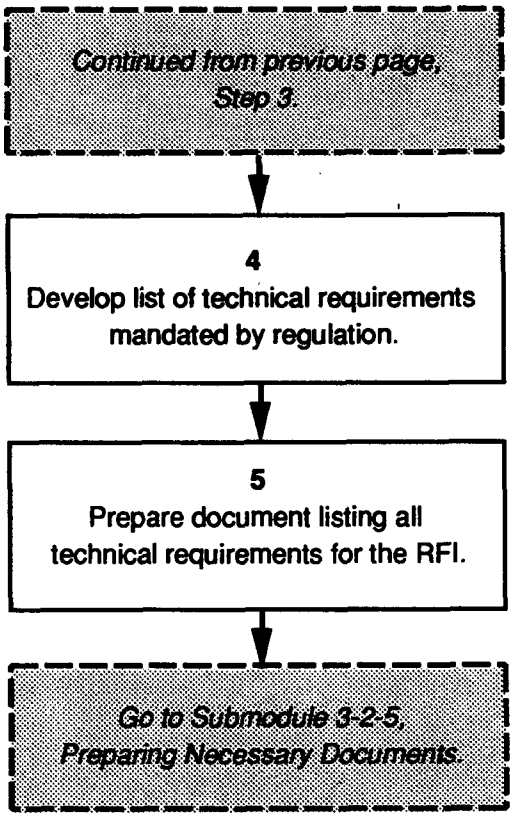
Submodule 3-2-4: Determining the Technical Requirements of the RCRA Facility Investigation

This submodule discusses the process of determining the technical requirements to meet the objectives of the RCRA Facility Investigation (RFI).

Step 1 **Start.**

Step 2 The first step in assessing the technical requirements for the RFI is to review the permit, order, or Federal Facility Compliance Agreement (FFCA). Often, these documents will contain technical requirements, such as the solid waste management units (SWMUs) to be investigated, the environmental media to be sampled, or specific sample collection points.

Step 3 The second requirement is to develop a list of technical requirements for the collection and analysis of environmental samples. This process relates to the data quality objectives (DQOs) for the investigation. For example, if groundwater monitoring is required, the owner/operator will need to develop specific requirements and procedures for well construction, development, and sampling. (Proposed 40 CFR §264.512(a)(2))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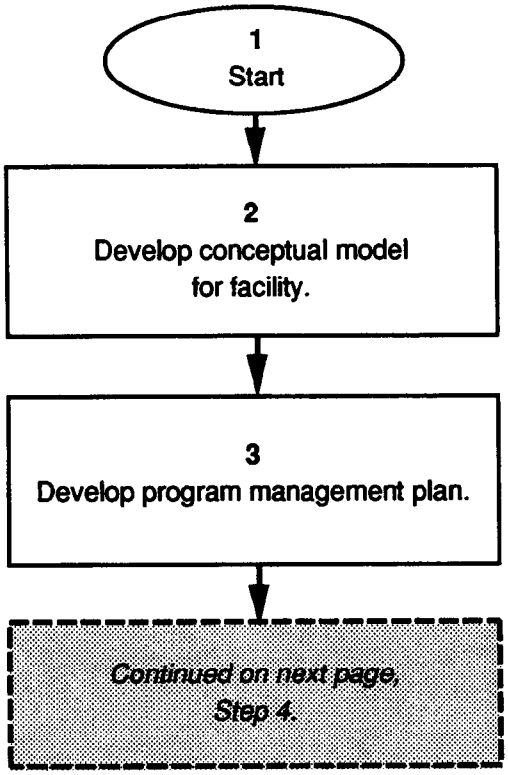
4
Develop list of technical requirements mandated by regulation.
5
Prepare document listing all technical requirements for the RFI.
Go to Submodule 3-2-5, Preparing Necessary Documents.

Step 4 The last category of technical requirements is those specified in regulation. Usually, these requirements will be discovered during the development of DQOs for the site. An example of a regulatory technical requirement is the testing procedures for characterizing hazardous waste. The owner/operator should review other legal authorities for regulatory technical requirements as well. Specific requirements to examine include those governing storage and disposal requirements (i.e., the ban on land disposal of certain wastes) for investigation derived or corrective action wastes, and the applicability of minimum technology requirements. Note that compliance with other laws may affect facilities differently depending on the nature of their FFCAs and applicable IAGs.

Step 5 Prepare a document discussing technical requirements for conducting the RFI. This document will be used in developing the RFI plan, as well as in developing Statements of Work during the contracting process.

Submodule 3-2-5: Preparing Necessary Documents



Submodule 3-2-5: Preparing Necessary Documents

This submodule discusses developing the documents that are generally required for conducting an RFI. These documents include site conceptual models, program management plans (PMPs), health and safety plans (HASPs), data collection quality assurance plans (DCQAPs), data management plans (DMPs), and public involvement plans (PIPs). While a conceptual model, PMP, HASP, DCQAP, and DMP are not specifically required under the proposed Subpart S rule, these documents are recommended in EPA guidance on conducting RFIs. Further, Federal Facility Compliance Agreements (FFCAs), Inter-Agency Agreements, RCRA §3008(h) orders, and RCRA permits may require all of these elements as part of the RFI plan.

Step 1 Start.

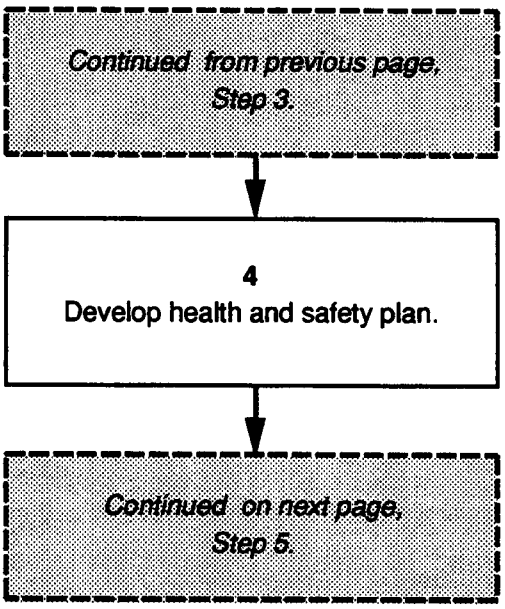
Step 2

The first document required is a conceptual model for the facility. The data collected during the review of existing information about the facility are used to develop hypotheses regarding extent of contamination at the facility, the available routes of migration, and the potential threats posed to human health and the environment. The hypotheses developed in the conceptual model are tested, redefined, and modified during the course of the RFI. This document should include a discussion of the entire facility, as well as specific information about each SWMU requiring corrective action.

Step 3

Given the size and complexity of most DOE facilities, it is likely that the facility will prepare a facility-wide Installation Work Plan followed by SWMU-specific work plans. If this approach is used, it is necessary to develop a program management plan (PMP) (Proposed 40 CFR §264.512(a)(1)). A PMP typically accomplishes the following:

- Describes the mission of the program;
- Establishes the chain-of-command and specifies delegations of responsibility;
- Provides for internal reporting requirements;
- Creates any programmatic quality assurance (QA) objectives and procedures including provision for QA audits; and
- May establish minimum acceptable performance standards for:
  - development of documents (e.g., DCQAPs, work plans),
  - conduct of investigation or remedial activities,
  - preparation and implementation of HASPs, or
  - report formats.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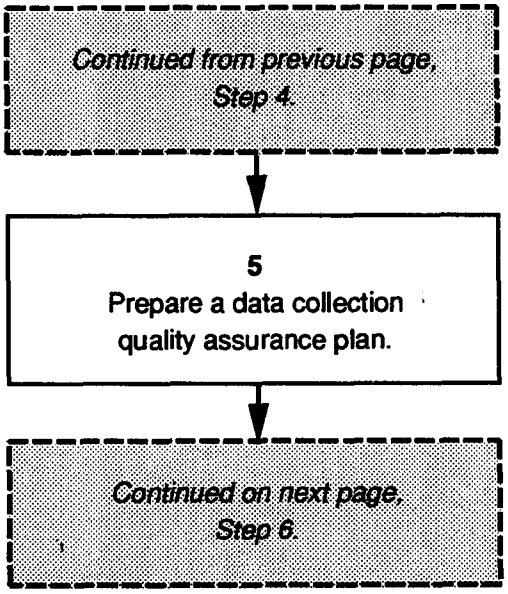
4
Develop health and safety plan.
Continued on next page, Step 5.

Step 4 A health and safety plan (HASP) is required for all investigations at hazardous waste sites. The specific requirements are found at 29 CFR §1910.120 - Hazardous Waste Operations and Emergency Response (HAZWOPER). Minimally the HASP should include the following:

- Site characterization and hazard analysis;
- Employee training necessary to successfully fulfill the HASP;
- A description of the conditions for use of personal protective equipment (PPE);
- A description of the medical surveillance requirements for employees engaged in onsite activities;
- Environmental monitoring equipment operation;
- Methods of site control employed during the investigation;
- Decontamination procedures;
- Emergency response procedures;
- Confined space entry procedures; and
- Spill containment procedures.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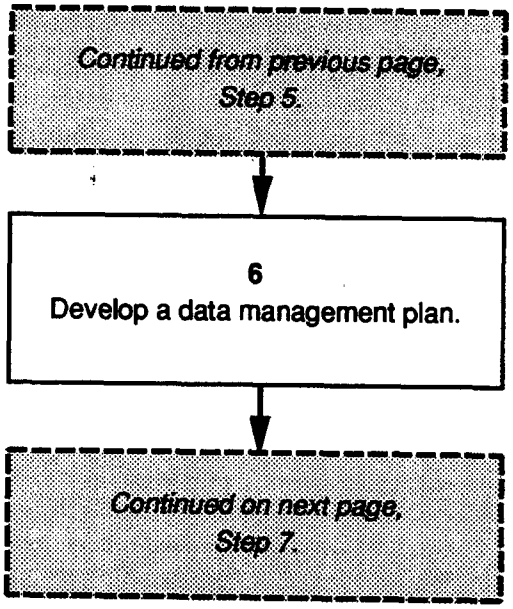
5
Prepare a data collection quality assurance plan.
Continued on next page, Step 6.

Step 5 A data collection quality assurance plan (DCQAP) is a recommended document for planning the RFI and may be required under proposed 40 CFR §264.512(a)(3). A DCQAP is a document which presents in specific terms the data collection strategy, sampling locations and procedures, field measurement procedures, and sample analysis methods designed to achieve adequate data quality. The elements of a DCQAP include:

- A description of the intended uses of the data as related to the overall technical approach to the RFI;
- The specific methods and procedures for assessing the precision, accuracy, and completeness of the data;
- A description of the rationale used to ensure that the data accurately and precisely represent a characteristic population;
- A description of the measures to be taken to ensure that the data sets collected can be compared to one another;
- The schedule for, and information required in, quality assurance reports;
- A discussion of methods for selecting appropriate sample and field measurement collection points, which media and parameters are to be sampled or measured, the conditions for sampling or measuring, and the procedures to prevent contamination of samples;
- A discussion of the methods for ensuring that a statistically sufficient number of samples or measurements are collected;
- A discussion of the methods for documenting all field operations related to sampling or field measurements, especially chain-of-custody requirements;
- A discussion of sample container or field measurement device selection, sample preservation, and measurement device calibration procedures;
- A specific discussion of the acceptable methods for sample preservation, storage, preparation, and analysis;
- A discussion of chain-of-custody within the laboratory;
- Specific calibration methods for lab instrumentation;
- Specific procedures for data reduction, validation, and reporting;
- A description of preventive maintenance requirements for sampling and analysis devices;
- A description of internal and external quality control and lab and systems audits; and
- The mechanism for correcting problems.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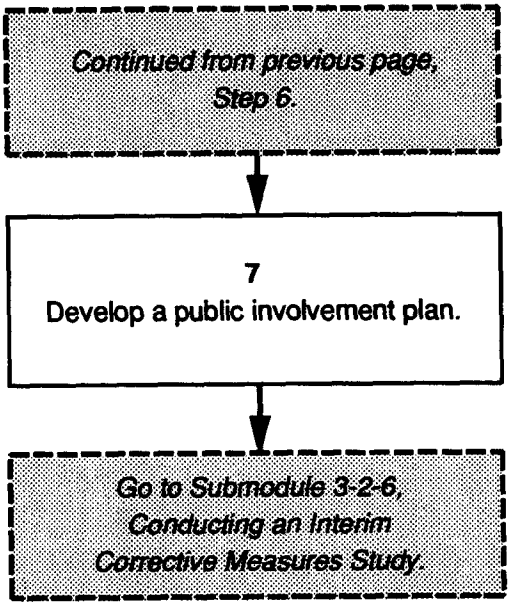
6
Develop a data management plan.
Continued on next page, Step 7.

Step 6 A data management plan (DMP) is another document recommended for an RFI and may be required under proposed 40 CFR §264.512(a)(4). A DMP is a document that details the acceptable methods for recording and presenting data collected during the RFI. The specific elements of a DMP are:

- A discussion of the elements for the data record including:
  - A system for assigning unique identifiers to samples;
  - Identification of the sample collection point;
  - The raw data from the sample analysis;
  - The parameter measured; and
  - The final value for the parameter measured.

- The format for the tabular display of data including:
  - Unsorted (raw) data;
  - Results for each medium or contaminant monitored;
  - Stratification of data; and
  - Summary of the data.

- The format for the graphical display of data including:
  - Sample location or sampling grid;
  - Sampling area boundaries;
  - Areal extent of the contamination;
  - Levels and changes in the concentration of contaminants on a geographic basis; and
  - The location of potential receptors.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7
Develop a public involvement plan.
Go to Submodule 3-2-6, Conducting an Interim Corrective Measures Study.

Step 7

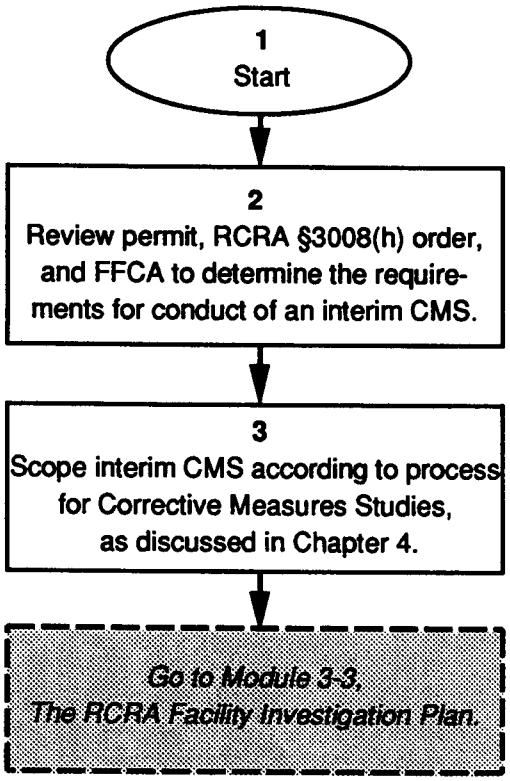
In keeping with the intent to promote public participation in RCRA and CERCLA investigative and remedial activities, the facility should develop a public involvement plan (PIP). The PIP should be a formal document, and should be reviewed and updated on a regular basis. The elements of a PIP include:

- Provisions for interviewing local governmental officials, community leaders, and affected individuals to assess the concerns of the surrounding population;
- Specific plans to provide notification on the availability of information on site conditions and investigation results;
- Plans for conducting public meetings to communicate directly with the citizens in the local community; and
- Providing a local information repository and administrative record.

Many of the elements of a PIP will support the community relations requirements of the permit modification and remedy selection process.

The DOE Office of Environmental Guidance has developed a guidance document entitled *Public Participation in Environmental Restoration Activities (1991)* that provides a detailed discussion of the elements of a PIP.

Submodule 3-2-6: Conducting an Interim Corrective Measures Study



Submodule 3-2-6: Conducting an Interim Corrective Measures Study

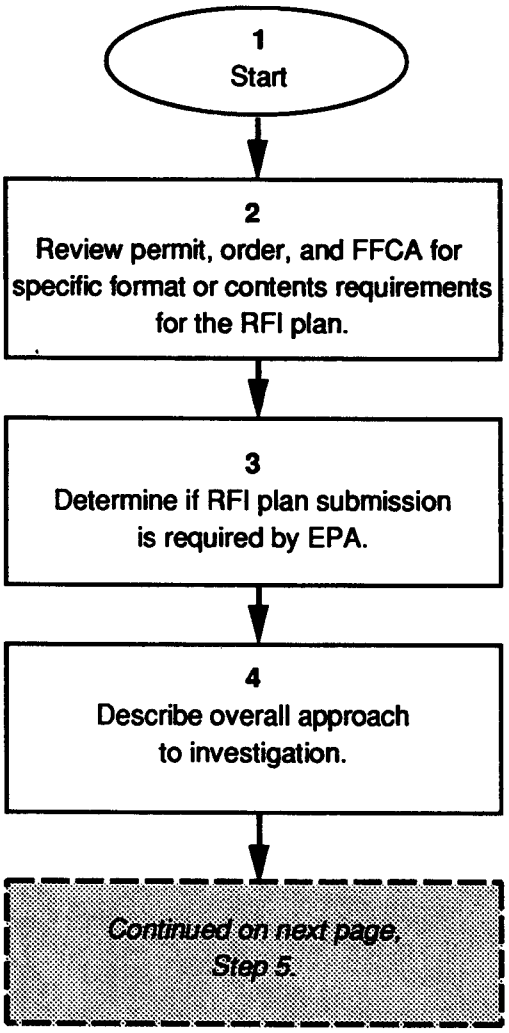
This submodule discusses conducting an interim Corrective Measures Study (CMS).

Step 1 **Start.**

Step 2 Review the terms of the permit, order, or Federal Facility Compliance Agreement (FFCA) to determine the requirements for conduct of an interim CMS. The EPA may require an interim CMS to prevent delays in implementing the corrective measure for the site.

Step 3 Usually an interim CMS involves conducting limited-scale treatability studies. However, EPA may require other activities as part of this process. In any case, refer to Module 4-2 - Planning the Corrective Measures Study for details on planning an interim CMS. (55 FR 30814)

Module 3-3: The RCRA Facility Investigation Plan



Module 3-3: The RCRA Facility Investigation Plan

This module discusses preparing the RCRA Facility Investigation plan. Under the proposed 40 CFR §264.512, a requirement for development of an RFI plan is at the discretion of the EPA Regional Administrator; however, the proposed rule states that a plan is likely to be required for most RFIs. For additional information on developing the RFI plan, refer to the EPA document *RCRA Facility Investigation Guidance (Four-Volume Set) (Final)* (May, 1989).

The preamble to the proposed Subpart S rule uses the term "work plan." However, the proposed rule uses the term "plan." This document relies on the language used in the proposed rule, rather than the language used in the preamble.

Step 1 Start.

Step 2

Review the permit, order, and Federal Facility Compliance Agreement (FFCA) for requirements to submit an RFI plan to the EPA Regional Administrator and for specific content or format requirements.

Step 3

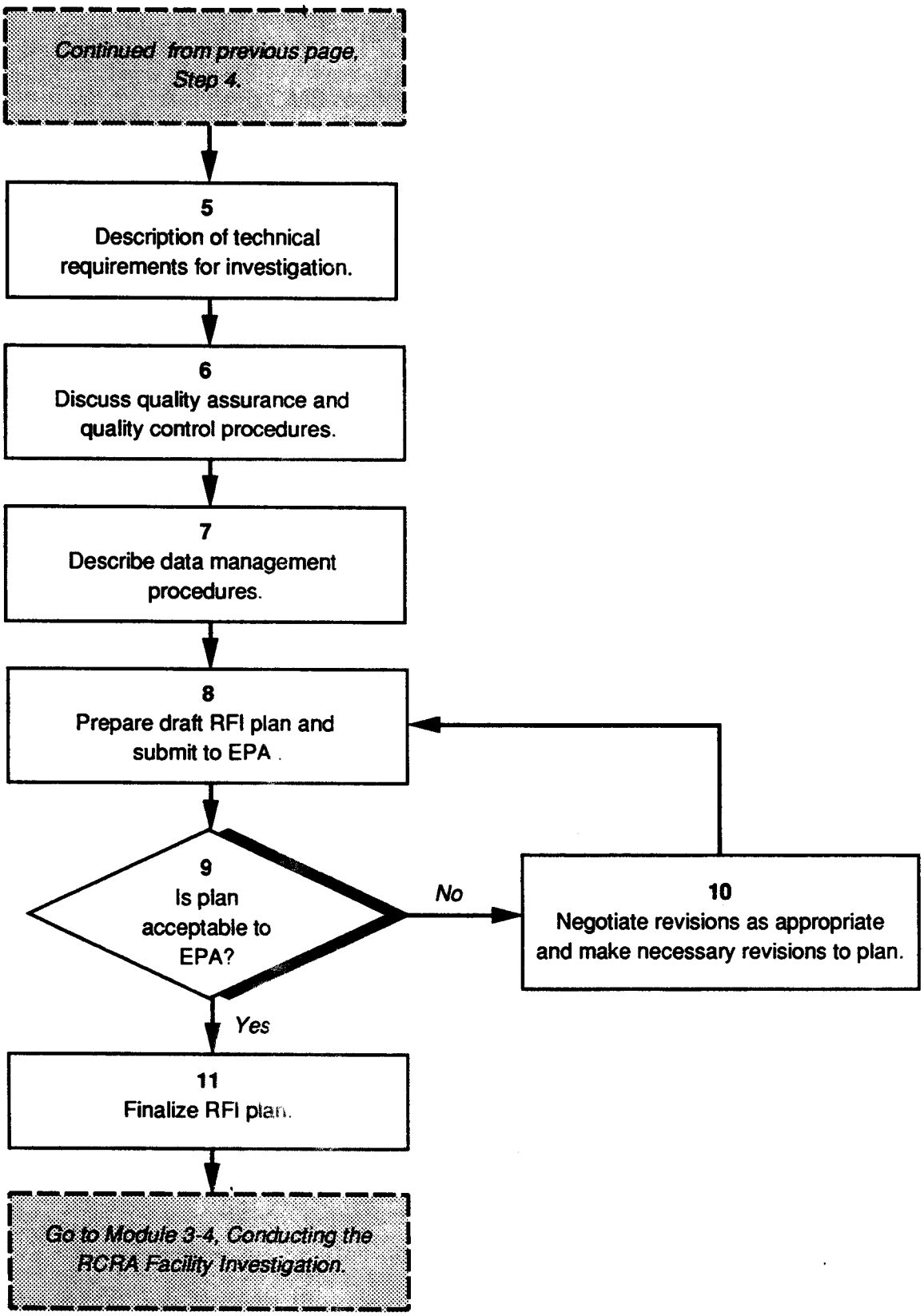
Under the proposed Subpart S rule, the contents of the RFI plan are at the discretion of the EPA Regional Administrator. However, the plan should include discussion of the following areas. (Proposed 40 CFR §264.512)

Step 4

A description of the overall approach to the investigation. This description should include:

- Discussion of the objectives for the investigation (reference to the document prepared for this purpose, as discussed in Submodule 3-2-3);
- A proposed schedule for the investigation;
- The qualifications of the persons involved in conducting the investigation;
- Reference to any CAMUs established during the RFI (see Submodule 3-2-2); and
- A plan for assessing the progress and direction of the investigation as the results of data collection and analysis begin to provide understanding of facility conditions.

Note: This assumes that the facility has the necessary documentation. Developing the proposed schedule is particularly important. The approved schedule will become an enforceable part of the facility permit schedule of compliance.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5
Description of technical requirements for investigation.
6
Discuss quality assurance and quality control procedures.
7
Describe data management procedures.
8
Prepare draft RFI plan and submit to EPA .
9
Is plan acceptable to EPA?
No
10
Negotiate revisions as appropriate and make necessary revisions to plan.
Yes
11
Finalize RFI plan.
Go to Module 3-4, Conducting the RCRA Facility Investigation.

Step 5 A specific description of the technical and analytical requirements for conducting the investigation, and a discussion of how the RFI will fulfill these requirements. Many of the documents prepared during the planning process may be included directly to complete this section of the RFI plan. Note this assumes that the facility has the necessary documentation in place. These documents include:

- The program management plan (PMP);
- The data collection quality assurance plan (DCQAP) and data management plan (DMP);
- The data quality objectives summary; and
- The list of specific and regulatory technical requirements for the investigation.

An example would be for the owner/operator to provide a detailed description of the location and construction specifications for wells, sampling frequency, and acceptable analytical methods for conducting a groundwater monitoring program.

Step 6 The proposed Subpart S rule includes a requirement for the RFI plan to include discussion of the quality assurance and quality control procedures. These areas are addressed in the data collection quality assurance plan (DCQAP) developed during the planning process. The DCQAP should be incorporated directly into the RFI plan. (Proposed 40 CFR §264.512(a)(3))

Step 7 Discussion of the data management procedures and format to ensure that RFI data and summary results are presented in a clear and logical manner. (Proposed 40 CFR §264.512(a)(4))

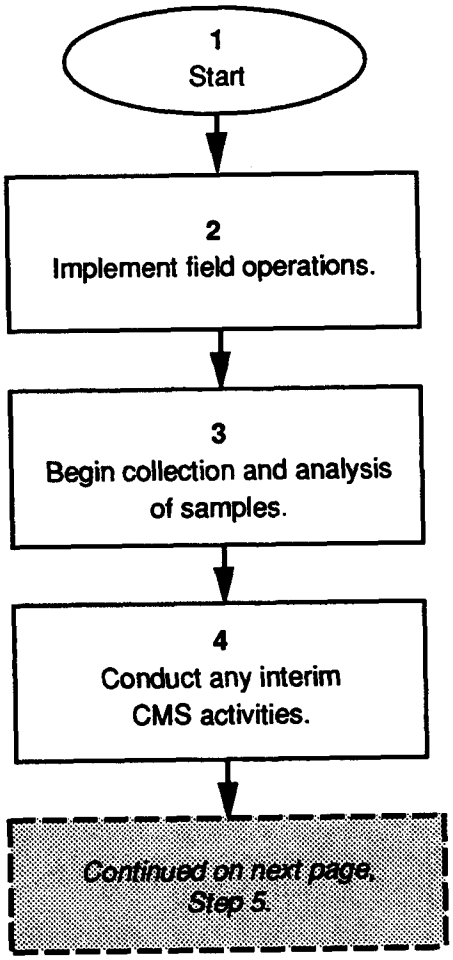
Step 8 Once the draft RFI plan is complete, submit the draft plan to the EPA Regional Administrator for review and approval. (Proposed 40 CFR §264.512(b))

Step 9 After the plan is submitted, the EPA Regional Administrator makes a determination of whether or not the plan is acceptable.

Step 10 If the RFI plan was not approved by the EPA Regional Administrator, discuss and negotiate any necessary revisions with the EPA Regional Administrator. Revise the plan and resubmit the draft RFI plan for review.

Step 11 The approved RFI plan will be incorporated into the facility permit schedule of compliance. (Proposed 40 CFR §264.512(b))

Module 3-4: Conducting the RCRA Facility Investigation



Module 3-4: Conducting the RCRA Facility Investigation

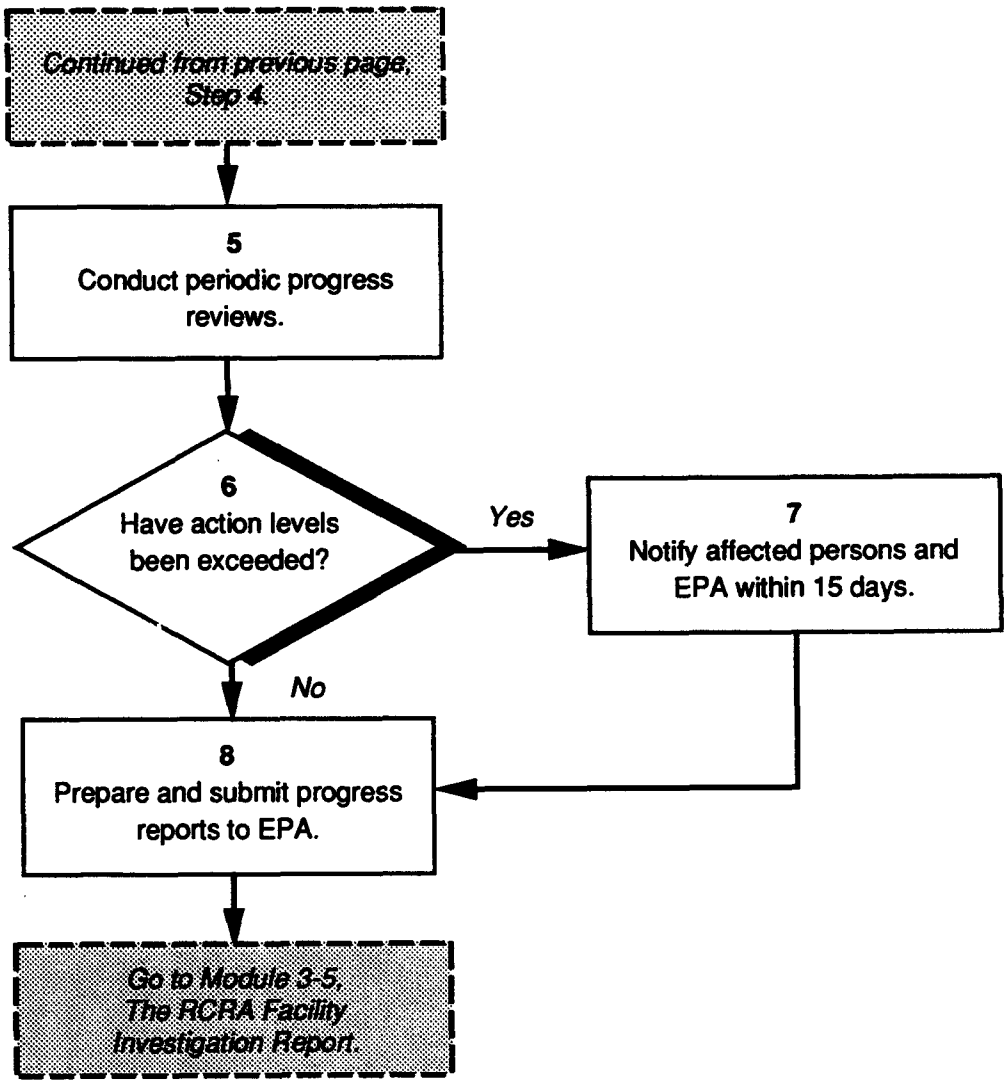
This module discusses conducting the actual investigative aspects of the RCRA Facility Investigation (RFI). In large part, this is a matter of implementing the RFI plan discussed in Module 3-3.

Step 1 **Start.**

Step 2 Begin field operations by placing any required monitoring devices, such as monitoring wells for groundwater, and air sampling stations, at the locations specified in the RFI plan.

Step 3 Begin collecting and analyzing environmental samples in accordance with the RFI plan. These activities were planned based upon the requirements of the permit, order, Federal Facility Compliance Agreement (FFCA), data collection quality assurance plan (DCQAP), overall technical approach, and RFI objectives. Any results must comply with the validation, data management, and reporting procedures specified in the RFI plan or supporting documents.

Step 4 Conduct any activities required as part of an interim Corrective Measures Study (CMS). While these activities are conducted concurrent with the RFI, the owner/operator should always consider them a separate function, not part of the RFI.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5
Conduct periodic progress reviews.
6
Have action levels been exceeded?
Yes
7
Notify affected persons and EPA within 15 days.
No
8
Prepare and submit progress reports to EPA.
Go to Module 3-5, The RCRA Facility Investigation Report.

Step 5 Conduct periodic reviews of the RFI and any interim CMS to assess the progress toward achieving the objectives set during the planning process. These reviews have several functional elements:

- Analysis of collected data to determine if revision of the project would provide focus to the examination of problems at the SWMU;
- Examination of problems arising during implementation of the project plan, and provision of potential or implemented solutions;
- Discussion of the progress of implementing the RFI and interim CMS, through comparison against the schedule included in the facility's permit schedule of compliance;
- Recommendations for revisions to the RFI or interim CMS plans or any supporting documents developed during the planning process;
- Recommendations for no further action; and
- An assessment of the opportunities for implementing a phased corrective measure or conducting interim measures.

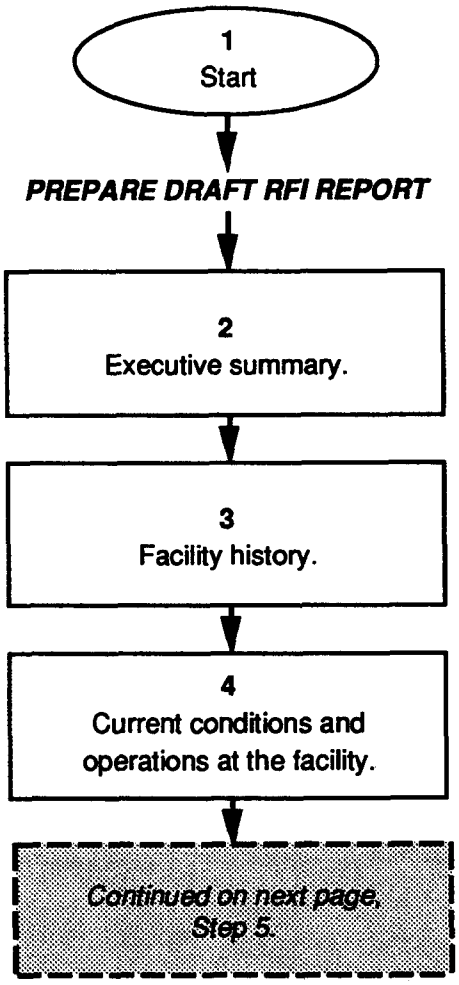
A document summarizing the findings of the review should be developed and submitted to the EPA Regional Administrator as, or included in, any required periodic progress reports. (Proposed 40 CFR §264.513(a))

Step 6 A determination needs to be made if action levels have been exceeded for a particular contaminant.

Step 7 If the analysis of samples or monitoring results shows exposure of persons beyond the facility boundary to concentrations of hazardous waste or hazardous waste constituents in excess of the action levels specified in the facility permit, RCRA §3008(h) order, or Federal Facility Compliance Agreement (FFCA), the owner/operator must notify the EPA Regional Administrator *and* any potentially exposed person. This notification must be in writing, and must be provided within 15 days of discovery of the potential for exposure. While not a requirement of the proposed Subpart S rule, the owner/operator should also consider notifying owners of adjacent property as well as local residents if these periodic reviews indicate there is no evidence of contamination migration beyond the facility boundary. (Proposed 40 CFR §264.560)

Step 8 Using the periodic progress review documents and action level reports, prepare and submit to the EPA Regional Administrator any progress reports required for the RFI or interim CMS. Based upon these reports, the EPA Regional Administrator may revise any aspect of the RFI or interim CMS.

Module 3-5: The RCRA Facility Investigation Report



Module 3-5: The RCRA Facility Investigation Report

The RCRA Facility Investigation (RFI) report is the principal document used to justify a "Determination of No Further Action" or for planning a Corrective Measures Study (CMS). All activities and effort expended in the RFI process to this point have been aimed at developing this report. The RFI report should incorporate or summarize all the information collected during the RFI and interim CMS. In many cases, the information required in the RFI report is included in documents prepared as part of other RFI activities, and these documents should be incorporated either directly or by reference. Under the proposed Subpart S rule, the EPA Regional Administrator has the authority to specify the format and content of the RFI report. (Proposed 40 CFR §264.513)

Step 1 Start.

Prepare Draft RFI Report

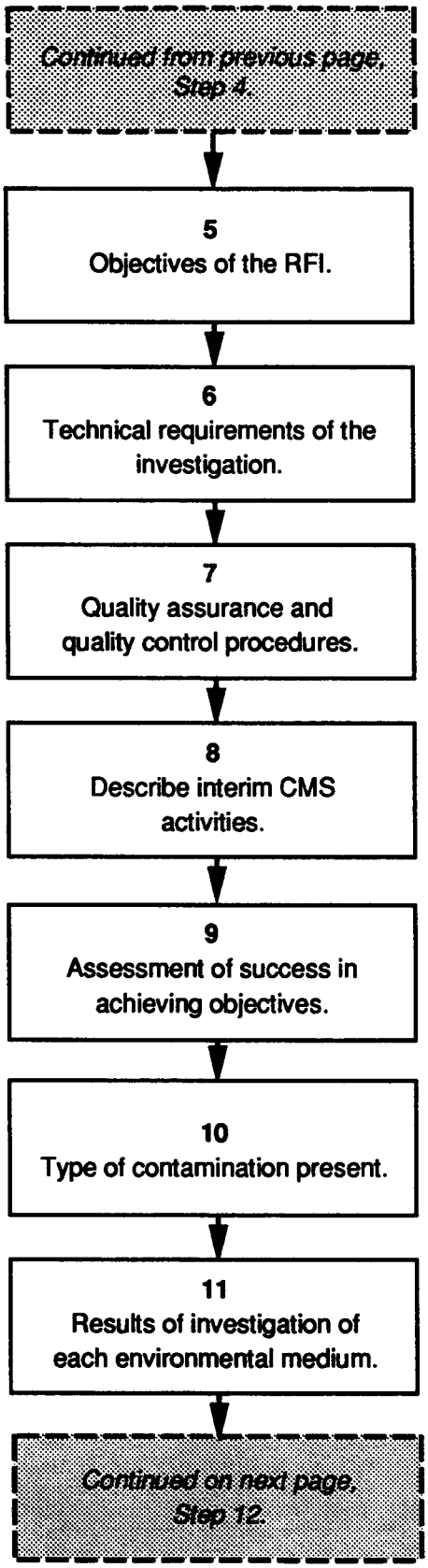
Step 2 An executive summary highlighting the important findings of the RFI and identifying any recommended actions.

Step 3 A brief discussion of the facility history based upon the documents reviewed during the planning process, including information on:

- The dates of operation of the facility and of the solid waste management unit (SWMU) under consideration;
- The types of wastes managed at the facility and at the SWMU;
- Any reports of releases at the facility or from the SWMU; and
- Any actions (e.g., interim measures or CERCLA removals) taken at the facility or at the SWMU.

Step 4 A brief discussion of the current conditions and operations at the facility, including:

- Current waste management activities at the facility;
- Available information on the extent and rate of migration of contaminants released from the SWMU;
- Current status (operational/not operational) of the facility; and
- Information from other investigations or remedial activities occurring at the site.


Continued from previous page, Step 4.
5
Objectives of the RFI.
6
Technical requirements of the investigation.
7
Quality assurance and quality control procedures.
8
Describe interim CMS activities.
9
Assessment of success in achieving objectives.
10
Type of contamination present.
11
Results of investigation of each environmental medium.
Continued on next page, Step 12.

Step 5 A discussion of the objectives set for the RFI during the planning process, in particular any of the data quality objectives (DQOs) established for the investigation.

Step 6 A detailed discussion of the technical requirements of the investigation, including:

- Environmental media sampled and the rationale for sample collection;
- Sampling and analysis techniques employed; and
- Specifications for any sampling equipment, monitoring wells, or other devices associated with sample collection (e.g., monitoring well construction, types of samplers to be used).

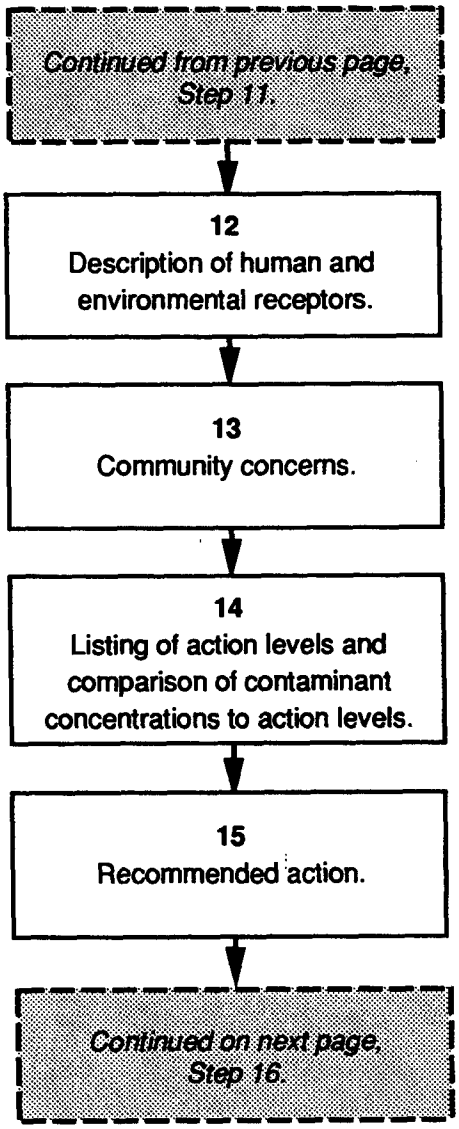
Step 7 Discussion of the quality assurance procedures used during the RFI (this can be met through inclusion of the data collection quality assurance plan (DCQAP) in the report).

Step 8 A description and summary of interim Corrective Measures Study (CMS) activities conducted concurrent with the RFI.

Step 9 An assessment of the degree to which the objectives of the RFI were achieved.

Step 10 A detailed discussion of the type of contamination present at the facility, including discussion of the physical, chemical, and toxicological properties of the contaminants.

Step 11 A detailed discussion of the results of the investigation. This discussion should include the findings for each environmental medium examined.

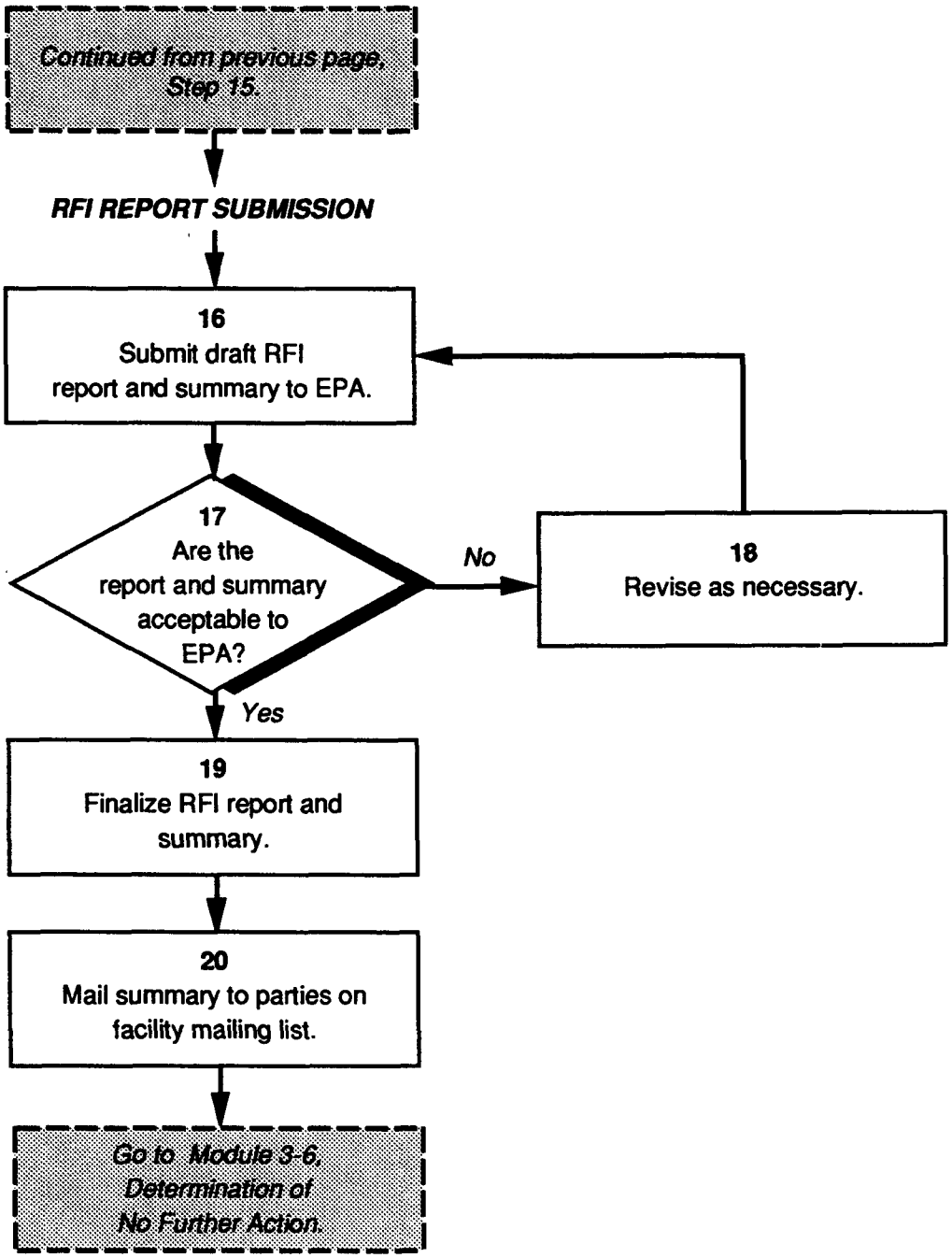

Continued from previous page, Step 11.
12
Description of human and environmental receptors.
13
Community concerns.
14
Listing of action levels and comparison of contaminant concentrations to action levels.
15
Recommended action.
Continued on next page, Step 16.

Step 12 Identification of actual and potential human and environmental receptors impacted by the release, and an assessment of the risk posed to these receptors.

Step 13 A discussion of the concerns of the local community identified through the public involvement plan.

Step 14 A listing of any action levels set for the investigation, and comparison of these levels to actual contaminant concentrations.

Step 15 Identification and justification of the owner/operator's recommendations regarding further action at the site.


Continued from previous page, Step 15.
RFI REPORT SUBMISSION
16
Submit draft RFI report and summary to EPA.
17
Are the report and summary acceptable to EPA?
No
18
Revise as necessary.
Yes
19
Finalize RFI report and summary.
20
Mail summary to parties on facility mailing list.
Go to Module 3-6, Determination of No Further Action.

RFI Report Submission

Step 16 Submit the draft report and report summary to EPA for review and approval.

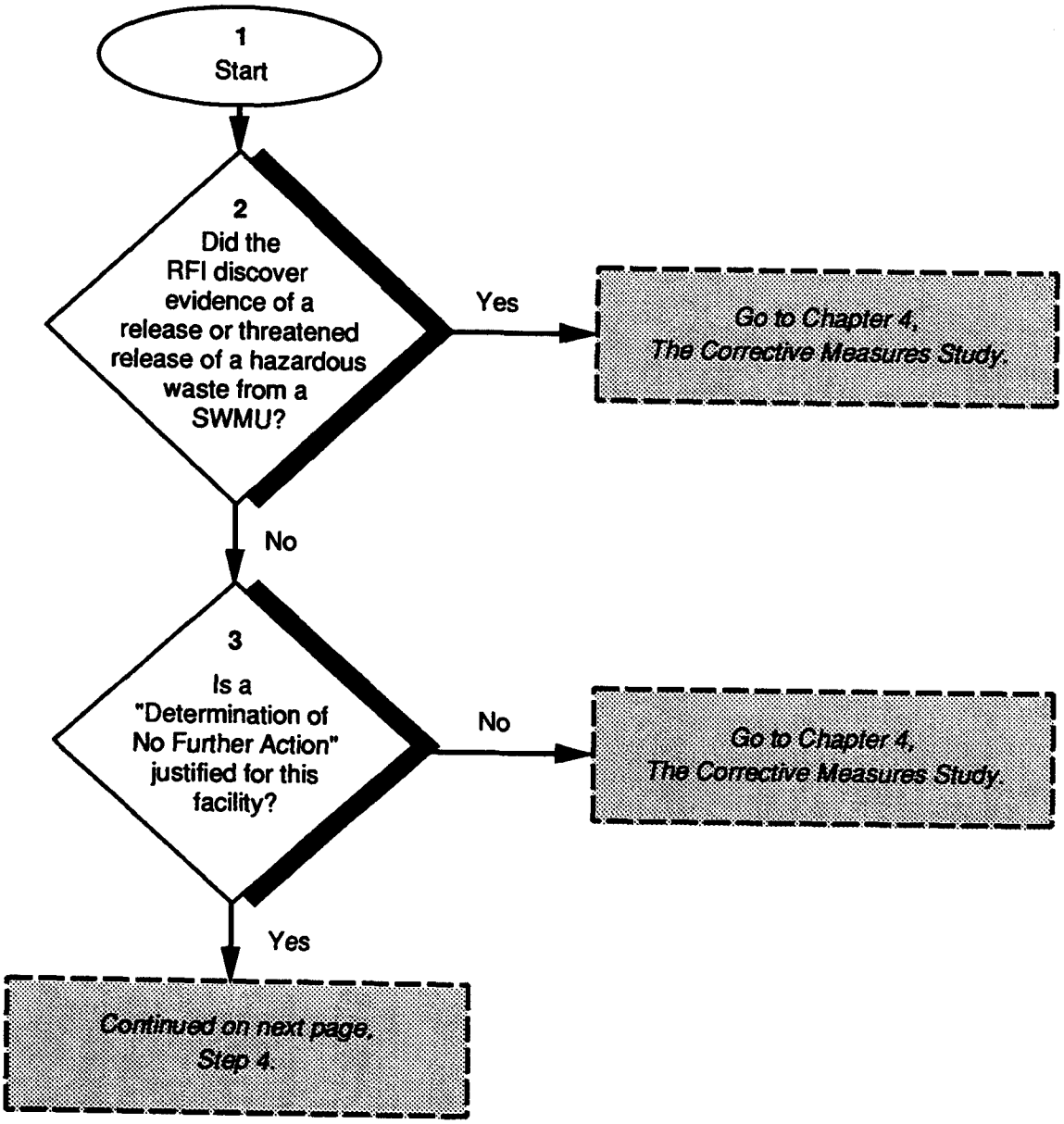
Step 17 Upon review of the draft RFI report and report summary, EPA may require the owner/operator to conduct analyses or additional investigations, or expand upon an aspect of the investigation. (Proposed 40 CFR §264.513(c))

Step 18 If the report has been returned by EPA for additional work, conduct any additional investigations, revise, and resubmit the report to EPA for review and approval.

Step 19 Once accepted, the final RFI report and the final RFI report summary will be used by EPA as the basis for deciding the next action at the facility.

Step 20 Mail the EPA-approved RFI report summary to all parties on the facility mailing list. The facility mailing list is required under 40 CFR §124.10(c)(1)(viii) and is developed and maintained by EPA as part of the permitting process. (55 FR 30813)

Module 3-6: Determination of No Further Action



Module 3-6: Determination of No Further Action

This module will discuss: (1) the "Determination of No Further Action" process; and (2) the mechanism for the permit modification or rescission of the RCRA §3008(h) order compelling corrective action. (Proposed 40 CFR §264.514)

Step 1 Start.

Step 2

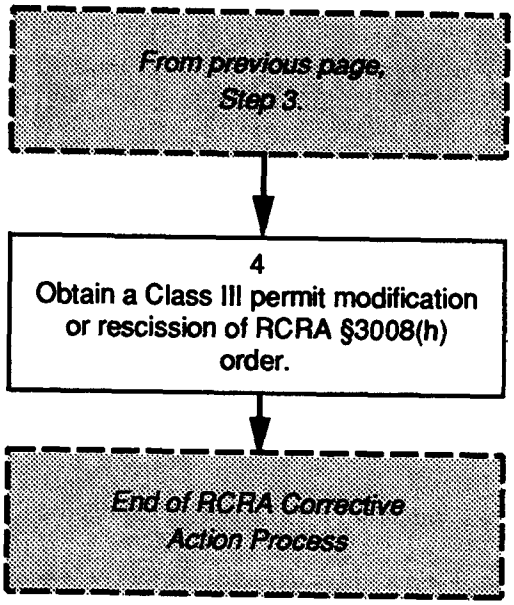
If the RCRA Facility Investigation (RFI) does not find evidence of a release or threatened release of a hazardous waste from a solid waste management unit (SWMU), the owner/operator may request a determination that no further action is required at that SWMU. The owner/operator may request such a determination upon analysis of the periodic progress reviews, or upon completion of the RFI. The EPA will review the request and decide if such a finding is justified. (Proposed 40 CFR §264.514(a)(1))

Step 3

A "Determination of No Further Action" is justified if:

- There is no release or threatened release of a hazardous waste or hazardous waste constituent from a SWMU;
- The substance(s) released is (are) not hazardous wastes or hazardous waste constituents;
- The release is not from a solid waste management unit (SWMU);
- The release is a permitted release, regulated under another authority, *and* EPA intends to pursue remediation under the terms of the permit;
- The release does not pose a threat to human health or the environment;
- The release exceeds action levels, but the EPA Regional Administrator determines a CMS is not required; or
- The release is below the action levels established for the RFI.

Information such as the results of environmental sampling, risk analyses, and contaminant migration modeling, which should be part of the RFI report, are some of the types of information that the regulatory agency will require to evaluate if the request for a "Determination of No Further Action" is justified. The most direct method of preparing a comprehensive document to support such a request is to include all pertinent data in the RFI report and to make the request when the RFI report is submitted.


From previous page, Step 3.
4
Obtain a Class III permit modification or rescission of RCRA §3008(h) order.
End of RCRA Corrective Action Process

Step 4 If the owner/operator conducted the RFI (as is the case at most DOE facilities) and did not find a release or threatened release that would require further RCRA Corrective Action, the owner/operator must request a Class III final modification of the permit for the facility, or request that EPA rescind the RCRA §3008(h) order compelling corrective action.

A Class III permit modification requires:

- Notification of all parties on the facility mailing list and the appropriate State and local governmental entities of the proposed change;
- Publication of a newspaper notice of the request, including an announcement of a 60-day comment period and the date, time, and location of an informational public meeting;
- A 60-day comment period;
- An informational public meeting on the request; and
- Placing a copy of the proposed modification and supporting documents in a publicly accessible location near the facility.

The requirements for Class III permit modifications are found at 40 CFR §270.42(c).

It is important to note that a Determination of No Further Action does not necessarily mean that no additional corrective action activities will be required. Under the proposed 40 CFR §264.514(c), the Regional Administrator can require additional corrective action investigations or studies if new information indicates that there is, or may be, a release from a SWMU. Further, a Determination of No Further Action does not prohibit the Regional Administrator from requiring monitoring if there is a likelihood of a release from a SWMU.

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OSW:530/SW-89-031
May 1989

The Resource Conservation and Recovery Act (RCRA)
(as amended by the Hazardous and Solid Waste Amendments (HSWA))
42 U.S.C. §6901 et seq.

Chapter 4

The Corrective Measures Study

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

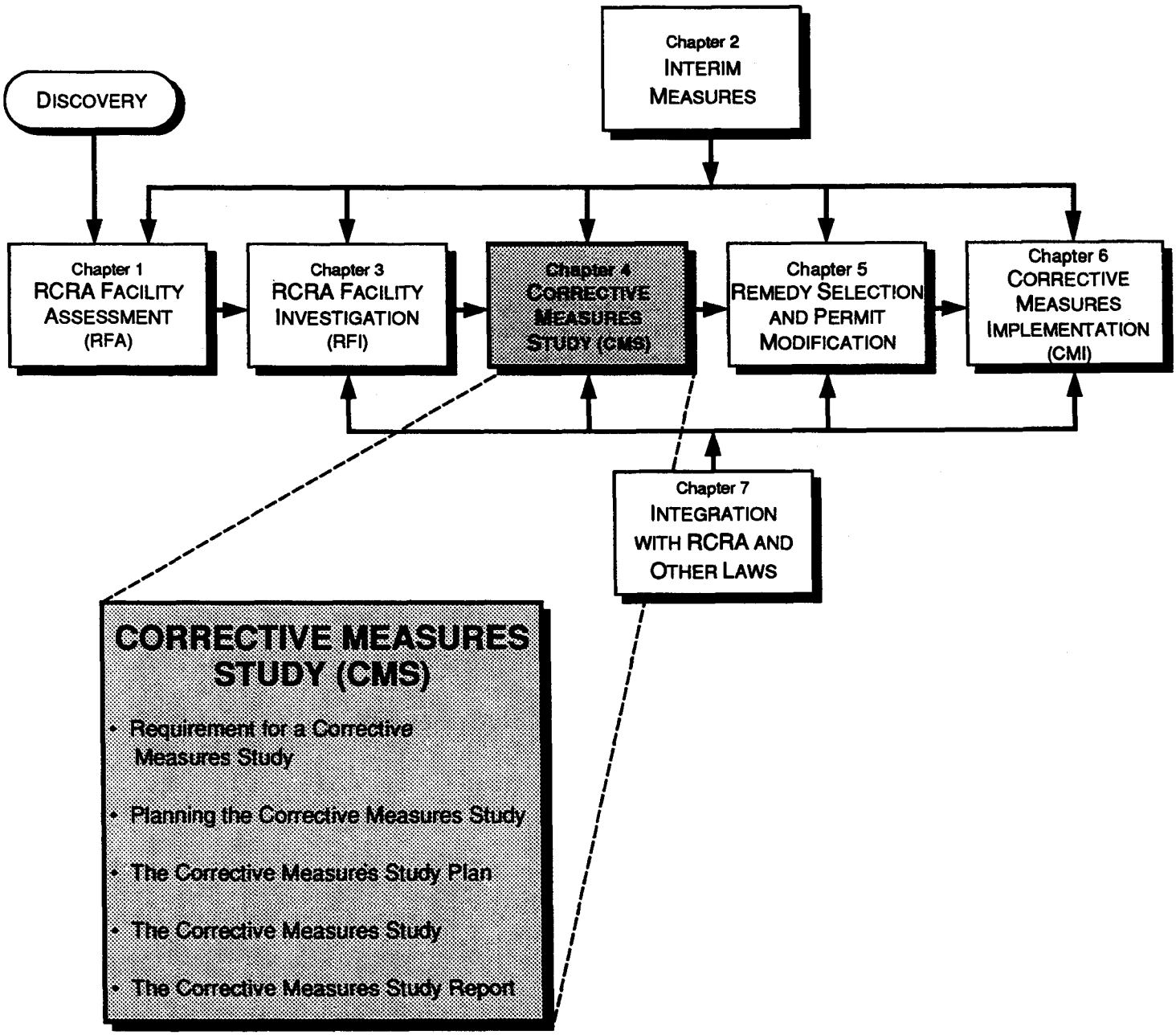
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

Sections 264.520 through 264.524 of the proposed Subpart S rule establish the procedural and substantive requirements for the conduct of a Corrective Measures Study (CMS). Similar to a Feasibility Study under CERCLA, the CMS is the process for evaluating the alternatives for the corrective measure.

Many areas of the proposed Subpart S rule are unclear as to their meaning or scope. In these areas, the meaning of the language of the proposed rule has been interpreted on the basis of "best professional judgment." It should also be noted that the presentation sequence for this material (especially on planning the CMS) is not in the exact sequence as presented in the proposed rule, and the guidance presented herein is not intended as a rigid structure. For any number of reasons (e.g., EPA or State requirements, streamlining of the CMS), the CMS process may vary from the sequence as presented. Examples of such variations are presented in this guidance document.

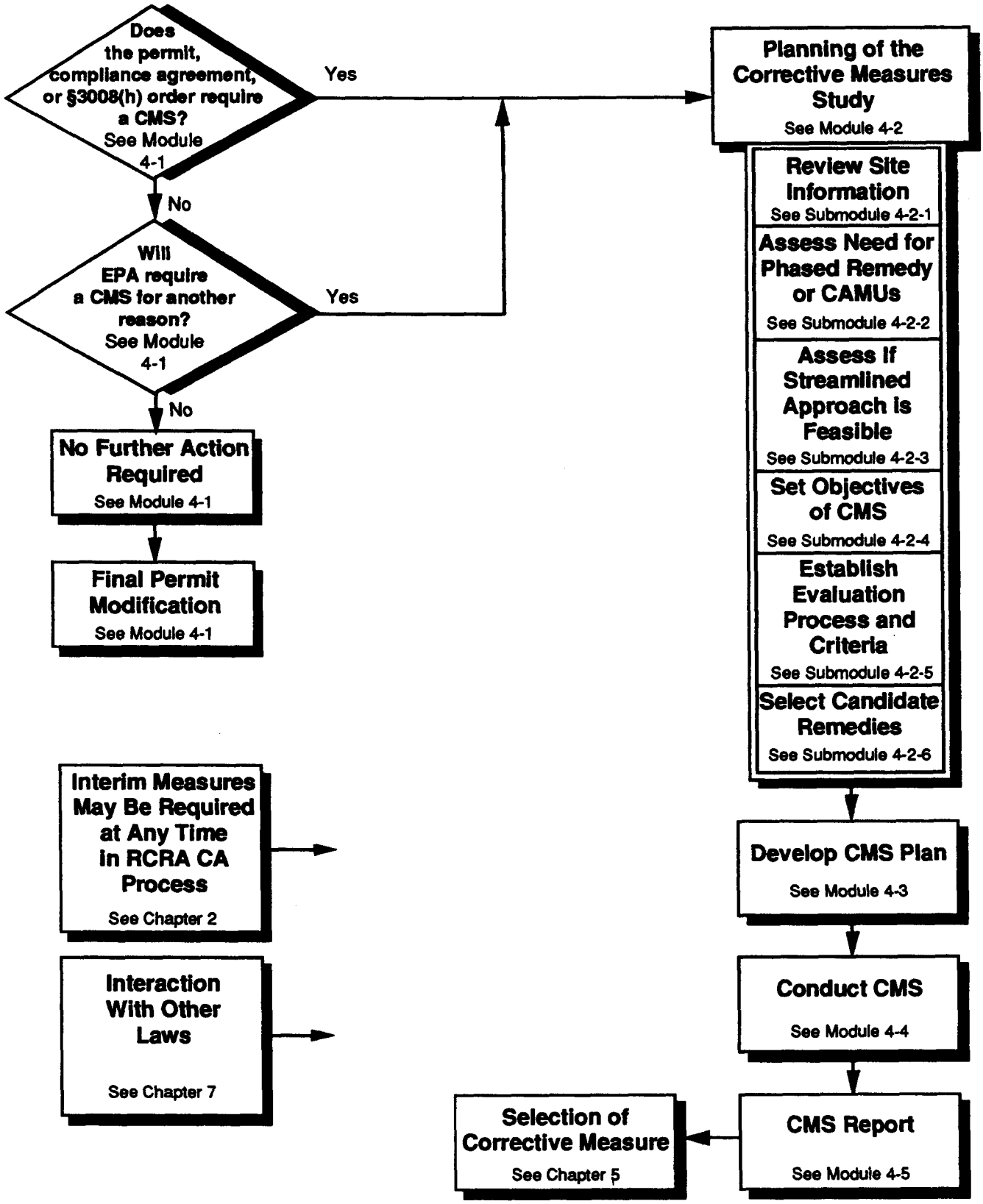
Throughout this chapter, reference is made to EPA. For the sake of clarity, this term was meant to include those States with appropriate RCRA authorization.

The following modules of this chapter provide a detailed discussion of the CMS process outlined in the graphic on the next page.

Module 4-1 Requirement for a Corrective Measures Study

There are two mechanisms triggering the requirement for a CMS. The primary mechanism for triggering a CMS is the discovery that the concentration of a contaminant released from a solid waste management unit (SWMU) exceeds the action level set for that contaminant. Action levels are media-specific health and environmental-based contaminant concentrations considered protective of human health and the environment. Action levels are often standards issued under other statutes, such as the Maximum Contaminant Levels under the Safe Drinking Water Act.[7] It must be noted that action levels do not necessarily represent the final concentrations that must be achieved through the implementation of a corrective measure. Action levels act as a presumptive contaminant concentration level which, if exceeded, requires the permittee to perform additional investigations, specifically the CMS.

[7] Examples of the promulgated standards used as action levels and supplemental mechanisms used to develop action levels are discussed in the proposed Subpart S rule at 55 FR 30814-30820.



Chapter Four: Corrective Measures Study (CMS)

The second mechanism for triggering a CMS is proposed 40 CFR §254.520(b), which allows EPA to require a CMS even when contaminant concentrations are below action levels, but where other site-specific considerations, such as impacts to sensitive environments, suggest a need for close evaluation of the need for remediation of the contamination.

Unless already specified in the facility permit or a RCRA §3008(h) order compelling corrective action, conduct of a CMS requires modification of the facility permit or issuance of an additional RCRA §3008(h) corrective action order. Permit modification requires negotiation of the modification with EPA, development of a draft permit, a public notice, a comment and response period, a public meeting (if necessary), incorporation of any revisions into the permit modification, and issuance of the final modified permit. For an interim status facility, EPA issues a RCRA §3008(h) corrective action order requiring the owner/operator to conduct a CMS.

Module 4-2 Planning the Corrective Measures Study

There are six principal steps to planning a CMS. These steps are: (1) review of existing information about the SWMUs at the facility; (2) determining if a phased remedy or establishing of a corrective action management unit (CAMU) is appropriate; (3) determining if a streamlined CMS is appropriate; (4) defining the objectives of the CMS; (5) establishing the process and criteria for evaluating the alternatives for the corrective measure; and (6) selecting candidate corrective measures for evaluation. Depending upon DOE, EPA, State, or other requirements or constraints, the sequence of steps may vary.

In addition, during the planning process the facility should consider any requirements for compliance with other statutes. Examples include requirements for compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Environmental Policy Act (NEPA), the Clean Water Act (CWA), and the Toxic Substances Control Act (TSCA). Areas where integration with other laws should be considered are discussed in this chapter; however, details are provided in Chapter 7.

Submodule 4-2-l Review of Site Information

The first step in the CMS process is a review of information about the release. The majority of this information is in the report(s) resulting from the RCRA Facility Investigation (RFI). Additional information may come from review of other sources, such as reports of releases, the RCRA Facility Assessment (RFA) report, and interim measures reports. Specific information sought during this review includes:

- Waste characteristics, including identity; physical, chemical, and toxicological properties; and quantity or concentration;

- Environmental setting, including information on geology, hydrogeology, topography, population demographics, and relation of the SWMU to other SWMUs at the facility, and the relationship of the facility to the surrounding area;

- Evaluation of the risks posed to human health and the environment by the release;

- Actions (including interim measures) taken at the facility to control or minimize the threat posed by the release; and

- Current conditions at the facility.

Submodule 4-2-2 Phasing Corrective Measures and Establishing Corrective Action Management Units

The second step of the planning process is to evaluate the usefulness of a phased corrective measure and the potential benefits of establishing corrective action management units (CAMUs).

For complex sites where cleanup of the entire facility in a single action is impractical, EPA has the authority to divide the corrective measure into phases.[8] Phasing of a corrective measure is similar to the use of "operable units" under CERCLA, and represents any logically connected set of actions performed sequentially over time, or concurrently at different parts of the facility. If a phased corrective measure is appropriate at the facility, the CMS may also be broken into phases, with each phase of the CMS focusing on a particular phase of the corrective measure. Ideally, using a streamlined approach, a phased CMS requires consideration of both the remedial alternative for the individual phase ***and*** the ultimate remedial goals for the entire facility. Any phased corrective measure should complement, not impede, future remedial activities at the facility.

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[8] The proposed rule provides two mechanisms for phasing corrective Measures and is unclear on how EPA will approach the phasing of corrective measures. Under the first mechanism, EPA does not impose conditions on the phasing of a corrective measure, and the corrective measure is referred to as a "phased remedy." For additional information on phased remedies see the preamble to the proposed rule at 55 FR 30835, and §264.526(d). However, EPA may impose one or more of seven specific conditions as part of phasing-in a corrective measure. Such a corrective measure is referred to as a "conditional remedy" (see the preamble to the proposed rule at 55 FR 30833 and §264.525(f)).

Another consideration for the planning process is the use of CAMUs. Under the proposed Subpart S rule, EPA is authorized to designate an area of broad contamination as a CAMU. The use of CAMUs permits consolidation of several SWMUs into one single unit for purposes of conducting corrective action, The identification of a CAMU usually takes place shortly after the completion of the RFA, but the designation of areas as CAMUs may be revisited during the RFI or the CMS. If CAMUs have not been designated prior to the CMS, the owner/operator should consider proposing any appropriate areas as CAMUs. The primary benefit of using a CAMU to address large areas of contamination (usually the result of releases from a number of SWMUs) at a facility is that land-based treatment and disposal of contaminated materials from within the CAMU are not subject to either land disposal restrictions or minimum technology requirements.

Submodule 4-2-3 Streamlining the Corrective Measures Study

In planning the CMS, the third step is determining whether a streamlined CMS is appropriate. Streamlining involves tailoring the CMS to the complexity and scope of the situation at the facility and is similar to the Streamlined Approach for Environmental Restoration (SAFER) used for CERCLA Remedial Investigations/Feasibility Studies (RI/FS). A streamlined CMS offers several advantages. Most importantly, a streamlined CMS may not require extensive evaluation of numerous alternatives for the corrective measure. A streamlined CMS is appropriate for sites with the following types of conditions:

- The owner/operator proposes a highly protective corrective measure, such as a RCRA clean closure;
- Because of site conditions, there are few alternatives for the corrective measure as justified by proposed 40 CFR 40 CFR 9264.531 - Technical Impracticability;
- Expected future use of the site dictates a highly protective degree of cleanup;
- The remedial solution is straightforward and will use a tested and proven remedial technology; or
- Use of a phased remedy is appropriate.

Submodule 4-2-4 Developing the Objectives for the Corrective Measures Study

The fourth step in the planning process is developing the objectives of the CMS, primarily through establishing target media cleanup standards (MCS). As opposed to action levels, which are contaminant concentrations used to determine the need for a CMS, MCS are media-specific constituent concentrations which the corrective measure must achieve. The final MCS are set during the remedy selection process; however, setting target MCS provides an extremely useful tool for evaluating alternatives for the corrective measure. The EPA is not required to set, and retains the authority to revise, such target MCS. However, the owner/operator should try to negotiate with EPA for the creation of target MCS for the facility. If EPA is unwilling to set target MCS for the facility, the owner/operator should consider developing their own target MCS for use in evaluating the alternatives for the corrective measure.

Submodule 4-2-5 Establishing the Corrective Measures Study Evaluation Process and Criteria

The fifth step in planning the CMS is to establish the process and criteria for evaluating each alternative for the corrective measure. The CMS evaluation process and criteria should reflect the general evaluation factors for a CMS. The process and criteria should also reflect the standards and specific factors against which each alternative corrective measure will be judged during the final remedy selection process. The general evaluation factors for a CMS are:

- Performance, reliability, ease of implementation, and potential impacts from each remedial alternative;
- Effectiveness of each remedial alternative in achieving adequate source control;
- Time required to begin and complete each remedial alternative;
- Costs of each remedial alternative; and
- Institutional requirements (e.g., State, local, or public health regulations or permitting requirements) that might impact the implementation of each remedial alternative.

In rating each remedial alternative under these general evaluation factors, it is advisable to address each of the four standards for corrective measures and the five corrective measures selection factors. Under the proposed Subpart S rule, a corrective measure ***must:***

- Be protective of human health and the environment;
- Attain final (as opposed to target) MCS;

- Provide source control to reduce or eliminate further releases that may pose a threat to human health and the environment; and

- Comply with the standards for management of wastes generated as part of conducting the corrective measure.

The specific selection factors for the corrective measure are:

- Long-term reliability;

- Reduction of toxicity, mobility, and volume of the contaminants at the facility;

- Short-term effectiveness;

- Implementability; and

- Cost.

Submodule 4-2-6 Select and Screen Candidate Corrective Measures for Study

The sixth step of planning a CMS is to develop a list of candidate alternatives for the corrective measure. The list of candidate alternatives is developed through analysis of facility conditions and review of information on existing and innovative remedial technologies applicable to the problems at the facility. In addition to the list of alternatives developed by the owner/operator, EPA has the authority to specify remedial alternatives for consideration and study. Following the review of existing information on the candidate alternatives, it is possible to eliminate from consideration any alternative that is impractical or inappropriate to the site conditions.

The final list of alternatives for the corrective measure should always include a “no action” alternative. While selection of a “no action” alternative provides no active remediation of contamination, it is useful as a baseline for comparison with the other alternatives. Further, selection of a “no action” alternative may be justified in some cases. For example, the CMS may show that natural attenuation will result in achieving the MCS. A “no action” alternative may also be appropriate if the owner/operator can show that no additional reduction of risk posed to human health and the environment will result from conducting a corrective measure. A media-specific example for possible justification of a “no action” alternative is a contaminated aquifer that is not, and will not, impact a source or potential source of drinking water. Under the proposed Subpart S rule, EPA may elect not to require remediation to the MCS if the owner/operator can show that the contamination is not a threat to a current or potential source of drinking water or to environmental receptors.

Module 4-3 The Corrective Measures Study Plan

Conducting a CMS includes the development of the CMS Plan. Under the proposed Subpart S rule, EPA may require that the plan follow specific criteria, may include development of the plan in the facility permit schedule of compliance, or may require that the plan be subject to EPA review and approval. Further, under the proposed rule, a requirement for the submission of a CMS plan is at the discretion of EPA. Plan submission is not a mandatory action. However, if EPA requires submission of a plan, the approved plan becomes a part of the facility permit and is subject to the permit schedule of compliance (see 55 FR 30876-30877). The CMS plan should include discussion of:

- Current conditions at the facility;
- The general approach to investigating and evaluating potential remedial alternatives (e.g., use of a phased remedy or streamlined approach);
- Definition of the overall objectives of the CMS;
- A proposed schedule for the CMS;
- Identification of the alternatives for the corrective measure;
- The evaluation process and evaluation criteria for each alternative; and
- The format for presentation of the findings of the CMS.

Module 4-4 The Corrective Measures Study

Conducting CMS testing is a two-step process involving (1) evaluating the effectiveness of each alternative for the corrective action, and (2) analysis and evaluation of the testing results according to the evaluation process and criteria developed during the planning process and described in the CMS plan. While this process is usually conducted during the CMS, under the proposed Subpart S rule EPA has the authority to require testing to occur concurrently with the RFI in order to prevent a delay in conducting the corrective measure. Generally, concurrent testing would occur in the form of treatability studies.

The first phase of conducting the CMS is similar to a treatability study conducted under CERCLA and involves testing each alternative for the corrective measure. Testing of the alternative corrective measures can be either bench- or pilot-scale, depending upon the nature of the technology under evaluation and the level of detail required for the evaluation. With a proven technology, used under conditions similar to those of the site under study, the testing requirements may be minimal, especially if adequate data on the effectiveness of the technology are available for review.

Treatability testing can also be conducted as part of the RFI. However, testing during the RFI should be limited, as the CMS process may show the technology to be inappropriate to the conditions at the facility.

Bench-scale treatability testing is usually performed in a laboratory. Such testing involves conducting a series of treatability tests with different parameters on small quantities of contaminated material. Analysis of the results of these small-scale tests permits evaluation and optimization of the operational parameters of the alternative quickly and at a relatively low cost.

Pilot-scale treatability testing involves building a scaled-down version of a treatment technology and simulates the physical and chemical parameters of that particular remedial technology. Pilot-scale testing should simulate full-scale operations and usually permits only limited variance of operational parameters. The results of a pilot-scale test allow assessment of the overall effectiveness and practicality of a remedial technology.

Once the testing of the alternatives for the corrective measure is complete, each alternative is subjected to the evaluation process developed during the planning process.

Module 4-5 The Corrective Measures Study Report

During the conduct of the CMS, EPA may require periodic progress reports. Based upon the information in these reports, EPA may change any part of the CMS.

Upon completion of the CMS, the owner/operator prepares a draft CMS report and submits the report to EPA for review and approval. The CMS report must discuss how each alternative for the corrective measure satisfies the standards and selection factors. The key points to discuss in the CMS report are:

- The history of the facility;
- Current facility conditions, including a summary of risks posed by the facility;
- Identification and a description of each alternative corrective measure;
- Evaluation of each alternative including discussion of:
  - Long-term reliability and effectiveness of each remedy;
  - Reduction of toxicity, mobility, or volume of contaminants at the facility;
  - The short-term effectiveness of each potential remedy;
  - Implementability of each potential remedy;
  - Cost of each remedy; and

- Identification and justification of the owner/operator's preferred corrective measure.

After review of the draft CMS report, EPA may require the owner/operator to conduct additional investigations or studies of other alternative corrective measures. The final, EPA-approved CMS report becomes the basis for the remedy selection process discussed in the next chapter. It should also be noted that the owner/operator's preferred corrective measure is not binding upon EPA. The selection of the corrective measure is solely the responsibility of EPA and is based upon a specific procedure and set of criteria discussed in the next chapter.

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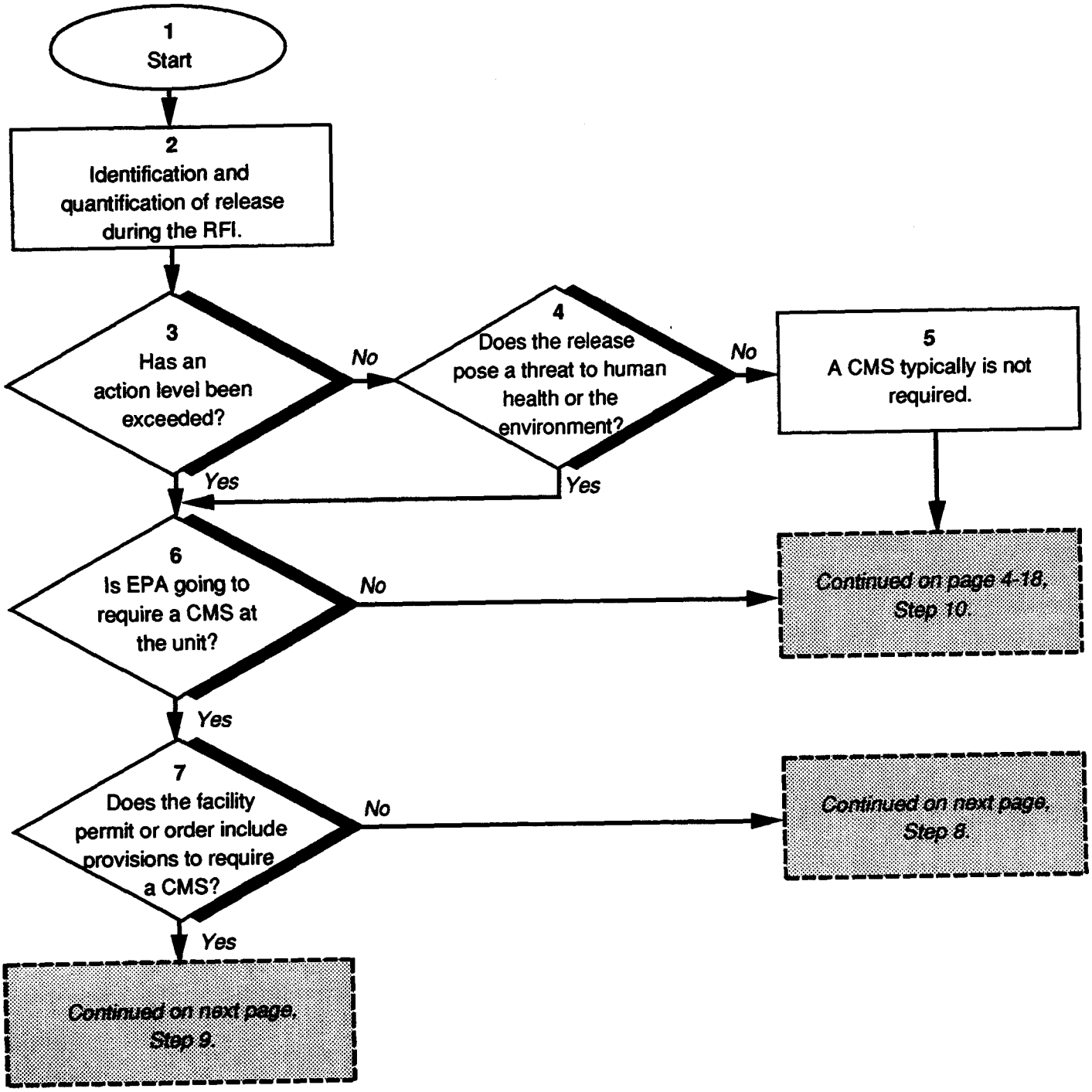
Module 4-1: Requirement for a Corrective Measures Study



Module 4-1: Requirement for a Corrective Measures Study

This module will discuss: (1) the mechanisms that trigger the requirement for a Corrective Measures Study (CMS); (2) the need for permit modification or additional RCRA §3008(h) orders; and (3) if applicable the justification of a "Determination of No Further Action."

Step 1 **Start.**

Step 2 Identification and quantification of a release from a solid waste management unit (SWMU) most likely will occur during the RCRA Facility Investigation (RFI). The determination whether a CMS is required may occur during the RFI (if adequate data are available) or immediately following completion of the RFI. This determination will be based on EPA review of the RFI report. Note that an administrative order or permit could require that an RFI be performed, but not specifically require a CMS. (Proposed 40 CFR §264.520(a))

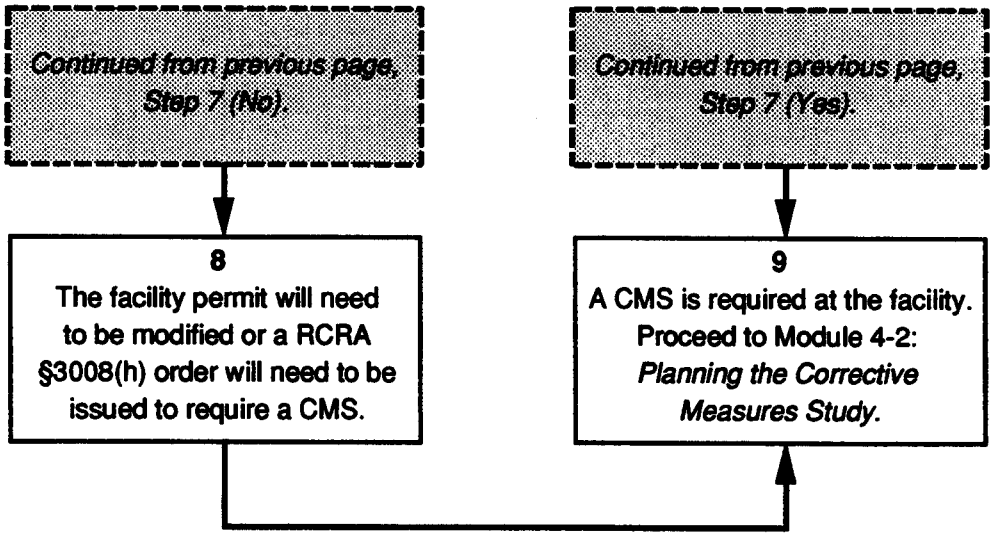
Step 3 The owner/operator will need to determine if the action level for any contaminant detected at the unit has been exceeded.

Step 4 If the release is not in excess of an action level, but is of concern because it poses a threat to human health or the environment (e.g., the release threatens a sensitive ecosystem or target population), EPA may require a CMS at the SWMU. (Proposed 40 CFR §264.520(b))

Step 5 If the release is not in excess of an action level and does not pose a threat to human health or the environment, then a CMS typically is not required at that SWMU.

Step 6 If the concentration of the contaminant released from the SWMU exceeds the action level for that contaminant or if the release poses a threat to human health or the environment, EPA will usually require a CMS for that SWMU. However, in some cases a CMS may not be required when an action level has been exceeded. For example, if the owner/operator can demonstrate there is no threat posed to human health or the environment by the release, and that the release is not likely to migrate offsite, EPA may elect to not require a CMS at the facility. (Proposed 40 CFR §264.520(c))

Step 7 If the existing RCRA §3008(h) order or the facility permit specifically requires a CMS under specified conditions, proceed to Step 9. If not, as may be the case with permits or RCRA §3008(h) orders at older facilities, proceed to Step 8.


Continued from previous page, Step 7 (No).
Continued from previous page, Step 7 (Yes).
8
The facility permit will need to be modified or a RCRA §3008(h) order will need to be issued to require a CMS.
9
A CMS is required at the facility. Proceed to Module 4-2: Planning the Corrective Measures Study.

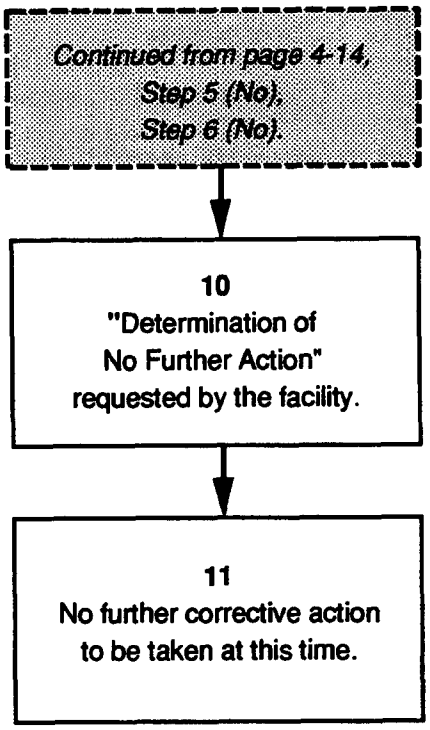
Step 8 If the facility permit does not contain a provision to require a CMS, a Class II permit modification or a supplemental §3008(h) order will be required. Obtaining a Class II permit modification requires:

- Submittal of a modification request to the EPA Regional Administrator that: (1) describes the exact change to be made to the permit conditions and supporting documents referenced by the permit, (2) identifies that the modification is a Class II modification, and (3) explains why the modification is needed;
- The permittee to submit the proposed modification to EPA;
- Notification of all parties on the facility mailing list as well as the appropriate State and local government entities;
- Publication of a newspaper notice of the proposed modification;
- A public meeting (if requested); and
- A copy of the proposed modification and any supporting documents be placed at a location accessible to the public.

If EPA does not respond to a Class II permit modification request within 120 days, the facility is authorized to perform the change under the modification up to 180 days only, during which time both parties (EPA and the facility) must fulfill procedural requirements. The modification goes into effect automatically. If a supplemental RCRA §3008(h) order is required, EPA will issue an order specifying the need for a CMS.

The requirements for a Class II permit modification are found at 40 CFR §270.42(b).

Step 9 A CMS is required for the SWMU and the permit or RCRA §3008(h) order includes provisions to require a CMS. Proceed to Module 4-2: Planning the Corrective Measures Study.


Continued from page 4-14,
Step 5 (No),
Step 6 (No).
10
"Determination of
No Further Action"
requested by the facility.
11
No further corrective action
to be taken at this time.

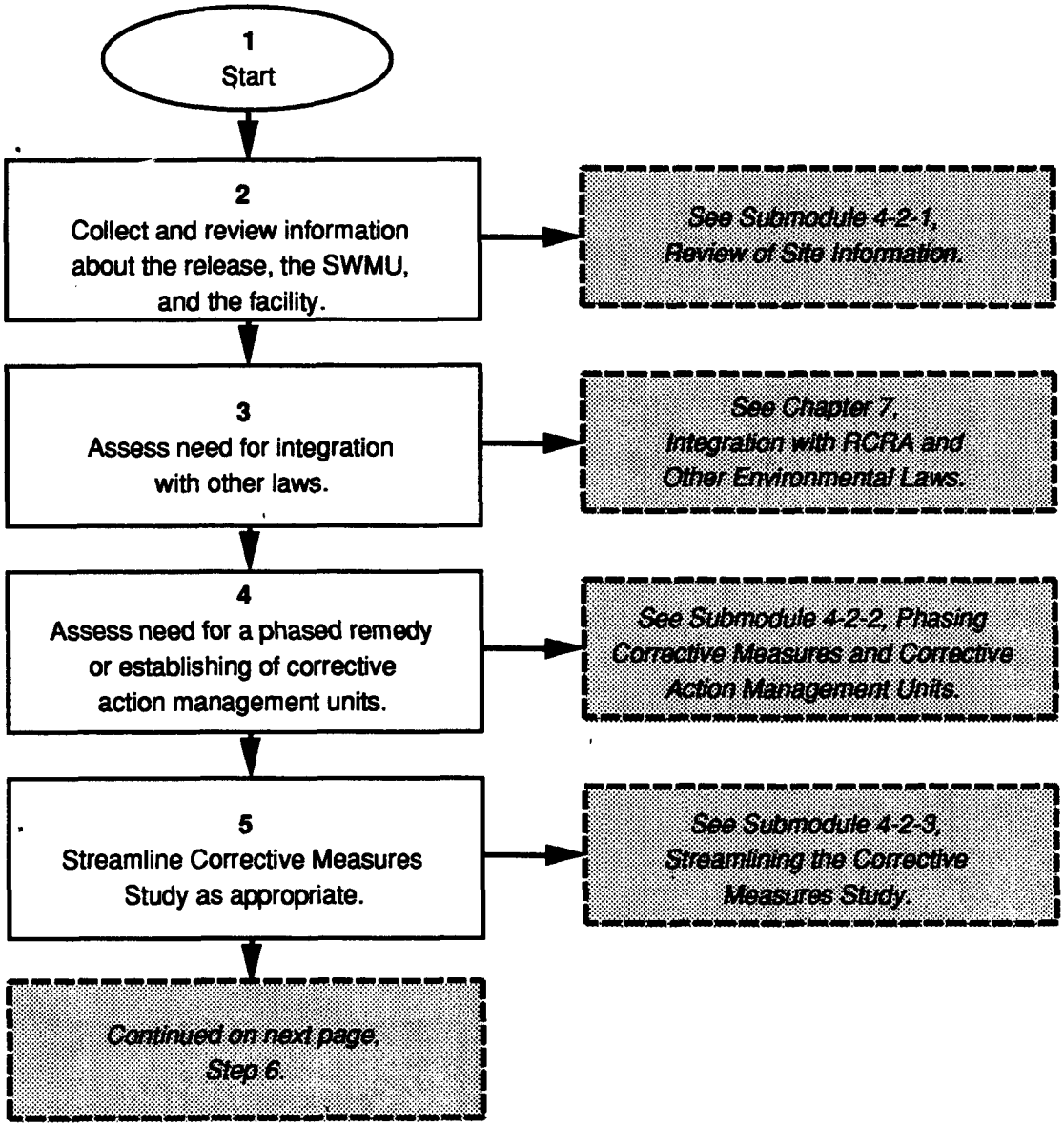
Step 10 If EPA does not intend to require a CMS to be conducted at the unit, then the owner/operator can request a "Determination of No Further Action" at that unit (proposed 40 CFR §264.514). Such a finding permits the owner/operator to request a Class III final modification of the permit for the facility to end the corrective action requirements at that unit, or to request that EPA rescind the RCRA §3008(h) order compelling corrective action. This requires a Class III permit modification which entails:

- Submittal of a modification request to the EPA Regional Administrator that: (1) describes the exact change to be made to the permit conditions and supporting documents referenced by the permit; (2) identifies that the modification is a Class III modification; and (3) explains why the modification is needed;
- Notification of all parties on the facility mailing list and the appropriate State and local government entities;
- Publication of a newspaper notice of the request;
- A 60-day comment period;
- A public meeting (on request); and
- A copy of the proposed modification and supporting documents being placed in a location accessible to the public.

The requirements for Class III permit modifications are found at 40 CFR §270.42(c).

Step 11 Once EPA issues the "Determination of No Further Action" the facility can cease corrective action activities at that SWMU.

Module 4-2: Planning the Corrective Measures Study



Module 4-2: Planning the Corrective Measures Study

This module addresses the most important phase of conducting a Corrective Measures Study (CMS). A successful CMS depends largely upon the care and attention to detail which is used in planning the study.

Step 1 **Start.**

Step 2 Collect and review all available information about the solid waste management unit (SWMU) and the release from that SWMU. Information sources include:

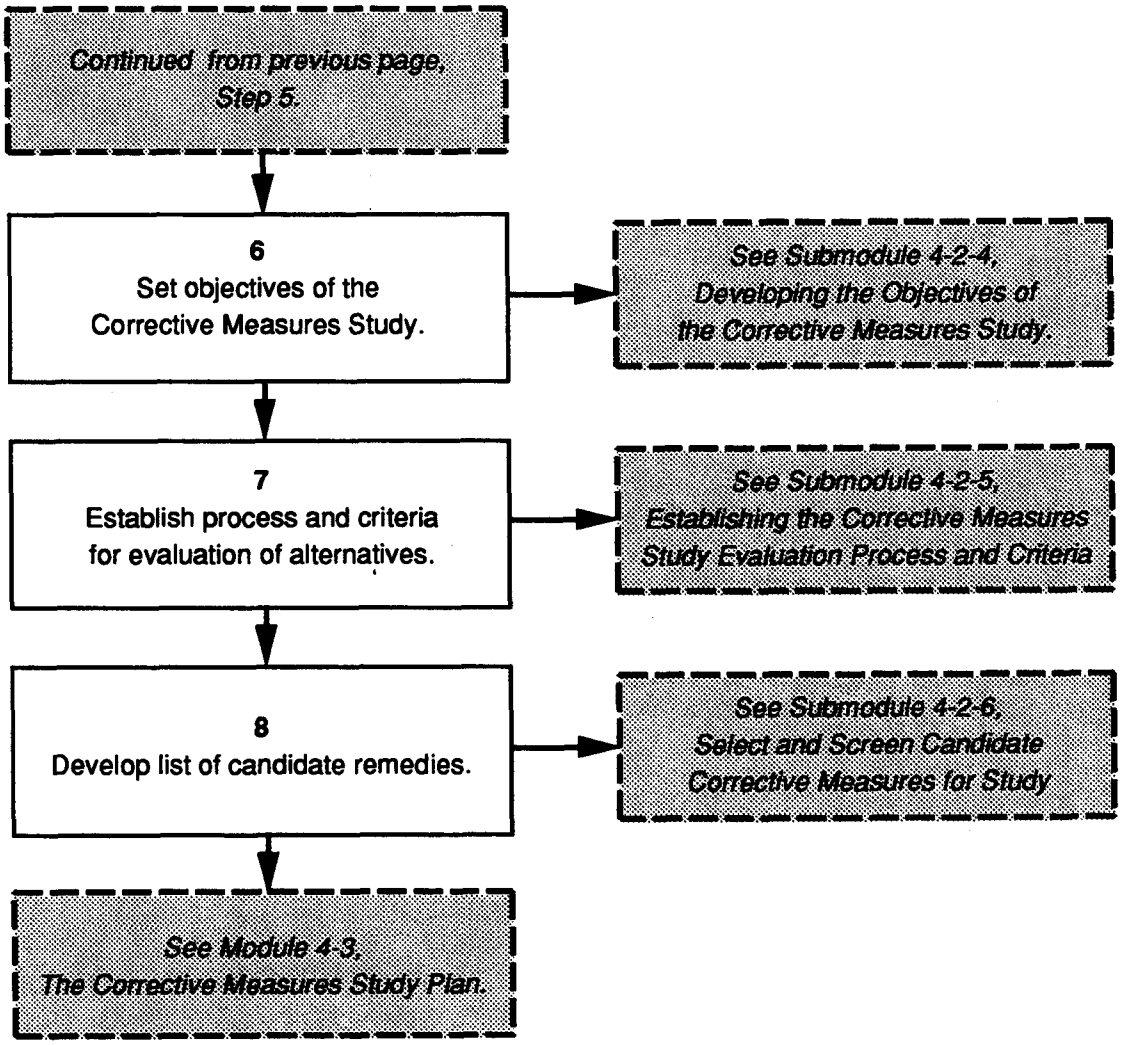
- Reports of releases;
- Reports of interim measures taken at the facility;
- The RCRA Facility Assessment (RFA) report; and
- The RCRA Facility Investigation (RFI) report.

See Submodule 4-2-1 for details on information required for this step.

Step 3 Assess the need for integration of the CMS with actions taken under other statutes. Examples would include the need for an Environmental Assessment or Environmental Impact Statement required under the National Environmental Policy Act (NEPA) or integration with a Remedial Investigation/Feasibility Study (RI/FS) conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). See Chapter 7 for information on the integration of RCRA Corrective Action with other laws.

Step 4 Determine the benefits of either using a phased corrective measure or establishing corrective action management units (CAMUs) at the facility. See Submodule 4-2-2 for information on phased corrective measures and CAMUs.

Step 5 Consider the use of a streamlined approach to the CMS. Streamlining can greatly simplify the CMS process. Streamlining is similar to the Streamlined Approach for Environmental Restoration (SAFER) used when conducting Remedial Investigations/Feasibility Studies under CERCLA. See Submodule 4-2-3 for a discussion of a streamlined CMS.

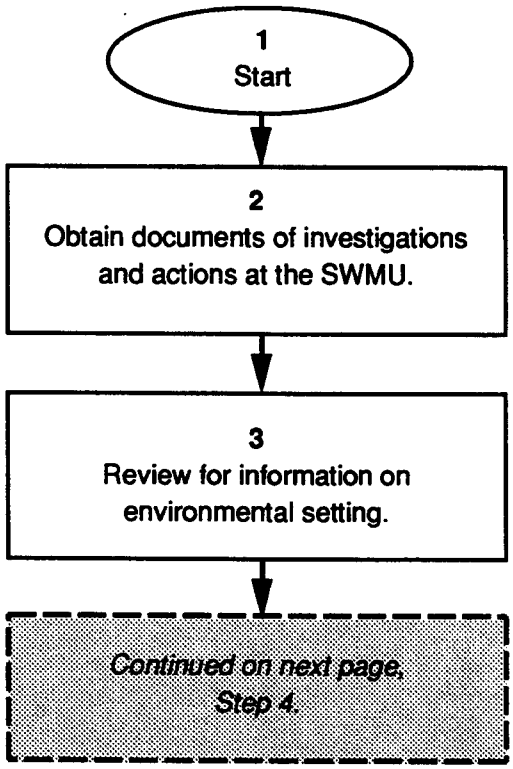

Continued from previous page, Step 5.
6
Set objectives of the Corrective Measures Study.
See Submodule 4-2-4, Developing the Objectives of the Corrective Measures Study.
7
Establish process and criteria for evaluation of alternatives.
See Submodule 4-2-5, Establishing the Corrective Measures Study Evaluation Process and Criteria
8
Develop list of candidate remedies.
See Submodule 4-2-6, Select and Screen Candidate Corrective Measures for Study
See Module 4-3, The Corrective Measures Study Plan.

Step 6 Set the objectives of the CMS. This will include developing and negotiating target media cleanup standards (MCS) with EPA and making tentative identification of the points of compliance. See Submodule 4-2-4 for a discussion of CMS objectives.

Step 7 Establish the process and criteria for evaluating each alternative corrective measure under consideration. The evaluation process should reflect the standards and evaluation factors that will be used to select the corrective measure. See Submodule 4-2-5 for a discussion of the CMS evaluation process.

Step 8 Develop a list of candidate remedies. This process will include an initial screening of the candidate remedies, and the elimination of those remedies that are inappropriate or obviously impractical given site conditions. See Submodule 4-2-6 for more information.

Submodule 4-2-1: Review of Site Information



Submodule 4-2-1: Review of Site Information

The review of information about the facility and the solid waste management unit (SWMU) collected during previous investigations provides the majority of the information required for planning the Corrective Measures Study (CMS). This submodule addresses this review process.

Step 1 Start.

Step 2

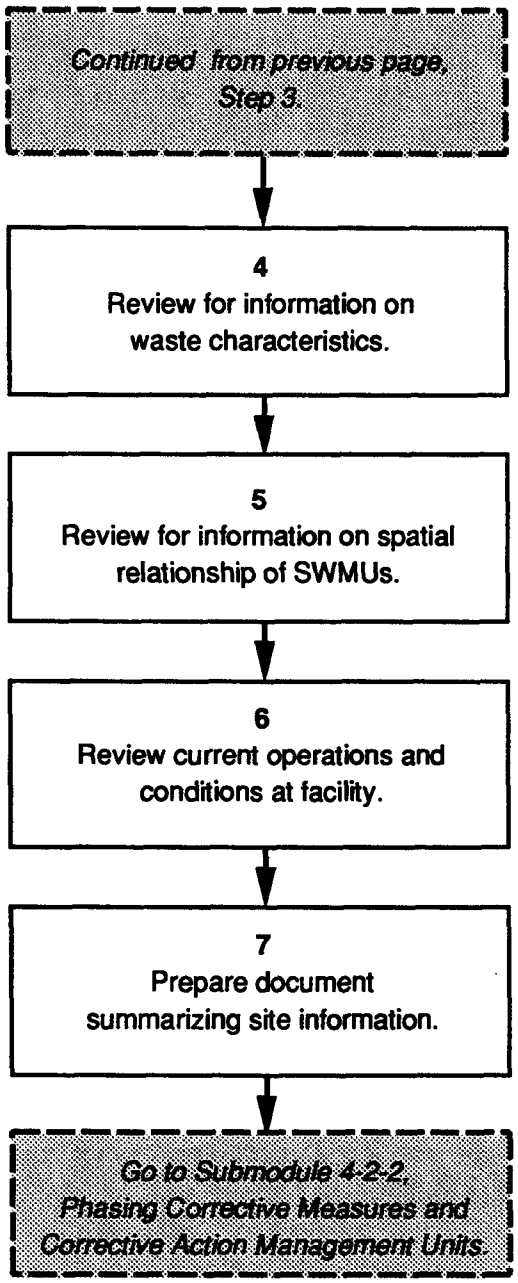
Obtain copies of all documents concerning investigations and actions taken at the facility that focused on the release from the SWMU under investigation. Documents which are necessary to this step of the CMS include:

- The RCRA Facility Investigation (RFI) report(s);
- The RCRA Facility Assessment (RFA) report;
- Interim measures reports;
- Notices of releases; and
- The facility permit or RCRA §3008(h) order.

Step 3

Review each document for information on the environmental setting of the facility, including information such as:

- Groundwater -- depth to the uppermost aquifer, aquifer characteristics, groundwater quality, groundwater use, and other hydrogeological information;
- Surface water -- overland distance to nearest surface water body, surface water quality, surface water uses, and other information;
- Air -- air quality, prevailing winds, typical meteorological conditions, and other information; and
- Soil -- type, chemical composition, total organic carbon, cation ion exchange capability, and other characteristics.


Continued from previous page, Step 3.
4
Review for information on waste characteristics.
5
Review for information on spatial relationship of SWMUs.
6
Review current operations and conditions at facility.
7
Prepare document summarizing site information.
Go to Submodule 4-2-2, Phasing Corrective Measures and Corrective Action Management Units.

Step 4 Review each document for information on the characteristics of the contaminants found at the facility, including:

- Identity of the contaminants;
- Physical, chemical, and toxicological (acute, chronic, and carcinogenic potential) properties;
- Quantity, including an estimate of the quantity and concentration of hazardous waste released to the environment;
- Areal extent of contamination;
- Impacted media (e.g., groundwater, soil); and
- Permitted waste treatment or disposal options (e.g., land disposal restrictions).

Step 5 Review each document for information on the relationship of the SWMU to other parts of the facility, and the relationship of the facility to the surrounding area, including information on:

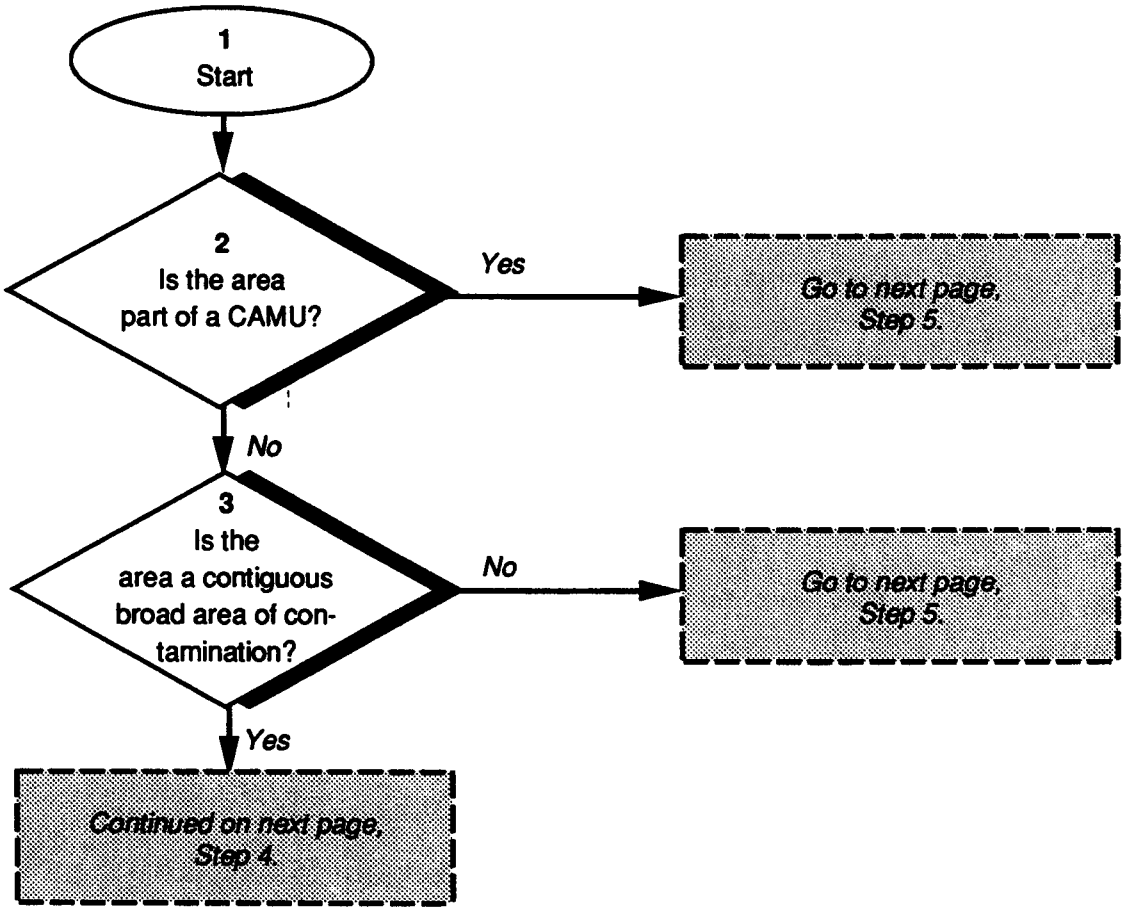
- Other releases at the facility that might be impacting the same area as the SWMU under investigation;
- Population demographics, and the location of the maximally exposed individual (MEI);
- Sensitive environments that might be impacted by the release;
- Permitted waste treatment or disposal occurring at other SWMUs at the facility; and
- Corrective action activities currently underway at other SWMUs at the facility.

Step 6 Review each document for information about current operations and conditions at the facility including:

- Types of waste treatment or disposal permitted at the facility, including waste treatment processes regulated under other statutes (e.g., water treatment facilities, injection wells);
- Interim measures taken at the SWMU; and
- Investigations being conducted under other authorities at the facility.

Step 7 Prepare a document summarizing the findings of this review. This document will be used as a reference throughout the CMS process, and will be incorporated into the CMS plan and CMS report.

Submodule 4-2-2: Phasing Corrective Measures and Corrective Action Management Units



Submodule 4-2-2: Phasing Corrective Measures and Corrective Action Management Units

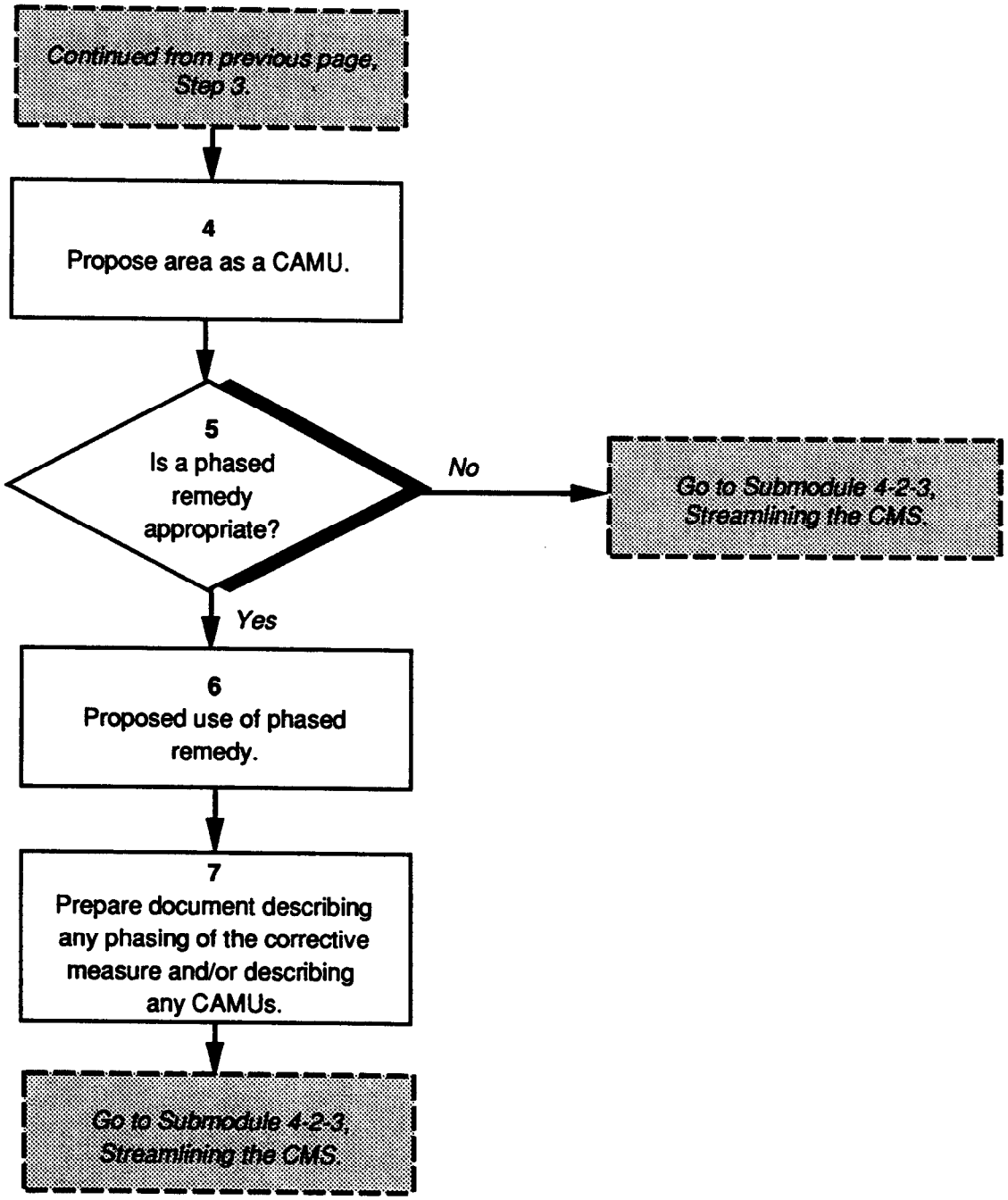
During the Corrective Measures Study (CMS), the owner/operator should evaluate the potential benefits of phasing the corrective measure and the use of corrective action management units (CAMUs) at the facility. These options provide the opportunity to combine efforts at a number of solid waste management units (SWMUs). This submodule will address the use of these options.

Step 1 **Start.**

Step 2 From the information collected during the review of investigations at the facility, determine if the area presently under consideration has been designated part of a CAMU. A CAMU may have been designated by EPA prior to, or as a result of, the RCRA Facility Investigation (RFI).(Proposed 40 CFR §264.551(c))

The designation of an area as a CAMU permits the movement of hazardous waste within the unit during remediation without triggering the land disposal restrictions or minimum technology requirements for a new or lateral expansion of a unit. This is the primary advantage of designating a broad area of contamination as a CAMU. (Proposed 40 CFR §264.551(c)(1) and (2))

Step 3 If the area represents a contiguous, broad area of contamination (which may also include within its perimeter one or more land-based SWMUs) it may qualify as a CAMU. Examples of SWMUs which may be included in a CAMU are soils surrounding a land-based unit such as a leaking surface impoundment or landfill. Areas that cannot be included in a CAMU include all non-land-based units such as incinerators or tanks. (55 FR 30843)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4
Propose area as a CAMU.
5
Is a phased remedy appropriate?
No
Go to Submodule 4-2-3, Streamlining the CMS.
Yes
6
Proposed use of phased remedy.
7
Prepare document describing any phasing of the corrective measure and/or describing any CAMUs.
Go to Submodule 4-2-3, Streamlining the CMS.

Step 4 Contact EPA and propose the area as a CAMU. Only the EPA is authorized to designate an area as a CAMU. EPA's decision will be based upon assessment of the extent and nature of the contamination, location of existing SWMUs within the contaminated area, and the ultimate remedial objectives established for the entire facility.

Step 5 Once the designation of any CAMUs is completed, consider whether the corrective measure should be implemented in phases. A phased remedy is any logically connected set of actions performed sequentially over time, or concurrently at different SWMUs or CAMUs. The initial phases should be consistent with the ultimate long-term remediation goals of the facility, and should complement, not impede, future actions. (Proposed 40 CFR §264.526(d))

In this step, evaluate the site conditions against the seven specific requirements for a "conditional remedy" (Proposed 40 CFR §264.525(f)). A conditional remedy, a type of phased remedy, is a process whereby the owner/operator is permitted to phase in a remedy over a period of time, contingent upon meeting certain requirements.

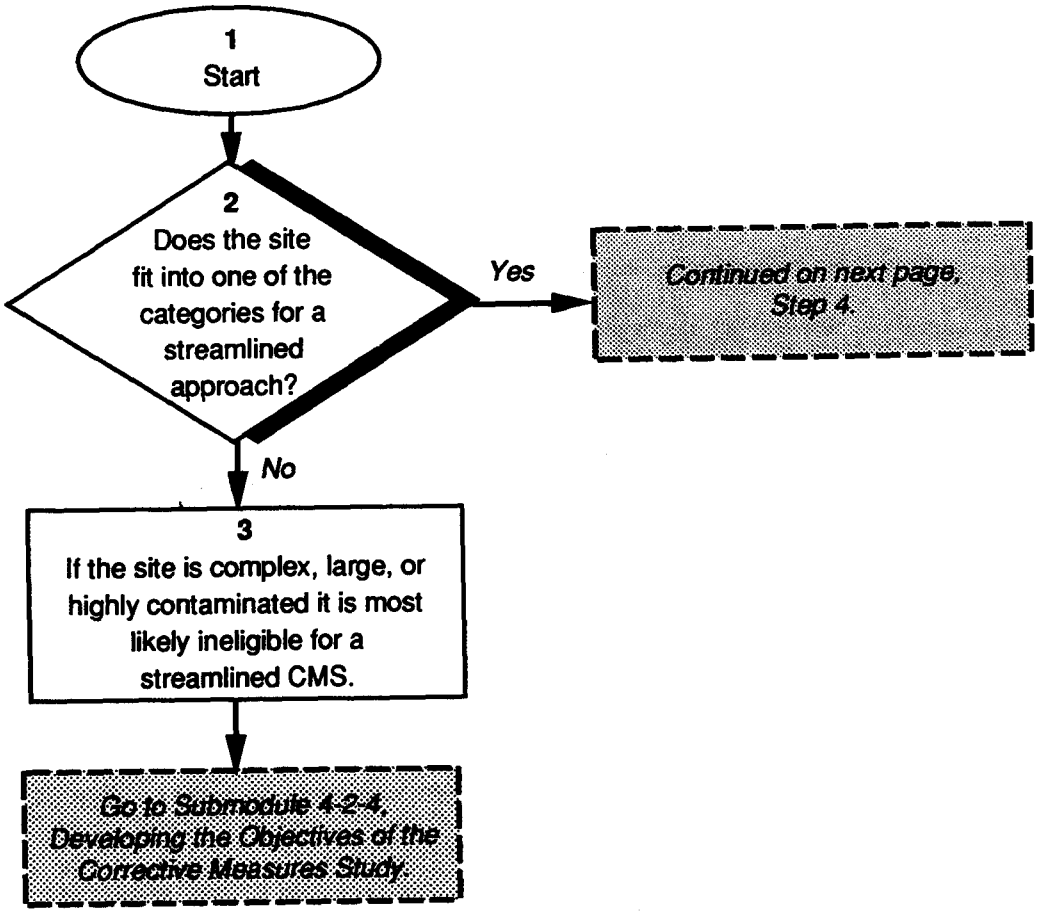
A conditional remedy *must*:

- Be protective of human health and the environment;
- Achieve all media cleanup standards (MCS) beyond the facility boundary, as soon as is practicable;
- Prevent further significant environmental degradation through the use of treatment or engineering controls at the source, and the use of engineered measures to prevent further migration of the release within the facility boundary;
- Institute controls to prevent exposure to hazardous wastes at the facility;
- Continue monitoring of releases in order to determine if significant environmental degradation does occur;
- Provide financial assurances; and
- Comply with the waste management standards for waste generated during corrective action.

Step 6 If appropriate to site conditions, propose the use of a phased or conditional corrective measure to EPA. With the proposal, provide all necessary supporting information required for review during the decision-making process.

Step 7 Develop a document describing any CAMUs designated by EPA, and/or describing any phasing of the CMS. This document will be used throughout the CMS process, and will eventually be incorporated into the CMS plan and CMS report.

Submodule 4-2-3: Streamlining the Corrective Measures Study



Submodule 4-2-3: Streamlining the Corrective Measures Study

In the preamble to the proposed Subpart S rule, EPA states that corrective measures at RCRA facilities will often be straightforward, presenting only a minimal need for evaluation of alternatives for the corrective measure (55 FR 30821). With this in mind, EPA proposes to allow streamlining of the Corrective Measures Study (CMS) under certain conditions, in an effort to speed the corrective action process. Streamlining is similar to the Streamlined Approach for Environmental Restoration (SAFER) used when conducting Remedial Investigations/Feasibility Studies under CERCLA. This submodule addresses streamlining the CMS.

Step 1 Start.

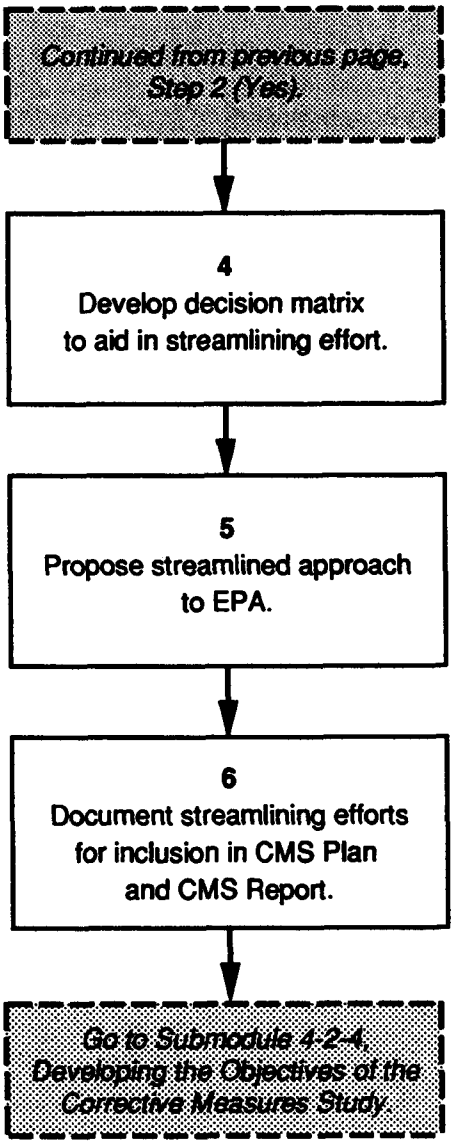
Step 2

From the information collected during the review of investigations at the facility, determine if the facility falls into one of these categories:

- The owner/operator proposes a highly protective corrective measure, such as a RCRA clean closure.
- Because of site conditions, there are few, if any, alternatives for the corrective measure.
- Expected future use of the site dictates a highly protective cleanup.
- The remedial solution is straightforward and will use a tested and proven remedial technology.
- Use of a phased or conditional remedy is appropriate.

Step 3

The use of a streamlined CMS is generally not appropriate for complex, large, or highly contaminated sites, or sites where very different remedial technologies exist for addressing the type of contamination at the facility.


Continued from previous page, Step 2 (Yes).
4
Develop decision matrix to aid in streamlining effort.
5
Propose streamlined approach to EPA.
6
Document streamlining efforts for inclusion in CMS Plan and CMS Report.
Go to Submodule 4-2-4, Developing the Objectives of the Corrective Measures Study.

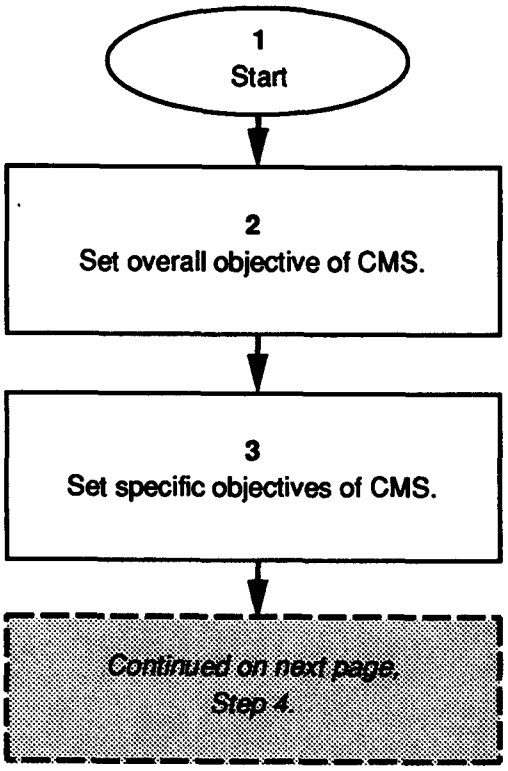
Step 4 Streamlining involves planning the CMS in such a way that as additional information is collected, that information is used to determine the next action to be taken.

The key to using a streamlined approach to the CMS is to first develop a decision matrix. This matrix should reflect the key decisions that must be made, list the specific information required to make those decisions, and list any critical evaluation factors, which, if not met, would eliminate a potential corrective measure from further consideration. Once this decision matrix is complete (or as complete as possible), analyze the matrix for critical points where, depending on the actual data collected, avenues of investigation can be eliminated or where specific decisions must be made. For example, if the SWMU contains deteriorating drums of the RCRA listed waste U055, 40 CFR §268 (the LDR) requires that the waste be treated by incineration or fuel substitution. This requirement limits the possible alternatives for the treatment of the waste, so other avenues of investigation can be eliminated early in the CMS process.

Step 5 Contact EPA and propose the use of a streamlined approach to conduct the CMS. When proposing the use of a streamlined approach to the CMS process, provide all supporting documentation (usually the findings in the RCRA Facility Investigation Report) to aid in the decision-making process.

Step 6 Prepare a document describing and justifying any streamlining of the CMS. This document will be used as part of the CMS plan and CMS report.

Submodule 4-2-4: Developing the Objectives of the Corrective Measures Study



Submodule 4-2-4: Developing the Objectives of the Corrective Measures Study

This submodule discusses the process of setting objectives for the Corrective Measures Study (CMS). Clearly defined objectives, both general and specific, provide not only an excellent planning tool, but also a means of evaluating the progress of the CMS.

Step 1 Start.

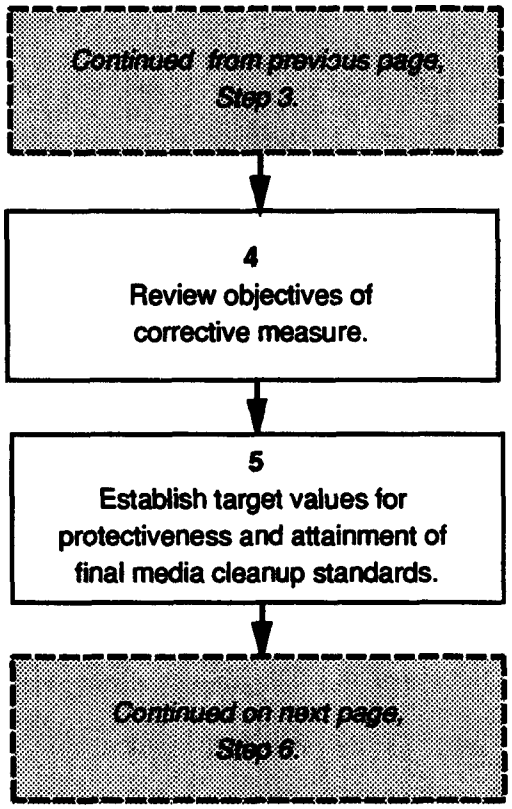
Step 2

The overall objective of the CMS is to provide an analysis of the alternatives for the corrective measure. This analysis will be used as the basis for selecting the final remedy (see Chapter 5).

Step 3

Achieving the overall CMS objective involves fulfilling a number of specific objectives. Establishing the objectives that lead to fulfilling the overall objective is a critical part of the planning process. These objectives not only provide direction to the rest of the planning process, they are also useful in assessing the progress of the CMS. Some examples of specific objectives for the CMS are:

- Ensuring that the draft CMS report provides all necessary information for the remedy selection process, and will require minimal revisions;
- Completion of the CMS within an established time frame;
- Minimizing delays in the CMS process; and
- Minimizing the effort expended studying alternatives which are impractical.


Continued from previous page,
Step 3.
4
Review objectives of
corrective measure.
5
Establish target values for
protectiveness and attainment of
final media cleanup standards.
Continued on next page,
Step 6.

Step 4 Evaluation of the alternatives for the corrective measure requires establishing target objectives to be achieved through implementation of the corrective measure. The proposed Subpart S rule sets four standards for a corrective measure (Proposed 40 CFR §264.525(a)). The corrective measure *must*:

- Be protective of human health and the environment;
- Attain final media cleanup standards (MCS);
- Provide source control to reduce or eliminate further releases of hazardous wastes or hazardous waste constituents that may pose a threat to human health and the environment; and
- Comply with the standards for management of wastes generated as part of conducting the corrective measure.

The remainder of this submodule discusses establishing definitive targets that will fulfill each of these standards.

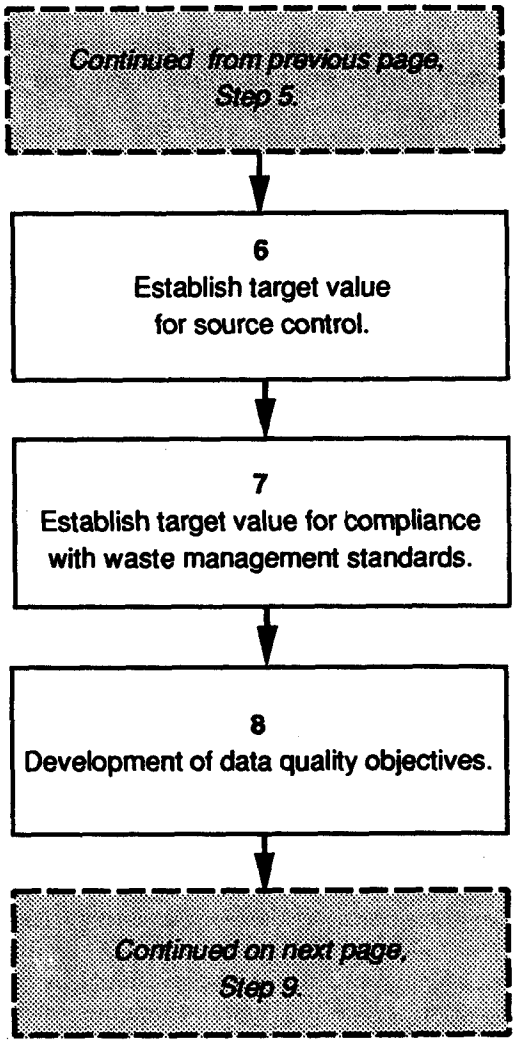
Step 5 The most important target values are those which provide for the protectiveness standard and the degree of attainment of final MCS. These two standards are closely linked. The MCS are media-specific health- and environmental-based contaminant concentrations which must be achieved by the corrective measure. The primary sources of MCS are promulgated standards deemed protective of human health and the environment (e.g., Maximum Contaminant Levels). When such standards do not exist, the corrective measure must achieve an adequate level of protection. For example, a lifetime risk from exposure to carcinogenic hazardous substances has been established within the range of one additional incidence of cancer in 10,000 persons to one additional cancer incidence per 1,000,000 persons. (Proposed 40 CFR §264.525(d))

While EPA is required to establish the final MCS during the remedy selection process, the development of a target MCS is a discretionary function. Further, these target MCS are in no way binding. Depending upon site-related factors, final MCS may be significantly different from the target MCS.

If EPA is unwilling to establish target MCS, the owner/operator should consider developing their own target MCS values for use during the evaluation process. Any target MCS developed by the owner/operator should use the methodology for establishing the final MCS (see Chapter 5) and should be technically valid. The owner/operator should recognize that such values are unlikely to be recognized by EPA, but provide the owner/operator a valuable tool in evaluating the alternatives.

Other definitive target values for the protectiveness standards might include:

- Engineered life span of the corrective measure;
- Acceptable risk arising from implementation; or
- Maximum acceptable time before the corrective measure shows beneficial results.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6
Establish target value for source control.
7
Establish target value for compliance with waste management standards.
8
Development of data quality objectives.
Continued on next page, Step 9.

Step 6 Establishing a target value for source control will provide a means for evaluating the source control standard. Ideally, the target value would be complete source control and prevention of any further releases from the SWMU. However, site conditions might make such a goal unattainable or unrealistic. In this case, the owner/operator should provide justification for selection of a lesser standard.

Step 7 The target value for compliance with the requirements of the waste management standard should be based upon compliance with all applicable solid and hazardous waste management standards. Any waivers of required waste management practices that may be authorized by EPA should also be considered.

Step 8 In addition to developing the overall, specific, and target objectives, development of data quality objectives (DQOs) may be required as part of planning the CMS. This function may be incorporated into, or borrow heavily from, the DQOs developed for the RFI. DQOs are used to ensure that all data collection efforts will provide sufficient data at a specified quality level to support the CMS. Developing DQOs includes preparation of a document outlining:

- Data collection strategy;
- Sample collection strategy;
- Standards for field measurements;
- Sample analysis; and
- Data management.

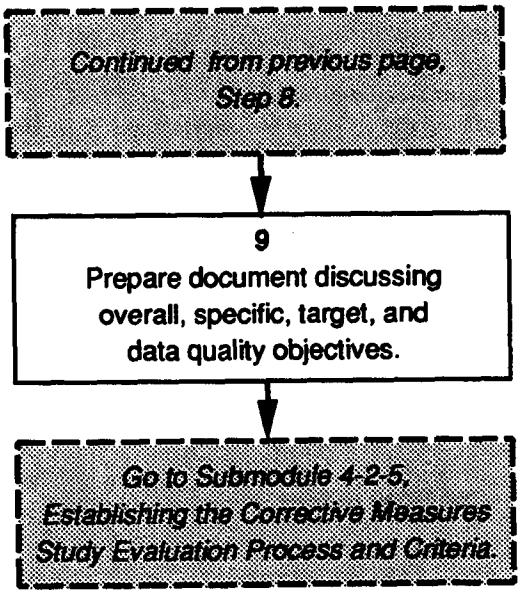
Detailed information on the development of DQOs can be found in these EPA documents:

RCRA Corrective Action Plan (Interim Final)
EPA Document No. EPA/530-SW-88-028
OSWER Directive 9902.3
June 1988

Data Quality Objectives for Remedial Response Activities
EPA Document EPA/540/G-87/003
OSWER Directive No. 9355.0-7B
1987

Interim Guidelines and Specification for Developing Quality Assurance Project Plans
EPA Document QAMS-005/80
1980

RCRA Facility Investigation (RFI) Guidance (Four-Volume Set) (Final)
EPA Document OSW:530/SW-89-031
OSWER Directive No. 9502.00-6C
1989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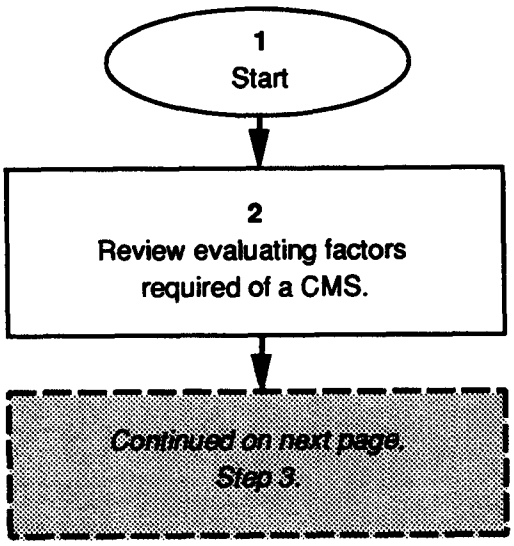
9
Prepare document discussing overall, specific, target, and data quality objectives.
Go to Submodule 4-2-5, Establishing the Corrective Measures Study Evaluation Process and Criteria.

Step 9 Prepare a document discussing the overall, specific, target, and data quality objectives of the CMS, and submit this document to EPA. This document will also be used as part of the CMS plan and the CMS final report.

Submodule 4-2-5: Establishing the Corrective Measures Study Evaluation Process and Criteria



Submodule 4-2-5: Establishing the Corrective Measures Study Evaluation Process and Criteria

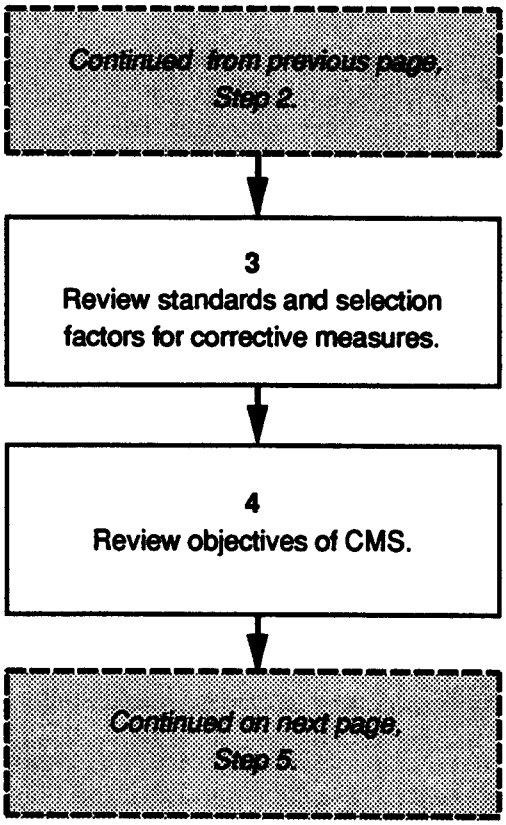
The Corrective Measures Study (CMS) provides the information for the selection of the corrective measure. An obvious requirement is for the CMS to provide information on each of the criteria used to select the corrective measure. This submodule discusses establishing the CMS evaluation process and criteria.

Step 1 Start.

Step 2

During a CMS each alternative corrective measure must be evaluated on the basis of five factors (Proposed 40 CFR §264.522(a)). These factors are:

- Evaluation of the performance reliability, ease of implementation, and potential impacts from each remedial alternative;
- Assessment of the effectiveness of each remedial alternative in achieving adequate source control;
- Assessment of the time required to begin and complete each remedial alternative;
- Estimation of the costs of each remedial alternative; and
- Assessment of institutional requirements (e.g., State, local, or public health regulations or permitting requirements) that might impact the implementation of each remedial alternative.


Continued from previous page, Step 2.
3
Review standards and selection factors for corrective measures.
4
Review objectives of CMS.
Continued on next page, Step 5.

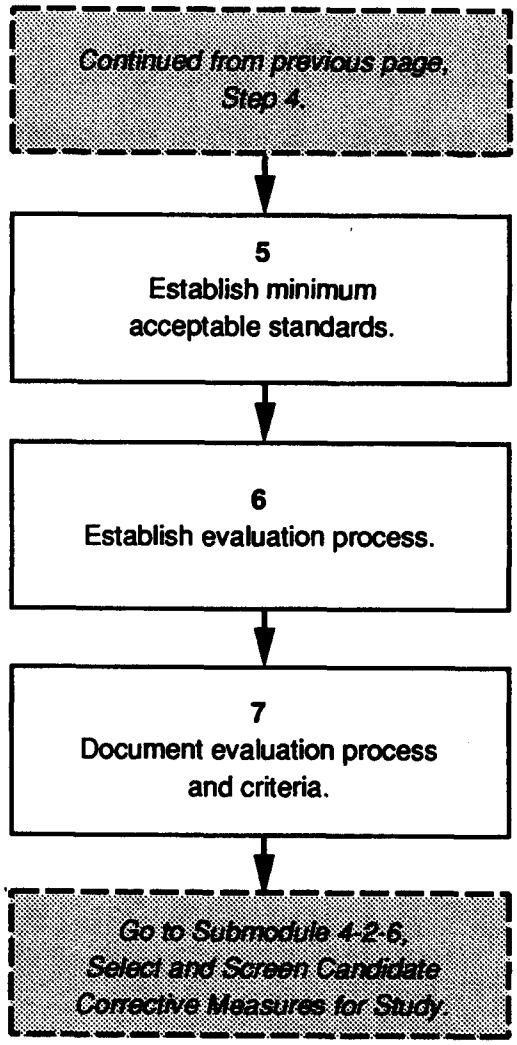
Step 3 With the CMS evaluation factors in mind, review the four standards and five selection factors used during the final selection of the corrective measure by EPA (Proposed 40 CFR §264.525(a) and (b)). Under the proposed Subpart S rule a corrective measure *must*:

- Provide protection of human health and the environment;
- Attain final media cleanup standards (MCS);
- Provide source control to reduce or eliminate further releases that may pose a threat to human health and the environment; and
- Comply with the standards for management of wastes generated during the corrective measure.

The factors used in selecting the final corrective measure are:

- Long-term reliability (greater than 30 years);
- Reduction of toxicity, mobility, and volume of the contaminants;
- Short-term effectiveness (the time until the implemented corrective measure results in a demonstrated reduction of risk to human health and the environment), including the risks associated with implementing the corrective measure;
- Ease of implementation and implementability; and
- Cost.

Step 4 Review the objectives set for the CMS. The most important CMS objectives are the target MCS established by EPA.


Continued from previous page, Step 4.
5
Establish minimum acceptable standards.
6
Establish evaluation process.
7
Document evaluation process and criteria.
Go to Submodule 4-2-6, Select and Screen Candidate Corrective Measures for Study.

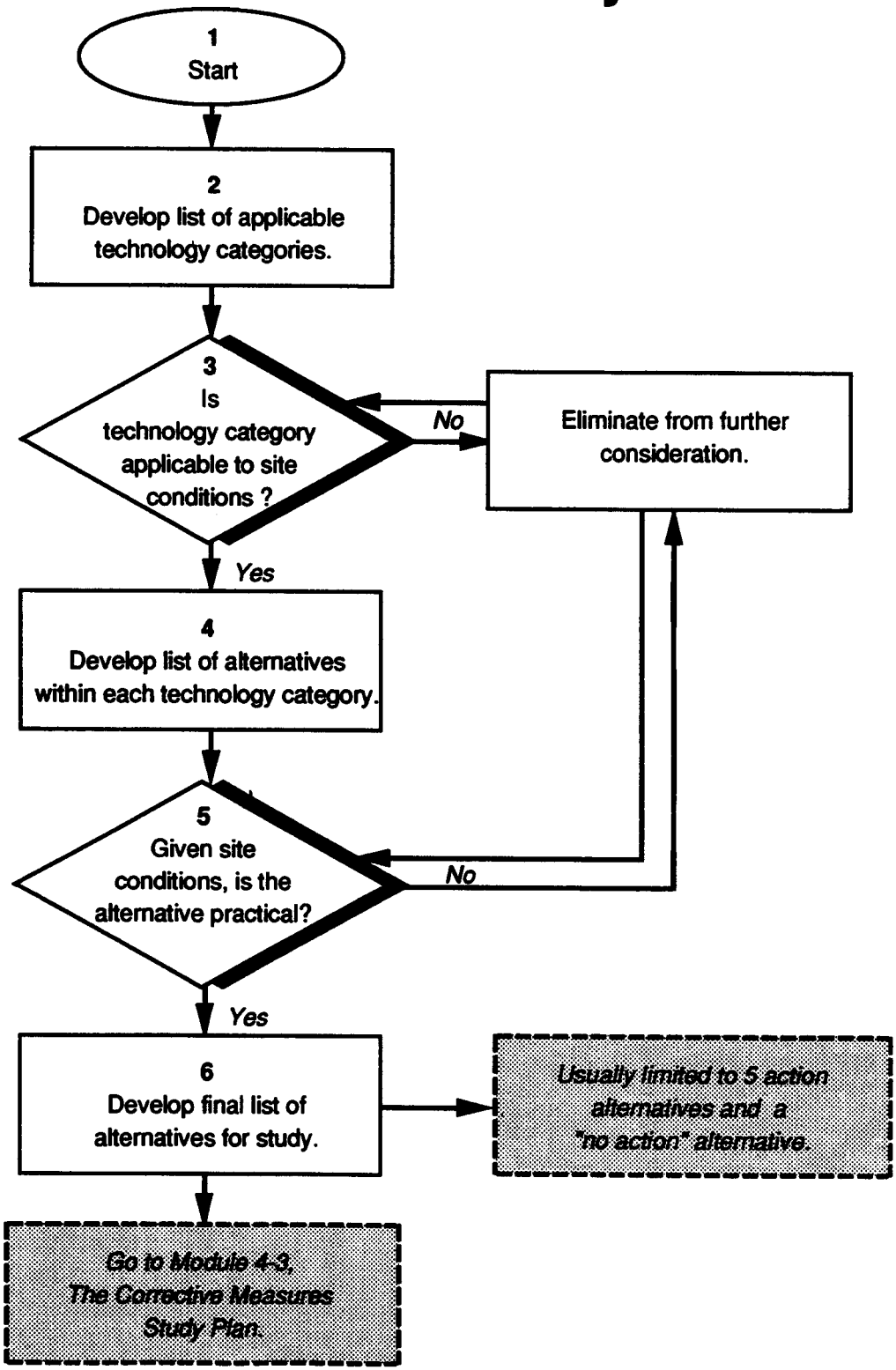
Step 5 With the CMS evaluation factors, standards for corrective measures, specific remedy selection factors, and objectives of the CMS in mind, establish a list of specific parameters that will be examined during the evaluation process. Where possible, establish a quantifiable minimum acceptable standard for each parameter. Some examples of specific parameters include:

- The effectiveness of the alternative in achieving target MCS;
- Useful life of the remedy;
- Demonstrated reliability of the alternative;
- The time required for mobilization and construction;
- Time until beneficial effects of the remedial alternative are demonstrated;
- The acceptable degree of risk to human health and the environment associated with implementing the remedy; and
- Fully loaded direct and indirect capital and operational costs.

Step 6 Establish the sequence for evaluation of each alternative. While the proposed Subpart S rule places equal weight on all the corrective measures standards and remedy selection factors, developing a sequence for the evaluation will provide a framework for conducting the evaluation and will aid in preparing the final CMS report.

Step 7 Prepare a document which discusses the evaluation process and criteria established for the CMS. This document will be incorporated into the CMS plan, and the CMS final report.

Submodule 4-2-6: Select and Screen Candidate Corrective Measures for Study



Submodule 4-2-6: Select and Screen Candidate Corrective Measures for Study

The final phase of planning the Corrective Measures Study (CMS) is to select and screen alternatives for the corrective measure.

Step 1 **Start.**

Step 2 With the information collected during the review of site information and the objectives developed for the CMS, prepare a list of the general types of remedial technology that may be appropriate to site conditions. This list may include technologies such as incineration, pump and treat systems, or capping.

It should be noted that some permits or orders, particularly those established prior to 1989, required the conduct of a Preliminary Evaluation of Corrective Measures Technologies (PECMT). This evaluation, generally required prior to the RFI, involved identifying candidate technologies so that baseline data needs to evaluate these technologies could be collected during the RFI. If a PECMT was required, it should be used as the starting point for this exercise.

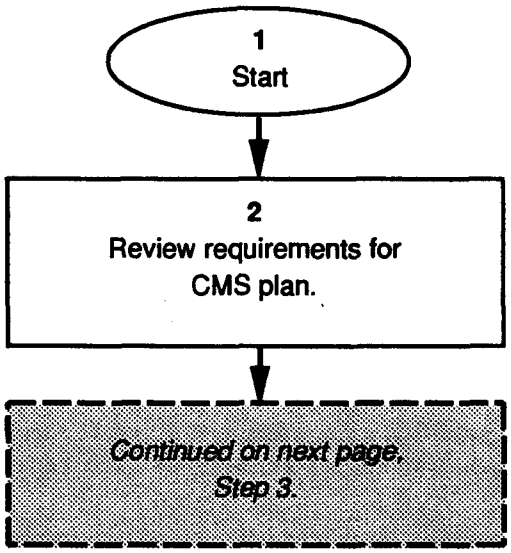
Step 3 Do not include any technology that obviously would not apply given the site conditions. For example, at a site with an air release, a pump and treat system for groundwater would be inappropriate to include in the list of remedial technologies.

Step 4 Develop a representative list of candidate remedies within each technology category. Review available information on each candidate corrective measure.

Step 5 Eliminate from consideration any candidate which is impractical due to site or other conditions. For example, a candidate remedy that has been shown to be effective only in small-scale applications should not be considered for a large-scale corrective measure.

Step 6 Prepare the final list of candidate remedies that will be evaluated in the CMS. This list should generally contain no more than five action alternatives, and should also contain a "no action" alternative. The "no action" alternative is used as a baseline to compare the other alternatives. An alternative which only reduce exposure (i.e., a fence) should not be considered a "no action" alternative. Such an action should be considered as a separate, limited-action alternative.

Module 4-3: The Corrective Measures Study Plan



Module 4-3: The Corrective Measures Study Plan

The Corrective Measures Study (CMS) plan is the principal document used during the conduct of the CMS. The CMS plan should incorporate all the information required for conducting the CMS, and should act as a key reference if questions or problems arise during the CMS. This module is devoted to discussing the CMS plan.

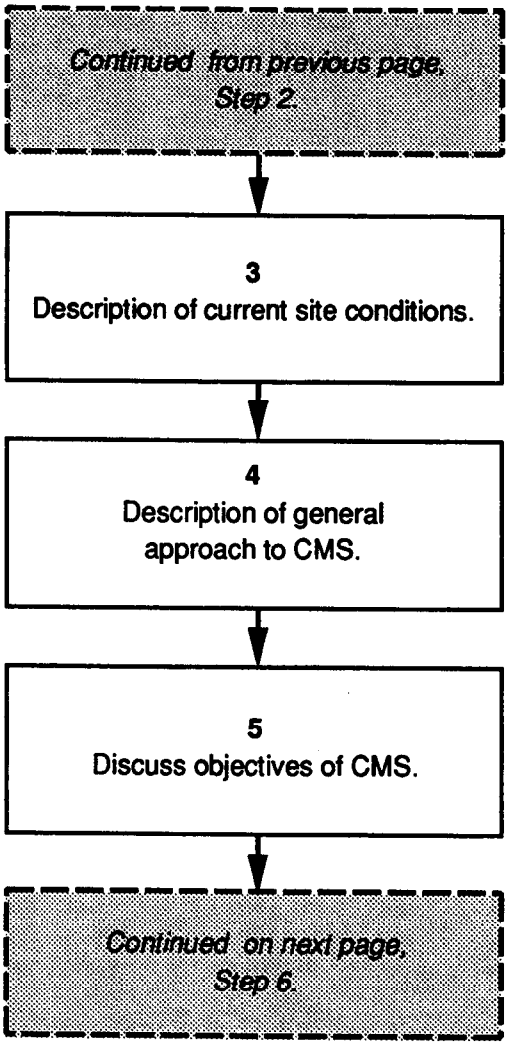
Step 1 Start.

Step 2

The requirements for the CMS plan are specified in proposed 40 CFR §264.523 and are discussed at 55 FR 30821 - 30823. According to these sections of the preamble and the proposed rule, the CMS plan should include discussion of the following elements:

- Current conditions at the site;
- The general approach to investigating and evaluating potential remedial alternatives (e.g., use of a phased remedy, streamlined approach);
- Description of the objectives of the CMS;
- A proposed schedule for the CMS;
- Identification of the alternatives for the corrective measure;
- The evaluation process and evaluation criteria for each alternative (including target media cleanup standards (MCS)); and
- The format for presentation of the findings of the CMS.

Each element will be discussed in additional detail in this module. It should be noted that parts of the CMS plan discussed below may be described in other documents that have already been prepared as part of the CMS effort. If so, the plan discussed in this section should incorporate, either directly or by reference, these documents.


Continued from previous page, Step 2.
3
Description of current site conditions.
4
Description of general approach to CMS.
5
Discuss objectives of CMS.
Continued on next page, Step 6.

Step 3 The description of the current site conditions should include a summary of information on:

- Environmental setting of the site, including appropriate information on:
  - Hydrogeology;
  - Soils;
  - Surface water;
  - Air quality and meteorological information;
- The affected media and extent of the contamination;
- Waste characteristics, including:
  - Identification of all contaminants found at the site;
  - Action levels for each contaminant found at the site;
  - The target MCS for each contaminant;
  - Important chemical and physical properties of each contaminant;
  - Health- or environment-based toxicological information (e.g., RfD, carcinogenic potential);
  - Waste quantity; and
- Potential receptors.

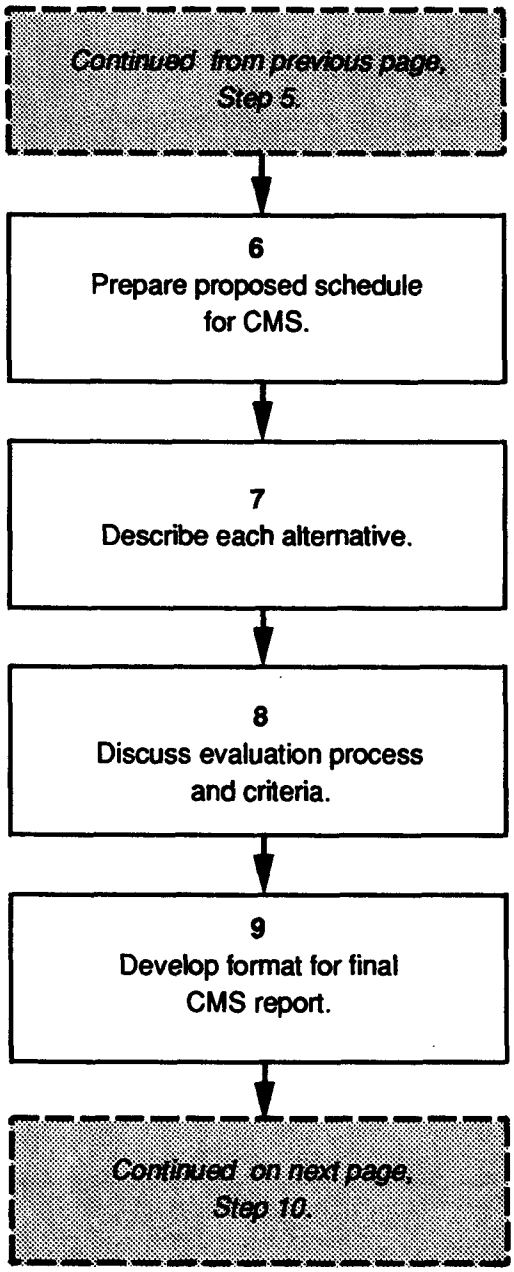
Step 4 The description of the general approach should include appropriate information on:

- Establishment of corrective action management units (CAMUs);
- Phasing of the corrective measure (including any conditions placed on phasing);
- Justification for a streamlined approach to the CMS; and
- Any required integration with other laws. (55 FR 30821-30823)

Step 5 The discussion of the objectives of the CMS should incorporate all objectives of the CMS which were developed during the CMS planning process. Included should be statements outlining the:

- Overall objectives of the CMS;
- Specific objectives of the CMS;
- Target objectives for the corrective measure; and
- Data quality objectives for any treatability studies conducted during the CMS.

This discussion should also include information on how these objectives will be used to direct and evaluate the progress of the CMS. (55 FR 30821-30823)


Continued from previous page, Step 5.
6
Prepare proposed schedule for CMS.
7
Describe each alternative.
8
Discuss evaluation process and criteria.
9
Develop format for final CMS report.
Continued on next page, Step 10.

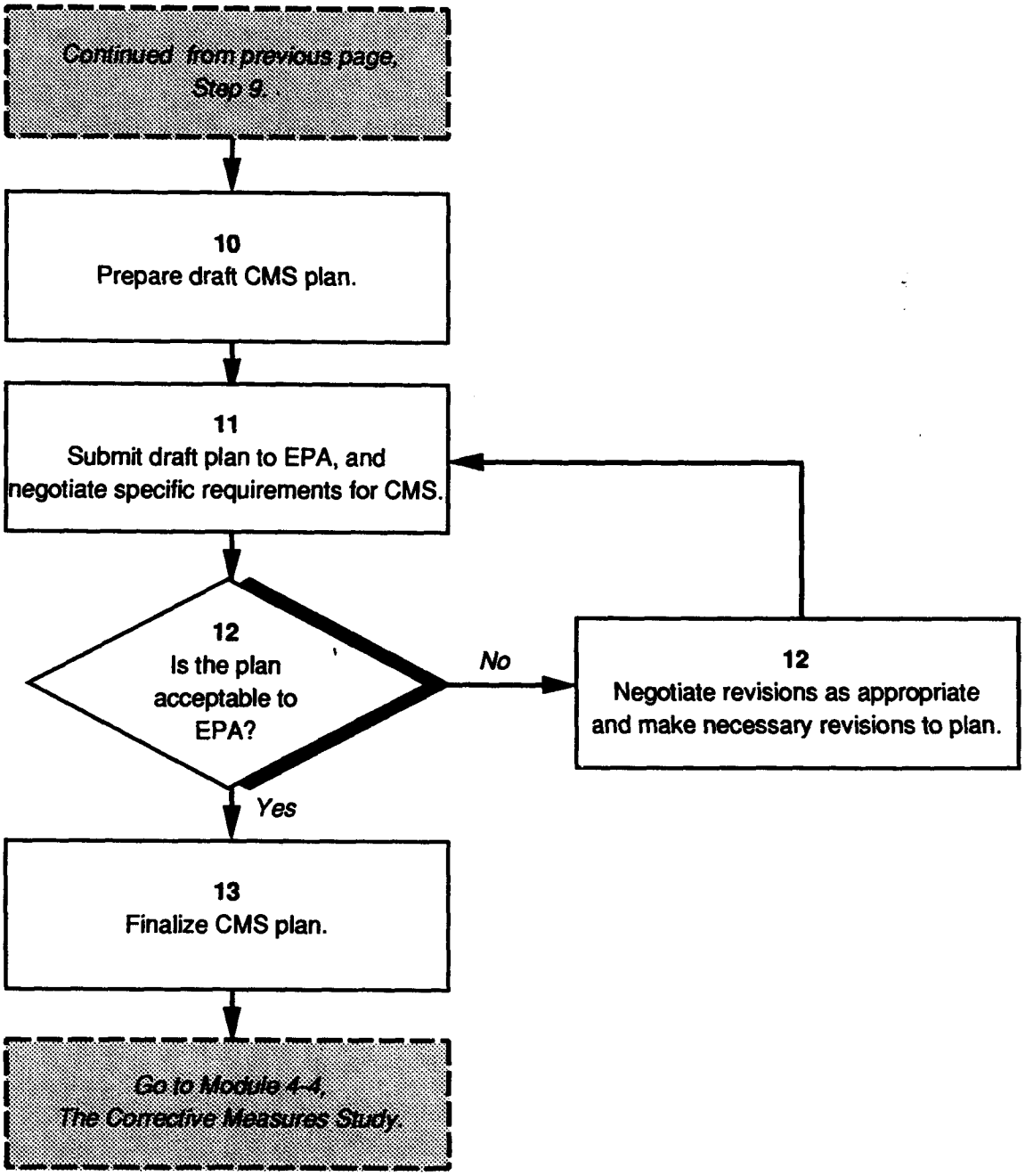
Step 6 The proposed schedule for conducting the CMS should include references to major milestones (e.g., completion of treatability testing, the draft CMS report). The proposed schedule should also reflect any other operations undertaken concurrently at the same solid waste management unit (SWMU). For example, if parts of the RCRA Facility Investigation (RFI) and CMS are being conducted concurrently, the proposed schedule should include reference to the major milestones of the RFI. Because the schedule will become a part of the facility permit, the schedule should be developed to be as flexible as possible. (55 FR 30821-30823)

Step 7 The CMS plan must include a brief discussion of each of the alternatives under consideration. The discussion of each alternative should include:

- How the alternative works;
- Results from previous usage under similar site conditions;
- Anticipated limitations of the alternative; and
- An estimate of the time needed to implement the alternative. (55 FR 30821-30823)

Step 8 The plan should discuss the CMS evaluation process established in the proposed Subpart S rule as well as the facility-specific evaluation process and criteria developed during the planning process. (55 FR 30821-30823)

Step 9 Inclusion of the format for presenting the results of the CMS is not mandatory, but may be required by EPA. EPA also has the authority to specify a format for the final CMS report. If EPA does not require a standardized report format, the owner/operator should develop a standardized format for the CMS report. A standardized report format simplifies developing reports, and offers a degree of consistency between reports developed for different sites. (55 FR 30821-30823)


Continued from previous page, Step 9.
10
Prepare draft CMS plan.
11
Submit draft plan to EPA, and negotiate specific requirements for CMS.
12
Is the plan acceptable to EPA?
No
12
Negotiate revisions as appropriate and make necessary revisions to plan.
Yes
13
Finalize CMS plan.
Go to Module 4-4, The Corrective Measures Study.

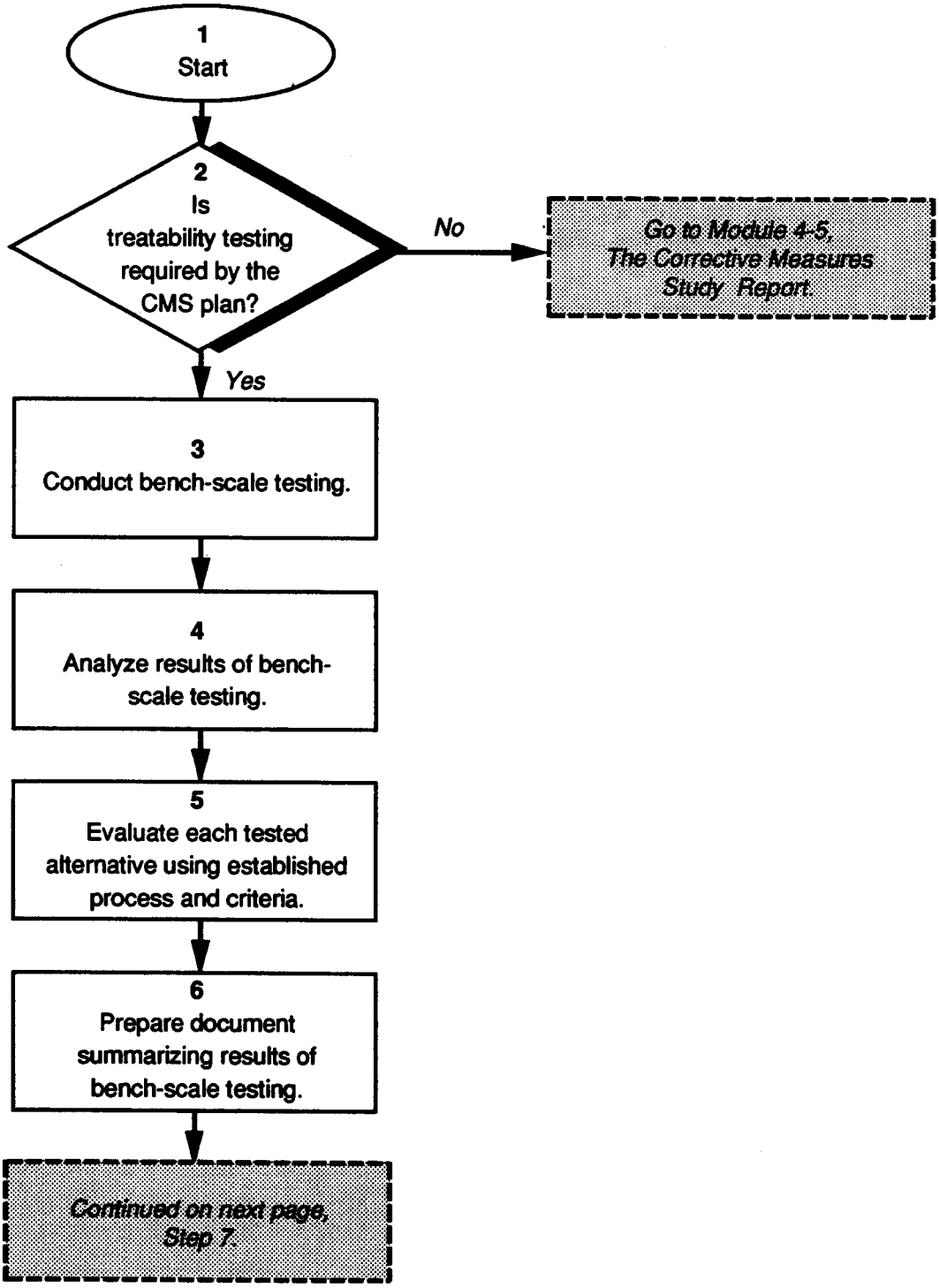
Step 10 Prepare the draft CMS plan.

Step 11 Submit the draft CMS plan to EPA for review. The draft plan represents DOE's opportunity to negotiate on certain conditions. Although the plan should be developed to comply with the requirements under the RCRA Corrective Action program, the plan should propose only those activities which are necessary to the selection of an appropriate corrective measure.

Step 12 If EPA requires revisions, revise and resubmit the draft plan to EPA. This activity may require meetings with EPA and negotiation on certain points. For example, the extent of any treatability testing should be limited to that which is required to evaluate the technology. The DOE should try to avoid requirements to conduct original or theoretical research during the evaluation of corrective measures technologies.

Step 13 Adopt the final, EPA-approved plan, and incorporate the plan into the facility permit.

Module 4-4: The Corrective Measures Study



Module 4-4: The Corrective Measures Study

Once the planning process and the Corrective Measures Study (CMS) plan are completed, conducting the actual testing of each alternative is largely a matter of implementing the plan. However, it is during this process that the important task of eliminating inappropriate remedies occurs. This module addresses the actual conduct of the CMS.

Step 1 **Start.**

Step 2 Determine if treatability studies are required by the CMS Plan (see 55 FR 30822).

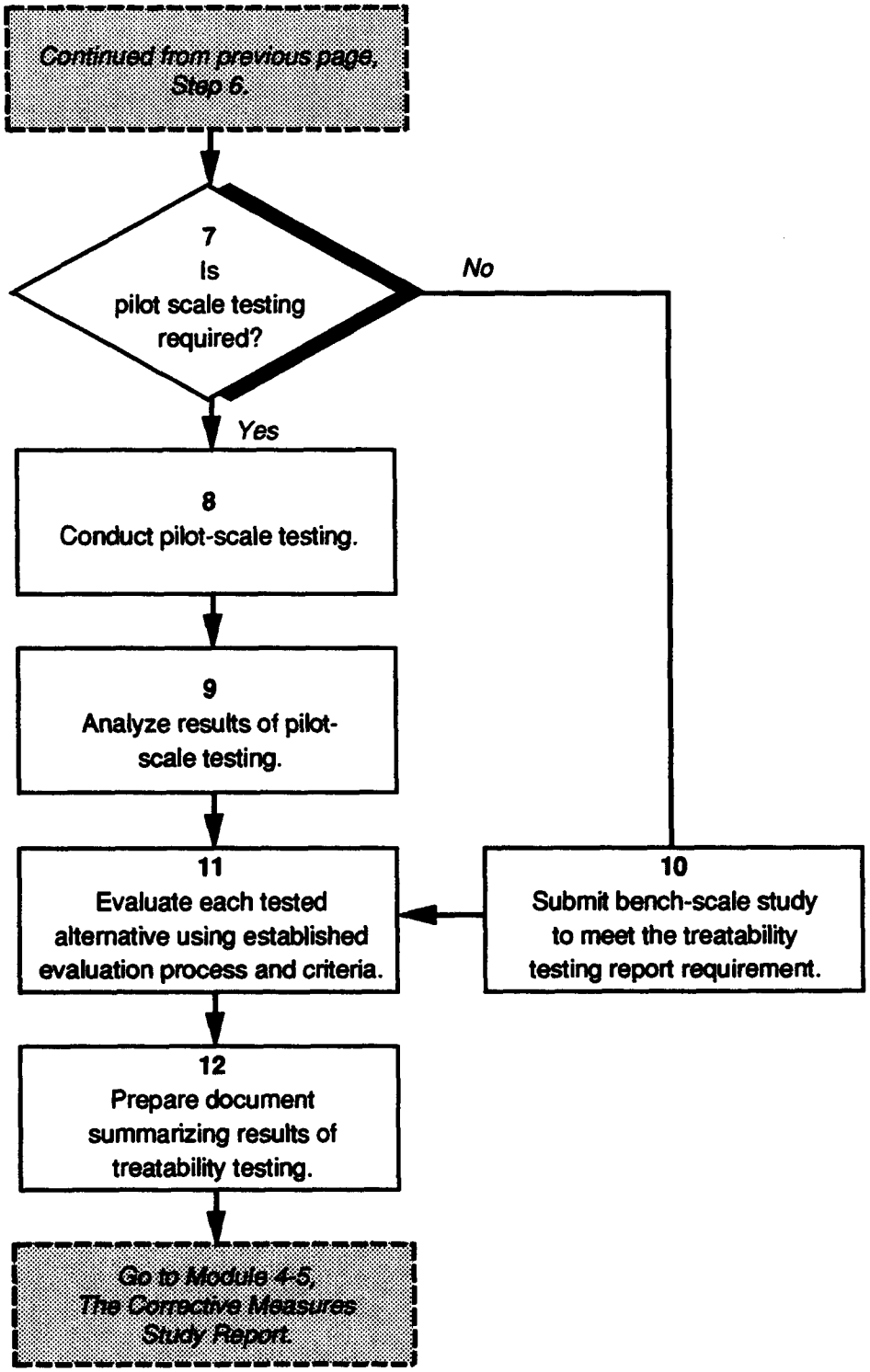
Step 3 For each alternative, conduct any bench-scale treatability testing that is required by the CMS plan.

This first phase of treatability testing as part of the CMS is usually performed in a laboratory. Bench-scale testing involves conducting a series of treatability tests with different parameters on small quantities of contaminated material. Analysis of the results of these small-scale tests permits evaluation and optimization of the operational parameters of the alternative quickly and at a relatively low cost.

Step 4 Analyze the results from the bench-scale testing, and summarize these results.

Step 5 Evaluate each alternative using the evaluation process and criteria discussed in the CMS plan. Eliminate from further consideration those alternatives which demonstrate obvious impracticality at this scale of testing.

Step 6 Prepare a document summarizing the findings of the bench-scale treatability tests and evaluation of the alternatives. This document will be used in developing the CMS report.


Continued from previous page, Step 6.
7
Is pilot scale testing required?
No
Yes
8
Conduct pilot-scale testing.
9
Analyze results of pilot-scale testing.
11
Evaluate each tested alternative using established evaluation process and criteria.
10
Submit bench-scale study to meet the treatability testing report requirement.
12
Prepare document summarizing results of treatability testing.
Go to Module 4-5, The Corrective Measures Study Report.

Step 7 For each alternative that remains following bench-scale testing, evaluate the need for pilot-scale testing.

Step 8 Conduct any required pilot-scale treatability testing. Pilot-scale treatability testing involves building a scaled-down version of a treatment technology. Pilot-scale testing should simulate full scale operations and usually permits only limited variance of operational parameters. The results of a pilot-scale test allow assessment of the overall effectiveness and practicality of a remedial technology.

Step 9 Analyze the results of the pilot-scale testing to determine:

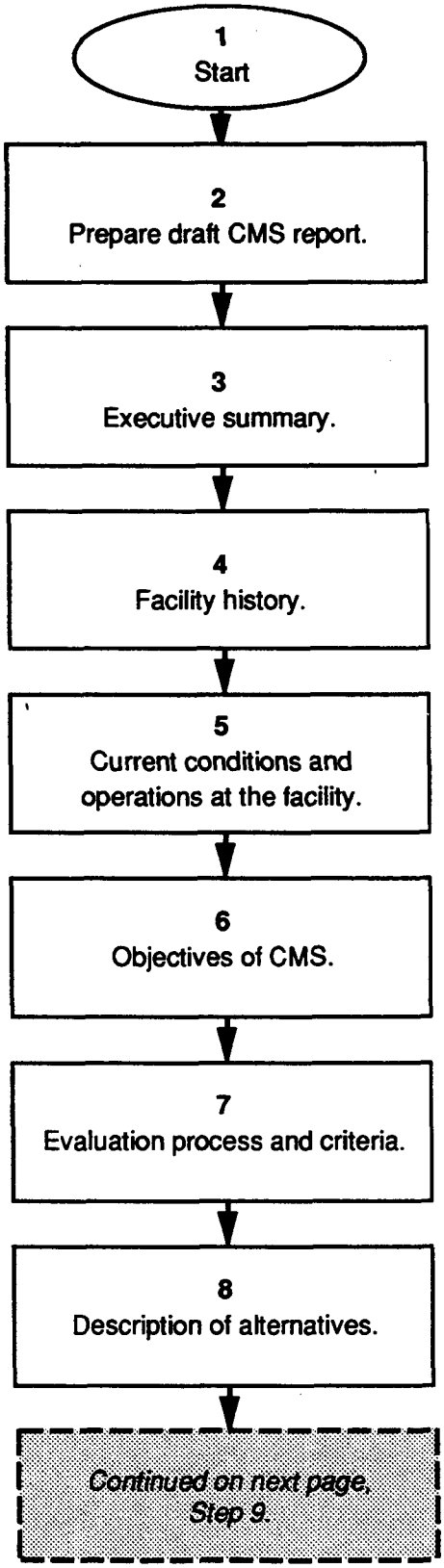
- The effectiveness of the corrective measure in reducing the toxicity, mobility, and volume of the waste;
- The maximum rate of operation or the expected rate of reduction of the contamination; and
- The optimal operating parameters.

Step 10 Submit the bench-scale testing document required in Step 6 to meet any requirements for treatability testing reporting.

Step 11 Evaluate each alternative using the evaluation process and criteria discussed in the CMS plan. Eliminate from consideration those alternatives that are impractical or unreliable.

Step 12 Prepare a document summarizing the findings of the bench- and pilot-scale treatability tests and evaluation of each alternative. This document will be used in developing the CMS report.

Module 4-5: The Corrective Measures Study Report



Module 4-5: The Corrective Measures Study Report

The Corrective Measures Study (CMS) Report is the principal document used during the selection of the corrective measure. All activities and effort expended in the CMS process to this point have been aimed at developing this report. The CMS report should incorporate or summarize all the information collected during the CMS. In many cases, the information required in the CMS report is included in documents prepared as part of other CMS activities, and should incorporate these documents, either directly or by reference.

Step 1 **Start.**

Step 2 From the information collected during the review of investigations, the final CMS plan, the results of any treatability studies, and the analysis of the alternative corrective measures, prepare a draft CMS report. The CMS report must include the following items. (Proposed 40 CFR §264.524)

Step 3 An executive summary highlighting the important findings of the CMS and identifying the preferred alternative for the corrective measure.

Step 4 A brief discussion of the site history based upon the documents reviewed during the planning process.

Step 5 A brief discussion of the current conditions and operations at the site, including reference to other investigations or remedial activities occurring at the site.

Step 6 A discussion of the objectives set for the CMS during the planning process, in particular any target media cleanup standards that were developed.

Step 7 A brief discussion of the process and criteria used to evaluate the alternatives.

Step 8 Identification and a brief description of each alternative corrective measure studied during the CMS.

Continued from previous page, Step 8.

9
Results of bench- or pilot-scale testing.

10
Effectiveness of alternatives.

11
Useful life of alternative.

12
Reliability and flexibility of alternative.

13
Complexity of operation and required maintenance.

14
Implementation.

15
Long- and short-term effectiveness.

Continued on next page, Step 16.

Step 9 A description and summary of any bench- or pilot-scale testing performed.

Step 10 An assessment of the effectiveness of the alternative, in terms of the ability of the alternative to perform the intended function.

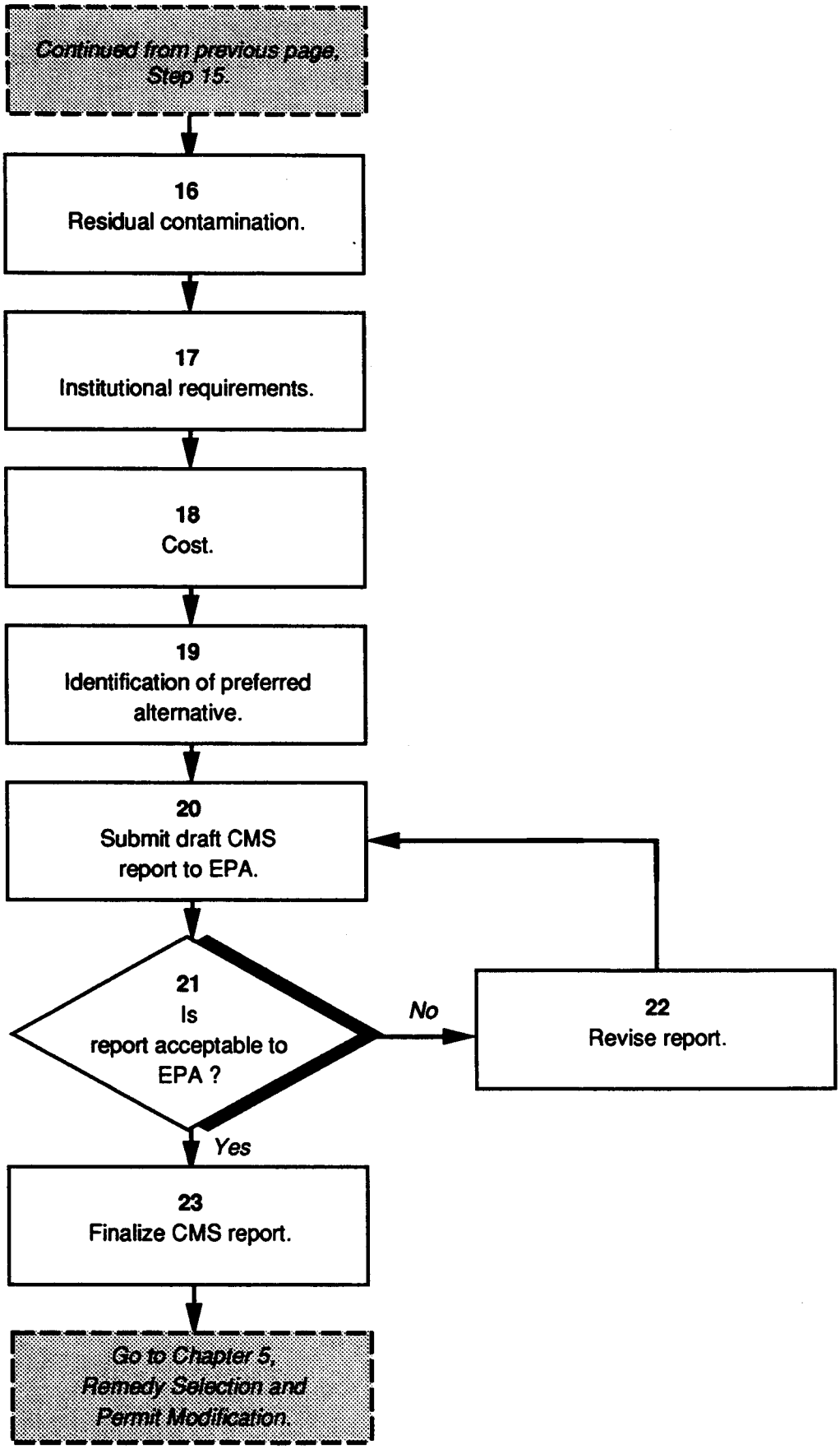
Step 11 An estimate of the useful life of the remedy, including a discussion of any replacement or repair which might be needed.

Step 12 A discussion of the demonstrated reliability and flexibility of the remedy operating under actual site or similar conditions.

Step 13 A discussion of the complexity of the operation of, and maintenance required by, the remedy.

Step 14 A description of the implementability and an estimate of the time required for implementation of each potential remedy, including a discussion of any potential obstacles to implementation and the time until beneficial results are seen.

Step 15 A discussion of the long- and short-term effectiveness of each potential remedy including discussion of any potential risks to human health and the environment associated with the remedy and possible means to mitigate these risks.


Continued from previous page, Step 15.
16
Residual contamination.
17
Institutional requirements.
18
Cost.
19
Identification of preferred alternative.
20
Submit draft CMS report to EPA.
21
Is report acceptable to EPA ?
No
22
Revise report.
Yes
23
Finalize CMS report.
Go to Chapter 5, Remedy Selection and Permit Modification.

Step 16 An estimate of any residual contamination at the site following completion of the corrective measure; and the potential for, and risks associated with, human exposure to residual contamination.

Step 17 A listing of all institutional requirements for the alternative (e.g., permits, public health standards).

Step 18 The estimated total cost of each remedy including a breakdown of the fully loaded direct and indirect capital and operation costs for the life of the corrective measure.

Step 19 Identification and justification of the owner/operator's preferred corrective measure.

Step 20 Submit the draft report to EPA for review and approval.

Step 21 Upon review of the draft CMS report, EPA may require the owner/operator to conduct analyses of additional alternatives. EPA may also require the owner/operator to expand upon the investigation of an alternative already evaluated during the CMS. If the report has been returned by EPA for additional work, conduct any additional investigations, revise, and resubmit the report to EPA for review and approval.

Step 22 Once accepted, the final CMS report will be used by EPA as the basis for the final selection of the corrective measure at the site. The final remedy selection process is discussed in the next chapter.

Step 23 Finalize the CMS report. Proceed to the next phase of corrective action, selection of the corrective measure and permit modification (discussed in Chapter 5).

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References

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The Resource Conservation and Recovery Act (RCRA)
(as amended by the Hazardous and Solid Waste Amendments (HSWA))
42 U.S.C. §6901 et seq.

Chapter 5

Remedy Selection and Permit Modification

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

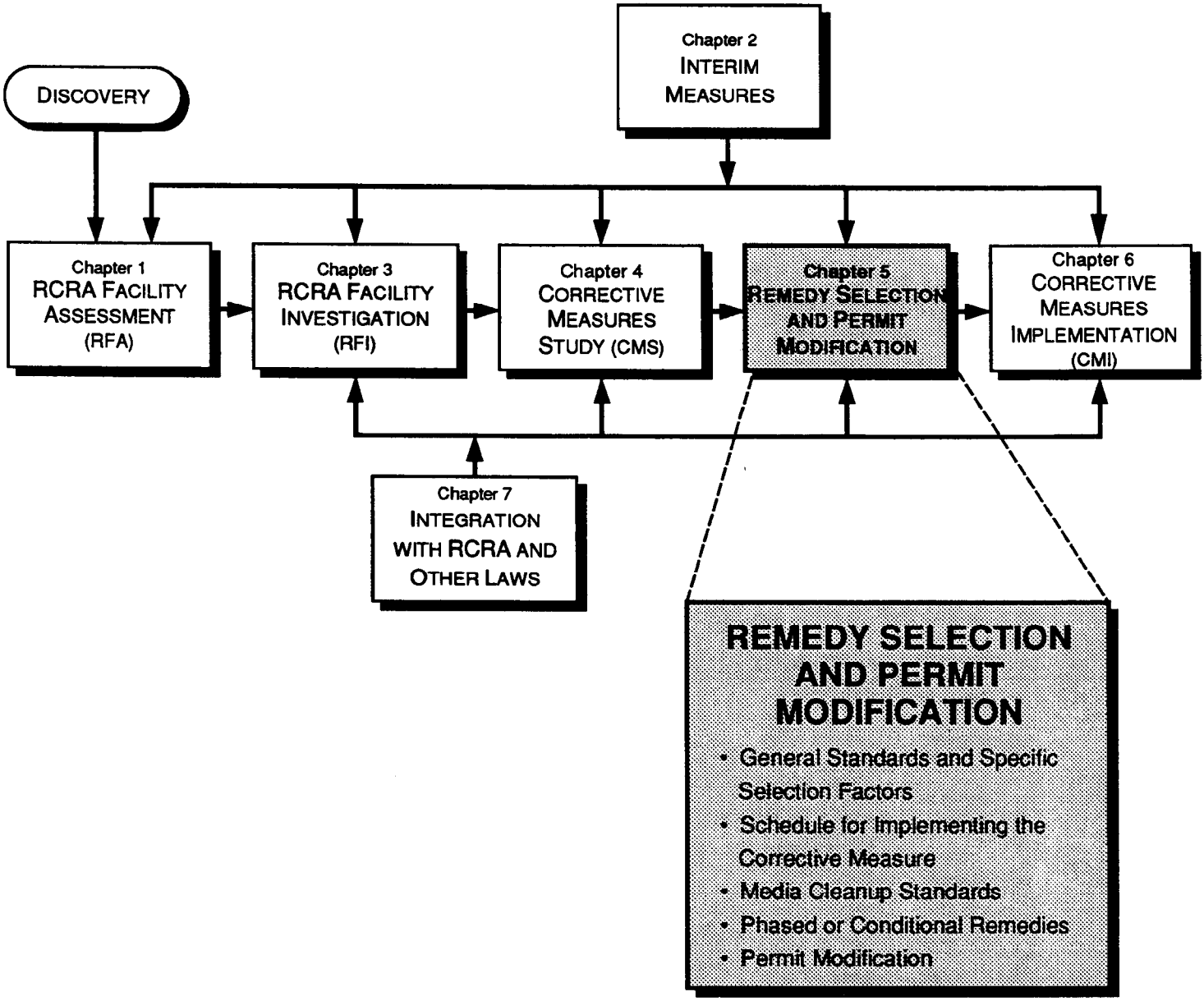
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

This chapter addresses two areas of the RCRA Corrective Action process, selection of the corrective measure and the process for modifying the facility permit to require implementation of that corrective measure.

Section 264.525 of the proposed Subpart S rule establishes the evaluation factors for selecting a corrective measure to address environmental contamination resulting from a release of hazardous wastes or hazardous waste constituents from a solid waste management unit (SWMU). This section also establishes the process for developing media cleanup standards (MCS). Section 264.526 establishes the requirements for the permit modification compelling implementation of the corrective measure.

Under the proposed Subpart S rule, the selection of the corrective measure is solely the responsibility of EPA and is accomplished through the permit modification process. Input from DOE occurs through the conclusions of the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) reports as well as through negotiation, discussion, and use of the opportunities for public comment during the permit modification process. In this way the selection of a corrective measure, which is an EPA-led effort, differs from other components of the RCRA Corrective Action process where the owner/operator was the lead agency.

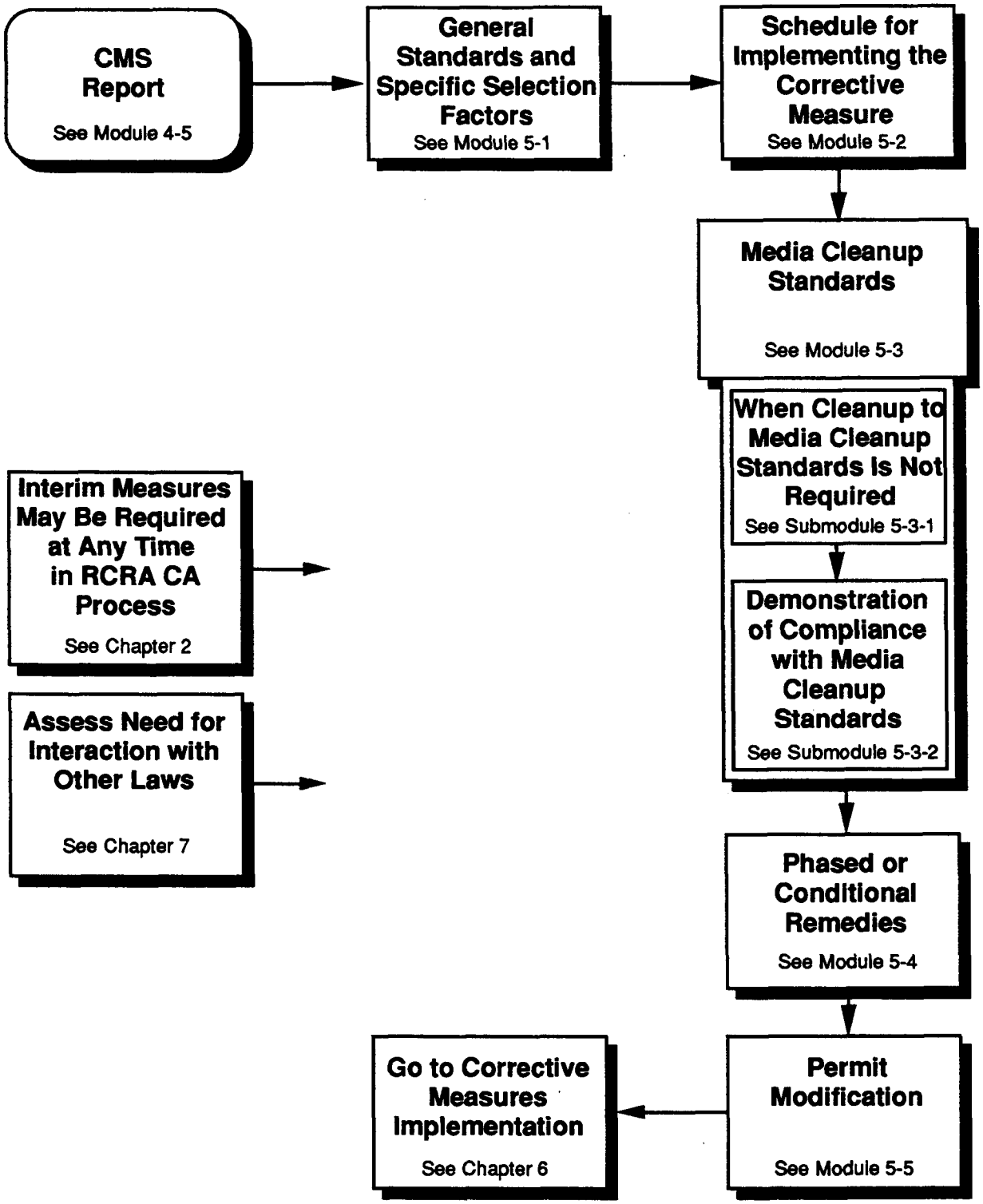
Many areas of the proposed Subpart S rule are not clear in meaning or scope. In these areas, the meaning of the language of the proposed rule has been interpreted on the basis of "best professional judgment." It should also be noted that the presentation sequence for the guidance that follows does not exactly match the sequence presented in the proposed rule, and the guidance is not intended as a rigid structure. For any number of reasons, the corrective measures selection and permit modification process may vary from the sequence as presented.

Throughout this chapter, there are references to EPA. For the sake of clarity this term includes those States with appropriate RCRA authorization.

The following modules of this chapter provide a detailed discussion of the remedy selection and permit modification process outlined in the graphic on the next page.

Module 5-1 General Standards and Specific Selection Factors

The Corrective Measures Study (CMS) process, discussed in Chapter 4 of this document, provided a detailed evaluation of several alternatives for the corrective measure. The bases for this analysis are the general performance standards and specific decision factors for selecting the corrective measure for the SWMU or corrective action management unit (CAMU). The general performance standards state that a corrective measure must:



Chapter Five: Remedy Selection and Permit Modification

- Provide protection of human health and the environment;
- Attain final media cleanup standards (MCS);
- Provide source control to reduce or eliminate further releases that may pose a threat to human health and the environment; and
- Comply with the standards for management of wastes generated during the corrective measure.

The specific decision factors used in selecting the final corrective measure are:

- Long-term reliability and effectiveness;
- Reduction of toxicity, mobility, and volume of the contaminants;
- Short-term effectiveness, including the risks associated with implementing the corrective measure;
- Implementability; and
- Cost.

Module 5-2 Schedule for Implementing the Corrective Measure

Under the proposed Subpart S rule, EPA specifies the schedule for implementing the corrective measure. The schedule is determined as part of the corrective measures selection process. The owner/operator of the facility has the opportunity to influence schedule development through the conclusions of the RFI and CMS reports, through negotiation and discussion with EPA, through use of the public comment period, and through the A-11 and A-106 budget documents.[9]

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[9] The A-11 and A-106 budget documents are prepared by each Federal agency as part of the budget request process. The A-11 report is forwarded to the Office of Management and Budget (OMB), and the A-106 document is forwarded to OMB through the EPA. EPA Regions review the A-106 and supply OMB and DOE with comments regarding pollution abatement projects. Funding for environmental compliance or cleanup projects is requested by a Federal agency through these mechanisms. If the funding request is denied by OMB, the agency will not receive funds to specifically conduct those activities. For additional information, consult the EPA document titled *The Federal Facilities Compliance Manual.*

In developing the schedule, EPA considers several factors, including:

- The extent and nature of the contamination;
- The capabilities of the alternatives for the corrective measure to achieve MCS and other objectives (e.g., source control, compliance with applicable waste management requirements) of the RCRA Corrective Action program;
- The availability of treatment or disposal capacity for wastes resulting from implementation of the corrective measure;
- The desirability of using an emerging technology;
- The risk posed to the surrounding area arising from exposure before implementation and completion of the corrective measure; and
- Other factors that EPA may consider pertinent.

In developing the schedule, EPA also evaluates the potential benefits of a phased implementation of the corrective measure. A phased corrective measure consists of any logically connected series of actions performed sequentially at the same SWMU or simultaneously or sequentially at different SWMUs within the facility.[10] A phased corrective measure is most likely to be selected when a single action is incapable of remediating all the SWMUs within a facility.

The final schedule issued by EPA becomes an enforceable part of the permit for the facility. If problems arise with maintaining compliance with the schedule, the proposed rule requires the owner/operator to seek a schedule modification (a minor permit modification) before becoming non-compliant. During development of the schedule, DOE should request inclusion of provisions allowing flexibility in the schedule. Adequate flexibility should minimize the number of modifications to the schedule.

Module 5-3 Media Cleanup Standards

Media cleanup standards (MCS) are media-specific concentrations of hazardous waste constituents which are determined by EPA to be protective of human health and the

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[10] Phased corrective measures are similar to operable units under CERCLA. Both represent a series of simultaneous or sequential actions at a single unit or several units that leads ultimately to the remediation of contamination at the entire facility. If there is a requirement for compliance with both RCRA and CERCLA, the owner/operator should determine if the unit is part of an operable unit defined under CERCLA. If so, the owner/operator should propose phasing the corrective measure using the same criteria and schedule that apply to the CERCLA units.

environment. Reduction of the concentration of hazardous waste constituents at the point of compliance to the MCS is the primary objective of the implemented corrective measure.

The final MCS are different from action levels and target MCS. Action levels are media-specific contaminant concentrations determined by EPA to be protective of human health and the environment, but are not cleanup goals. Rather, action levels serve as the triggering mechanism for a CMS. If, during the RFI, sampling determines that the concentration of hazardous waste constituents exceeds an action level, a CMS is usually required at that SWMU. Target MCS are preliminary cleanup goals established during the CMS to provide a benchmark for evaluating the effectiveness of the alternatives for the corrective measure. Target MCS and action levels can differ significantly from the final MCS established for the corrective measure.

Developing the MCS is a two-step process. The first step establishes the MCS based upon the risk to human health. This protectiveness standard sets the range for an acceptable risk from exposure to carcinogenic compounds at an excess lifetime cancer risk of 1 additional case of cancer in 10,000 persons to 1 additional incidence of cancer in 1,000,000 persons. The standard for systemic toxins is that concentration to which human populations (including sensitive subgroups) can be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime of exposure. The second step of setting the MCS involves adjusting the MCS to be more or less stringent based on other factors, including:

- The effects of exposure to multiple contaminants;
- The impact to environmental receptors;
- The cumulative risk arising from other exposures not directly related to the release; and
- The effectiveness, practicality, reliability, and other factors related to the alternatives for the corrective measure and the ability of the corrective measure to achieve the MCS.

Submodule 5-3-1 When Cleanup to Media Cleanup Standards Is Not Required

Under the proposed Subpart S rule, under certain conditions the owner/operator may not be required to clean up a release to MCS levels. These conditions include:

- No or minimal threat of exposure to the release from a SWMU exists;
- Implementation of a corrective measure will not significantly reduce any risk to human health and the environment; and
- The cleanup of a release is technically impractical.

The owner/operator is responsible for developing the evidence to support any request to waive the cleanup requirements. The owner/operator should carefully assess the cost of, and potential for, successfully supporting such an assertion. Such an evaluation may prove the benefits are outweighed by the cost of developing the supporting documentation. Further, the EPA retains the authority to require source controls or other measures to limit further releases or release migration from the SWMU.

Submodule 5-3-2 Demonstration of Compliance with Media Cleanup Standards

The EPA specifies the requirements for demonstrating compliance with MCS in the facility permit. These requirements include:

- Establishing the points where the owner/operator demonstrates compliance for each environmental media (known as the point of compliance (POC));
- The acceptable sampling, analytical, and statistical methods; and
- The period over which the facility will demonstrate compliance.

Ending the requirement for conducting a RCRA Corrective Action at the facility hinges upon the demonstration of compliance with the MCS established in the facility permit. Therefore, developing the requirements for demonstration of compliance requires close scrutiny by the facility, and if necessary, negotiation.

Module 5-4 Phased or Conditional Remedies

In the preamble to the proposed Subpart S rule, EPA states that conditional remedies are expected to be common at Federal facilities, due to the large number of SWMUs at most Federal facilities, technical limitations such as the availability of treatment technology, and the unique constraints of the Federal budget process. Adoption of a conditional remedy allows the owner/operator to phase-in a corrective measure over a specified period, providing certain conditions are met during implementation.[11] Under the proposed Subpart S rule a conditional remedy *must*:

- Be protective of human health and the environment;
- Achieve all MCS beyond the facility boundary, as soon as is practical;
- Prevent further significant environmental degradation by using treatment or engineering controls at the source, and use engineered measures to prevent further migration of the release within the facility boundary;

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[11] If no conditions are placed on the phase-in of a corrective measure, the process is referred to as a "phased remedy."

- Institute controls to prevent exposure to hazardous wastes at the facility;

- Continue environmental monitoring to determine if significant environmental degradation does occur;

- Provide financial assurances (not applicable at Federal facilities); and

- Comply with the waste management standards for waste generated during corrective actions.

There is one important feature and one important caveat to conditional remedies. The important feature of a conditional remedy is that contaminants can remain at an operating facility if: (1) the owner/operator implements source controls which prevent offsite migration; (2) the risk of exposure, additional releases, or further migration is low; and (3) there is remediation of offsite contamination to MCS (as soon as practical). The caveat is that conditional remedies are not necessarily final remedies. Remediation of all contamination at the facility is a potential requirement for a facility to discharge its obligation to conduct RCRA Corrective Action.

Module 5-5 Permit Modification

A modification to an existing facility permit (or RCRA §3008(h) order) requiring implementation of the corrective measure is the final step in the selection of the corrective measure.

If a permit modification is required, the permit modification follows the process for a "major permit modification" and requires development of the draft permit meeting specific requirements, and a public review and comment period.[12] The draft permit or permit modification and Statement of Basis are the documents which are made available to assist the public in understanding the RCRA Corrective Action activities at the facility. The specific elements required in the draft permit or permit modification are:

- A description of the technical features of the corrective measure necessary for achieving the standards for the corrective measure;

- A listing of all MCS, by environmental media, established for the corrective measure;

- The requirements for demonstration of compliance;

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[12] The standards governing major permit modifications are in 40 CFR §270.41, and the procedural requirements for developing major permit modifications are in 40 CFR §124.

- Specific requirements for the management of waste generated during implementation of the corrective measure;

- The procedures for decontamination, removal, or closure of any units or structures used during implementation of the corrective measure;

- A detailed schedule for implementing all the major technical features of the corrective measure; and

- Any requirements for submission of periodic progress reports.

The Statement of Basis (analogous to a Record of Decision under CERCLA) provides general information about the corrective measures selected by EPA, and also provides an explanation of the process and selection criteria.

The selected corrective measure and a schedule for implementing the corrective measure required under the permit modification become enforceable parts of the facility permit. Chapter 6 of this document discusses the actual implementation of the corrective measure.

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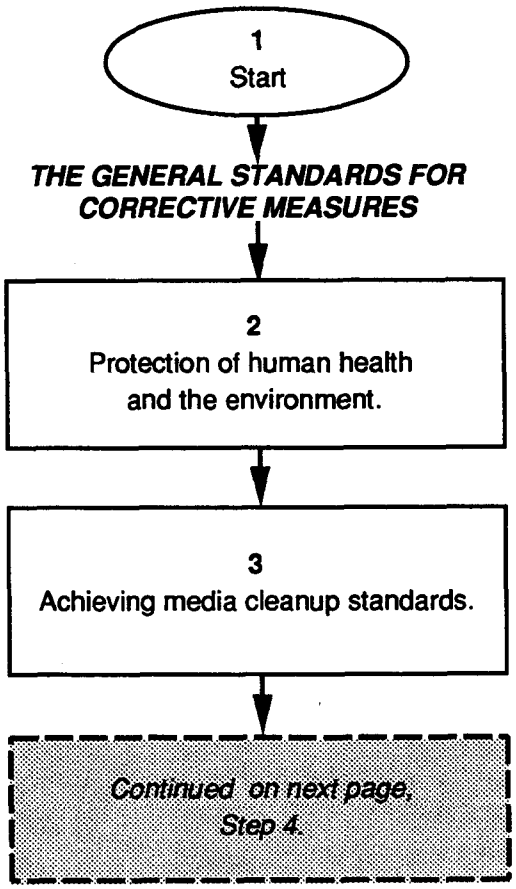
Module 5-1: General Standards and Specific Selection Factors



Module 5-1: General Standards and Specific Selection Factors

This module will discuss: (1) the general standards for corrective measures; and (2) the specific selection factors for corrective measures. Each is discussed in the following steps. The presentation sequence does not indicate any assignment of priority or relative importance.

Step 1 Start.

The General Standards for Corrective Measures (40 CFR §264.525(a))

Step 2 Protection of human health and the environment is the basic mandate of RCRA. This standard, protection of human health and the environment, allows EPA to require measures that do not relate directly to investigation or remediation of releases or potential releases, but which provide some form of protection. (40 CFR §264.525(a)(1))

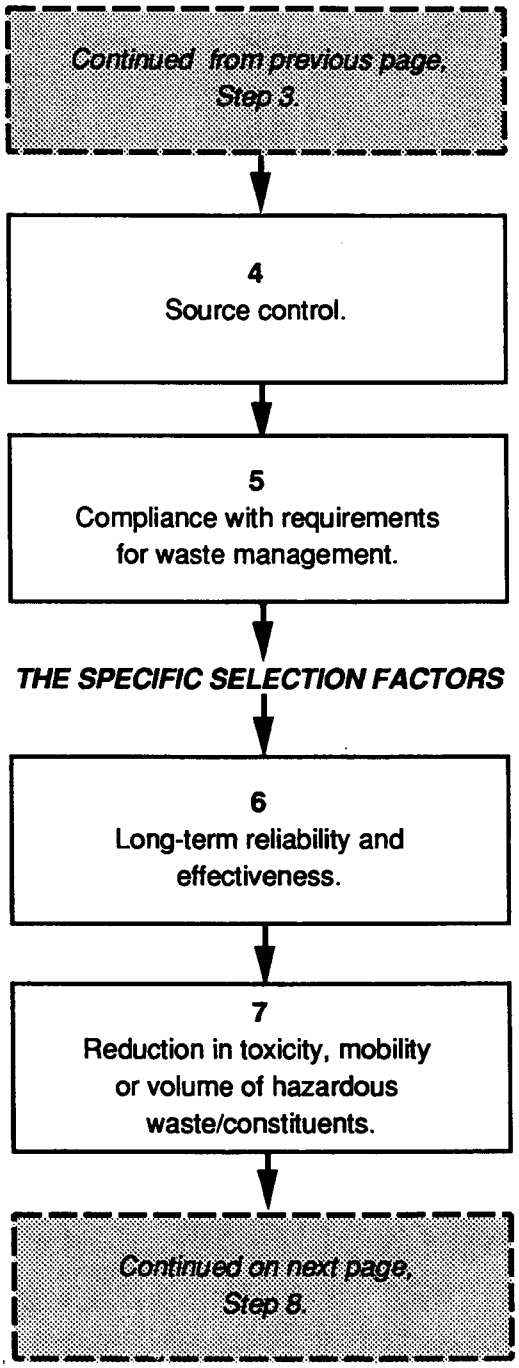
An example would be EPA requiring a facility to provide an alternative drinking water supply if a release from that facility had contaminated a sole source drinking water supply such that the aquifer was unusable as a drinking water supply. While not related to investigation or remediation of the release causing the groundwater contamination, the requirement to provide an alternative drinking water supply would be consistent with the intent of protecting human health.

Step 3 The second standard, achieving media cleanup standards (MCS), relates to the effectiveness of the corrective measure in achieving remediation to levels considered protective of human health and the environment. The MCS standard also provides a benchmark for evaluating the success of the corrective measure. These standards are target values for the protectiveness standard and the degree of attainment of final MCS. These two standards are closely linked. The MCS are media-specific health- and environmental-based contaminant concentrations which must be achieved by the corrective measure. The primary sources of MCS are promulgated standards deemed protective of human health and the environment (e.g., Maximum Contaminant Levels). When such standards do not exist, the corrective measure must achieve an adequate level of protection (see proposed 40 CFR §264.525(d) and (e)).

In developing the proposed Subpart S rule, EPA analyzed two other options:

- Remediation to background levels; and
- Remediation to health-based levels when there was actual or potential exposure.

Based upon the results of this analysis, EPA determined that remediation to background levels was prohibitively costly, and for the most part, technically impractical. Similarly the analysis determined that remediation only when there was actual or potential for exposure failed to provide long-term protection of human health and the environment. (40 CFR §264.525(a)(2))


Continued from previous page, Step 3.
4
Source control.
5
Compliance with requirements for waste management.
THE SPECIFIC SELECTION FACTORS
6
Long-term reliability and effectiveness.
7
Reduction in toxicity, mobility or volume of hazardous waste/constituents.
Continued on next page, Step 8.

Step 4 The third standard for selecting a corrective measure is source control. The objective of implementing a corrective measure is preventing further contamination or release migration. Without source control, any corrective measure is likely to be ineffective, or require perpetual implementation. Therefore, source control is one of the most important factors in developing a long-term, effective remedy. (40 CFR §264.525(a)(3))

Step 5 The fourth general standard for a remedy is compliance with the requirements for the management of solid and hazardous wastes generated by the corrective action. The purpose of this standard is twofold. First, this standard fulfills the intent of RCRA for protection of human health and the environment. Second, this standard helps ensure that conducting a corrective measure does not lead to a violation of other applicable waste management standards, possibly creating another facility requiring remediation of contamination. (40 CFR §264.525.(a)(4))

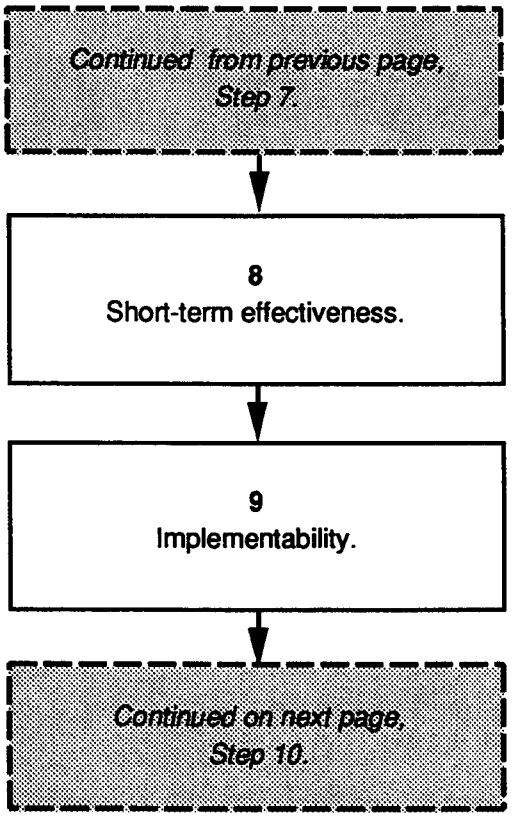
The Specific Selection Factors (40 CFR §264.525(b))

Step 6 The first specific selection factor is the long-term reliability and effectiveness of the corrective measure. This assessment includes:

- Evaluation of the remaining risk at the site once the corrective measure is completed;
- The adequacy and suitability of management, institutional, or technical control measures in preventing exposure to human or environmental receptors;
- Long-term reliability of any institutional controls;
- The potential need for replacement of components of the corrective measure (e.g., replacing a soil-clay cap or geotextile liner); and
- Evaluation of the risks posed if a component of the corrective measure fails or needs replacement.

While EPA states that no specific selection factor has greater weight than any other, EPA will place strong emphasis on selecting corrective measures that act to treat, rather than contain, wastes. (40 CFR §264.525(b)(1))

Step 7 The second selection factor is the degree to which the corrective measure reduces the toxicity, mobility, or volume of the hazardous waste or hazardous waste constituents at the facility. This selection factor relates to the preference for permanent reduction of the overall risk posed by the release as opposed to merely implementing source control. (40 CFR §264.525(b)(2))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8
Short-term effectiveness.
9
Implementability.
Continued on next page, Step 10.

Step 8 The third selection factor is the evaluation of the short-term effectiveness of the corrective measure (40 CFR §264.525(b)(3)). Short-term effectiveness is particularly important at facilities where waste or release characteristics pose a high risk to facility employees, adjacent populations, or when the facility is located in a densely populated area and the release has migrated or may migrate offsite. Specific factors for the evaluation of short-term effectiveness include:

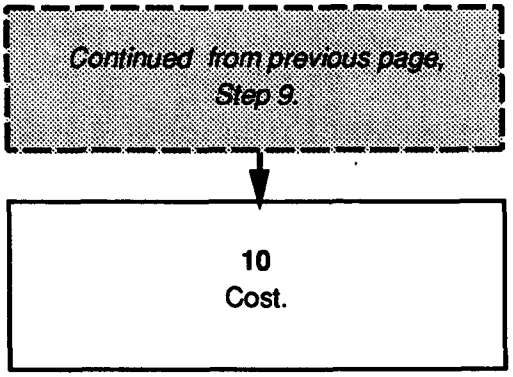
- Protection of the potentially exposed populations (i.e., the surrounding community) from risk associated with the implementation of the corrective measure (e.g., exposure to fugitive emissions, transportation of hazardous wastes offsite);
- Protection of workers engaged in onsite corrective action activities, for example, construction of the corrective measure or excavation of contaminated soil;
- The potential short-term impacts on sensitive environments, and possible means of mitigating those impacts; and
- The amount of time before the corrective measure results in a significant reduction in the risk posed by the facility.

Step 9 The fourth selection factor is implementability (40 CFR §264.525(b)(4)). The CMS report lists factors affecting implementation of the corrective measure. Such factors include:

- State and local permit requirements for construction or operation of the corrective measure;
- The technical difficulties associated with construction of the corrective measure;
- The potential for undertaking additional or subsequent corrective action (important when conducting interim measures, or conditional remedies); and
- The technical feasibility of a particular corrective measure.

If successful implementation of a corrective measure is technically impractical (e.g., remediation of a groundwater release into a Karst aquifer, availability of the corrective measures technology, the estimated time for cleanup to reach MCS is greater than 130 years, the cost of cleanup to MCS is greater than $150 million) such considerations would weigh heavily against selection of that alternative.[13]

[13] The regulatory impact analysis section of the proposed Subpart S rule states that remedies that failed to achieve cleanup in a 130 year period and or that would cost over $150 million dollar cost were "impracticable" (see 55 FR 30863).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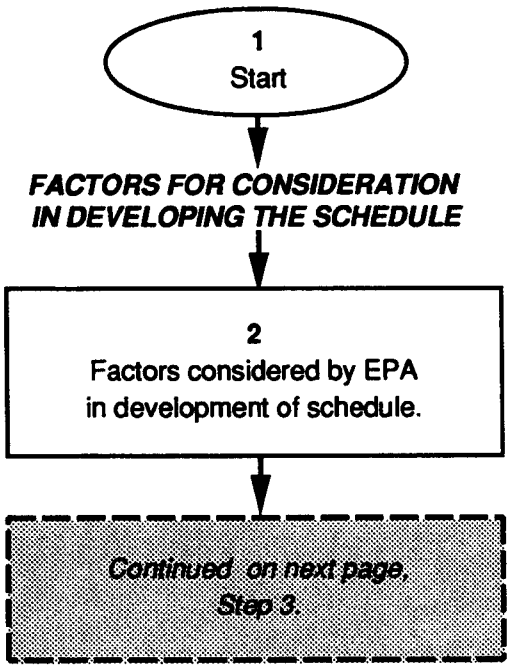
Step 9.
10
Cost.

Step 10 The fifth selection factor is cost. Often two or more alternatives for a corrective measure offer similar protection, but vary widely in cost. In these cases, EPA considers the relative cost an important consideration in selecting the corrective measure. Cost is the last of the criteria evaluated, and will play an important role when two feasible alternatives provide similar protection of human health and the environment within the same amount of time. (40 CFR §264.525(b)(5))

For example, two alternatives for the corrective measure are equally protective of human health and the environment over both the long and short term. Both are technically feasible and easily implemented. However, Alternative 1 has an estimated cost of $1,000,000. Alternative 2 is estimated to cost $30,000,000. Using cost as the deciding factor for selection, EPA would probably favor Alternative 1 over Alternative 2.

Module 5-2: Schedule for Implementing the Corrective Measure



Module 5-2: Schedule for Implementing the Corrective Measure

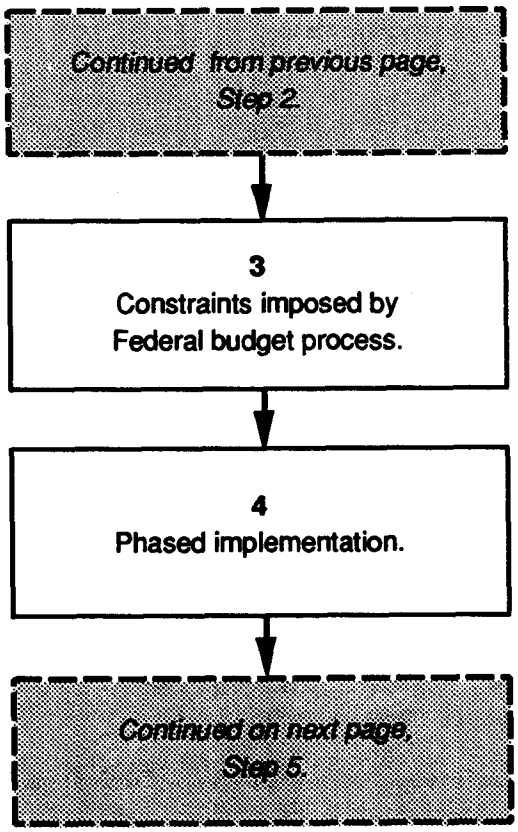
This module discusses the factors and requirements for developing the schedule for implementing the corrective measure.

Step 1 Start.

Factors for Consideration in Developing the Schedule

Step 2 There are six factors EPA considers when developing the schedule for implementation of the corrective measure (40 CFR §264.525(c)). These are:

- The extent and nature of the contamination at the facility;
- The practical capabilities of the corrective measure when evaluated against the media cleanup standards and other objectives for the corrective measure;
- The availability of treatment and/or disposal capacity for wastes generated during the remediation;
- The desirability of using emerging technologies;
- Potential risks posed to human health and the environment prior to completion of the corrective measure; and
- Other factors deemed relevant by the EPA Regional Administrator.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3
Constraints imposed by Federal budget process.
4
Phased implementation.
Continued on next page, Step 5.

Step 3

An additional factor which EPA considers at a Federal facility are the constraints imposed by the Federal budget process. Federal agencies rely on appropriations to fund environmental compliance and cleanup activities. Part of the process of obtaining funding for environmental compliance or restoration projects is submission of Pollution Abatement Plans and Projects Reports (also known as "A-106 reports") to EPA.

The A-106 reports discuss the projected funding requirements for pollution abatement projects over a 5-year period. EPA is responsible for reviewing these submissions, and prioritizing the funding requests submitted by the various Federal agencies. Recognizing that there are never enough funds to complete all projects within a single fiscal year, EPA places the highest priority on funding projects where a facility is non-compliant, or where a facility will become non-compliant if funding is not available. Based upon the review of the A-106 submissions, EPA may recommend that Federal agency budget requests be revised to meet established priorities. If a Federal facility has requested funding for a specific environmental project and the request is denied, a Federal agency can be required to reprogram funds allocated to other activities, transfer authority for pollution abatement projects, or request a supplemental appropriation. However, under the terms of the Anti-Deficiency Act (31 USC §1341) a Federal facility cannot be required to allocate funds beyond those for which the facility receives appropriations and is authorized to spend.

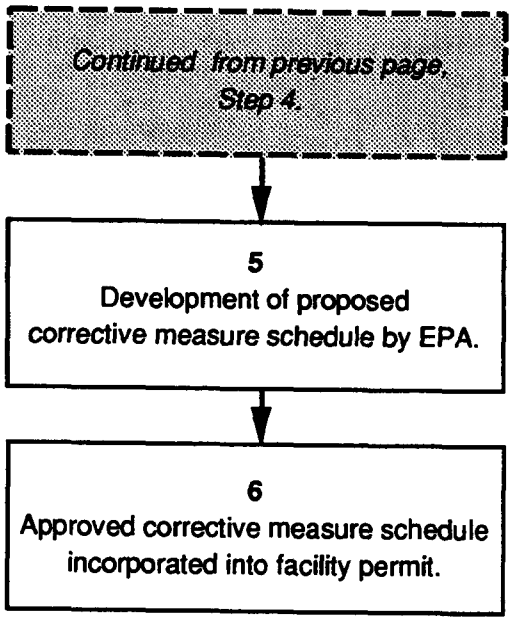
Obviously, a lack of funding will prohibit the facility from implementing the corrective measure. The facility often can use the funding issue to influence the schedule development process.

Step 4

When developing the draft schedule for implementing the corrective measure, the owner/operator of the facility should discuss with EPA phasing the implementation of the corrective measure.

As an example, a phased implementation is appropriate when a single corrective measure is intended for use at several SWMUs at the facility. Such an approach allows for evaluation of that corrective measure under actual conditions, and may prevent the large-scale implementation of an ineffective corrective measure.

Another situation where phased implementation of corrective measures would be appropriate is when remediation of a release from a SWMU requires the use of multiple remedial approaches. For example, a corrective measure at a SWMU containing buried drums which have released hazardous waste constituents to groundwater would require excavation of the drums and associated contaminated soil, followed by installation of a system to address the groundwater contamination. (55 FR 30825)

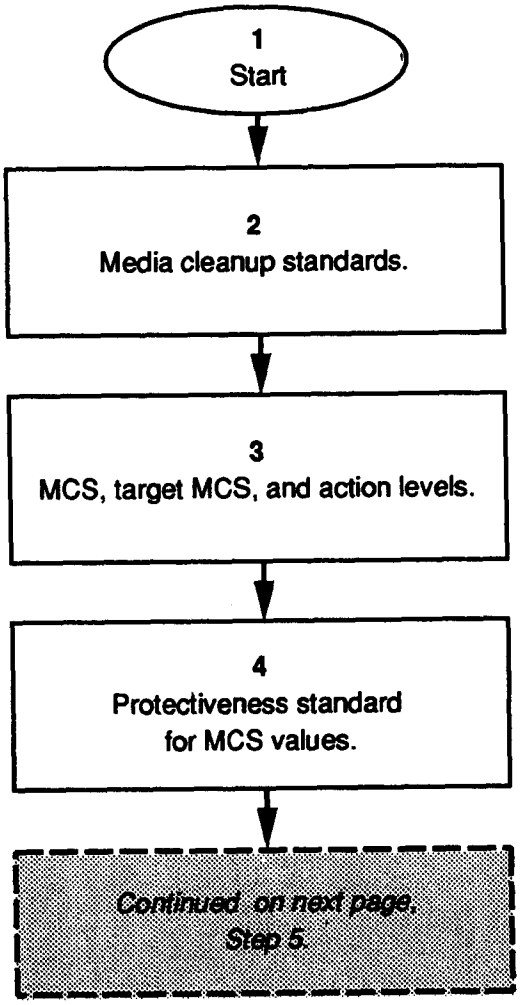

Continued from previous page, Step 4.
5
Development of proposed corrective measure schedule by EPA.
6
Approved corrective measure schedule incorporated into facility permit.

Step 5 The EPA develops a proposed schedule for implementing the corrective measure, and includes the proposed schedule in the draft permit or permit modification. The owner/operator of the facility has the opportunity to influence schedule development through the conclusions of the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) reports, through negotiation and discussion with EPA, through use of the public comment period, and through the submission of A-106 reports to EPA. The owner/operator must take an active role, participating with EPA in developing the proposed schedule.

There are many factors which influence the schedule for the corrective measure. Examples include the availability of the necessary technical expertise, the availability of funding, the complexity of construction, or the demonstrated time a corrective measure will need to reach the established cleanup standard. For example, treatability studies conducted during the CMS may provide an estimate of the length of time required to treat a certain volume of waste (e.g., the maximum feed rate for an incinerator). The proposed schedule will reflect the length of time required to treat the volume of contaminated material at the SWMU under consideration. (55 FR 30825)

Step 6 The schedule, once approved, becomes an enforceable part of the facility permit. To remain in compliance with the terms of the permit, the owner/operator must notify EPA of any deviations from the schedule prior to occurrence and request a permit modification before becoming non-compliant. During development of the schedule, DOE should request inclusion of provisions allowing flexibility in the schedule. Adequate flexibility should minimize the number of modifications to the schedule. (55 FR 30825)

Module 5-3: Media Cleanup Standards



Module 5-3: Media Cleanup Standards

This module discusses establishing media cleanup standards (MCS), and the process for demonstrating compliance with these standards.

Step 1 Start.

Step 2

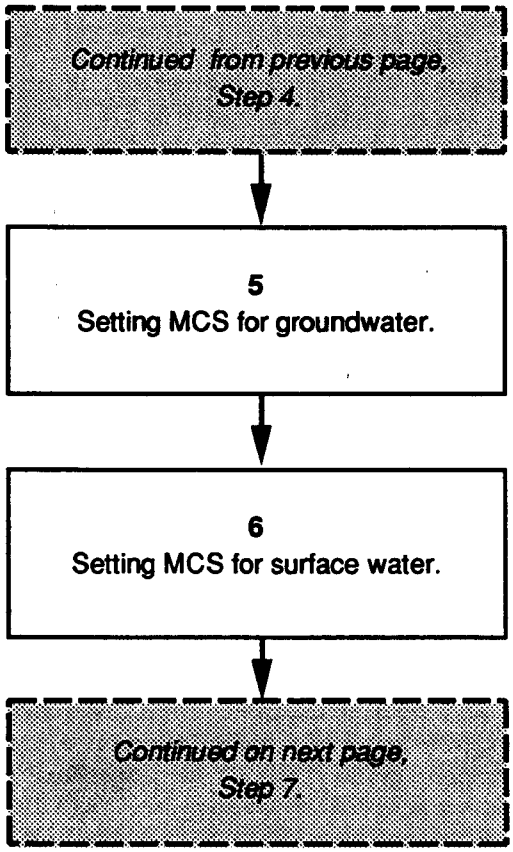
Media cleanup standards (MCS) represent constituent concentrations in groundwater, surface water, soils, and air that a corrective measure must achieve to comply with the standards for the corrective measures which were discussed in Module 5-1. These standards are usually concentrations established under other authorities (such as Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act).

Step 3

The final MCS can be different from action levels and target MCS. Action levels are media-specific contaminant concentrations determined by EPA to be protective of human health and the environment, but are not clean up goals. Rather, action levels serve as the triggering mechanism for an CMS. If during the RFI, sampling determines that the concentration of hazardous waste constituents in a media exceeds an action level, a CMS is usually required at that SWMU. Target MCS are preliminary cleanup goals established during the CMS to provide a benchmark for evaluating the effectiveness of the alternatives for the corrective measure. Target MCS and action levels can differ significantly from the final MCS established for the corrective measure.

Step 4

If no concentration value is established under another authority, the MCS are established based upon concentrations which are deemed protective of human health and the environment. The departure point for establishing these levels for carcinogenic compounds is an excess lifetime risk of cancer in the range of 1 additional incidence of cancer in 10,000 persons to 1 additional incidence of cancer in 1,000,000 persons. For non-carcinogenic compounds, the MCS are set at the maximum concentration where no adverse effects are seen in cases of acute or chronic exposure. This level is referred to as the "no observable adverse effects level" (NOAEL).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Step 4.
5
Setting MCS for groundwater.
6
Setting MCS for surface water.
Continued on next page,
Step 7.

Step 5 Typically, the MCS for groundwater will be based on MCLs. MCLs are maximum concentrations of contaminants allowed in drinking water and are considered protective of human health and the environment. The use of MCLs is consistent with other programs such as the standards under Subpart F. Presently there are 34 MCLs promulgated (6 microbiological contaminants, 3 radionuclides, and 25 organic and inorganic contaminants). MCLs for the chemical contaminants are listed in Appendix B of the proposed Subpart S rule.

Where MCLs are available for a particular constituent but the groundwater at a site is not currently used for a drinking water supply, and is unsuitable for use as a drinking water supply in the future, MCLs will still ordinarily be used by EPA as MCS, however cleanup to MCLs may not be required if the facility can demonstrate that cleanup to MCS is not necessary to protect human health and the environment. See Submodule 5-3-1, Step 3 and proposed 40 CFR §264.525(d)(2)(ii) for additional information on making this determination.

If no MCL is available, the MCS will be set at levels protective of human health and the environment. Typically, for systemic toxins this would be at the no observed adverse effect level (NOAEL), and for carcinogens, at a level where the excess lifetime cancer risk is $1x10^{-4}$ to $1x10^{-6}$.

Step 6 MCS for surface water are based on:

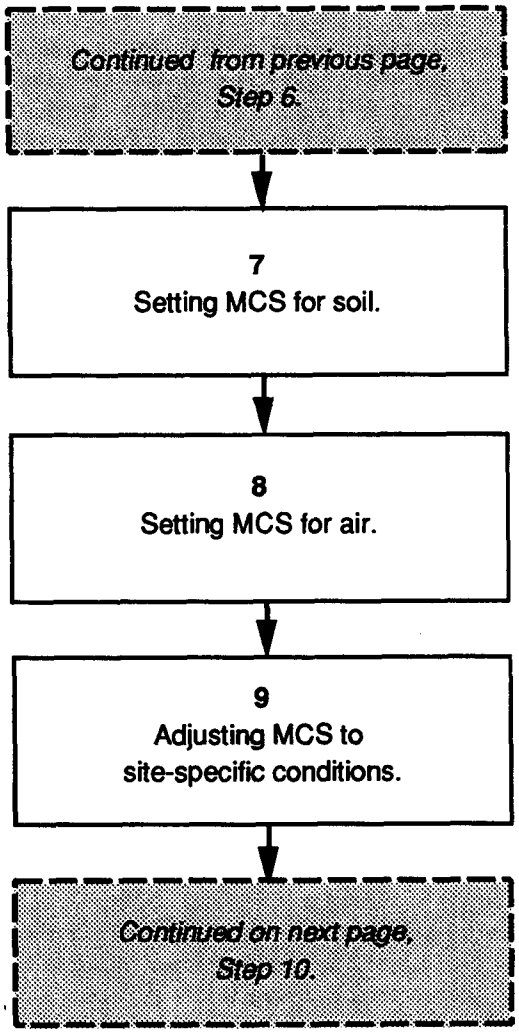
- Numerically expressed State water quality standards.
- MCLs; and
- Risk-based analysis.

State water quality standards established pursuant to the CWA §303 that are expressed as numerical values will be used as MCS, when such values have been established for the surface water body in question.

Where specific numerical values have not been developed, but where narrative water quality standards do exist, EPA will set MCS as numerical interpretations of the narrative standard.

Where numerical water quality standards or numerical interpretations of narrative standards are either unavailable or inappropriate, MCLs will be used, if the surface water has been designated as a drinking water source.

Where a numerical water quality standard, a numerical interpretation of narrative standards, or an MCL is not available for a particular hazardous waste constituent in surface water designated by the State for drinking, EPA will establish MCS in accordance with accepted risk analysis techniques. Typically, for systemic toxins this would be at the no observed adverse effect level (NOAEL), and for carcinogens, at a level where the excess lifetime cancer risk is $1x10^{-4}$ to $1x10^{-6}$.


Continued from previous page, Step 6.
7
Setting MCS for soil.
8
Setting MCS for air.
9
Adjusting MCS to site-specific conditions.
Continued on next page, Step 10.

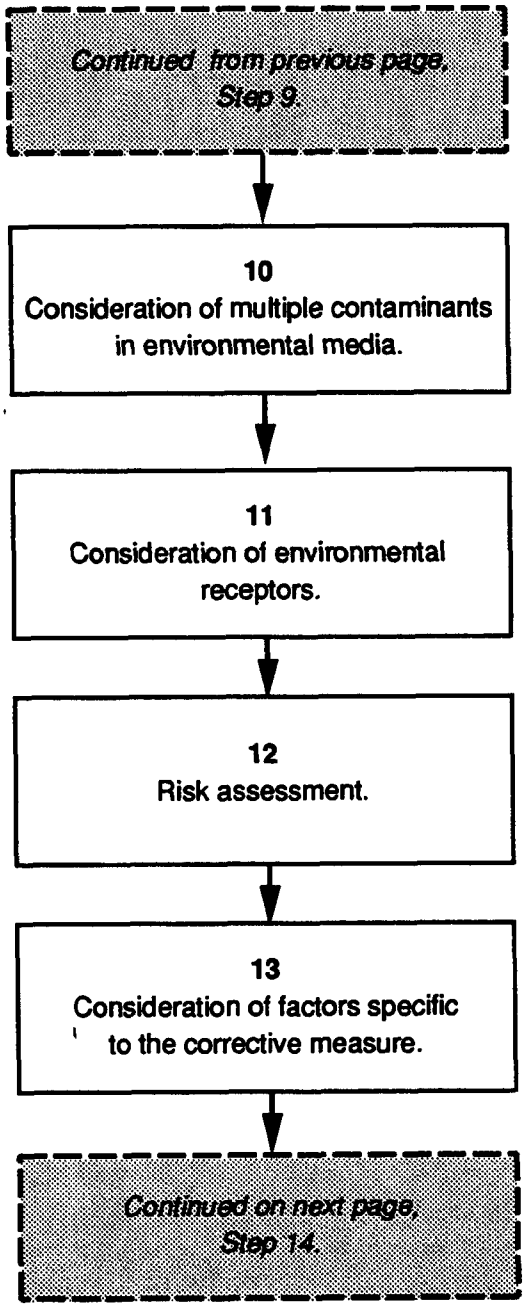
Step 7 In establishing media cleanup standards for soil based on exposure via direct contact, EPA will use the exposure assumptions listed in Appendix D of the proposed Subpart S rule. These exposure assumptions apply to sites near areas that are now residential or are reasonably projected to become residential. Different exposure assumptions may be used where different exposure scenarios are likely based on current and projected future land use at or near the site. For example, for sites in industrial areas that are likely to remain industrial in the foreseeable future, exposure assumptions more appropriate to industrial land use might be used.

Typically, MCS will not be set for "deep" soil (i.e., soil at depths greater than 2 feet from the surface). Such soils do not pose a direct-contact exposure threat, but can be a source of contaminants to other media, especially ground- and surface water. In such cases the soil would be considered a source, rather than a release. Typically the remedy would specify containment, removal or treatment measures for the soil in the same manner as for other sources (e.g., landfills) (see 55 FR 30827).

Step 8 MCS for air will be based on an assessment of the risk related to long-term human exposure. The general objective is to prevent exposure of nearby individuals (typically offsite) to harmful levels of airborne toxins and carcinogens released from SWMUs. EPA will use accepted risk assessment practices when setting the MCS for air. This evaluation will focus on determining the greatest risks to humans. The point of compliance (POC) therefore is at the most exposed individual (MEI). The MEI represents locations where people spend a significant amount of time on a daily basis, but does not include transient exposures to air emissions (e.g., persons driving by the facility). It is expected that the POC will typically be outside the facility boundary, thus MCS might be set at any dwelling, private or public building, or other public or private area where exposures could occur on a regular or continuous basis, or at the unit or facility boundary (see 55 FR 30831).

In establishing the location(s) of the MEI, EPA will not include onsite facility workers, but would include people who live onsite, such as military personnel and families who reside at a Federal facility required to obtain a RCRA permit. Occupational exposures generally are the purview of the Occupational Safety and Health Administration (OSHA). Under OSHA Instruction CPL 2-2.37A of January 29, 1986, OSHA and EPA have agreed that OSHA has the lead role in providing for the safety and health of workers at hazardous waste facilities. OSHA has established standards for such exposures in 29 CFR §1910.120.

Step 9 The final MCS levels established for a facility depend on other factors discussed in the next steps. (40 CFR §264.525(d)(1))


Continued from previous page, Step 9.
10
Consideration of multiple contaminants in environmental media.
11
Consideration of environmental receptors.
12
Risk assessment.
13
Consideration of factors specific to the corrective measure.
Continued on next page, Step 14.

Step 10 The first factor which will be considered in establishing final MCS for a facility is the effect of multiple contaminants in the medium. In considering the risks posed by multiple contaminants, EPA will rely on the procedures and principle in the EPA guidance document *Guidelines for the Health Risk Assessment of Chemical Mixtures* (51 FR 34104). In general, this consideration means the MCS for a single carcinogenic constituent will reflect a cumulative (for all contaminants present) excess risk of cancer no greater than 1 additional incidence in 10,000 persons. As a result, the final MCS for a single constituent of a mixture may be considerably lower than if the individual constituent was the sole contaminant present in the medium. (40 CFR §264.525(d)(1)(iii)(A))

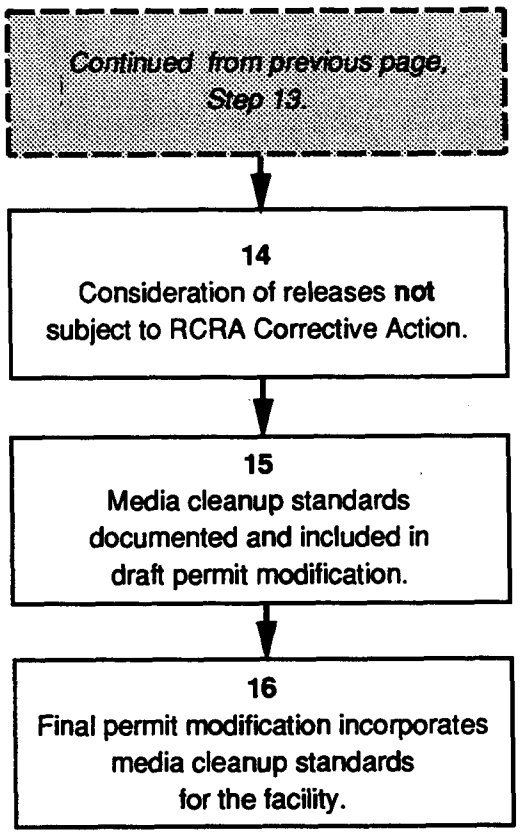
Step 11 The second consideration for establishing MCS is the environmental receptors which are threatened by the release. If sensitive ecosystems (e.g., wetlands) or endangered species are impacted by the release, EPA may require remediation to concentrations below the level required for protection of human health.

In the proposed Subpart S rule, EPA states that guidance on assessing ecological impacts is planned for development, but until such guidance is issued, these evaluations will occur on a case-by-case basis. The Federal Water Quality Criteria are an example of a standard which EPA may consider in these case-by-case determinations. (40 CFR §264.525(d)(1)(iii)(B))

Step 12 The third consideration involves evaluation of the cumulative risk posed when populations are exposed to multiple sources or through multiple pathways. These sources or pathways may or may not be subject to RCRA Corrective Action. The basis for this consideration is similar to those for multiple contaminants in a medium. The MCS set under these circumstances will reflect a cumulative excess cancer risk no greater than 1 incidence of cancer in 10,000 persons. (40 CFR §264.525(d)(1)(iii)(C))
For example, a population is exposed to high airborne lead levels from a lead smelter which is not part of the facility subject to RCRA Corrective Action. The facility subject to corrective action must address a release of lead to a drinking water supply. In this case, the MCS for the lead in the drinking water could be established at a lower level than if the airborne exposure pathway was not present, even though the source of the additional risk is at an unrelated facility which is not subject to RCRA Corrective Action. The EPA believes the RCRA mandate to protect human health provides the authority to require remediation to below the typical MCS in such cases.

Step 13 The fourth consideration when establishing the MCS includes factors specific to the corrective measure under consideration. These include the reliability, effectiveness, practicality, ability to attain MCS, and other factors which are reflected in the specific corrective measures selection factors. (40 CFR §264.525(d)(1)(iii)(D))

Examples of considerations which can be reflected in the final MCS are limited exposure risk, exposure through the food chain, or contamination of "deep soils" not posing a direct-contact exposure threat. Any assessment of risks posed by the facility conducted as part of the RFI or CMS provides information which may be valuable in making these evaluations.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14
Consideration of releases not subject to RCRA Corrective Action.
15
Media cleanup standards documented and included in draft permit modification.
16
Final permit modification incorporates media cleanup standards for the facility.

Step 14 If there is a release of a hazardous waste or hazardous waste constituent from the SWMU, and there is existing contamination attributable to a source not subject to corrective action, EPA can require corrective action at the SWMU, but cannot require remediation below the existing or background level resulting from the other source.

For example, a specific hazardous waste constituent is found in groundwater downgradient from a SWMU. The owner/operator demonstrates that the concentration downgradient does not exceed the concentration upgradient, and the upgradient source is not subject to corrective action. In this case, the owner/operator is not required to remediate the groundwater contamination. However, if the concentration downgradient was higher than the concentration upgradient, the owner/operator could be required to implement a corrective measure to reduce the contamination downgradient of the SWMU to the same concentration as upgradient of the SWMU.

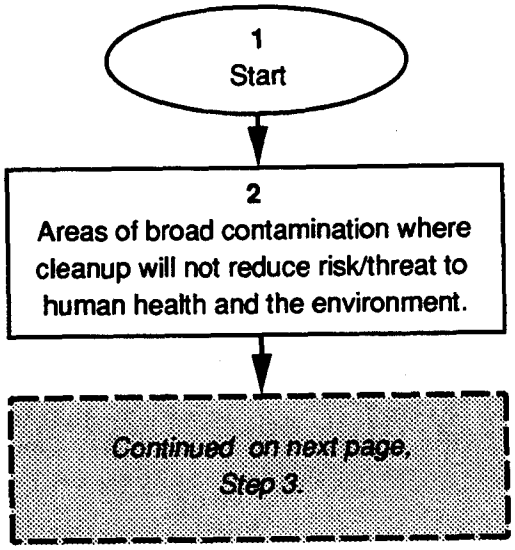
There is an apparent contradiction between this requirement and the requirement discussed in Step 12 of this module. In the example in Step 12, it might appear the facility is being required to remediate to below "background levels." This is not the case. In the example in Step 12, another exposure pathway is considered (i.e., the airborne lead levels from the lead smelter), but in the example, the airborne lead has not been shown to contribute to the lead contamination of the groundwater at the facility. Thus, the facility can be required to remediate the lead in the groundwater to below the typical MCS for lead. However, if the facility could demonstrate that the airborne lead contributed to the groundwater contamination, and the facility could quantify the concentration contributed from the airborne lead source, the facility may be able to establish that the MCS should be set at this "background" concentration.

At facilities with requirements for CERCLA and RCRA compliance, EPA can designate the remedial efforts at more than one unit area as an "area-wide" remedial effort through use of the authority of CERCLA §104(d)(4). Under these circumstances, EPA may require remediation of contamination to below the existing or background concentrations.

Step 15 The final MCS are documented and included in the draft permit modification, and may be included in the Federal Facility Compliance Agreement (FFCA).

Step 16 The final permit modification will establish the MCS for the facility, and demonstration of compliance with the final MCS is required for release from the RCRA Corrective Action process. The process of permit modification is discussed in detail in Module 5-5. (40 CFR §264.526(b)(2))

Submodule 5-3-1: When Remediation to Media Cleanup Standards Is Not Required



Submodule 5-3-1: When Remediation to Media Cleanup Standards Is Not Required

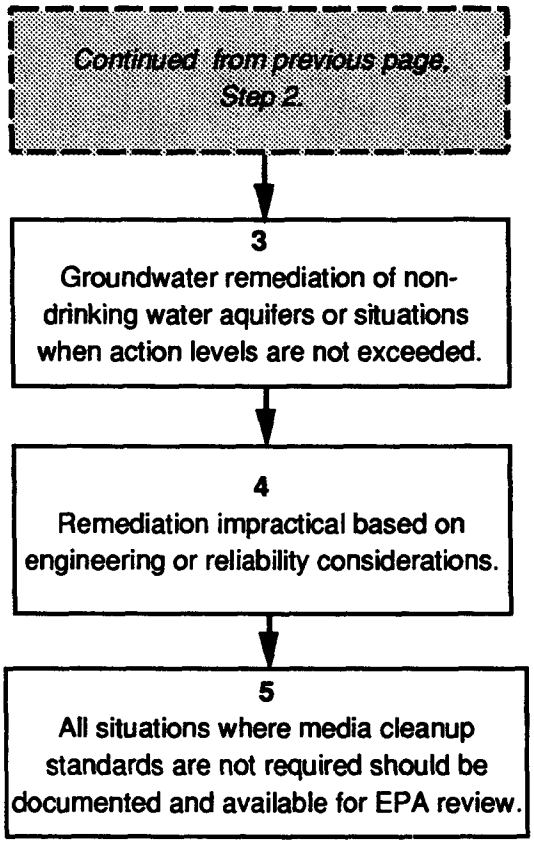
Under the proposed Subpart S rule, in certain situations the owner/operator may not be required to remediate a release to media cleanup standards (MCS). This submodule discusses these situations.

Step 1 Start.

Step 2

The first situation involves areas of broad contamination. If the risk from the release from a SWMU is trivial compared to the overall risk from the contamination already present, or where remediation to MCS will not contribute to a reduction of the risk posed, EPA has the discretion to not require remediation to MCS. In these cases the owner/operator may be required to conduct other activities which provide some reduction of the risk, to control the source of the release, or to contribute to an area-wide remedial effort under other authorities such as CERCLA. (40 CFR §264.525(d)(2)(i) and 55 FR 30828)

For example, an aquifer is already contaminated by offsite sources. A release from a SWMU contributes a minor amount to the total contamination. In this case, remediation of the quantity of waste released from the SWMU may provide only a limited benefit. In such a case, EPA may elect to limit the response to implementing source controls at the SWMU in order to prevent further environmental degradation.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3
Groundwater remediation of non-drinking water aquifers or situations when action levels are not exceeded.
4
Remediation impractical based on engineering or reliability considerations.
5
All situations where media cleanup standards are not required should be documented and available for EPA review.

Step 3 The second situation involves remediation of a release to groundwater. Cleanup to MCS may not be required if the owner/operator demonstrates that the contamination: (1) does not impact an aquifer which is a current or potential source of drinking water; and (2) the contaminated aquifer is not hydraulically connected with waters to which the hazardous waste constituents could migrate in concentrations which could increase contamination in the groundwater to concentrations exceeding action levels.

In determining if an aquifer is a current or potential source of drinking water, EPA will rely on the *RCRA Groundwater Protection Strategy* guidance which was issued in 1986. Generally, Class III aquifers or aquifers with total dissolved solids (TDS) levels over 10,000 mg/L (ppm) are not considered potential sources of drinking water.

In any case, these determinations are made on a case-by-case basis, and the responsibility for providing all supporting information falls upon the owner/operator. The owner/operator must demonstrate *both* conditions specified above through hydrogeological studies, land use planning, and population demographics. The owner/operator should refer to the EPA Groundwater Protection Strategy Technical Enforcement Document (OSWER 9950.1) for specific information on the necessary evaluations for establishing such an assertion. (40 CFR §264.525(d)(2)(ii) and 55 FR 30829)

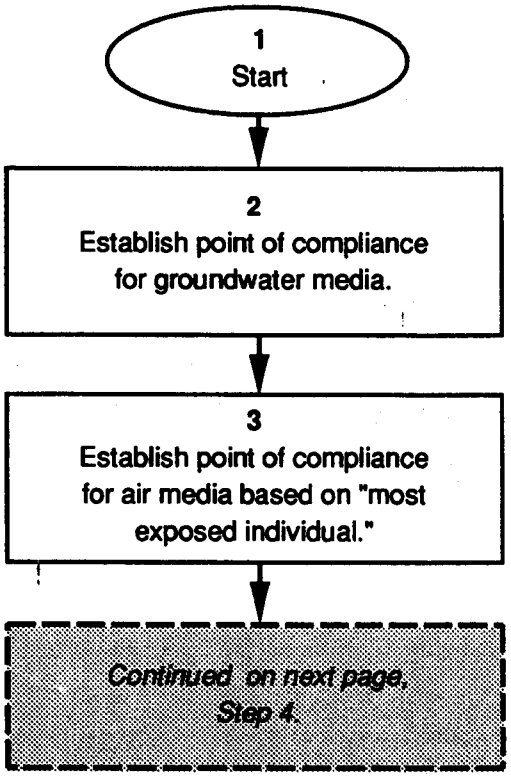
Step 4 The third situation where remediation to MCS is not required occurs when achieving MCS is impractical due to engineering feasibility and reliability considerations.

In this case, the owner/operator must, to quote the preamble to the proposed Subpart S rule, "…provide clear and convincing information to support any assertion that such cleanup is technically impractical."

An example of a situation where cleanup to MCS may be impractical is the presence of contaminants in a mature Karst formation. A mature Karst formation is characterized by sinkholes and cave development. The use of standard remediation techniques (i.e., pump-and-treat) in a mature Karst aquifer is impractical due to the impact of the two types of fluid flow regimes on contaminant transport efficiencies, the relationship of discharge and recharge to variations in weather patterns, and the need for rigorous and expensive characterization of the aquifer. (55 FR 30830)

Step 5 If any of these situations arises at a facility, the owner/operator should document the findings, and provide this document and all supporting evidence to EPA. This information is usually discussed in the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) reports, but a separate document detailing such findings should be provided to EPA. (40 CFR §264.525(d)(2)(iii))

Submodule 5-3-2: Demonstration of Compliance With Media Cleanup Standards



Submodule 5-3-2: Demonstration of Compliance With Media Cleanup Standards

The procedures and requirements for demonstrating compliance with the media cleanup standards (MCS) are established as a Class III (major) permit modification to a final RCRA Part B permit. This submodule discusses the establishment of the points of compliance for each medium, the methods for establishing compliance, and the period of performance over which compliance must be evaluated and demonstrated.

Step 1 Start.

Step 2

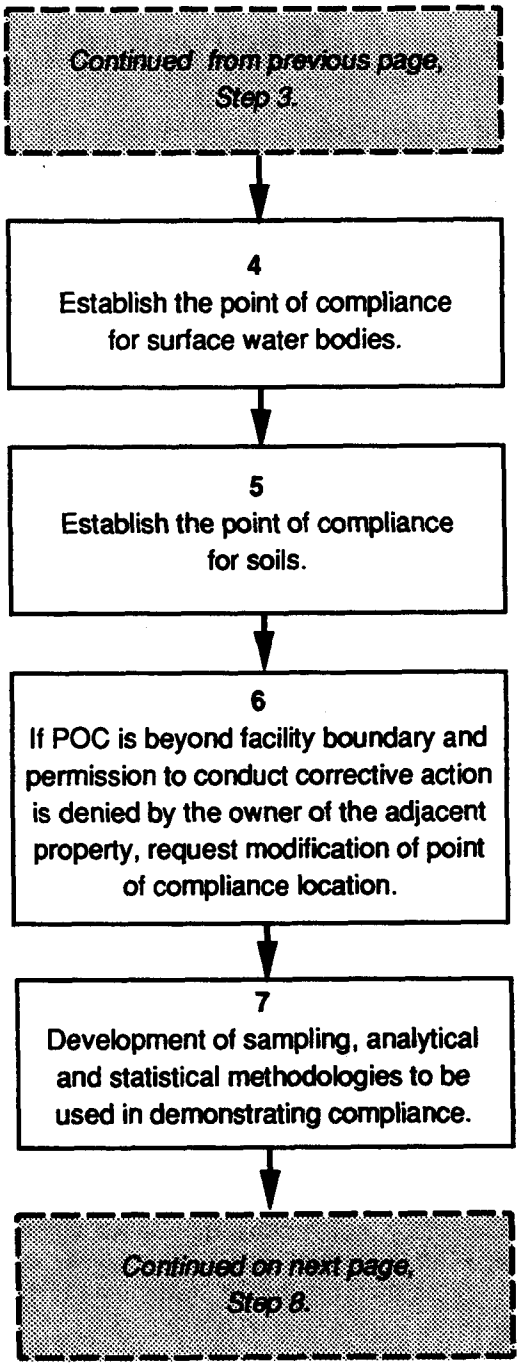
Under the proposed Subpart S rule, the point of compliance (POC) for remediation of groundwater generally will be the entire region of contaminated groundwater (i.e., the entire plume). In the case of a drinking water supply aquifer, the owner/operator would be required to demonstrate that following remediation the aquifer was acceptable for use as a drinking water supply. In the case of a SWMU where wastes are left in place during a corrective action, the EPA Regional Administrator may require the owner/operator to install groundwater monitoring wells to demonstrate that hazardous waste constituents are not migrating from the unit.

In any case, EPA specifies the location of any groundwater monitoring wells. The owner/operator should provide EPA with information on existing monitoring wells or potential locations for monitoring wells. (40 CFR §264.525(e)(1)(i))

Step 3

The primary point of compliance for air is the most exposed individual (MEI). The MEI is the point(s) of maximum long-term exposure. The population considered when determining the MEI includes those persons who spend a significant portion of their time at that location (e.g., persons living within the facility boundary as occurs at many Department of Defense facilities, nearby residents not living within the boundaries of the facility, persons at neighboring facilities, schools). Those persons exposed while passing near the facility are not considered when determining the MEI. Those persons working at the facility are not considered when determining the location of the MEI. The Occupational Safety and Health Act (OSHA) regulates employee exposure, and EPA and OSHA use this authority to address employee exposure.

If other conditions warrant, such as a threat to a sensitive environmental receptor, the EPA Regional Administrator may set the compliance point for air at a point other than the MEI. The location of the compliance point typically is where the EPA Regional Administrator will require that monitoring stations be established. (40 CFR §264.525(e)(1)(ii))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4
Establish the point of compliance for surface water bodies.
5
Establish the point of compliance for soils.
6
If POC is beyond facility boundary and permission to conduct corrective action is denied by the owner of the adjacent property, request modification of point of compliance location.
7
Development of sampling, analytical and statistical methodologies to be used in demonstrating compliance.
Continued on next page, Step 8.

Step 4 The point of compliance for surface water is the point where the release enters the water, even if this point is located outside the boundaries of the facility. The use of this point applies to point and non-point sources, and for those situations where groundwater flows into a surface water body. If the surface water contamination impacts sediments, points and depths for demonstrating compliance with MCS in the sediments will be specified in the permit.

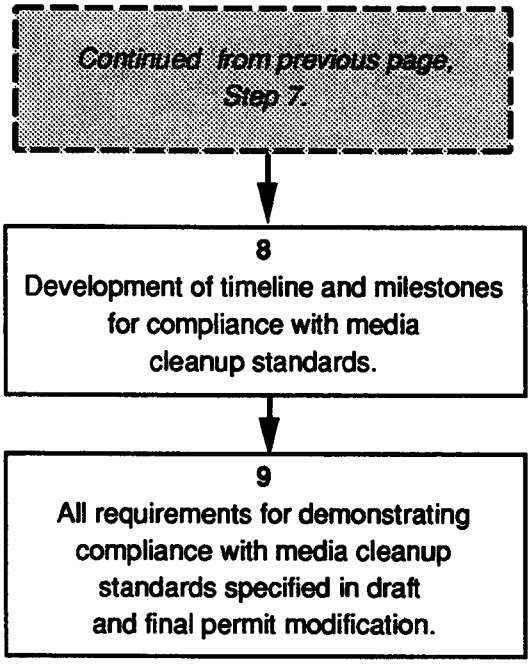
Usually the location of the point of compliance for surface water (where surface water sampling points are located) will be readily apparent (i.e., as with a point source) but in other cases (as with non-point or groundwater sources) this point may not be clearly defined. In either case, the point of compliance is specified by the EPA Regional Administrator and reflects the uses of the water (i.e., drinking water supply, industrial supplies) and the environmental and ecological importance of the water body. (40 CFR §264.525(e)(1)(iii))

Step 5 Any point where direct contact may occur is used to establish the point of compliance for soils. However, in establishing the point of compliance, the EPA Regional Administrator will consider the potential for cross media contamination (i.e., contaminated soils leading to groundwater contamination), and the point of compliance may reflect such concerns. (40 CFR §264.525(e)(1)(iv))

Step 6 A facility may be required to conduct corrective action where a point of compliance is established beyond the facility boundary. In these cases, the facility must secure permission from the owner of any property onto which facility personnel must enter in order to conduct corrective action activities. If this permission is denied, the facility may, under the authority of RCRA §3004(v) request that the EPA Regional Administrator modify or rescind the requirement to conduct corrective action beyond the facility boundary. (40 CFR §264.525(e)(1)(v))

Step 7 The EPA Regional Administrator may establish sampling, analytical, and statistical methods and frequency for sampling to demonstrate compliance and will specify these requirements in the facility permit. Other documents prepared during the course of the RCRA Corrective Action, such as the RCRA Facility Investigation Plan supply information useful in complying with these requirements.

As part of these requirements, a quality assurance project plan (QAPP) or data collection quality assurance plan (DCQAP) for use when conducting the corrective measure may be required by the EPA Regional Administrator. These documents provide the organizational and technical requirements for ensuring that data quality is adequate to support any decision-making processes which rely on these data. Similar documents are prepared during the RFI and CMS, and a detailed discussion of the requirements for these documents can be found in Chapters 3 and 4. (40 CFR §264.525(e)(2))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Step 7.
8
Development of timeline and milestones for compliance with media cleanup standards.
9
All requirements for demonstrating compliance with media cleanup standards specified in draft and final permit modification.

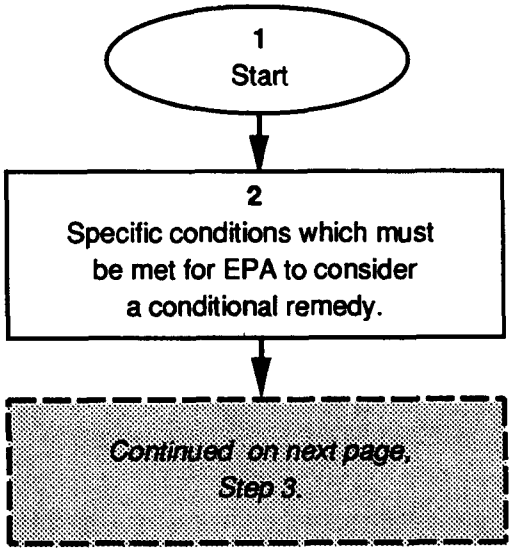
Step 8 Under the proposed Subpart S rule, the EPA Regional Administrator specifies in the permit the length of time the owner/operator must demonstrate compliance with MCS at the facility (sometimes referred to as the period of performance), once the MCS are met by the implemented corrective measure. In developing this requirement, the EPA Regional Administrator considers the following factors:

- The extent and concentrations of the hazardous wastes released;
- Information on the environmental fate and transport mechanisms of the contaminants;
- The accuracy of the monitoring techniques;
- The characteristics of the affected media; and
- The environmental setting of the facility, particularly any seasonal, meteorological, or other environmental variables which might affect the accuracy of the monitoring results.

If the facility successfully demonstrates compliance with the MCS for the period of performance specified in the permit, the facility can request a permit modification ending the corrective action. This request must be certified by an independent registered professional engineer. However, if the concentrations of contaminants rise above the MCS, the facility will have to continue operation of the corrective measure. Once the MCS are again achieved, the period of performance starts anew (the "clock" is reset to "zero"). (40 CFR §264.525(e)(3))

Step 9 All the requirements for demonstrating compliance with the MCS for the facility are specified in the draft and final permit modification. It is incumbent on the facility to support the MCS development process through discussions and negotiations with the EPA Regional Administrator. This support can range from supplying complete copies of all necessary documentation to EPA in a timely manner, suggesting locations for the points of compliance, recommending sampling and analytical protocols, and negotiation of the MCS period of performance. (40 CFR §264.526(b)(3))

Module 5-4: Phased or Conditional Remedies



Module 5-4: Phased or Conditional Remedies

Implementing the corrective measure is often a complex, costly, and lengthy undertaking. The proposed Subpart S rule allows phasing the implementation of the corrective measure. Phasing of the implementation of the corrective measure is similar to the use of operable units during CERCLA Remedial Actions. Each phase represents a logically connected sequence of activities that is consistent with, and complementary to, completing the corrective measure. However, EPA may impose certain conditions on the phasing of a corrective measure (phasing without conditions is referred to as a "phased remedy," whereas if conditions are placed on the phasing, the process is called a "conditional remedy"). In light of the conditions at, and budgetary constraints placed on, Federal facilities, EPA anticipates the frequent use of conditional remedies at Federal facilities. This module discusses the approach to implementing a conditional remedy (i.e., phasing-in the corrective measure).

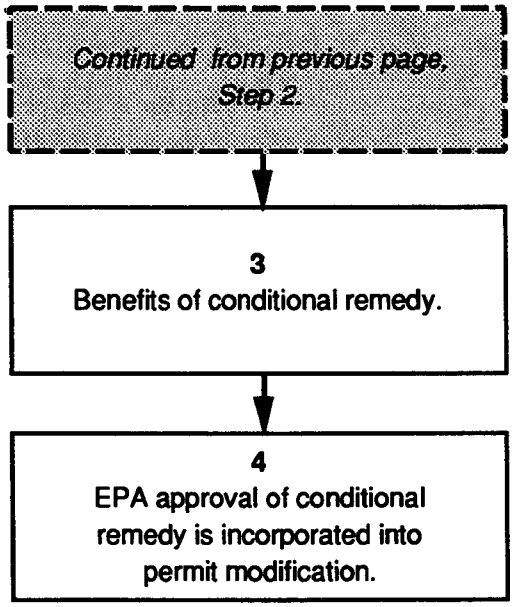
Step 1 Start.

Step 2

The key requirement for a conditional remedy is that the facility can work to prevent further environmental degradation during the phase-in of the corrective measure (40 CFR §264.525(f)(2)). If this requirement cannot be met, the use of a conditional remedy is not appropriate and is unlikely to be considered by EPA.

There are seven specific conditions which a conditional remedy *must* meet:

- Protection of human health and the environment;
- Achieving *all* media cleanup standards (MCS) beyond the facility boundary, as soon as is practical;
- Prevention of further environmental degradation through source controls, and the use of engineered measures to prevent further migration of the release within the facility boundary;
- Implementation of management and institutional controls to prevent exposure to hazardous wastes at the facility;
- Continuation of environmental monitoring to determine if additional environmental degradation occurs;
- Provision for financial assurances (not applicable to Federal facilities); and
- Compliance with standards for waste management for wastes generated during the corrective measure.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3
Benefits of conditional remedy.
4
EPA approval of conditional remedy is incorporated into permit modification.

Step 3 The benefit of using a conditional remedy is that EPA may permit contaminants to remain at an operating facility (for the term of the permit) if:

(1) The owner/operator implements source controls which prevent offsite migration;

(2) The risk of exposure, additional releases, or further migration is low; and

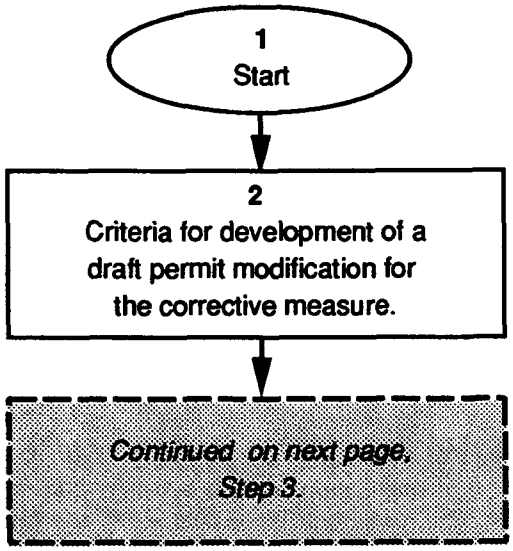
(3) There is remediation of offsite contamination to MCS (as soon as practical).

However, these provisions should not be confused with the final cleanup at the facility. Conditional remedies are not necessarily final remedies. Remediation of all contamination at the facility is a potential requirement for discharging the obligation to conduct RCRA Corrective Action.

An example of a situation where a conditional remedy may be used is a SWMU consisting of buried drums, which have leaked and contaminated the underlying aquifer with hazardous waste constituents. The owner/operator could phase the remedy to first implement source control and prevent additional releases through excavation of the drums and contaminated soils. The second phase of the corrective measure would be implementing measures to prevent further migration of the contamination through use of slurry walls or a groundwater extraction system. The final phase would involve implementation of a groundwater remediation system such as a pump-and-treat system. (55 FR 30833)

Step 4 Authorizing conditional remedies is a discretionary function. EPA is under no obligation to consider the use of this option, even if a facility can demonstrate ability to meet any and all conditions. Through negotiation with EPA, the facility should seek authorization to conduct conditional remedies whenever appropriate. If EPA authorizes the facility to conduct a conditional remedy, any requirements and conditions imposed by EPA are incorporated into the draft and final permit or permit modification.

Module 5-5: Permit Modification



Module 5-5: Permit Modification

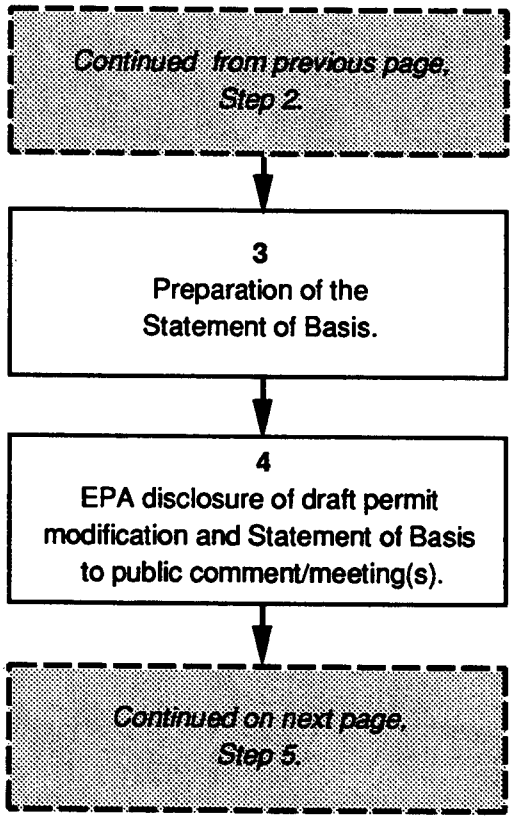
The RCRA §3008(h) order, permit, or permit modification creates the binding requirement to conduct the selected corrective measure and specifies the conditions under which the facility will operate while conducting the corrective measure. The specific standards for this type of permit modification are found in the proposed Subpart S rule at 40 CFR §264.526 and follow the procedures for a major permit modification found at 40 CFR §124 and in the proposed rule at 40 CFR §§270.41-270.43. This process includes development of the permit modification, a comment and response period, and a public hearing.

Step 1 Start.

Step 2

EPA, often in consultation with the facility owner/operator, develops a draft permit modification specifying the corrective measure. Under proposed 40 CFR §264.526(b) the draft permit modification is required to include:

- A description of the technical features of the corrective measure that are necessary for achieving the general standards established for corrective measures (40 CFR §264.526(b)(1));
- A listing of all media cleanup standards (MCS) established for the corrective measure (40 CFR §264.526(b)(2));
- The specific requirements for demonstrating compliance, including points of compliance, the frequency and duration of sampling, and specific analytical, sampling, and data management requirements (40 CFR §264.526(b)(3));
- The period of performance required;
- Specific requirements for the management of waste generated during implementation of the corrective measure (40 CFR § 264.526(b)(4));
- The requirements and procedures for decontamination, removal, or closure of any units or structures used during implementation of the corrective measure;
- A detailed schedule for implementing all the major technical features, and a target date for completion of the corrective measure; and
- Any requirements for submission of periodic progress reports.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3
Preparation of the Statement of Basis.
4
EPA disclosure of draft permit modification and Statement of Basis to public comment/meeting(s).
Continued on next page, Step 5.

Step 3 Following development of the draft permit modification, EPA will prepare a Statement of Basis or a Fact Sheet. The Statement of Basis and Fact Sheet are similar in purpose to a Record of Decision (ROD) under CERCLA. A Statement of Basis or Fact Sheet provides a general discussion of the alternative EPA selected and an explanation of the MCS established for the facility.

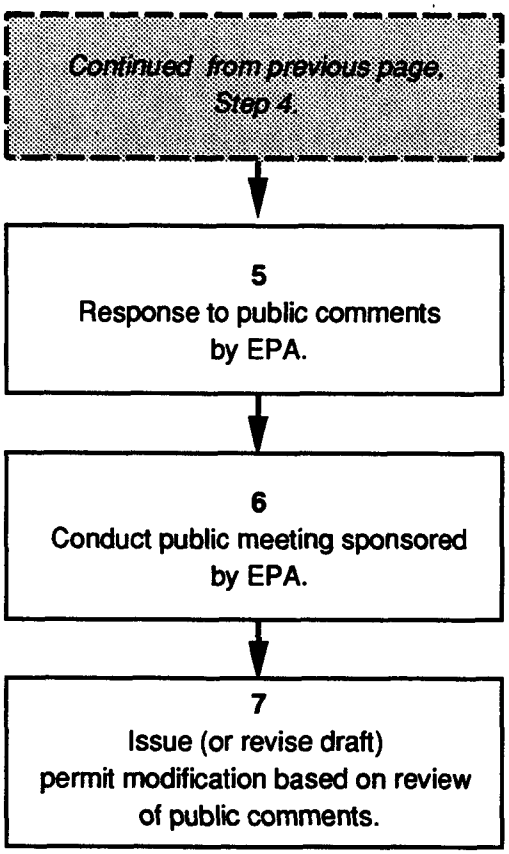
The content and detail of the Statement of Basis includes:

- A brief description of the derivation of the conditions of the draft permit and the reasons for these conditions; and
- A reason supporting any intent to deny or terminate the permit.

A Fact Sheet is more detailed; however, the content will vary depending on the nature and complexity of the corrective measure. Typically a Fact Sheet includes:

- A brief description of the type of facility or activity subject to the permit;
- The type and quantity of waste being proposed for treatment, storage, or disposal;
- A brief summary of the conditions applicable to the permit and the reasons for these conditions;
- A discussion of any variances to the regulations and the proposed alternatives, along with justification for these variances and alternatives;
- A description of the process to be used in reaching a final decision on the permit modification; and
- The name, address, and telephone number of the EPA contact person able to supply additional information.

Step 4 Once the draft permit modification and Statement of Basis are completed, EPA may provide an advance copy to the facility for review and comment. In any case, once the draft permit or permit modification is complete, EPA will provide a written notice of a 45-day public comment period. This notice must be published in a local newspaper 30 days prior to commencement of the comment and response period. At the same time, EPA may announce the date for a public hearing, if such a meeting is requested by the owner\operator or the public (public hearings are expected to occur at most DOE facilities, due to the high-profile status of these facilities). Information on the location and hours of operation of a document repository where the public can review all documents related to this RCRA Corrective Action is also provided in the announcement. (55 FR 30835)


Continued from previous page, Step 4.
5
Response to public comments by EPA.
6
Conduct public meeting sponsored by EPA.
7
Issue (or revise draft) permit modification based on review of public comments.

Step 5 The EPA is required to respond to all comments received during this period. The owner/operator should provide written comments on the corrective measure selected for the facility, discussing areas of agreement and disagreement with EPA. The owner/operator should realize the permit is unlikely to be drastically altered once it has reached this point in the process. The facility should attempt to influence the permit during development, through negotiations and discussions with EPA. The comment and response period also provides a useful mechanism for educating and informing the public on the DOE policy and approach to environmental compliance and restoration.

Step 6 The owner/operator usually is invited to participate in the public hearing (if one is required). If EPA does not extend such an invitation, the owner/operator should seek listing as a speaker. At the public hearing the owner/operator has the opportunity to provide the local community information on the corrective action under discussion. Equally important is the opportunity the facility has for increasing the owner/operator's awareness of the concerns of the local community. By learning the concerns of the local community, the owner/operator is able to address these issues, reducing the chances for a confrontation over implementing the corrective measure or over other issues of concern. (55 FR 30848)

Step 7 Following the public meeting and the close of the comment and response period, EPA will prepare a written response to all comments received regarding the draft modification. Once these responses are prepared and incorporated into the administrative record for the permit modification, EPA may issue or revise the draft permit modification. If substantial revisions are required, EPA may reopen the public comment and response period. If no or only minor revisions are required, the EPA will issue the permit modification, and the facility may begin implementing the corrective measure. The implementation of the corrective measure is discussed in the next chapter of this document.

The DOE Office of Environmental Guidance (EH-231) has developed a detailed guidance document entitled *Public Participation in Environmental Restoration (DOE/EH-0221, November, 1991)* that provides information on the requirements for community relations.

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A Guide to Developing Superfund Proposed Plans
OSWER Directive No. 9335.03-02FS-2
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Corrective Action During Interim Status
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Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (Proposed Rule)
55 FR 30798, Friday, July 27, 1990

Draft Guidance on Developing Superfund Decision Documents
OSWER Directive 9355.3-02
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Enforcement Actions Under RCRA and CERCLA at Federal Facilities
OSWER Directive No. 9992.0
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Guidance on Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)
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Public Participation in Environmental Restoration Activities
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RCRA Corrective Action Plan (Interim Final)
OSWER Directive No. 9902.3
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RCRA Groundwater Monitoring Technical Enforcement Guidance Document
OSWER Document 530/SW-86-005
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The National Oil and Hazardous Substance Pollution Contingency Plan
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Chapter 6

Corrective Measures Implementation

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

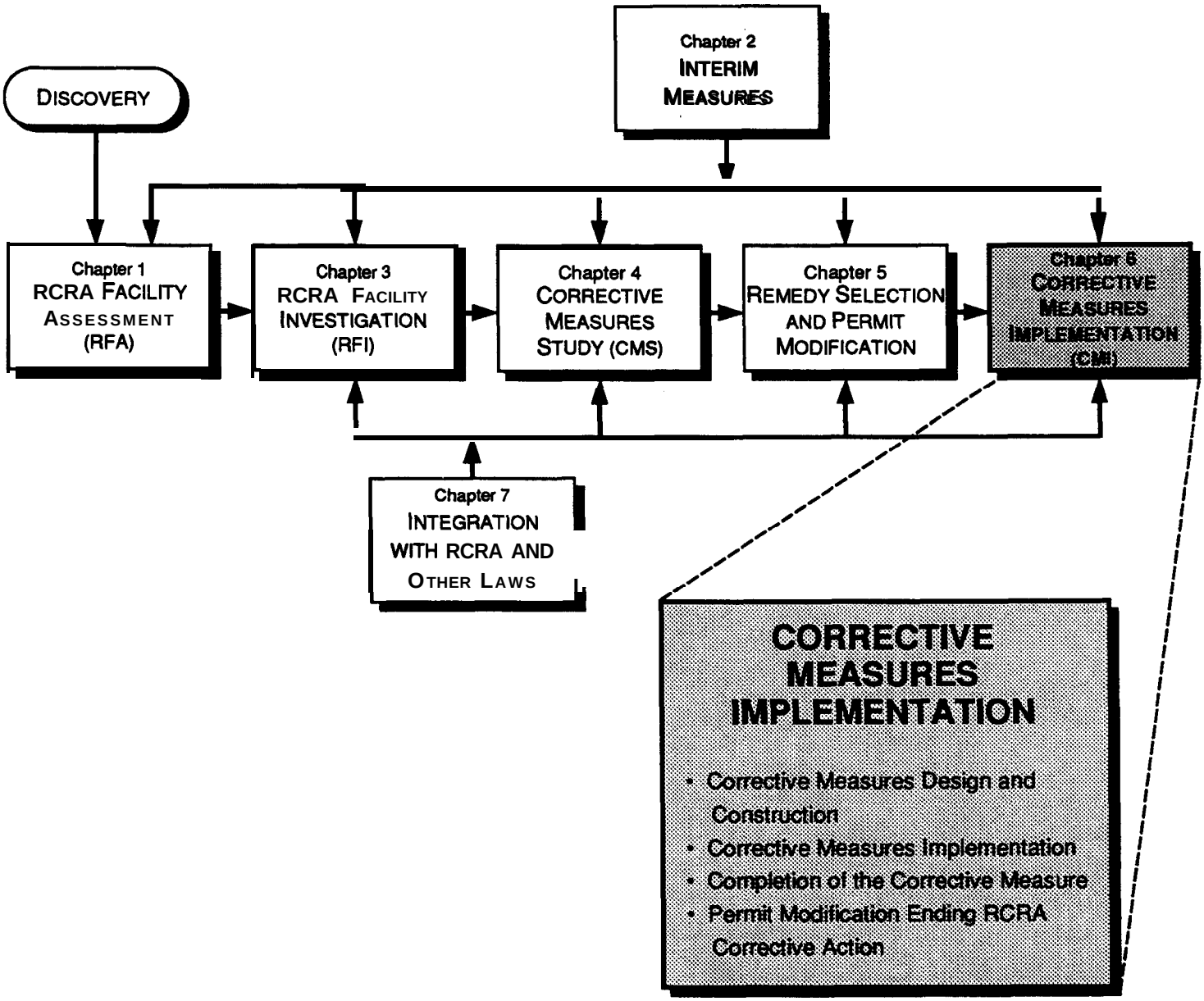
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

This chapter discusses the design, construction, implementation, and process for demonstrating completion of the corrective measure. This discussion also addresses the final permit modification process which discharges the facility's obligation to conduct RCRA Corrective Action.

Section 264.527 of the proposed Subpart S rule establishes the requirements for the design and construction of the corrective measure. Sections 264.528 and 264.529, respectively, address reporting requirements and EPA oversight during Corrective Measures Implementation (CMI). Section §264.530 of the proposed Subpart S rule addresses the requirements for demonstrating completion of the corrective measure and the permit modification process which ends the requirement for the facility to conduct RCRA Corrective Action.

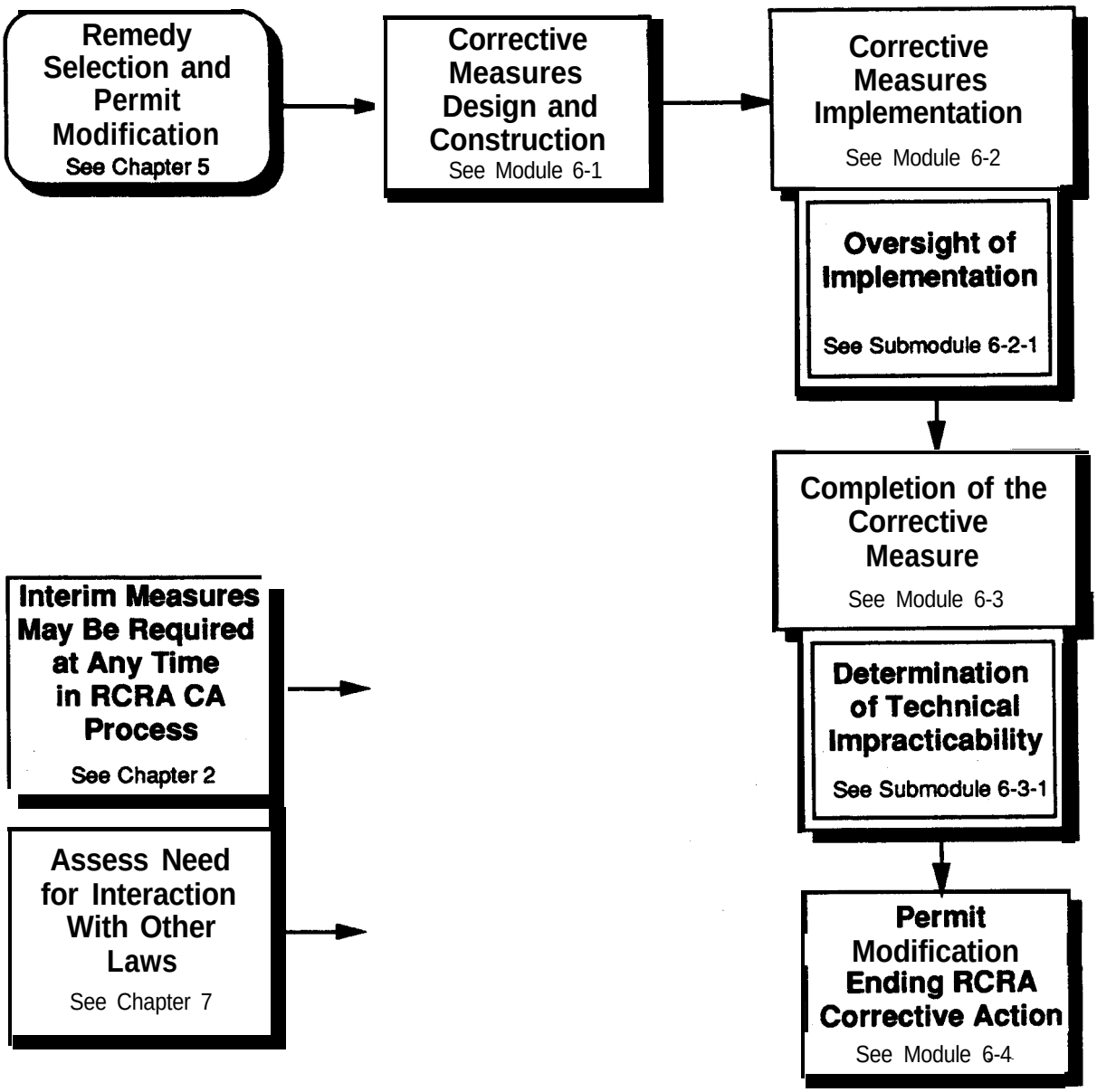
Many areas of the proposed Subpart S rule are unclear as to their meaning or scope. In these areas, the meaning of the language of the proposed rule has been interpreted on the basis of "best professional judgment." It should also be noted that the presentation sequence for this material is not in the exact sequence as presented in the proposed rule, and the guidance presented herein is not intended as a rigid structure. For any number of reasons, Corrective Measures Implementation may vary from the sequence as presented.

Throughout this chapter, there are references to EPA. For the sake of clarity, this term includes those States with appropriate RCRA authorization. Similarly, the term "owner/operator" includes the actual owner/operator of the facility and any contractors retained by the facility owner/operator.

The following modules of this chapter provide a detailed discussion of the process for implementing the corrective measure, as outlined in the graphic on the next page.

Module 6-1 Corrective Measures Design and Construction

Under the proposed Subpart S rule, EPA may require the owner/operator to submit a detailed plan, including corrective measures specifications, and complete construction drawings for the corrective measure. Such a requirement usually appears in the facility schedule of compliance in the modified permit or in the Federal Facility Compliance Agreement (FFCA). The proposed Subpart S rule does not provide specific requirements for these plans to implement the corrective measure. However, planning the implementation of the corrective measure may involve development of:



Chapter Six: Corrective Measures Implementation (CMI)

- A program management plan (PMP) which describes the overall management strategy for implementing the corrective measure, establishes roles and responsibilities of the personnel involved in the project, and provides a description of the qualifications of the personnel assigned to the project;

- Updating the public involvement plan (PIP) to reflect the need to keep the public abreast of progress and/or problems as the corrective measures are implemented;

- Preparation of a document describing:

  - How the design meets the requirements of applicable regulations;
  - How the design minimizes environmental and community impacts;
  - The technical factors related to the design;
  - Any assumptions made in developing the design; and
  - Any possible sources of error in the design process;

- Preparation of detailed drawings, flow diagrams, and material and energy balance calculations for the corrective measure;

- A listing of, and specifications for, all equipment (including those required for implementation of the health and safety plan) and materials required to implement the corrective measure;

- The results of any field or laboratory testing related to the corrective measure, including any bench- or pilot-scale treatability testing conducted during the Corrective Measures Study (CMS);

- An operation and maintenance plan (O&MP) which describes normal operation and maintenance procedures, potential problems and anticipated solutions, routine monitoring or testing procedures, safety procedures, a description of the equipment related to the corrective measure, and the record keeping and reporting procedures and requirements;

- An estimate of the fully loaded cost of the corrective measure;

- A proposed schedule for implementing the corrective measure, including a critical path analysis and identification of milestones;

- Development of a data collection quality assurance plan (DCQAP) for the collection and analysis of samples required for compliance monitoring;

- Development of construction quality assurance objectives and a program for ensuring the quality of the construction; and

- The development of a health and safety plan (HASP).

The owner/operator will be required to develop, and submit to EPA for approval, any or all of these documents. All submitted documents are subject to approval (or unilateral revision) by EPA. The owner/operator should discuss any revisions required by EPA, and should seek a negotiated settlement of the areas of disagreement.

Module 6-2 Corrective Measures Implementation (CMI)

Implementing the corrective measure is a two-phase process. The first phase involves the construction of the corrective measure, and starts once EPA approves the design, specifications, and the construction, quality assurance and other plans. The length of time required for this phase depends on several factors including the complexity of the project, problems encountered during construction, seasonal influences, and the availability of resources.

In the preliminary construction phase, the owner/operator (or owner/operator's contractor) should verify the conditions at the facility through a review of the RCRA Facility Investigation (RFI) report, the Corrective Measures Study (CMS) report, the modified permit, the FFCA, and the Statement of Basis or Fact Sheet. The next phase of the preliminary implementation is to conduct a review of the implementation plans, drawings, and calculations. Only when the owner/operator is confident the necessary groundwork for beginning construction is complete should construction begin.[14]

While construction of the corrective measure proceeds, the owner/operator should conduct the necessary inspections and reviews as described in the construction quality assurance plan (CQAP) to ensure the construction meets all specifications. At the same time, the owner/operator should begin training the personnel that will be responsible for operating and maintaining the corrective measure.

The second phase of Corrective Measures Implementation (CMI), operation of the corrective measure, begins once construction and acceptance testing are complete. The requirements for operating the corrective measure varies with the nature of the measure. For example, operation of a hazardous waste incinerator is very complex, requiring constant monitoring and maintenance. The other extreme is a clay-soil cap,

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[14] It appears redundant to have the owner/operator or owner/operator's contractor review plans already prepared. If the author of the plans is also the implementer, such reviews are obviously brief. However, if the author and implementer are different, a review by those responsible for implementation appears prudent.

which is an example of a corrective measure which requires limited operational or maintenance activities.

Submodule 6-2-l Oversight of Implementation

During the implementation of the corrective measure, the owner/operator submits periodic progress reports to EPA. The facility permit or FFCA specifies the frequency, content, and format for these reports. While the proposed Subpart S rule does not establish specific requirements, the preamble to the proposed rule states that facilities posing a high risk to human health and the environment will be subject to close EPA oversight during implementation of the corrective measure.

In addition to the submission of periodic progress reports, the proposed Subpart S rule states that EPA will conduct onsite inspections of the design, construction, and operation of the corrective measure. Such inspections can result in permit modifications, additional requirements, or revision of the plan for implementing the corrective measure.

If EPA discovers the facility is non-compliant with the terms of the modified permit (for example, falling behind the established schedule without making a request for a schedule modification), the EPA will issue a Notice of Non-compliance. The EPA document ***The Federal Facilities Compliance Strategy*** (1988) discusses the processes available for resolving non-compliance at Federal facilities.

Module 6-3 Completion of the Corrective Measure

Under the proposed Subpart S rule, a corrective measure is complete when:

- The facility demonstrates compliance with the media cleanup standards (MCS) established in the modified permit;

- All permit requirements for actions addressing the source of the release are satisfied; and

- The facility demonstrates compliance with the procedures specified in the permit for the removal and/or decontamination of all equipment, devices, or structures used in conducting the corrective measure.

In addition to developing a document detailing the specific information supporting the claim that the corrective measure is complete, the facility is required to obtain certification of the completion of the corrective measure from an independent professional(s) skilled in the appropriate discipline(s).

Module 6-3-l Determination of Technical Impracticability

If, after a "reasonable effort" (which includes active efforts to achieve all requirements of the permit) the owner/operator demonstrates that the corrective measure is incapable of meeting a given performance standard of the modified permit, then the owner/operator may request a Determination of Technical Impracticability. For example, treatment systems for groundwater contamination often demonstrate an initially rapid decrease in the concentration of contaminants, but soon achieves a steady state, where additional operation has no appreciable benefit. The owner/operator must provide EPA with all evidence and documentation to support such a determination. Following review of the information, EPA may require the owner/operator to conduct an evaluation of additional alternatives, in a process similar to the Corrective Measures Study (CMS). The evaluations may focus on assessment of means to improve the effectiveness of the selected corrective measure, further assessment of alternatives already evaluated in the CMS, or assessment of alternatives not yet considered. Based upon these studies, EPA will either issue a modification to the permit requiring implementation of another corrective measure, or, if all possible options for the corrective measure are completely impractical, a Determination of Technical Impracticability. A Determination of Technical Impracticability may include additional requirements to protect human health and the environment.

The Determination of Technical Impracticability represents a finding that remediation of the release is not feasible from a technical standpoint, and such a determination does not represent a discharge of the requirement to conduct RCRA Corrective Action nor does it discharge the owner/operator's obligation for the ultimate cleanup of the facility. EPA reserves the authority to require additional efforts if advances in technology provide a corrective measure capable of remediating the contamination at the facility.

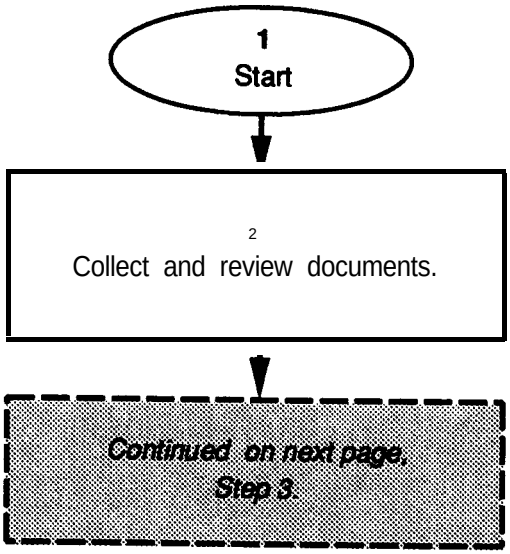
Module 6-4 Permit Modification Ending RCRA Corrective Action

Following documentation and certification of the completed corrective measure, the owner/operator must request a Class III permit modification to end the requirement to conduct RCRA Corrective Action. This type of permit modification requires negotiation of the modification with EPA, development of a draft permit, a public notice, a comment and response period, a public hearing (if necessary), incorporation of any revisions into the permit modification, and issuance of the final modified permit or Federal Facility Compliance Agreement (FFCA). For an interim status facility, EPA will rescind the RCRA §3008(h) corrective action order, and modify the FFCA.

In the preamble to the proposed Subpart S rule, EPA states that the requirement to conduct RCRA Corrective Action ends only upon completion of the corrective measures at all SWMUs at the facility. In the case of completed corrective measures at widely separated SWMUs which are affecting different media, the owner/operator

may request a partial release from the RCRA Corrective Action program. In either case, *all* implementation and reporting requirements established in the permit remain in effect until all corrective measures at the facility are complete. Failure to continue required actions, such as monitoring or reporting, even if the corrective measure at a SWMU is complete, may represent non-compliance with the terms of the facility permit.

Module 6-1: Corrective Measure Design and Construction



Module 6-1: Corrective Measure Design and Construction

This module will discusses the requirements of a comprehensive work plan for the implementation of the corrective measure. This comprehensive work plan reflects all aspects of the planning, design, and construction of the corrective measure. Additional activities not specified in the proposed Subpart S rule are also discussed in this module. While not legally enforceable requirements, these activities represent "best management practices" and, as such, should be aspects of the Corrective Measures Implementation process. Often these additional requirements are included in the Federal Facility Compliance Agreement (FFCA) or in the facility permit.

The actual process of developing the work plan may differ from the information presented in this module, due to factors associated with the implementation of corrective measures.

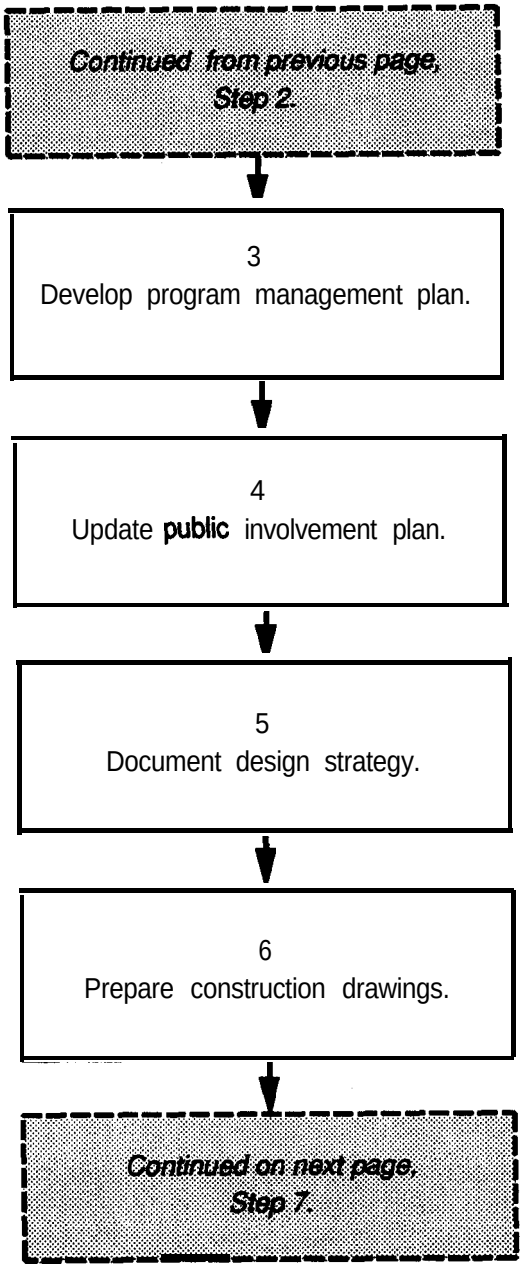
Step 1 Start.

Step 2

The first task in developing a work plan for the implementation of the selected corrective measure is a review of all documents related to the facility, the unit, and the release. These documents include:

- The permit, RCRA §3008(h) order, or FFCA for the facility which specifies the corrective measure for the unit, the requirements for demonstrating compliance, the media cleanup standards (MCS), and any additional requirements placed on the facility;
- The Corrective Measures Study (CMS) report;
- The RCRA Facility Investigation (RFI) report;
- The RCRA Facility Assessment (RFA) report;
- Reports of interim measures; and
- Notices of releases.

The owner/operator or the owner/operator's contractor should review these documents for information on conditions at the facility, for the specific requirements of the permit, and for information on the alternative selected for implementation. This step is extremely important when the owner/operator's contractor has not been involved in the corrective action activities at the facility.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3
Develop program management plan.
4
Update public involvement plan.
5
Document design strategy.
6
Prepare construction drawings.
Continued on next page, Step 7.

Step 3 The next step in the planning process is development of a program management plan (PMP). The PMP should include:

- A description of the overall management strategy for implementing the corrective measure;
- A description of the roles and responsibilities of the personnel involved in the project; and
- A description of the qualifications of the personnel assigned to the project. (See the EPA document *RCRA Corrective Action Plan* for additional details.)

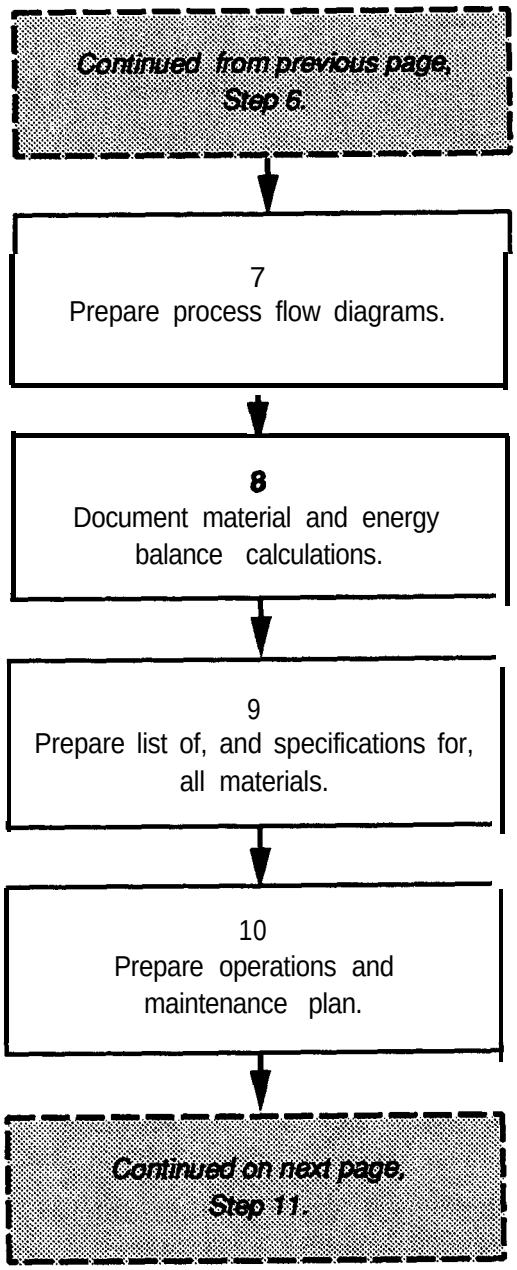
Step 4 Update the public involvement plan (PIP) to reflect the need to keep the public abreast of progress and/or problems as the Corrective Measures Implementation proceeds. Upon completion of the engineering plans and design, the facility should prepare and distribute an updated fact sheet and conduct an informal public hearing to discuss the implementation of the corrective measure. Preparation and distribution of additional fact sheets and regularly scheduled informal public hearings should be conducted throughout the implementation process. This additional effort will keep the public aware of the progress in implementing the corrective measure.

Step 5 Prepare a design strategy document describing the manner and methods to:

- Meet the requirements of applicable Federal, State, and local regulations for performance and construction;
- Minimize environmental and community impacts;
- Address the technical factors related to the design;
- Account for assumptions made in developing the design; and
- Account for possible sources of error in the design process.

The design strategy document bears a strong relationship to the Record of Decision (ROD) prepared as part of preparing an Environmental Impact Statement (EIS) (if an EIS is required for NEPA compliance - see Chapter 7). The facility may wish to consider developing the ROD for an EIS (if one is required) in a manner which will allow the ROD to be used to fulfill the requirements for this document.

Step 6 Once the review and planning phases are completed, the owner/operator should prepare a complete set of detailed construction drawings for the corrective measure. (40 CFR §264.527(a)(1))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7
Prepare process flow diagrams.
8
Document material and energy balance calculations.
9
Prepare list of, and specifications for, all materials.
10
Prepare operations and maintenance plan.
Continued on next page, Step 11.

Step 7 The owner/operator should prepare a complete set of process flow diagrams for the corrective measure. These drawings should show the entire process of the corrective measure, and should include details on both the on- and offsite treatment systems. (40 CFR §264.527(a)(1))

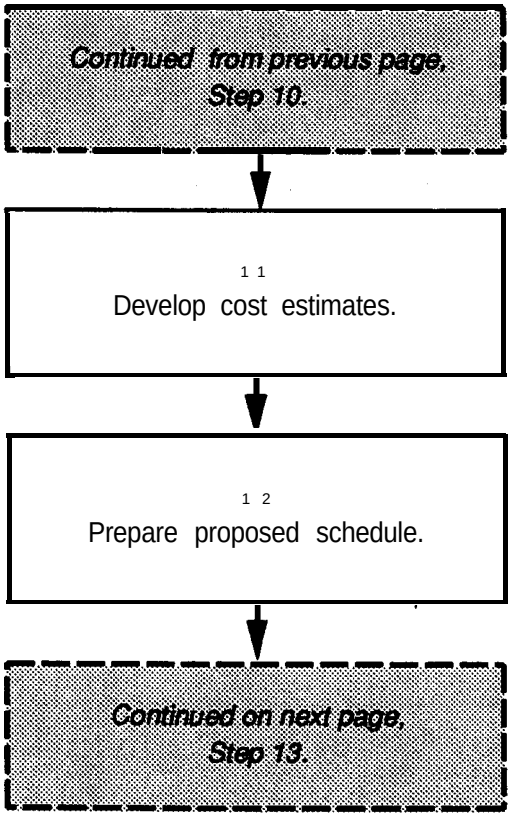
Step 8 The owner/operator should document all engineering calculations and the material and energy balance calculations for the corrective measure.

Step 9 The owner/operator should prepare a list of, and specifications for, all equipment and materials required to implement the corrective measure. Included in this list are:

- All equipment required to ensure employee health and safety (specified in the health and safety plan);
- All materials required for construction of the corrective measure including materials and specifications for prefabricated sections;
- All construction equipment required to implement the corrective measure (such items as heavy equipment, special tools, or special materials handling devices) and the source and availability of this equipment; and
- A summary of specifications for the materials and equipment required for implementation of the corrective measure to be used included in the construction quality assurance plan. (40 CFR §264.527(a)(1))

Step 10 The owner/operator will prepare an operation and maintenance plan (O&MP) for the corrective measure which describes:

- The normal operation and maintenance procedures;
- Potential problems and anticipated solutions to such problems;
- The routine monitoring or testing procedures;
- Safety procedures;
- The equipment related to the corrective measure; and
- The record keeping and reporting procedures and requirements.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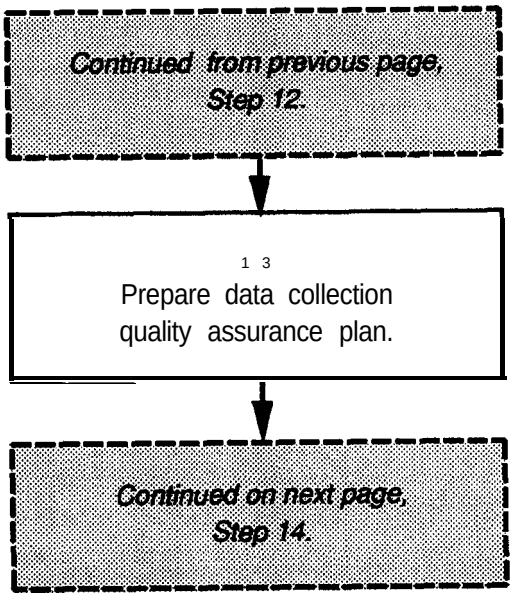
11
Develop cost estimates.
12
Prepare proposed schedule.
Continued on next page, Step 13.

Step 11 The next task in planning the corrective measure is development of a cost estimate. This estimate should reflect the fully-loaded cost of the corrective measure. Fully loaded cost includes all short- and long-term costs and an estimate of the extent of all long-term liabilities. Examples of information to include in the cost estimate are:

- The cost of all materials required to construct the corrective measure;
- The costs associated with the manpower required to implement the corrective measure, including:
  - Salaries;
  - Costs for insurance;
  - Required contributions (e.g., Social Security, pensions);
  - Costs for health monitoring;
  - Cost for specialized training;
  - Estimated costs of long-term health related liability;
  - Other costs;
- Costs for overhead, operations, and profit; and
- The cost of waste disposal, including costs for long-term liabilities related to waste disposal.

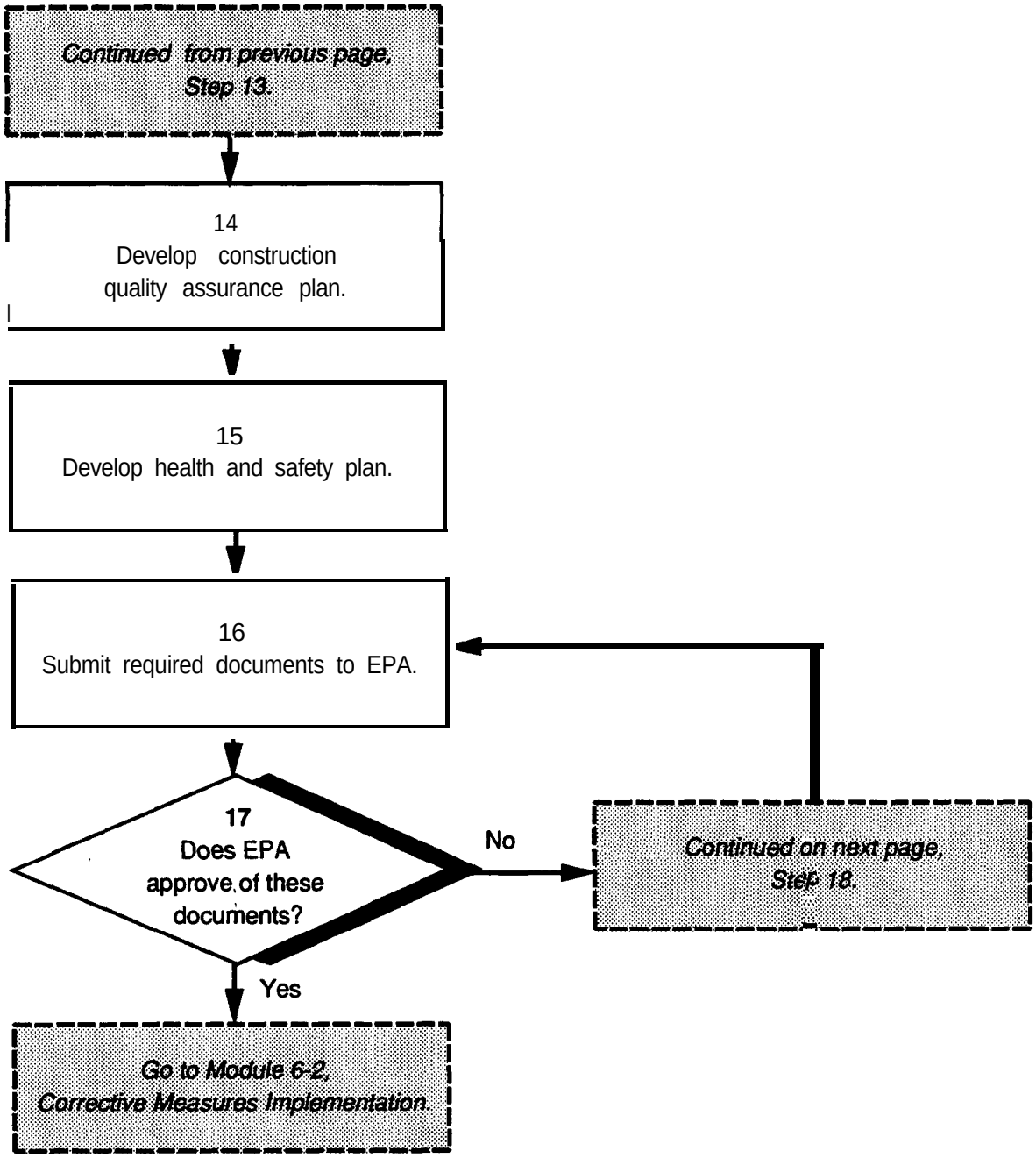
Step 12 A schedule for implementing the corrective measure will be developed by the owner/operator which includes:

- Any reporting requirements established in the permit, RCRA §3008(h) order, or FFCA, such as implementation progress reports or monitoring and sample analysis reports;
- A critical path analysis highlighting extremely critical functions, activities, or decisions which, if not met, would force the facility to request a modification of the schedule of compliance; and
- Identification of the significant milestones of the implementation process such as the completion of important phases in the construction, dates for conduct and completion of acceptance testing, the dates for actual implementation of the corrective measure, and dates for progress reviews, inspections, or other functions related to implementing the construction quality assurance or data collection quality assurance plans. (40 CFR §264.527(a)(3) and (4))


Continued from previous page,
Step 12.
13
Prepare data collection
quality assurance plan.
Continued on next page,
Step 14.

Step 13 As a corrective measure requires sampling and analysis to demonstrate compliance with MCS, the owner/operator will need to develop a data collection quality assurance plan (DCQAP). A DCQAP is a document which presents in specific terms the data collection strategy, sampling locations and procedures, field measurement procedures, and sample analysis methods designed to achieve adequate data quality. The elements of a DCQAP (for more information see the EPA document *Data Quality Objectives for Remedial Response Activities*) include:

- A description of the intended uses of the data (data quality objectives);
- The specific methods and procedures for assessing the precision, accuracy, and completeness of the data (data quality objectives);
- A description of the rationale used to ensure that the data accurately and precisely represent a characteristic population (data quality objectives);
- A description of the measures to be taken to ensure that the data sets collected can be compared to one another;
- The schedule for, and information required in, quality assurance reports;
- A discussion of the media and parameters to be sampled or measured, the conditions for sampling or measuring, and the procedures to prevent contamination of samples;
- A discussion of the methods for ensuring that a statistically sufficient number of samples or measurements are collected;
- A discussion of documenting all field operations related to sampling or field measurements, especially chain-of-custody requirements;
- A discussion of sample container or field measurement device selection and sample preservation and measurement device calibration procedures;
- A specific discussion of the acceptable methods for sample preservation, storage, preparation, and analysis;
- A discussion of chain-of-custody within the laboratory;
- Specific calibration methods for lab instrumentation;
- Specific procedures for data reduction, validation, and reporting;
- A description of preventive maintenance requirements for sampling and analysis devices;
- A description of internal quality control checks, and lab and systems audits; and
- The mechanism for correcting problems.


Continued from previous page, Step 13.
14
Develop construction quality assurance plan.
15
Develop health and safety plan.
16
Submit required documents to EPA.
17
Does EPA approve of these documents?
No
Continued on next page, Step 18.
Yes
Go to Module 6-2, Corrective Measures Implementation.

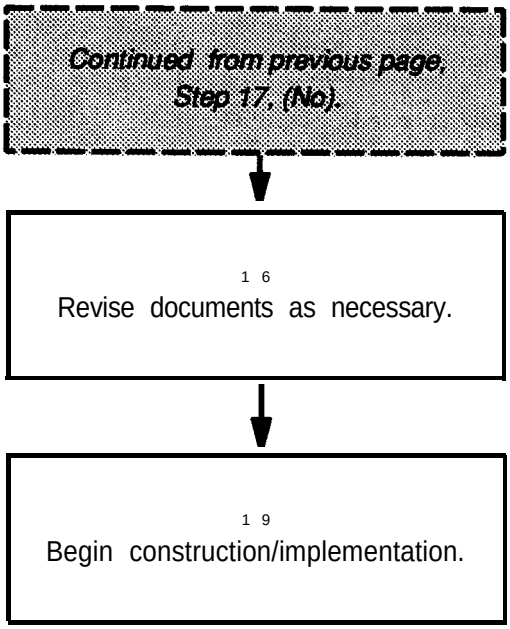
Step 14 The owner/operator will also need to develop a construction quality assurance plan (CQAP) for the construction activities in the implementation process. While a CQAP is different in nature and scope from a DCQAP, the owner/operator may elect to use the same format for preparing the CQAP document. The CQAP will specify testing methods to ensure that materials meet specifications, establish an inspection program, and provide the details for acceptance testing of the corrective measure. (40 CFR §264.527(a)(4))

Step 15 The development of a health and safety plan (HASP) for the implementation of the corrective measure is a requirement under the Occupational Safety and Health Act (OSHA). The specific requirements for a HASP are outlined at 29 CFR §1910.120 - Hazardous Waste Operations and Emergency Response (HAZWOPER). The minimum requirements for a HASP are:

- Site characterization and hazard analysis;
- Employee training necessary to successfully fulfill the HASP;
- A description of the conditions for use of personal protective equipment (PPE);
- A description of the medical surveillance requirements for employees engaged in onsite activities;
- Environmental monitoring equipment operation;
- Methods of site control employed during the investigation;
- Decontamination procedures;
- Emergency response procedures;
- Confined-space entry procedures; and
- Spill containment procedures.

Step 16 The owner/operator may be required to submit any or all of the documents prepared during this process to EPA for review and approval. Review the facility permit or FFCA for specific requirements for document submission.

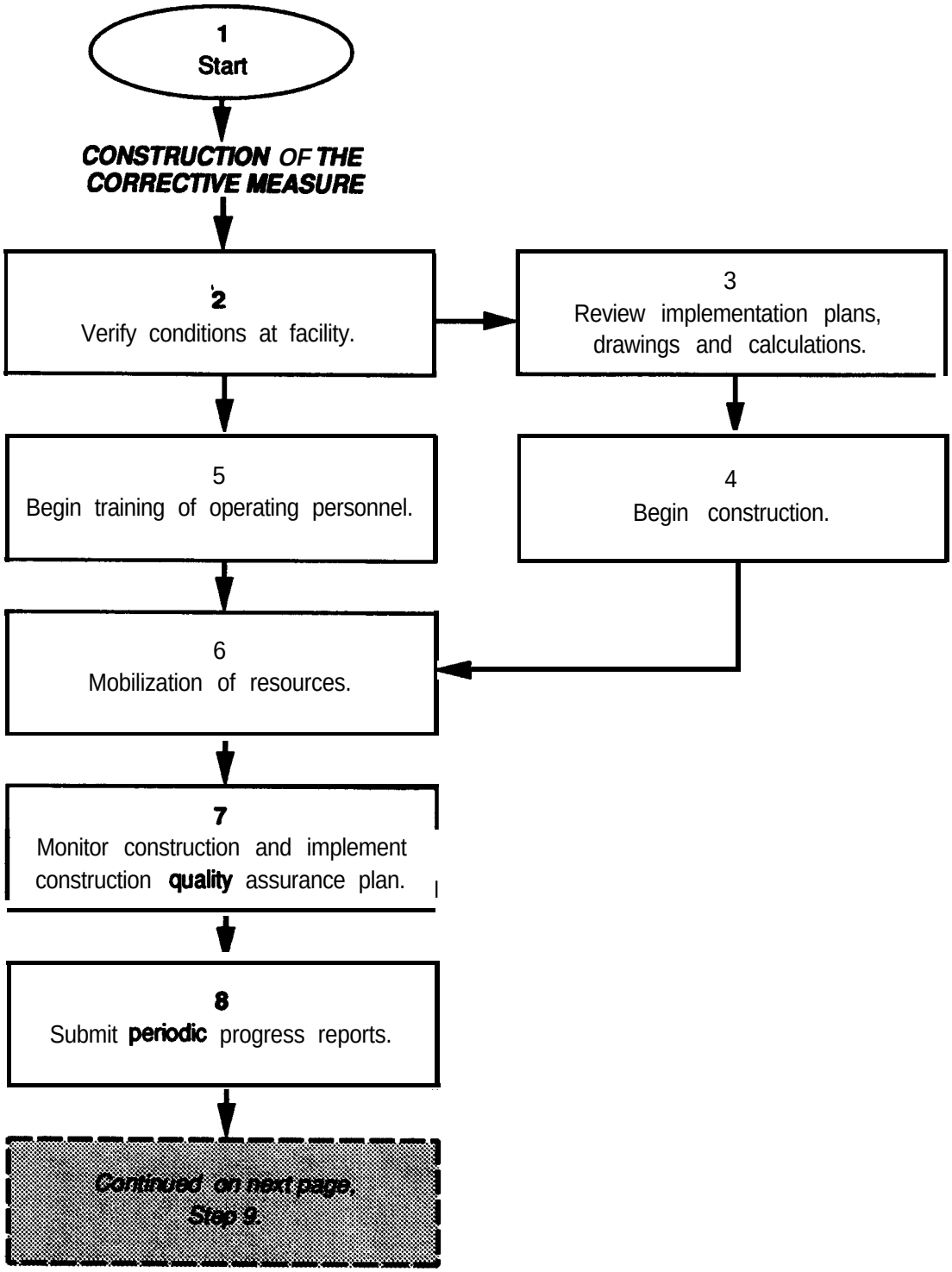
Step 17 EPA reviews and either approves or rejects the documents submitted by the owner/operator.


Continued from previous page, Step 17, (No).
16
Revise documents as necessary.
19
Begin construction/implementation.

Step 18 If the documents were unacceptable to EPA, the owner/operator should request a meeting with EPA to discuss and negotiate any revisions before revising the documents. The owner/operator should recognize that under the proposed Subpart S rule, discussion and negotiation of any revisions is a discretionary action by EPA. EPA could, within their authority, unilaterally revise the document and require the facility to implement the revised plan. Once these discussions and negotiations are complete, the facility should revise and resubmit the documents to EPA.

Step 19 Once the documents are approved by EPA, construction and/or implementation of the corrective measure can begin.

Module 6-2: Corrective Measures Implementation



Module 6-2: Corrective Measures Implementation

This module will discuss implementation of the corrective measure. The implementation process consists of two phases, construction of the corrective measure and the operation of the corrective measure.

Step 1 Start.

Construction of the Corrective Measure

Step 2 The first task in the preliminary phase of implementation is to verify the conditions at the facility through review of the RCRA Facility Investigation (RFI) report, the Corrective Measures Study (CMS) report, and the facility permit and Statement of Basis. This step is required only if those implementing the corrective measure are unfamiliar with the conditions at the facility.

Step 3 The next phase of the preliminary implementation is to review the implementation plans, drawings, and calculations. This step is required only if those implementing the corrective measure are unfamiliar with the design and specifications for the corrective measure.

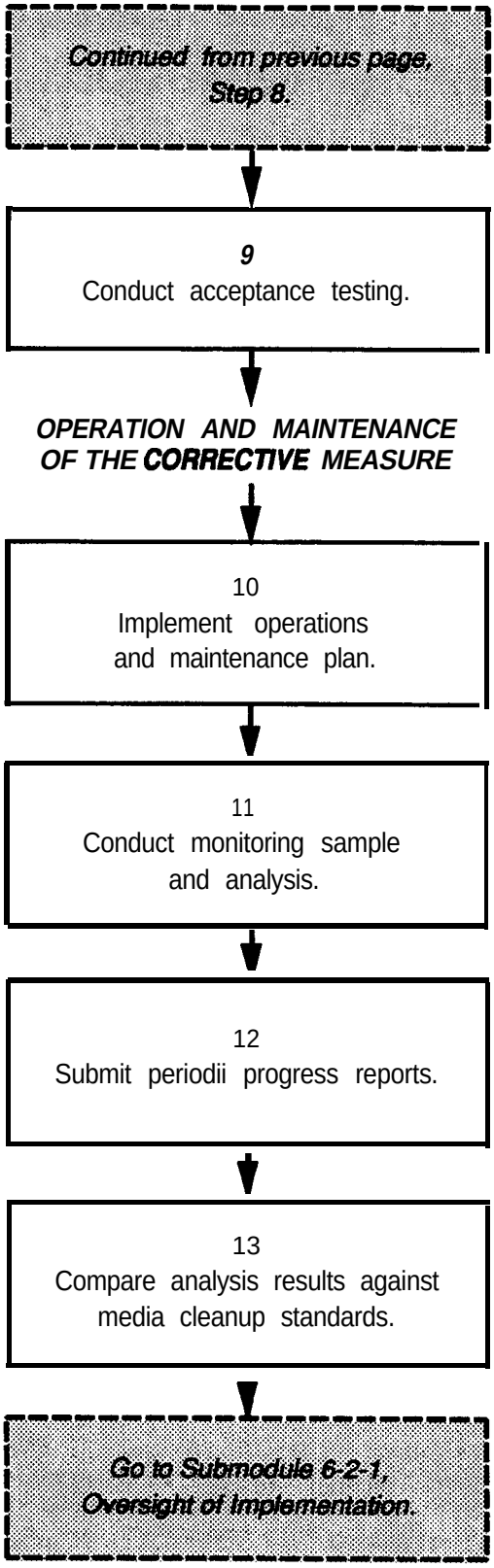
Step 4 If the plans, drawings, and other documents are satisfactory, then begin construction of the corrective measure. (40 CFR §264.527(b)(1))

Step 5 Concurrent with the construction of the corrective measure, the owner/operator should begin training the personnel who will be responsible for the operation and maintenance of the corrective measure.

Step 6 The initial phase of construction is mobilization of the necessary equipment, personnel, and resources. Mobilization of the necessary resources is often a complex process, and can take many months to complete. Included in mobilization is the acquisition of any equipment, tools, materials, prefabricated structures or devices, and hiring and training the personnel required for construction of the corrective measure.

Step 7 Actual construction of the corrective measure is the next step in the process. The construction process includes conducting necessary quality assurance procedures, inspections, and preparing reports.

Step 8 Prepare and submit any periodic progress reports required by the permit or Federal Facility Compliance Agreement (FFCA). An example would be a report on the progress of constructing a particular treatment unit, including information on the progress of construction, the results of inspections and acceptance testing, and success in adhering to the schedule of compliance. (40 CFR §264.528)


Continued from previous page, Step 8.
9
Conduct acceptance testing.
OPERATION AND MAINTENANCE OF THE CORRECTIVE MEASURE
10
Implement operations and maintenance plan.
11
Conduct monitoring sample and analysis.
12
Submit periodii progress reports.
13
Compare analysis results against media cleanup standards.
Go to Submodule 6-2-1, Oversight of Implementation.

Step 9 Upon completion of any phase of the construction of the corrective measure, conduct the necessary inspections and acceptance testing as specified in the construction quality assurance plan (CQAP). This process will ensure the corrective measure meets the specifications and performance standards established for the corrective measure.

Operation and Maintenance of the Corrective Measure

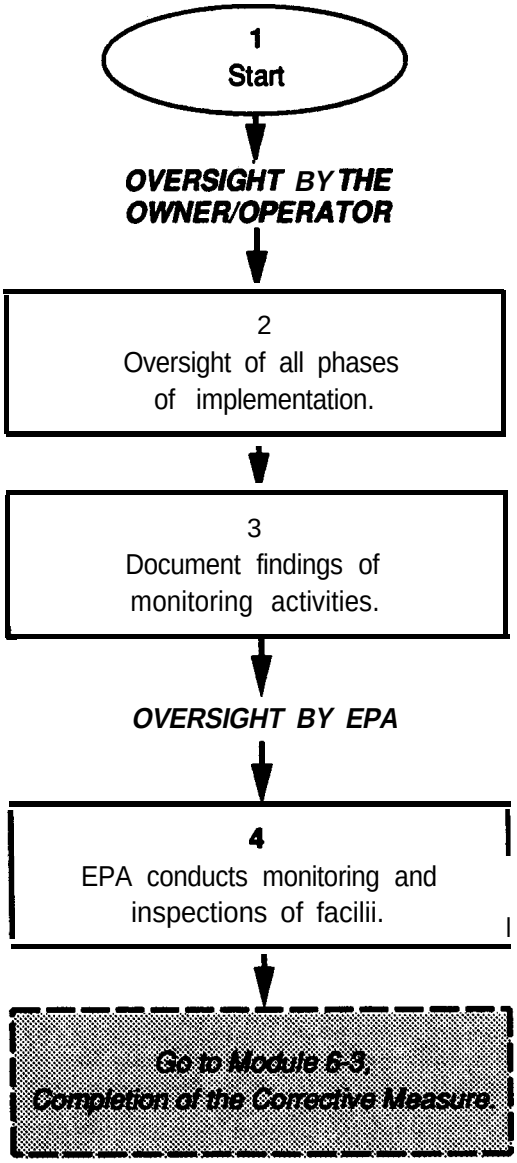
Step 10 Once the corrective measure construction and acceptance testing is completed, commence operations and maintenance. This process consists of implementing the operations and maintenance plan.

Step 11 Conduct the sampling and analysis required to demonstrate compliance. The sampling and analysis must conform to the requirements of the data collection quality assurance plan (DCQAP) developed during the planning process.

Step 12 Prepare and submit any progress reports required under the permit or FFCA. (40 CFR §264.528)

Step 13 At the completion of each round of sampling and analysis, compare these results against the media cleanup standards established in the facility permit. Once the contamination concentrations are at or below MCS, the period over which the facility must demonstrate compliance begins.

Submodule 6-2-l : Oversight of Implementation



Submodule 6-2-1: Oversight of Implementation

This submodule will discuss the oversight required for the corrective measures. Oversight of the implementation is conducted by both the owner/operator and by EPA.

Step 1 Start.

Oversight by the Owner/Operator

Step 2 The owner/operator must oversee all phases of implementation including the construction and acceptance testing activities. This function ensures that the construction of the corrective measure complies with:

- The specifications and requirements detailed in the planning process for implementation;
- The terms of any contracts for construction or operation; and
- The applicable requirements of the construction quality assurance plan (CQAP) and data collection quality assurance plan (DCQAP).

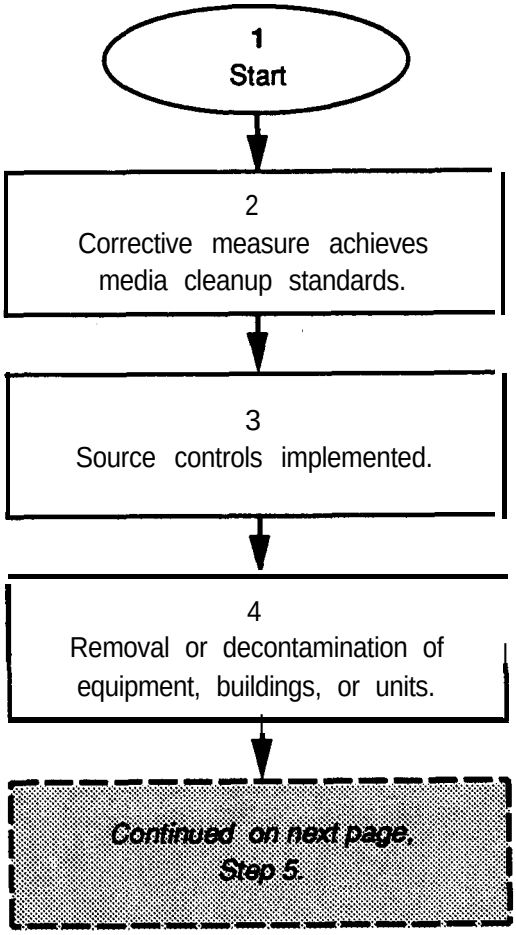
Step 3 The owner/operator should document the findings of all oversight activities. Such reports are valuable for:

- Developing periodic progress reports for submission to EPA;
- Providing information on the effectiveness of the corrective measure when attempting to demonstrate compliance with the terms of the permit; and
- Substantiating any claims of "reasonable effort" if the facility requests a Determination of Technical Impracticability.

Oversight by EPA

Step 4 Under the proposed Subpart S rule, EPA will conduct periodic inspections to assess the progress in implementing the corrective measure. In performing this function, EPA will review the periodic progress reports submitted by the facility, and may also conduct onsite inspections and oversight of the design, construction, operation, and maintenance of the corrective measure. (40 CFR §264.529)

Module 6-3: Completion of the Corrective Measure



Module 6-3: Completion of the Corrective Measure

This module discusses the criteria for completion of the corrective measure.

Step 1 Start.

Step 2

The first condition the owner/operator must meet is compliance with all media cleanup standards (MCS) specified in the facility permit. The demonstration requirements and performance period are part of the facility permit, and must be achieved at *all* points of compliance specified in the facility permit. (40 CFR §264.530(a)(1))

For example, a facility is conducting a corrective action on groundwater contamination using a pump-and-treat system. After several years of operation, the facility can demonstrate that the contaminant concentrations are less than the MCS established in the facility permit. The demonstration of compliance provisions of the permit requires the facility to cease the pump-and-treat operation for 1 month. At the end of the month the facility conducts additional sampling to determine if the concentration of contaminants has remained below the MCS. If the concentration remained below MCS, the facility could be required to continue monitoring for as long as several years, as part of demonstrating compliance with the MCS. If, however, at the end of the month (or at any time during the period of performance) the concentrations rose above the MCS, the facility would be required to resume the pump-and-treat operations.

Step 3

The second condition is the completion of all source control measures specified in the facility permit. This condition relates to the source control requirement of the general performance standards for corrective measures. The periodic progress reports and monitoring activities conducted while implementing the corrective measure are useful in demonstrating compliance with this criteria. (40 CFR §264.530(a)(2))

Step 4

The last criteria for demonstrating that the corrective measure is complete involves the removal or decontamination (often referred to as demobilization) of all units, equipment, devices, or structures required to implement the corrective measure. When attempting to meet this criterion, the owner/operator should also provide information demonstrating compliance with the requirements for management of the wastes generated during the corrective measure. (40 CFR §264.530(a)(3))

Although the proposed Subpart S rule requires completion of demobilization before the facility can discharge the requirements for corrective action, the owner/operator should seek an official statement from EPA that the requirements for demonstrating compliance specified in the facility permit, RCRA §3008(h) order, or Federal Facility Compliance Agreement (FFCA) have been met, before engaging in demobilization.

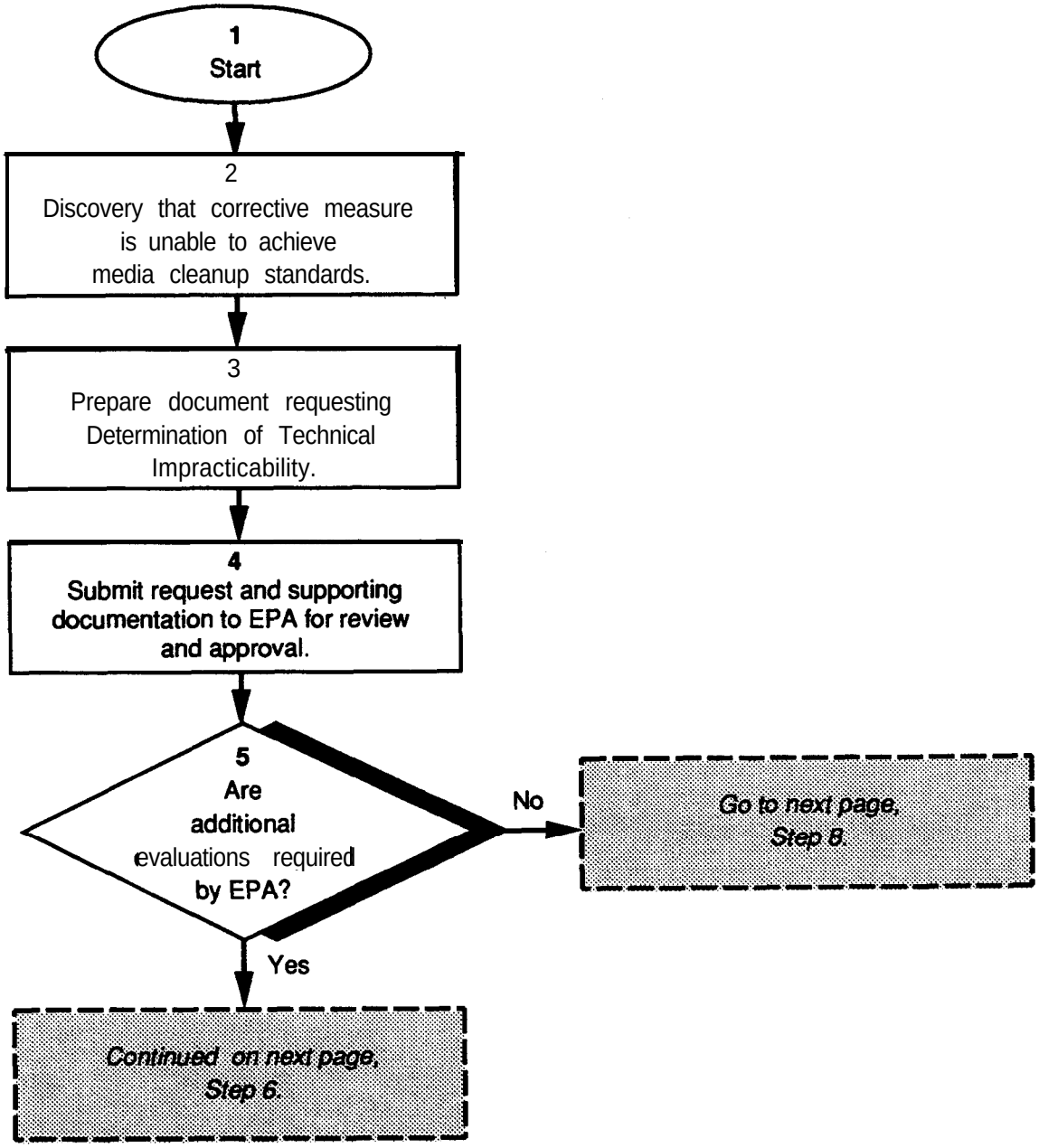
Continued from previous page, Step 4.
5
Prepare report documenting completion of corrective measure.
6
Report reviewed and certified by independent professional.
Go to Submodule 6-3-1, Determination of Technical Impracticability.

Step 5 The owner/operator will prepare a report providing all information necessary to support the claim that the corrective measure is complete (40 CFR §264.530(b) and 55 FR 30837). This report should include a discussion of the following areas:

- The history of the facility, including a discussion of the RCRA Corrective Action activities taken at the facility;
- A summary of the findings of:
  - The RCRA Facility Assessment (RFA);
  - The RCRA Facility Investigation (RFI);
  - The Corrective Measures Study (CMS);
- Any interim measures conducted at the facility;
- The corrective measure selected for the facility
- A listing of all MCS established for the facility;
- The implementation of the corrective measure;
- A summary of the requirements for demonstrating compliance;
- Documentation that all MCS have been achieved;
- Documentation that all source control measures have been successfully implemented; and
- Documentation of the removal or decontamination of all equipment, structure, and units used to implement the corrective measure.

Step 6 The facility will need to have this report reviewed and certified by an independent professional with the appropriate technical expertise. The proposed Subpart S rule provides no information on how to select such a professional, stating that the selection of this person will vary depending on the type of problems at the facility. (40 CFR §264.530(b) and 55 FR 30837)

Submodule 6-3-1: Determination of Technical Impracticability



Submodule 6-3-1: Determination of Technical Impracticability

This submodule discusses Determinations of Technical Impracticability.

Step 1 **Start.**

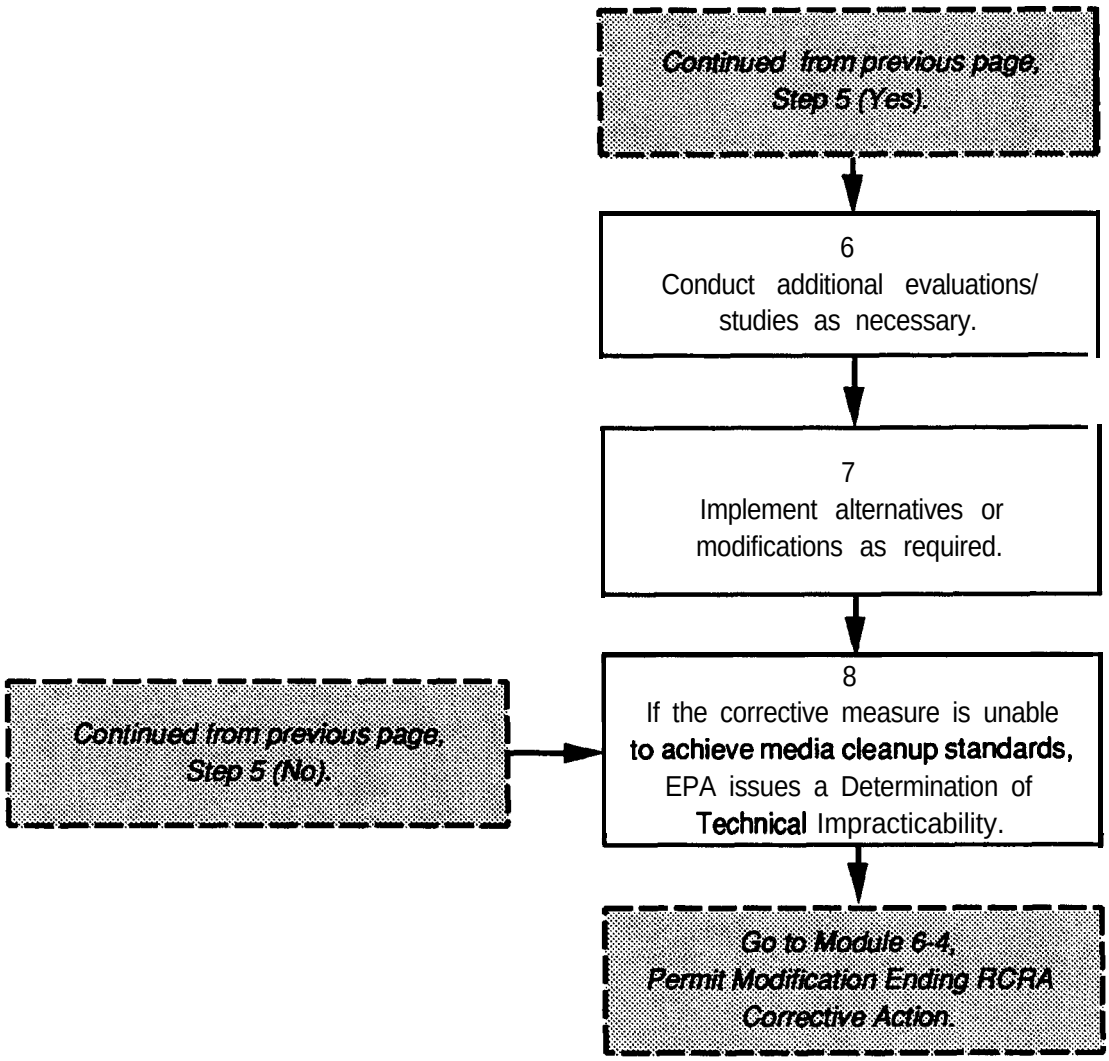
Step 2 If the owner/operator discovers that the corrective measure is unable to achieve a performance standard of the facility permit, then the owner/operator may request a Determination of Technical Impracticability. It is important to understand that many corrective measures (especially those involving remediation of groundwater contamination) may have to operate for years before enough information is available to support a request for a Determination of Technical Impracticability. (40 CFR §264.531(a))

Step 3 In requesting such a determination, the owner/operator first prepares a document showing: (1) there was a "reasonable effort" to implement the corrective measure and to achieve the performance standards of the facility permit; and (2) that due to technical reasons, the corrective measure has not, and will not, achieve the performance standard. In developing this document, the owner/operator uses information from the periodic reports submitted to EPA, and data collected by the compliance monitoring activities.

The preamble to the proposed Subpart S rule provides no specific guidance on the meaning of "reasonable effort." However, in the Regulatory Impact Analysis for the proposed Subpart S rule, a corrective measure was deemed not feasible if the time to achieve cleanup exceeded 130 years, or would cost in excess of $150 million (see 55 FR 30861). The proposed rule does state that EPA intends to examine all requests for a Determination of Technical Impracticability on a case-by-case basis. (55 FR 30838)

Step 4 The owner/operator then submits the document to EPA for review. EPA will review the document and supporting evidence, and may provide comments on the document. (55 FR 30838)

Step 5 EPA may require the owner/operator to conduct additional evaluations of alternative technologies. The owner/operator should discuss any such requirements with EPA, and attempt to limit the number of any additional evaluations.

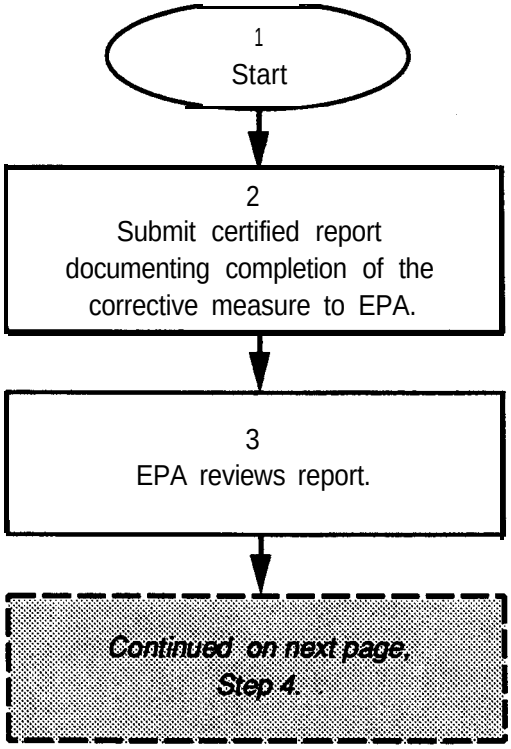

Continued from previous page, Step 5 (Yes).
6
Conduct additional evaluations/ studies as necessary.
7
Implement alternatives or modifications as required.
Continued from previous page, Step 5 (No).
8
If the corrective measure is unable to achieve media cleanup standards, EPA issues a Determination of Technical Impracticability.
Go to Module 6-4, Permit Modification Ending RCRA Corrective Action.

Step 6 The owner/operator conducts the evaluations required by EPA. These evaluations may include simple modifications to the corrective measure already in operation, a re-evaluation of alternatives already considered in the Corrective Measures Study (CMS), or assessment of alternatives not yet considered at this unit or facility, including newly developed or experimental technologies. (55 FR 30838)

Step 7 Based upon the results of these additional studies, EPA may require implementation of one or more of these alternatives. Such a requirement will be incorporated into the facility permit, RCRA §3008(h) order, or Federal Facility Compliance Agreement (FFCA). (40 CFR §264.531(b)(2))

Step 8 If the EPA determines corrective measures are technically impracticable at the facility, EPA issues a Determination of Technical Impracticability. However, such a determination is not a release from any requirement to conduct the feasible aspects of the corrective measure, nor does it release the owner/operator from responsibility for ultimately remediating the site to the MCS. If subsequent advances in remedial technology present a solution to the problem, EPA reserves the authority to require the owner/operator to implement such technology. (55 FR 30838)

Module 6-4: Permit Modification Ending RCRA Corrective Action



Module 6-4: Permit Modification Ending RCRA Corrective Action

This module discusses the process for modifying the facility permit upon completion of the corrective measure.

Step 1 **Start.**

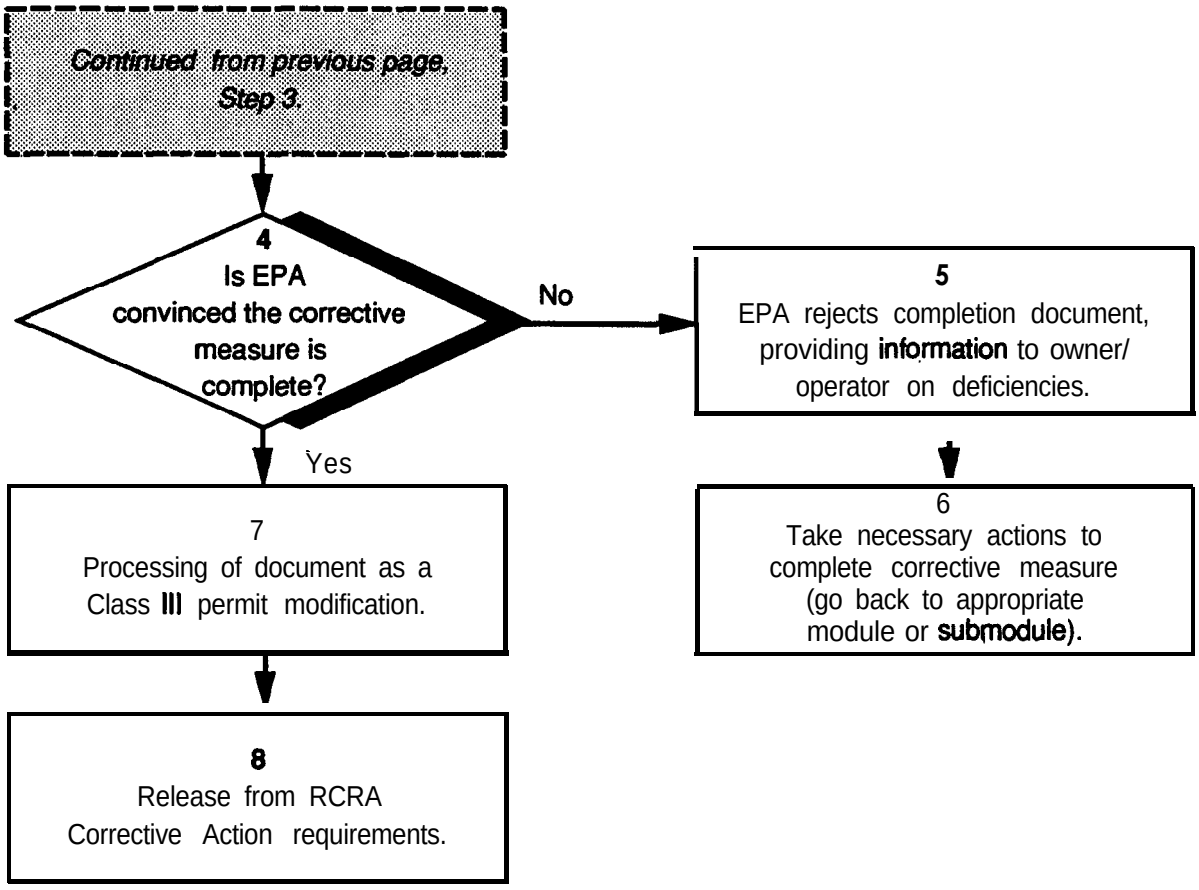
Step 2 The owner/operator submits to EPA the report demonstrating completion of the corrective measure (certified by a qualified independent professional) claiming completion of the corrective measure (see Module 6-3). (40 CFR §264.530(b))

Step 3 EPA reviews the evidence supporting the claim of completion. The specific factors EPA will assess include:

- Demonstration of compliance with the media cleanup standards (MCS) established in the modified permit;
- Demonstration that all permit requirements for actions addressing the source of the release are satisfied;
- Demonstration of compliance with the procedures specified in the permit for the removal and/or decontamination of all equipment, devices, or structures used in conducting the corrective measure.

EPA will also determine if *all* RCRA Corrective Action requirements are completed at *all* units at the facility. Completion of RCRA Corrective Action occurs only upon completion of *all* corrective action activities at the facility. However, in the case of a completed corrective measure at a unit widely separated from and affecting different media than the other units at the facility, the owner/operator may request a partial release from the RCRA Corrective Action program. (55 FR 30838)

NOTE: All implementation and reporting requirements established in the permit remain in effect until *all* RCRA Corrective Action activities at the facility are completed. Failure to continue required actions such as monitoring or reporting, even if the corrective measure at a SWMU is complete, may represent non-compliance with the facility permit. (40 CFR §264.530(a) and 55 FR 30838)


Continued from previous page, Step 3.
4
Is EPA convinced the corrective measure is complete?
No
5
EPA rejects completion document, providing information to owner/ operator on deficiencies.
Yes
6
Take necessary actions to complete corrective measure (go back to appropriate module or submodule).
7
Processing of document as a Class III permit modification.
8
Release from RCRA Corrective Action requirements.

Step 4 EPA determines if the corrective measure has been completed.

Step 5 If EPA determines that all RCRA Corrective Action requirements are not completed, EPA will reject the request, and will provide the owner/operator information on the actions required to compete the corrective measure. It is incumbent for the owner/operator to discuss any deficiencies with EPA before undertaking action to comply. The owner/operator should negotiate with EPA to establish the actions required to complete the corrective measure, and should insist these requirements be made part of the facility permit, RCRA §3008(h) order, or Federal Facility Compliance Agreement (FFCA).

Step 6 The owner/operator takes the necessary measures to complete the remedy.

Step 7 If EPA determines that all requirements of the facility permit have been met, then the request is processed as a Class III owner/operator-requested permit modification. A Class III permit modification requires:

- Notification of all parties on the facility mailing list and the appropriate State and local governmental entities;
- Publication of a newspaper notice of the request;
- A 60-day comment period;
- A public hearing on the request; and
- A copy of the proposed modification and supporting documents being placed in a location accessible to the public.

The requirements for Class III permit modifications are found at 40 CFR §270.42(c). (40 CFR §264.530(c)(1))

Step 8 Once the final permit modification releasing the facility from the RCRA Corrective Action process is complete, the owner/operator may continue normal operations.

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References

Closure of Hazardous and Mixed Waste Management Units at DOE Facilities
DOE/EGD (RCRA)-002-0690
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Corrective Action During Interim Status
OSWER Directive 9481.09-84
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Corrective Action: Technologies and Applications (Seminar Publication)
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Data Quality Objectives for Remedial Response Activities: Volumes 1 and 2
OSWER Directive No. 9355.0.07B
March 1987

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January 1990

Guidance on RCRA Corrective Action Decision Documents: The Statement of Basis, Final Decision, and Response to Comments
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February 1991

Obtaining Variances from the Treatment Standards of the RCRA Land Disposal Restrictions
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OSWER Directive No. 9902.3
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OSWER Directive No. 9502.00-6C
OSW:530/SW-89-031
May 1989

Chapter 7

Integration with RCRA and Other Environmental Laws

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Note to the Reader

On February 16, 1993, EPA promulgated a portion of the proposed Subpart S rule as a final rule *(see Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule, 58* FR 8658, Tuesday, February 16, 1993). This final rule sets forth the requirements for establishing corrective action management units (CAMUs) or temporary units during RCRA corrective actions. The specific requirements for CAMUs and temporary units under the final rule differ significantly from the requirements of the proposed rule (see 55 FR 30842-30844, July 27, 1990). Rather than delay publication of this guidance, the DOE Office of Environmental Guidance has chosen not to incorporate these changes into this guidance. Therefore, the discussions of CAMUs and temporary units appearing in this document are based solely on the proposed Subpart S rule. A copy of the final CAMU and temporary unit rule is provided as an appendix to this guidance. A summary of the major provisions of the rule is provided below.

The final rule does not change the most important benefit of establishing a CAMU, namely, remediation wastes (a new class of wastes established in this rule) generated during corrective action can still be disposed of in a CAMU without triggering the land disposal restrictions (LDRs) or minimum technology requirements (MTRs). However, the final rule does make several significant changes in the requirements for CAMUs and temporary units. Briefly, these changes include:

- **CAMUs are no longer limited to contiguous areas of contamination, but are now linked primarily to where remediation wastes are managed; that is, designation of CAMUs is now related to the function and purpose they serve in facilitating management of remediation wastes during cleanup rather than the to the areal extent of contamination.**
- **Establishing a new class of wastes called remediation wastes. Only remediation wastes can be managed in a CAMU or temporary unit.**
- **Permitting disposal of remediation wastes, generated at any location within the boundaries of a facility, in a CAMU.**
- **Creating a set of specific decision factors that must be considered when establishing CAMUs or temporary units.**

Note to the Reader
(continued)

- **Establishing regulations for permits, permit modifications, orders, or order modifications establishing CAMUs or temporary units that include: (1) specific elements that must be included; (2) documentation requirements for the decision; and (3) requirements for public participation in the process.**

- **Establishing requirements for designating regulated units (i.e., land-based units such as landfills, surface impoundments, or waste piles) as CAMUs.**

- **Setting out requirements for closure of CAMUs.**

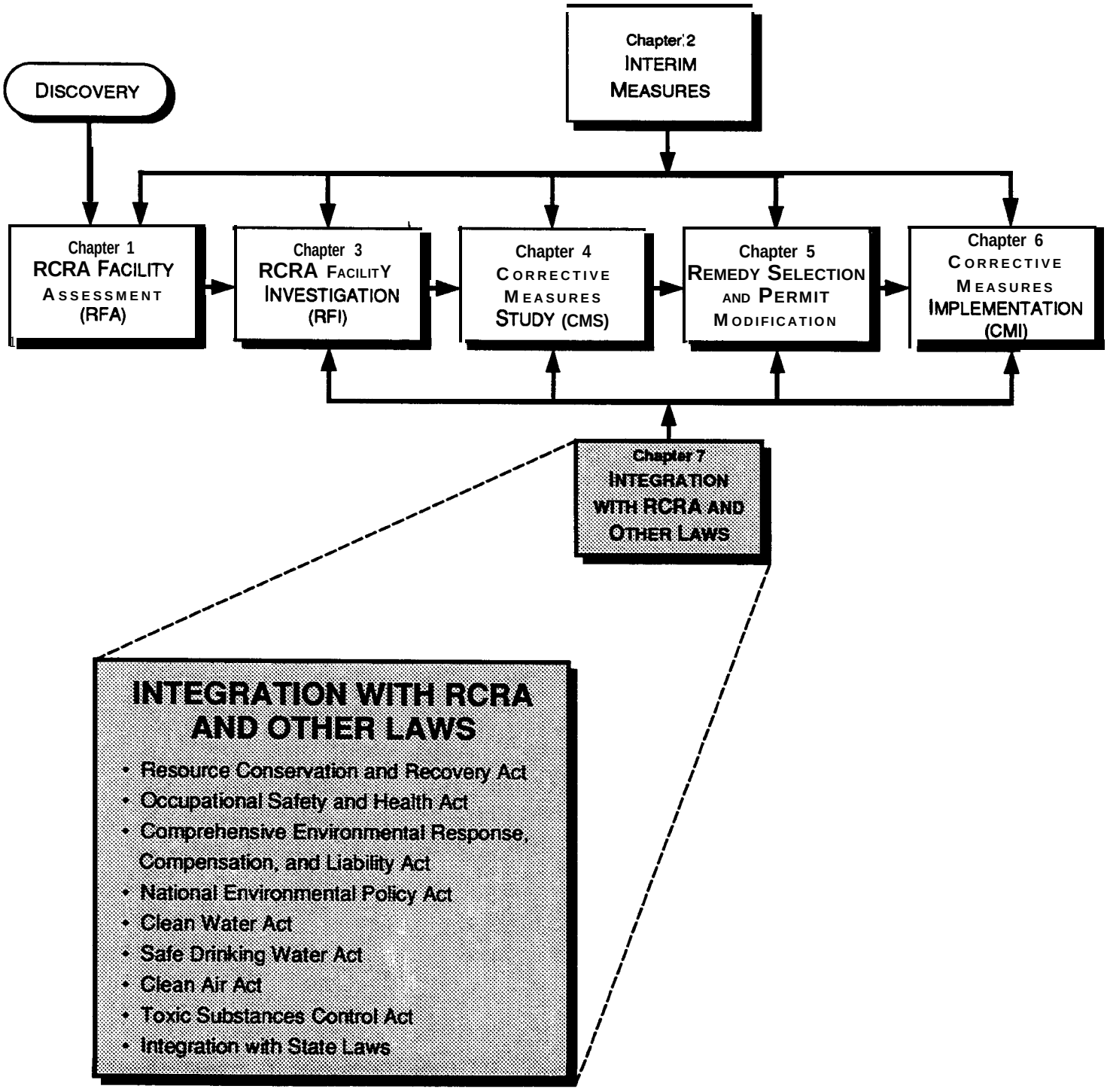
- **Limiting the designation of temporary units to tanks and container storage units.**

- **Increasing the permissible life of a temporary unit from 180 days to 1 year.**

- **Establishing specific requirements for granting extensions to the operational time limit placed on temporary units.**

- **Providing specific details on how the CAMU and temporary unit final rule will be implemented in States that are: (1) not authorized for the base RCRA program; (2) authorized for the RCRA base program, but not for corrective action; and (3) authorized for corrective action.**

RCRA Subpart S Corrective Action Process



Introduction

A facility conducting RCRA Corrective Action must comply not only with the specific requirements of the proposed Subpart S rule, but also with other RCRA requirements and the requirements of other Federal and State environmental laws. In many cases, compliance with the requirements of other environmental laws requires actions such as obtaining permits, controlling emissions, protecting workers, and complying with other standards during investigation and remediation.

This chapter is not intended as a complete guide to compliance with other environmental laws. The chapter provides only an overview of some of the more important requirements for compliance with other Federal environmental laws as well as providing information of corrective action in States with RCRA authorization. In many cases, States have enacted laws which are more stringent than the Federal laws. It is important for a facility conducting a RCRA Corrective Action to consult with persons knowledgeable and experienced in compliance with the applicable laws and regulations. This is especially important during the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) phases of RCRA Corrective Action. Selection and implementation of a corrective measure usually require consideration of, and in many cases, compliance with other laws and regulations. For example, if a facility with groundwater contamination is required to implement a pump-and-treat air stripping system to remove volatile organic compounds, the implemented corrective measure may need to comply with the requirements of the Clean Air Act to control volatile emissions. In addition, a facility conducting a RCRA Corrective Action should coordinate with other EPA programs (e.g., Air, Water) and any State and local authorities to ensure that any actions taken while conducting a RCRA Corrective Action are within established technical, administrative, and procedural requirements.

The modules in this chapter address integration of RCRA Corrective Action under the proposed Subpart S rule with the following:

- Other RCRA requirements;

    - Generator and Transporter Requirements
    - Waste Characterization
    - Corrective Action under Subpart F
    - Land Disposal Restrictions
    - Subtitle D
    - Public Participation and Community Relations
    - Closure and Post-closure
    - Underground Storage Tank Program

- The Occupational Safety and Health Act;
- The Comprehensive Environmental Response, Compensation, and Liability Act;
- The National Environmental Policy Act;
- The Clean Water Act;
- The Safe Drinking Water Act;
- The Clean Air Act;
- The Toxic Substances Control Act; and
- State laws.

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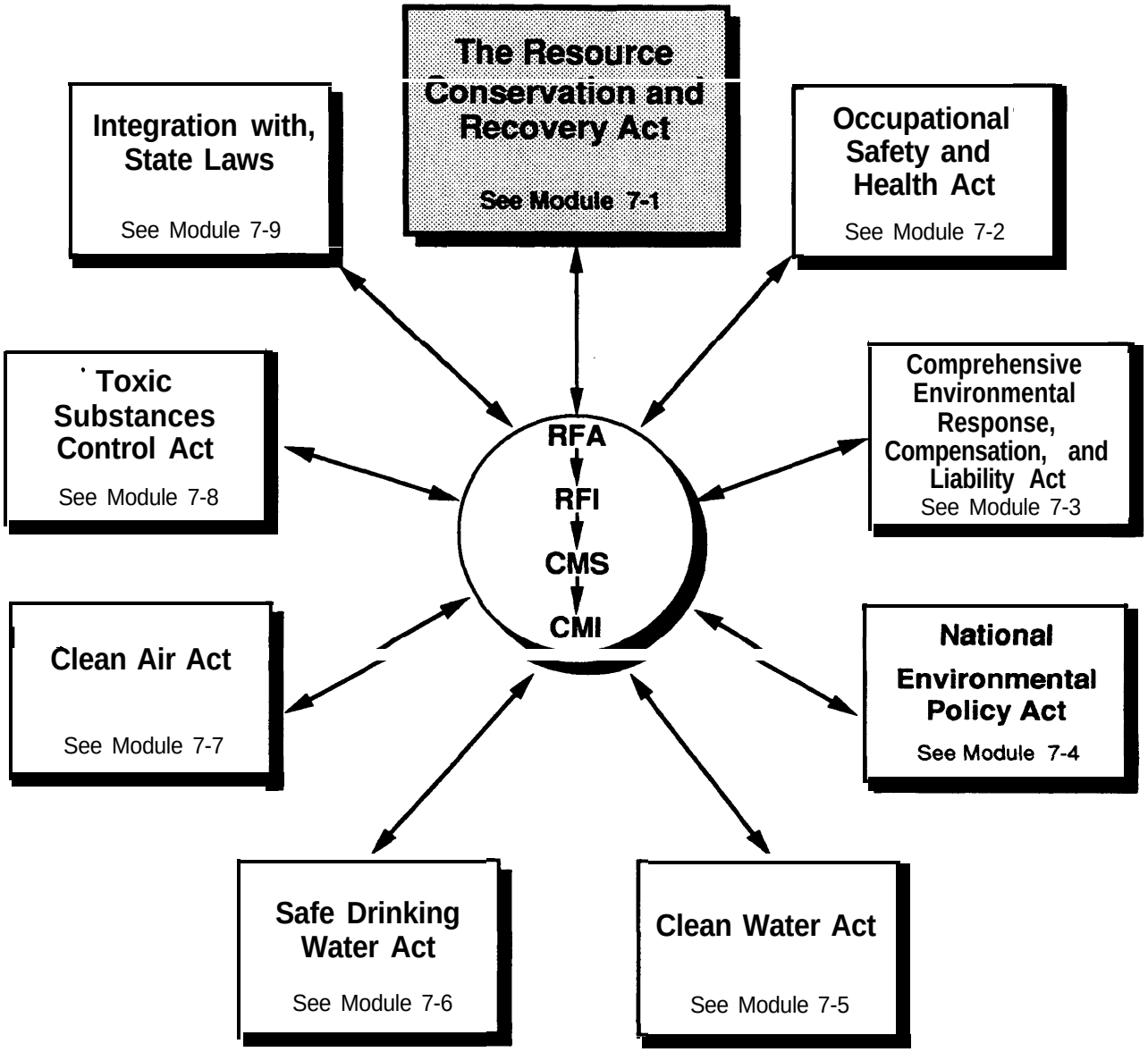


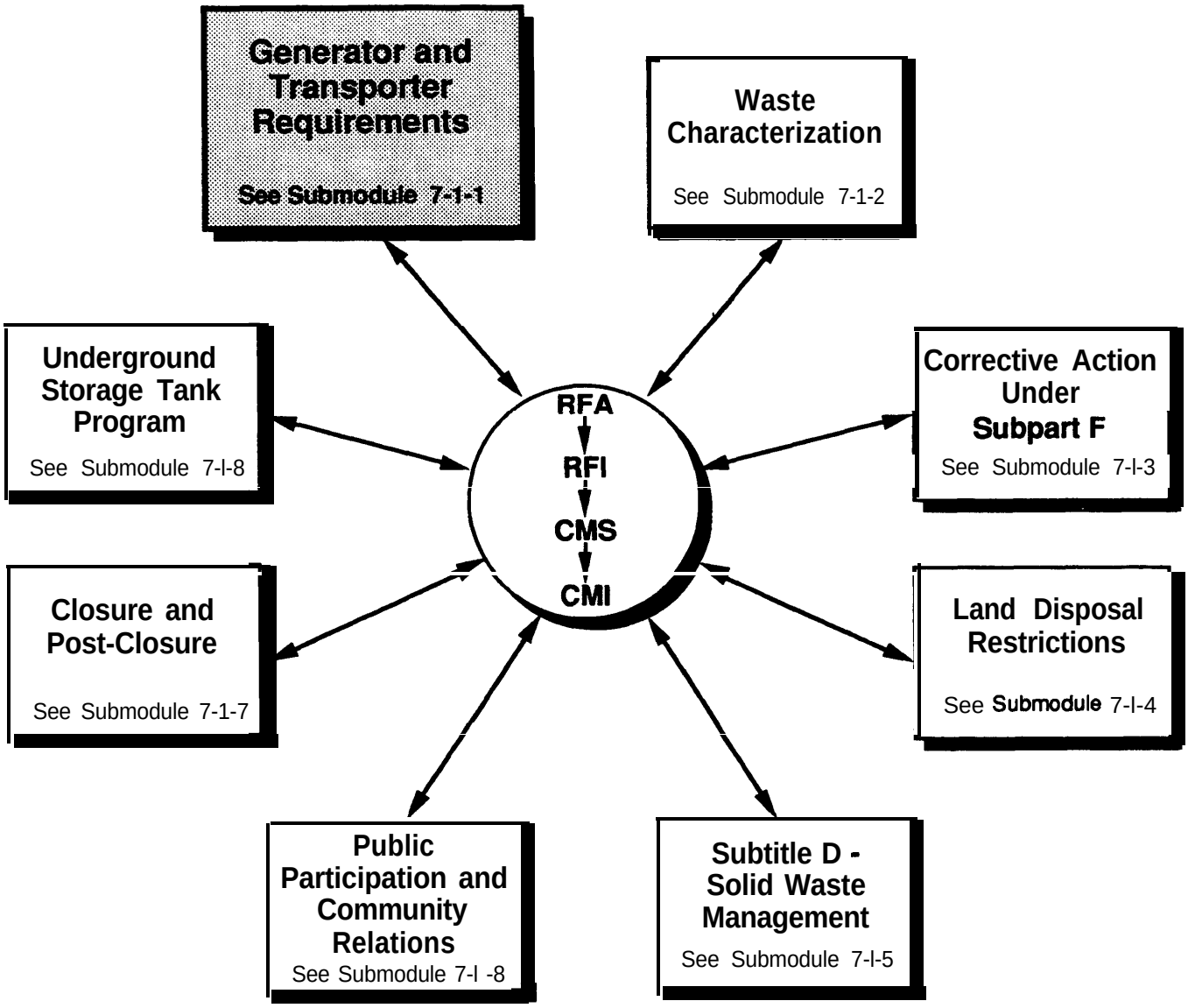
Chapter Seven - Integration with RCRA and Other Environmental Laws

Module 7-1: Resource Conservation and Recovery Act

A facility conducting RCRA Corrective Action is already involved in compliance with RCRA through the permitting, interim status, and corrective action processes. However, a facility conducting corrective action must also comply with other RCRA requirements, such as the standards for generators of hazardous waste, management of solid waste, or closure. This module discusses the important aspects of RCRA compliance during corrective action including:

- Generator and Transporter Requirements;
- Waste Characterization;
- The Groundwater Protection Program established under 40 CFR §264 - Subpart F and 40 CFR §265 - Subpart F;
- The Land Disposal Restrictions;
- Management of Solid Waste under Subtitle D;
- Public Participation and Community Relations;
- Closure and Post-closure; and
- The Underground Storage Tank Program

Each of these areas of RCRA compliance is discussed in the following submodules.


Generator and Transporter Requirements
See Submodule 7-1-1
Waste Characterization
See Submodule 7-1-2
Underground Storage Tank Program
See Submodule 7-l-8
Corrective Action Under Subpart F
See Submodule 7-l-3
RFA
RFI
CMS
CMI
Closure and Post-Closure
See Submodule 7-1-7
Land Disposal Restrictions
See Submodule 7-l-4
Public Participation and Community Relations
See Submodule 7-l -8
Subtitle D - Solid Waste Management
See Submodule 7-l-5

Submodule 7-1-1: Generator and Transporter Requirements

While conducting the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS), and while implementing the corrective measure, the facility may be generating both hazardous and solid wastes. Facilities conducting RCRA Corrective Action must comply with the regulations under 40 CFR Part 262 (generator standards) and 40 CFR Part 263 (transporter standards) for hazardous waste management.

Under the proposed 40 CFR §264.551(c) of the Subpart S rule, there is one important exemption from the hazardous waste management standards of 40 CFR §§261 and 262. This exemption allows an area representing a contiguous, broad area of contamination (which may also include within its perimeter one or more land-based SWMUs) to be designated a corrective action management unit (CAMU). The designation of an area as a CAMU allows the movement of hazardous waste within the unit during remediation without triggering the requirements for transporting hazardous waste, the land disposal restrictions, or the minimum technology requirements for a new or lateral expansion of a unit.

Under 40 CFR Part 262, generators of hazardous waste must:

- Obtain an EPA Hazardous Waste Generator Identification Number, and if required, a State Hazardous Waste Generator Number, to ship, treat, store, or dispose of hazardous wastes offsite (a permitted facility should already have an EPA Identification Number) (40 CFR §262.12);

- Determine if the residues are a non-hazardous solid waste (subject to RCRA Subtitle D requirements) or a hazardous waste (subject to RCRA Subtitle C requirements) (40 CFR §262.11)[15];

- If the wastes are hazardous wastes, determine if the wastes are listed or characteristic wastes and if the wastes are radioactive mixed wastes (40 CFR §262.11(b) and (c));

- Determine the requirements for the treatment, storage, or disposal of the waste (e.g., applicability of the land disposal restrictions) (40 CFR §262.11(d));

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[15] Refer to the DOE Office of Environmental Guidance (EH-231) Graphic Guidance document titled *The Definition of Solid and Hazardous Waste Under RCRA (1992)* for further information.

- Keep up-to-date records of:

  - The type and quantity of hazardous waste generated *per calendar month* (40 CFR §262.34);

  - Any training programs conducted by the facility (40 CFR §262.34(a)(4));

  - All safety procedures for the facility;

  - The identity and quantity of wastes shipped offsite, and the location to which the wastes were shipped (40 CFR §262.20); and

  - The actual Uniform Hazardous Waste Manifests prepared when shipping waste offsite and returned by the receiving treatment, storage, or disposal facility (TSDF) (40 CFR §262.20).[16]

- Use proper containers, storage practices, and labels on all containers of hazardous waste (40 CFR §262.30 and 264.33);

- Adhere to the following onsite storage requirements (40 CFR §262.34):

  - Hazardous waste can be accumulated in tanks or containers at a facility (without a TSDF permit or interim status) for up to 90 days for generators, and 180 or 270 days for small quantity generators.

  - Hazardous waste must be clearly labeled as hazardous waste, employees must be trained in handling hazardous wastes, and all the facility must comply with the applicable technical and administrative requirements of 40 CFR §264 (interim status facilities see 40 CFR §265) Subpart I - Use and Management of Containers and Subpart J - Tank Systems.

  - Up to 55 gallons of hazardous waste, or 1 quart of acutely hazardous waste may be accumulated near the point of generation (a satellite accumulation area) without triggering requirements for compliance with 40 CFR §265 Subpart I or J at the point of generation.

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[16] If a Uniform Hazardous Waste Manifest is not returned to the generator within 45 days after shipment, the generator must undertake a search for the missing manifest and wastes to determine the disposition of the waste, and must also notify EPA that the manifest was not returned within the allotted time.

- Prepare a contingency plan describing emergency response activities, review and update the plan regularly, and ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies (40 CFR §262.34(a)(4))[17];

- Submit biennial reports to EPA that list the identity and quantity of hazardous waste generated, the names of the transporters used, and the name of the TSDF receiving the hazardous waste (40 CFR §262.41);

- Initiate a hazardous waste minimization program as required under RCRA §3002(b), or if the facility is a small quantity generator demonstrate a "good faith effort" to comply with the hazardous waste minimization requirements; and

- Complete a Uniform Hazardous Waste Manifest for each shipment of hazardous waste. Under 40 CFR §262.20 following information must be included:

  - The identity of the generator, transporter and TSDF;

  - The identity, quantity, hazard, and RCRA hazardous waste number(s) of the wastes;

  - The number and type of containers;

  - The total quantity of waste; and

  - The signature of the responsible parties at the generator, transporter, and TSDF (40 CFR §261.20).

As a generator of hazardous waste, DOE often acts as the transporter of the waste. However, DOE also uses contracted transporters for hazardous waste as well. In either case, DOE must ensure that the requirements for the transportation of hazardous waste are met by party acting as the transporter. Under 40 CFR Part 263 transporters of hazardous waste must:

- Obtain an EPA Hazardous Waste Transporter Identification Number, and if required a State Hazardous Waste Transporter Number, to ship hazardous wastes from a generator to a TSDF (40 CFR §263.11);

- Use the Uniform Hazardous Waste Manifest provided by the generator (40 CFR §263.20);

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[17] For additional information see the DOE Office of Environmental Guidance document *Preparation of RCRA Contingency Plans (July, 1992)*.

- Comply with the requirements of the manifest for delivery to the TSDF (or alternate) listed on the manifest (40 CFR §263.21);

- Comply with all U.S. Department of Transportation requirements for transporting hazardous waste (49 CFR §100-199) (40 CFR §263.10);

- Maintain the required records (40 CFR §263.22); and

- Report and respond to any release of the hazardous waste which occurs while the hazardous waste is under the control of the transporter (40 CFR §263.30).

For shipments of hazardous waste occurring entirely within the boundaries of a facility there is no requirement for the use of a Uniform Hazardous Waste Manifest. However, compliance with DOT regulations and the use of a Uniform Hazardous Waste Manifest is required if the transportation occurs over a public highway, or between non-contiguous facilities.

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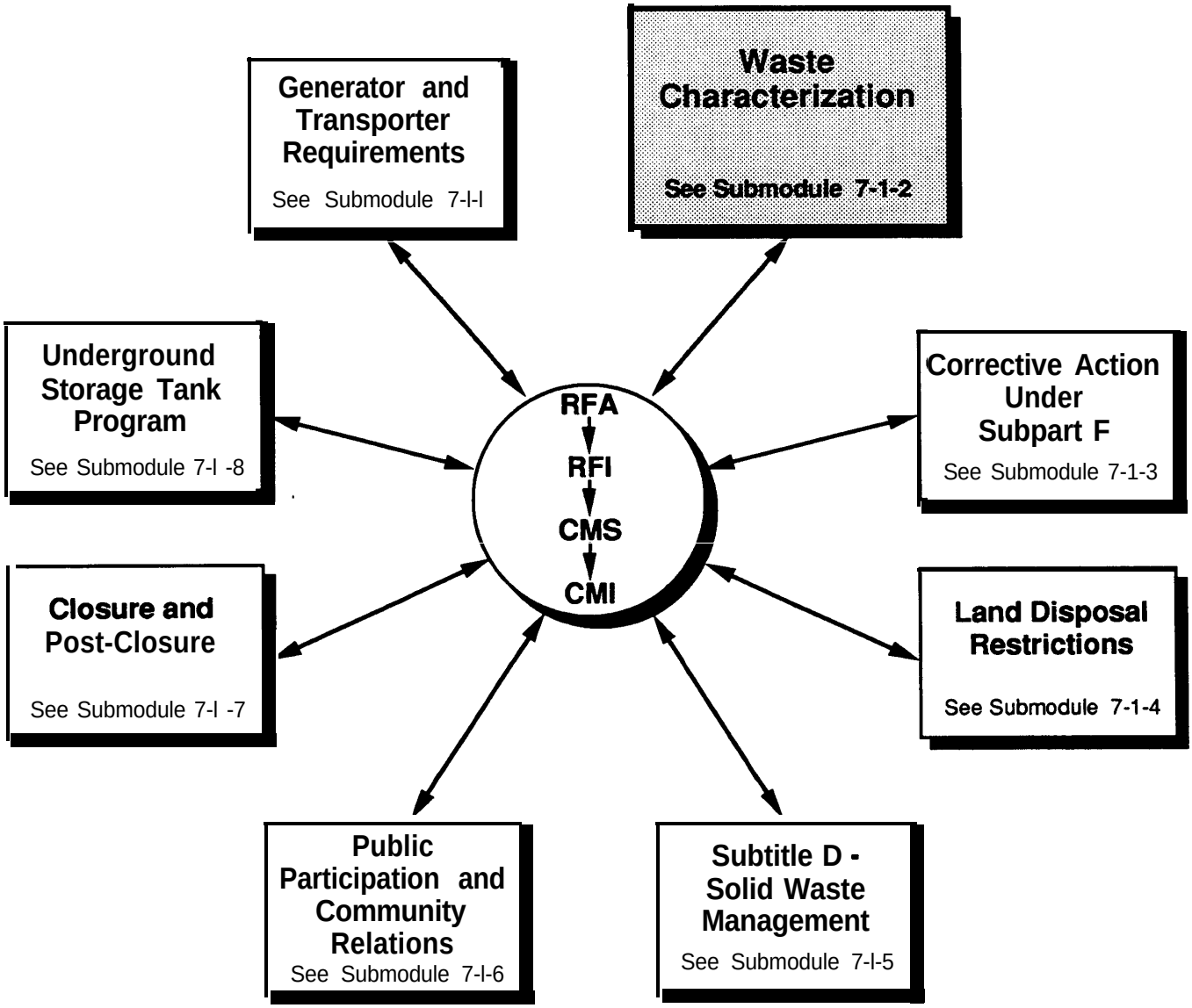
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Submodule 7-1-2: Waste Characterization

Waste Characterization to Require RCRA Corrective Action

A requirement for RCRA Corrective Action arises from the discovery of a release or potential release of hazardous wastes or hazardous waste constituents from a solid waste management unit (SWMU) at a treatment, storage, or disposal facility (TSDF). It is important to understand that a released material *must* be classifiable as a hazardous waste or hazardous waste constituent for EPA to require RCRA Corrective Action. RCRA Corrective Action is not limited to releases of listed or characteristic hazardous wastes identified in 40 CFR Part 261. Under the proposed Subpart S rule, RCRA Corrective Action requirements extend to releases of any substance meeting the statutory definition of hazardous waste in RCRA §1004(5). Accordingly, RCRA Corrective Action requirements are applicable to releases of hazardous waste constituents. Hazardous waste constituents include the compounds listed in 40 CFR Part 261 Appendix VIII and 40 CFR Part 264 Appendix IX.

Characterization of Wastes Generated During RCRA Corrective Action

The proposed Subpart S rule requires that the facility determine and comply with all applicable waste management standards for wastes generated during RCRA Corrective Action. Thus, to comply with this requirement, all wastes generated during RCRA corrective action must be classified as solid, hazardous, or exempted wastes in order to determine the applicable waste management requirements.

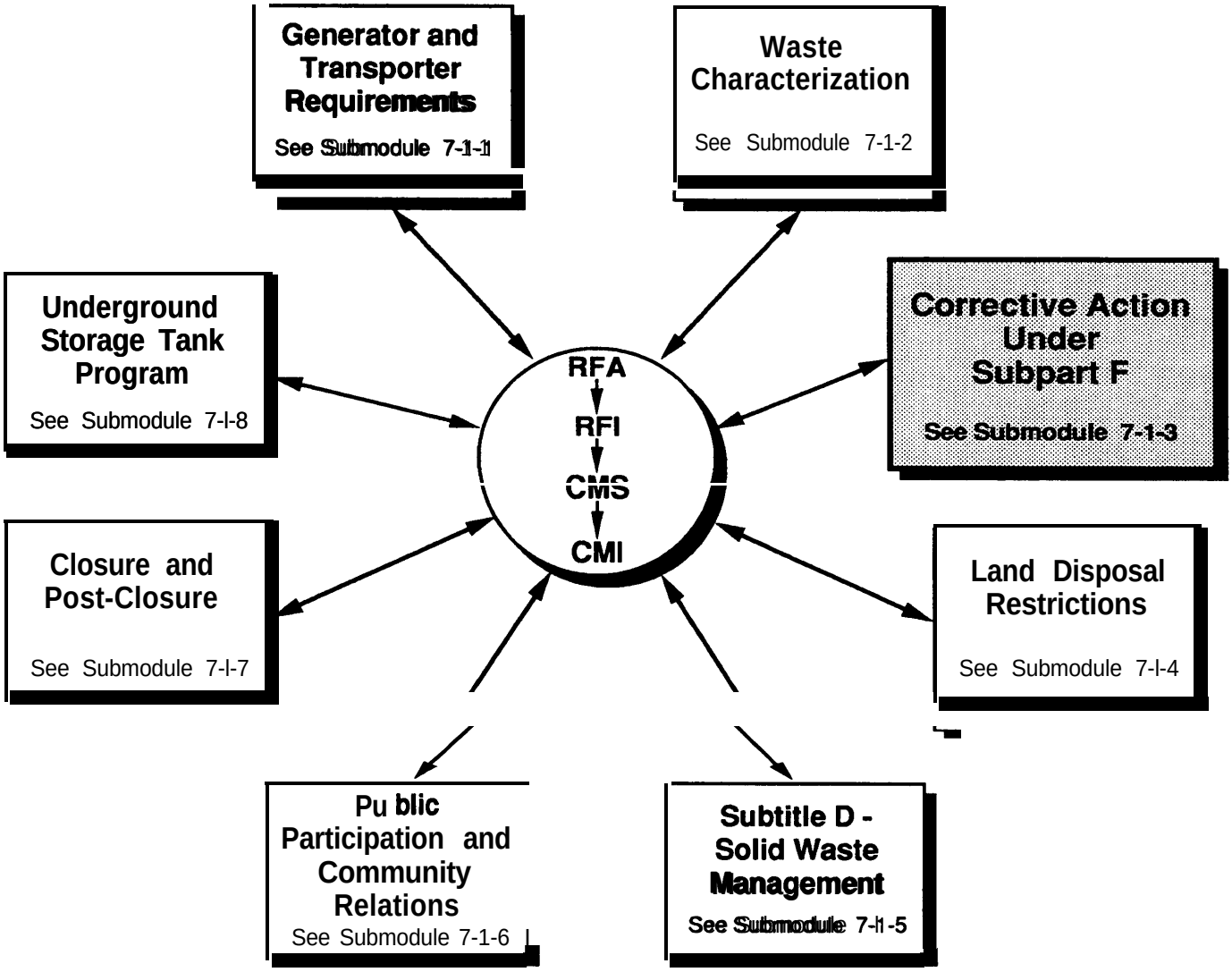
The definition of solid waste includes any material which is abandoned, recycled, "inherently waste-like," and which is not specifically excluded by variance or exemption. The term "abandonment" includes disposal, burning or incineration, and accumulation prior to, or in lieu of, disposal, burning or incineration. "Recycling" includes accumulation, storage, and treatment of wastes in a manner constituting disposal, burning wastes for energy recovery, reclaiming wastes, or accumulating wastes speculatively. "Inherently waste-like" includes specific wastes such as certain chlorinated phenols which are recycled or materials which contain compounds listed at 40 CFR §261 Appendix VIII. Wastes exempted from the definition of solid waste include domestic sewage and any mixture of other wastes which passes through a sewer system to a publicly owned treatment works (POTW), point source industrial wastewater discharges regulated under the Clean Water Act, irrigation return flows, spent nuclear and by-product materials defined by the Atomic Energy Act, in-situ mining materials, pulping liquors that are reclaimed, spent sulfuric acid used to make virgin sulfuric acid, and secondary materials reclaimed and returned to the original generation process for reuse. Examples of solid wastes which might be generated during a RCRA Corrective Action include uncontaminated construction debris and uncontaminated trash or wastepaper associated with onsite activities.

Section 1004(5) of RCRA defines a hazardous waste as a solid waste (including liquids and gases) which, because of quantity, concentration, physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or in serious, irreversible, or incapacitating reversible illness. The definition of hazardous waste also includes those solid wastes which pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed. Under the regulatory definition, a solid waste is a hazardous waste if the waste is listed as a hazardous waste in 40 CFR §261 Subpart D, exhibits one or more of the characteristics (corrosivity, ignitability, reactivity, or toxicity) of a hazardous waste described in 40 CFR §261 Subpart C, or is mixed with a hazardous waste. The proposed Subpart S rule also considers hazardous waste constituents as hazardous waste. Hazardous waste constituents are the compounds listed in 40 CFR Part 261 Appendix VIII and 40 CFR Part 264 Appendix IX. The definition of hazardous waste does not include certain solid wastes which are specifically excluded, such as certain oil and gas exploration and production wastes, mining wastes, or cement kiln wastes.

The classification of the wastes generated during a RCRA Corrective Action not only allows the facility owner/operator to determine the applicable waste management requirements, but also permits the facility owner/operator to assess various approaches to the RCRA Corrective Action such as using corrective action management units (CAMUs) or temporary units. For example, if several SWMUs release identical hazardous waste constituents, the entire area of contamination may be eligible for classification as a CAMU.

As of December 1991, there is an additional complication regarding the characterization of hazardous wastes. In December 1991, the U.S. Court of Appeals for the District of Columbia, ruling in the case of *Shell Oil Co. et al. v. EPA*, vacated the "mixture" and "derived-from" rules on the grounds that EPA had not complied with the requirements for public notice and comment. However, the court suggested that EPA consider reenacting the rules, in whole or in part, on an interim basis, pending opportunity for full notice and public comment. EPA did this and the rules are in effect on an "interim" basis, pending further action. Until the issues surrounding the "mixture" and "derived-from" rules are finally resolved, facility owners and operators should follow the status of these rules closely to determine the requirements for compliance.

It is important to understand that waste characterization is a very difficult process, requiring extensive chemical analyses and careful regulatory interpretation. The difficulty of this process is compounded by the regulations, which are often unclear. The DOE Office of Environmental Guidance (EH-231) has developed a graphic guidance entitled *The Definition of Solid and Hazardous Waste Under RCRA*. This document is an excellent reference for use when conducting waste characterization during RCRA Corrective Action.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Submodule 7-1-3: Corrective Action Under Subpart F

The regulations EPA has promulgated under the Resource Conservation and Recovery Act (RCRA) create two primary corrective action programs. The first, under the proposed Subpart S rule, is concerned with corrective action for releases of hazardous wastes and hazardous waste constituents to all environmental media from solid waste management units (SWMUs), and is the primary focus of this guidance document. The other primary RCRA Corrective Action program, created under 40 CFR §264 Subpart F (for permitted facilities) and 40 CFR §265 - Subpart F (for interim status facilities), specifically addresses releases to groundwater from SWMUs which are classified as regulated units. Regulated units (a subset of SWMUs) defined under (40 CFR §264.90(a)(2)) include waste piles, surface impoundments, land treatment units, landfills or miscellaneous units which received hazardous waste after July 26, 1982.

In order to ensure consistency in implementing corrective action at regulated units (which are a subset of SWMUs) and other solid waste managements units, and to achieve environmental results as rapidly and effectively as possible, EPA is proposing to revise the Subpart F regulations to make them consistent with the key features of Subpart S. The proposed revisions to Subpart F may reference parts of the proposed Subpart S regulations. EPA has not provided information on the degree of these revisions, or on an anticipated date for issuance of the proposed changes to the Subpart F regulations.

General Provisions

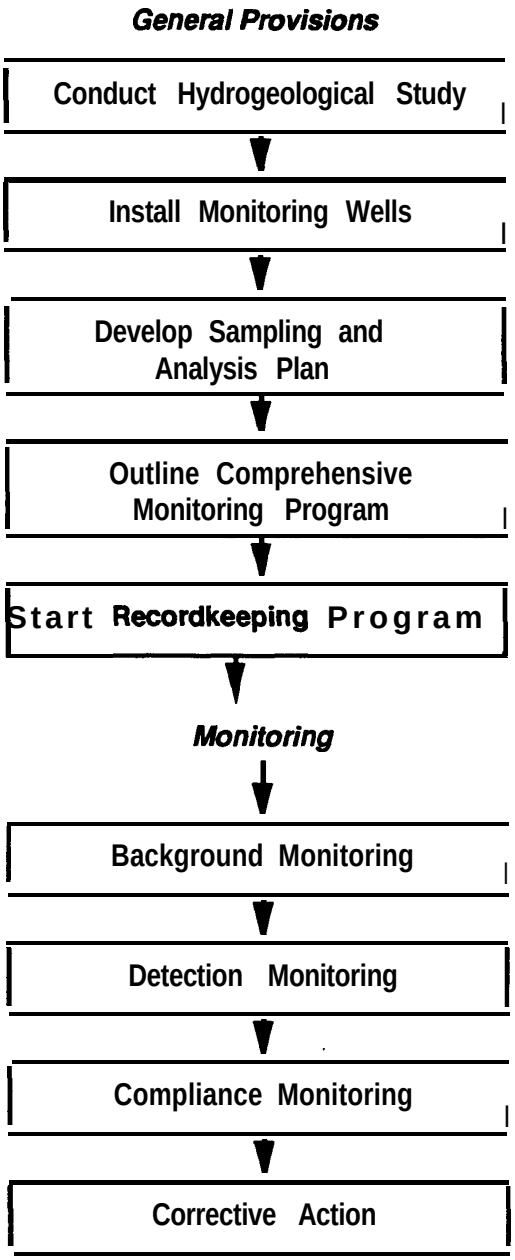
As a condition of interim status or a RCRA permit to operate a hazardous waste treatment, storage, or disposal facility (TSDF), facilities which operate regulated units are required to initiate a groundwater monitoring program capable of assessing the facility's impact on the uppermost aquifer underlying the facility. The groundwater monitoring requirements for permitted facilities requires:

- Conducting a hydrogeological study to determine the characteristics of the underlying aquifer;

- The implementation of a "detection monitoring" program consisting of a sufficient number of wells, properly located and constructed, which would allow detection of any groundwater impacts by a unit (40 CFR §264.92(a));

- A sampling and analysis plan which describes the procedures for sample collection, preservation, shipment, and analysis, and for establishing the chain-of-custody for each sample (40 CFR §264.97(d)-(j));

40 CFR §264 – Subpart F Program



- Preparation of an outline for a more comprehensive "compliance" groundwater monitoring program (if required), capable of determining (1) if hazardous waste or hazardous waste constituents have entered groundwater, (2) the rate and extent of migration of such releases, and (3) the concentration of the hazardous waste or hazardous waste constituents in the groundwater; and

- A record keeping program.

Background Monitoring

It is important to establish the background concentrations at a regulated unit. In this process, the facility collects quarterly samples from an upgradient well for one year, and analyzes these chemicals for specific compounds. The specific compounds for which background concentrations are set fall into three categories (1) the Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act, (2) groundwater quality parameters (chloride, iron, manganese, phenols, sodium, and sulfate concentrations), and (3) groundwater contamination parameters (pH, specific conductance, total organic carbon, total organic halogens, and hazardous waste constituents specified in the facility permit). The purpose of establishing background levels is to provide a departure point for use when determining if the groundwater quality is deteriorating as a result of releases of hazardous waste or hazardous waste constituents from the regulated unit. (40 CFR §264.97)

The implementation of these basic requirements at a facility has four phases: (1) background monitoring; (2) detection monitoring; (3) compliance monitoring; and (4) corrective action. A general discussion of each phase shown in the graphic on the opposite page follows.

Detection Monitoring (40 CFR §264.98)

Detection monitoring of groundwater contaminants is conducted on a semi-annual basis, and on an annual basis for groundwater quality parameters. The purpose of detection monitoring is to determine if hazardous wastes or hazardous waste constituents are being released to groundwater from a regulated unit.

The point where the detection monitoring is conducted (the point of compliance) is at the vertical plane located at the hydraulically downgradient limit of the regulated unit, extending from the surface to the lowest point of the uppermost aquifer underlying the regulated unit(s). This is different from the point of compliance set under the proposed Subpart S rule. Under the proposed Subpart S rule, the point of compliance can be set at any point determined to provide protection of human health and the environment.

If hazardous wastes or hazardous waste constituents are discovered in groundwater samples at concentrations which are statistically greater than background, the facility must notify EPA within 7 days and must commence compliance monitoring.

Compliance Monitoring (40 CFR §264.99)

The purpose of compliance monitoring is to determine if the release of hazardous waste constituents to groundwater detected during the detection monitoring phase requires implementation of corrective action. The facility permit will specify the compounds for which the facility must monitor. Generally, these compounds are found in 40 CFR §264 Appendix IX. The permit will also specify the Groundwater Protection Standard for the facility. This standard can be set at the background concentration of contaminants, the Maximum Concentration of Constituents for Groundwater Protection values found in Table 1 of 40 CFR §264.94, or an Alternate Concentration Limit (ACL) approved by EPA. If hazardous wastes or hazardous waste constituents are detected in concentrations exceeding the Groundwater Protection Standard, the facility will be required to implement corrective action to reduce the concentration of contaminants below the applicable standards.

Corrective Action (40 CFR §264.101)

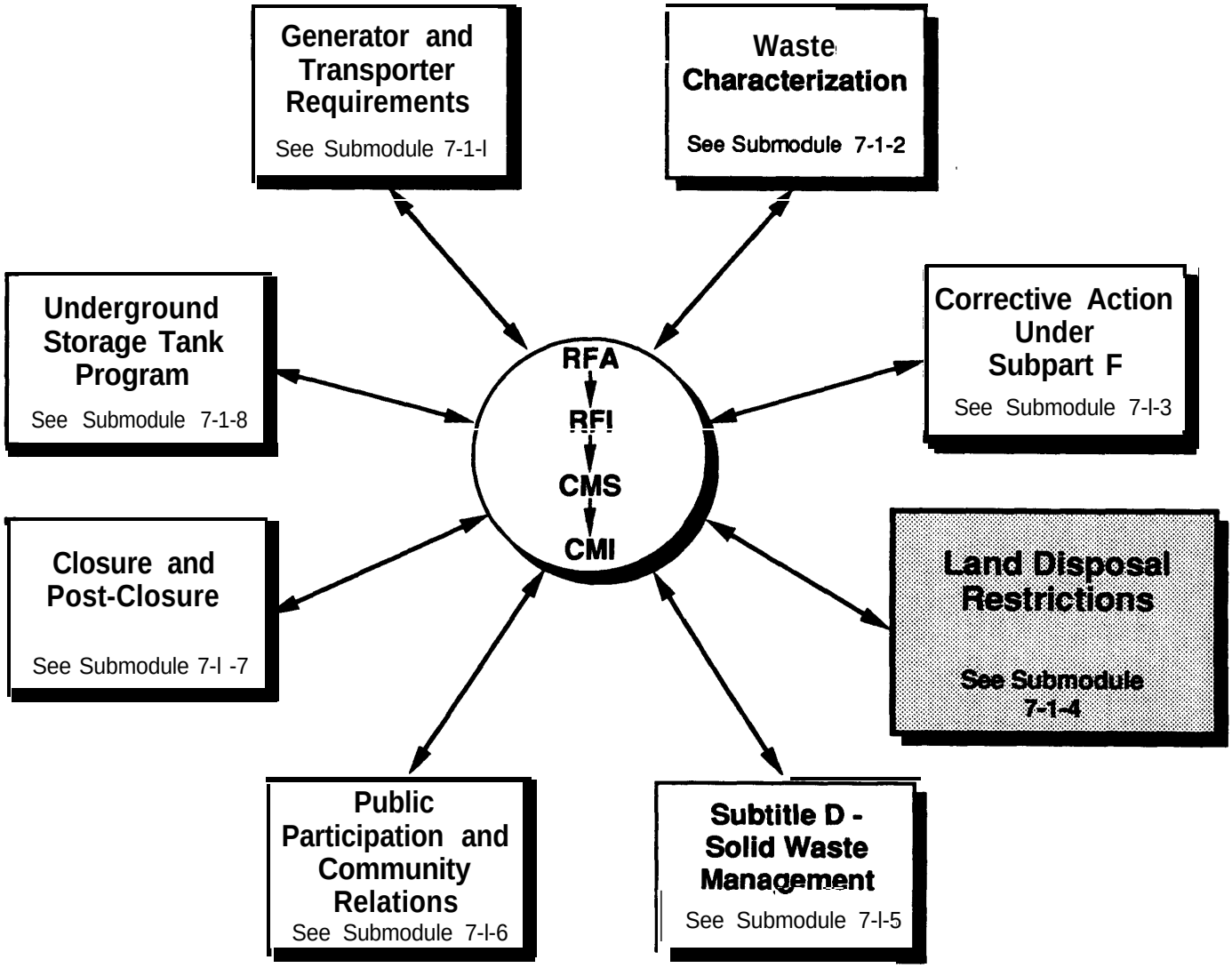
Corrective Action under Subpart F is limited to remediation of releases to groundwater. Under Subpart F, the facility may be required to remove the contaminants from the aquifer, or may be required to treat the contamination in place. The specific requirements for corrective action will be incorporated into the permit for the facility.

It is important to understand the relationship between the Subpart F and Subpart S Corrective Action Programs. The Subpart F program applies only when a release of hazardous waste constituents from a regulated unit (a subset of all SWMUs) impacts groundwater. Subpart S applies whenever there is a release of hazardous waste or hazardous waste constituents from *any* SWMU to *any* environmental media (see Table 7-1-3-1).

EPA plans to address releases to groundwater from regulated units using the Subpart F program. Releases from regulated units that impact other environmental media will be addressed through Subpart S. Releases from other SWMUs (i.e., SWMUs that are not regulated units) which impact groundwater or any other environmental media will be addressed through the Subpart S program. Note that a facility may have corrective action requirements under both Subpart F and Subpart S for releases from the same regulated unit. For example, if a release impacts both surface water and groundwater, Subpart S authority will be used to address the surface water contamination, and Subpart F authority will be used to address the groundwater contamination.

Table 7-1-3-1:
Application of Subpart F and Subpart S

Media Impacted	Type of Unit	Program
Groundwater	Regulated Units ---------- All Other SWMUs	Subpart F --------- Subpart S
Groundwater + Other Media (Soil, Surface Water, or Air)	Regulated Unit ---------- All Other SWMUs	Subpart F (for groundwater) Subpart S (for other media) ---------- Subpart S
Other Media (Soil, Surface Water, or Air)	Regulated Unit ---------- All Other SWMUs	Subpart S ---------- Subpart S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Submodule 7-1-4: Land Disposal Restrictions

The Hazardous and Solid Waste Amendments of 1984 (HSWA) impose restrictions on the land disposal of hazardous wastes. These restrictions, referred to as the Land Disposal Restrictions (LDRs) or "The Land Ban" are found at 40 CFR Part 268. Under HSWA, EPA was required to set levels or methods of treatment, which substantially diminish the toxicity of the waste or which substantially reduce the likelihood of migration of hazardous waste constituents from the waste. These treatment standards are based on the performance of the Best Demonstrated Available Technology (BDAT) for a specific hazardous waste. Upon the specified LDR effective dates, restricted wastes that do not meet treatment standards are prohibited from land disposal unless they qualify for certain variances or exemptions. For instance, an exemption is provided under the LDR program for facilities that can demonstrate that there will be no migration of hazardous waste constituents from the disposal unit or injection zone for as long as the waste remains hazardous. In addition, where adequate treatment capacity is not available, EPA can grant a national capacity variance, for up to two years, or, an extension to the effective date on a case-by-case basis. EPA has promulgated six major LDR rulemakings for various categories of wastes:

- Solvents and Dioxins (51 FR 40572, November 7, 1986) (this rulemaking also established the framework for the LDR program);
- California List Wastes (i.e., wastes containing PCBs, dioxin, cyanide, heavy metals, corrosives, or halogenated organic compounds) (52 FR 25760, July 8, 1987);
- First Third of Scheduled Wastes (53 FR 31138, August 17, 1988);
- Second Third of Scheduled Wastes (54 FR 26594, June 23, 1989);
- Third Third of Scheduled Wastes (including characteristic wastes) (55 FR 22520, June 1, 1990); and
- Certain Newly Listed Wastes and Hazardous Debris (57 FR 37194, August 18, 1992).

Separate rulemakings for the Underground Injection Control (UIC) program established hazardous waste disposal injection restrictions and requirements and set effective dates for solvents, dioxins, California list wastes, and First Third wastes.

Impact on RCRA Corrective Action

All activities which generate hazardous waste as part of a RCRA Corrective Action must comply with the LDR requirements of 40 CFR Part 268. For example, the facility must initially determine if wastes generated during corrective action are hazardous. In cases

where wastes are hazardous, the LDR requirements that apply to the waste must be determined. The facility must then determine if the waste, as generated, meets the treatment standard for that waste. If the waste does not meet the treatment standard, the facility must arrange to treat the waste to that standard. For the waste to be disposed of in a land-based unit, the waste must meet the applicable LDR treatment standards (see 40 CFR §268.7).

If the facility is shipping the waste offsite to a treatment, storage, or disposal facility (TSDF), the generating facility must notify the receiving facility that the waste is subject to the LDR requirements. The generating facility must also select a TSDF capable of achieving a specific numeric treatment standard using BDAT or other appropriate treatment technology. These requirements apply to all hazardous wastes generated and removed from the unit for treatment or other purposes, even if the waste or residuals are returned to the unit.

EPA has also established LDR requirements specifically for hazardous debris (57 FR 37193, August 18, 1992) and are in the process of developing a separate set of LDR treatment standards for contaminated soil (56 FR 55160, October 24, 1991). For hazardous soils, the existing treatment standards for the hazardous waste contaminating the soil remain as the applicable standards (until revised treatment standards are promulgated). LDR requirements apply to soils and debris (and other media) contaminated with land disposal restricted hazardous wastes because these media *contain* hazardous wastes.[18] Be aware that certain types of contaminated debris were provided a generic case-by-case capacity variance (57 FR 20766, May 15, 1992).[19] Certain hazardous soils are also the subject of a interim final case-by-case capacity variance (see 57 FR 47772, October 20, 1992.) However, these variances will both expire on May 8, 1993.

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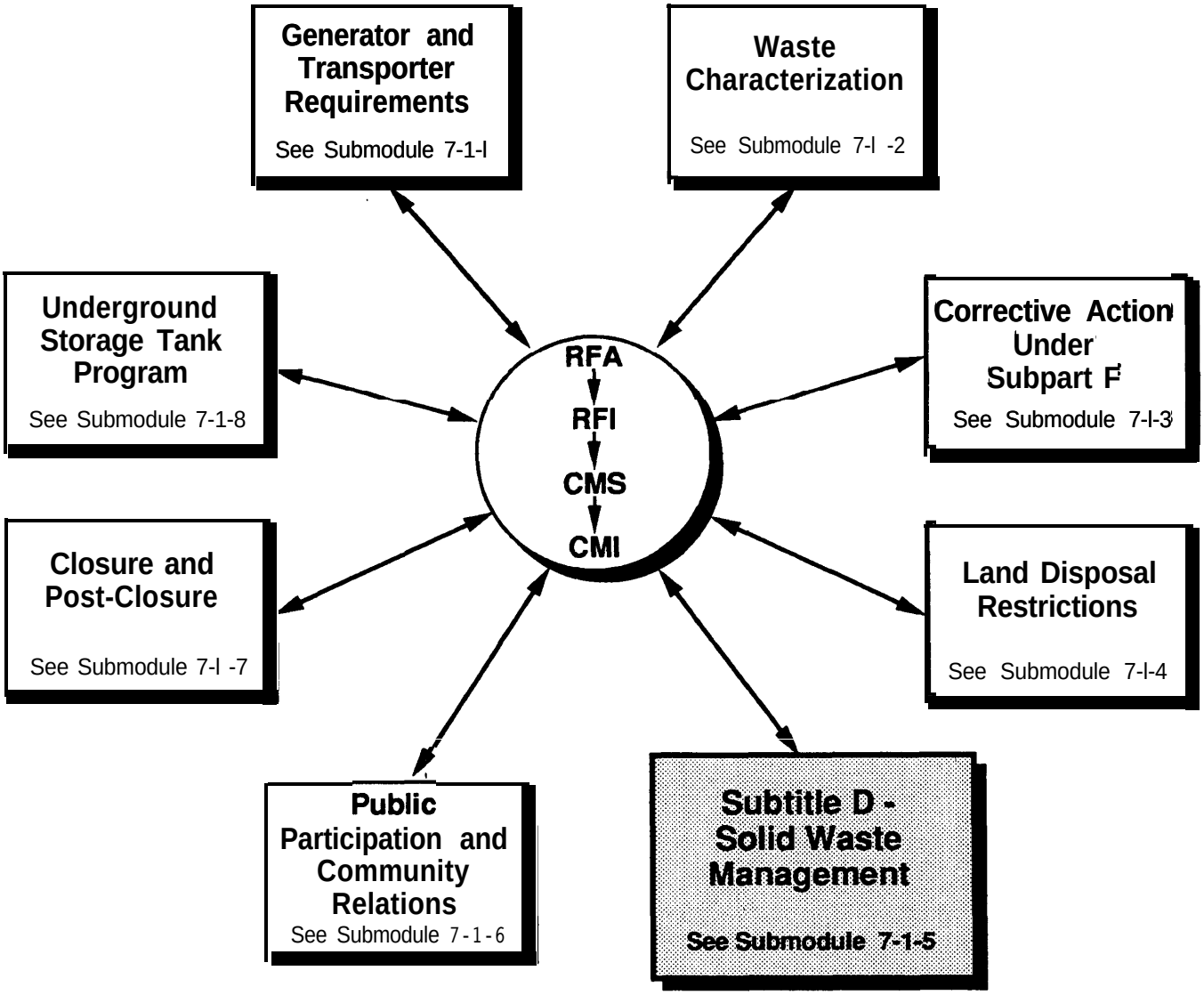
[18] Under EPA's "contained-in" policy, contaminated media (i.e., debris, soil, groundwater, sediments) containing RCRA wastes must be managed as if they were hazardous wastes until the media no longer contain the hazardous waste or until the hazardous waste is delisted.

[19] Refer to DOE's Environmental Guidance Regulatory Bulletin entitled *Hazardous Debris Case-by-Case Capacity Variance* (July 15, 1992).

Exemptions from LDRs During Corrective Action

There are numerous exemptions and variances from the LDR, including national capacity variances, case-by-case extensions to the effective date, variances from the treatment standard, and "no migration" variances. Further, the LDR do not apply to hazardous wastes land disposed prior to the effective date of an applicable land disposal restriction, if such wastes do not have to be removed or excavated for treatment. In the proposed Subpart S rule, EPA states that placement, and thus land disposal, does not occur when waste is moved or treated in-situ within the boundaries of a solid waste management unit (SWMU) or corrective action management unit (CAMU) (55 FR 30843). However, treatment schemes other than in-situ treatment may trigger the LDRs. This is important for RCRA Corrective Action activities since many corrective measures will involve treatment, consolidation, and capping of wastes within existing SWMUs or CAMUs. Further, treatment or disposal occurring within a unit will not trigger the minimum technology requirements for the unit (for additional information on CAMUs, see Chapter 3).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Submodule 7-1-5: Subtitle D - Solid Waste Management

Corrective Action as defined under the proposed Subpart S rule applies only to facilities subject to Subtitle C of RCRA, that is, facilities that generate, treat, store, or dispose of hazardous waste. Disposal of non-hazardous solid waste is subject to regulation under Subtitle D of RCRA.

EPA has two major roles under Subtitle D:

(1) To establish minimum national performance standards for the protection of human health and the environment from solid waste disposal facilities; and

(2) To assist States in making appropriate solid waste management decisions by offering up-to-date technical assistance.

EPA has promulgated a number of regulations governing the disposal of solid wastes:

- 40 CFR 241 - Guidelines for the Land Disposal of Solid Wastes;
- 40 CFR 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices; and
- 40 CFR 258 - Solid Waste Disposal Facility Criteria.

Of particular importance to owners and operators of solid waste disposal facilities are the regulations found at 40 CFR §258, part of which took effect on October 9, 1991 (56 FR 50978), and which become completely effective on October 9, 1993. These regulations apply specifically to municipal solid waste landfills (MSWLFs), a subset of all solid waste landfills, and they are much more comprehensive than the 40 CFR §241 or 40 CFR §257 regulations, which apply to all solid waste disposal facilities.

Under this rule, MSWLFs are defined as ". . . a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under §257.2. A MSWLF unit may also receive other types of RCRA subtitle D wastes, such as commercial solid waste, non-hazardous sludge, small quantity generator waste, and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion." Household waste is defined at 40 CFR §258.2 as ". . . any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas)."

Included in the MSWLF rule are criteria for groundwater monitoring and corrective action. The regulations found at 40 CFR §258 - Subpart G require the owner/operator of a MSWLF to establish a two-phase groundwater monitoring program, similar to the requirements of 40 CFR §264 - Subpart F and 40 CFR §265 - Subpart F. Like the Subpart F regulations for hazardous waste facilities, 40 CFR §258 - Subpart G is limited to monitoring and corrective action of releases to groundwater.

The requirements for corrective action under 40 CFR §258 - Subpart G and the proposed 40 CFR §264 - Subpart S rule are similar. A corrective action program under 40 CFR §258 - Subpart G would have to be designed to delineate the areal extent of the plume of contamination and to remediate the entire plume of contamination to the established maximum allowable constituent concentrations. Groundwater protection standards would be set using the same health and environmental based criteria as those under the proposed Subpart S rule. A major difference between the Subtitle C and Subtitle D approach to corrective action is the procedural requirements for the Subtitle D program. These requirements will be established by the States rather than by EPA.

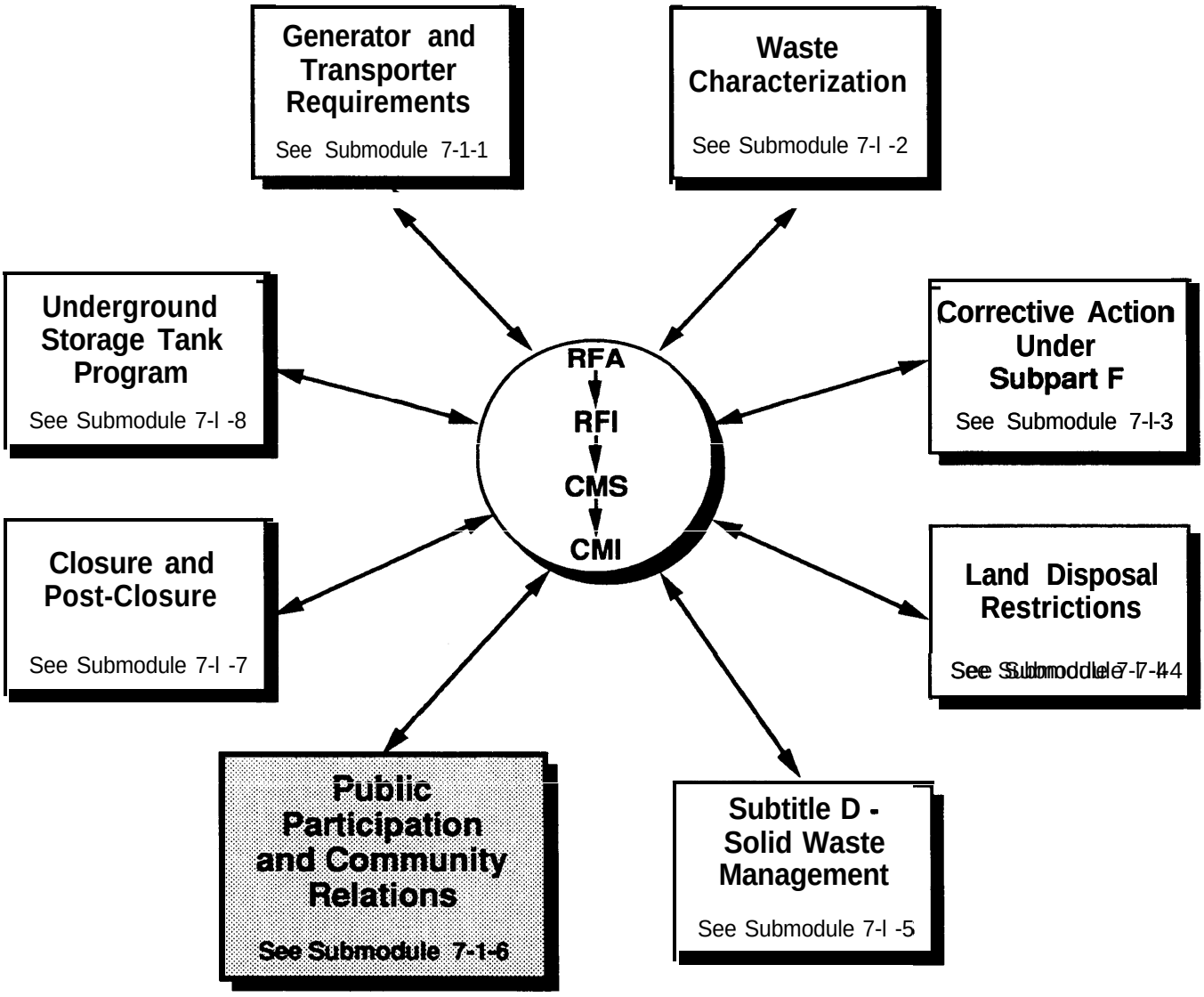
The MSWLF rule establishes no minimum amount of household waste below which a facility is exempt from regulation as a MSWLF. Therefore, even a solid waste landfill that receives mostly industrial or commercial solid waste (both are defined at 40 CFR §258.2) becomes a MSWLF if it accepts *any* household waste. In that case, the landfill is subject to the requirements under 40 CFR §258. If an owner/operator wants particular landfills not to be regulated under the requirements of 40 CFR §258, it is imperative to segregate the solid waste stream into household and other wastes. This will ensure that landfills receiving mainly industrial or commercial solid wastes will not be in violation of the 40 CFR §258 requirements. At the present time EPA has not issued proposed or final regulations governing industrial or commercial solid waste landfills, but regulations are being developed, and EPA expects to expand its regulation of such facilities in the future.

Relationship to Subtitle C

In developing the RCRA legislation, the Congress clearly intended that solid waste disposal facilities be regulated by different criteria than hazardous waste disposal facilities. However, even though there is little or no interaction between Subtitle C and Subtitle D regulations, some of the Subtitle D standards for solid waste disposal facilities could apply or be relevant to Subtitle C facilities conducting corrective action. For example, in the preamble to the proposed Subpart S rule, EPA states that it may be appropriate to apply the regulations at 40 CFR §257.3-8 (Safety Limits for the Concentration of Explosive Gases Generated by Solid Waste Disposal Facilities) to Subtitle C facilities with solid waste management units (SWMUs) that could generate methane. Similarly, a MSWLF (a type of SWMU) located at a Subtitle C permitted facility that releases hazardous wastes or hazardous waste constituents to the environment is subject to the Subtitle C corrective action program.

Another significant compliance issue for RCRA Subtitle C facilities conducting RCRA Corrective Action is the management of solid wastes generated during the corrective

action. Under the proposed Subpart S rule, one factor EPA assesses when considering plans for a corrective measure is compliance with the applicable standards for waste management. Specifically, the proposed language for 40 CFR §264.550-§264.552 requires "… any treatment, storage, or disposal of listed or identified hazardous waste … shall be in accordance with applicable standards…" (55 FR 30881) and "Treatment, storage, and disposal of non-hazardous solid wastes… shall be in accordance with applicable technical standards … pursuant to RCRA Subtitle D" (55 FR 30882). Thus, if the facility disposes of these non-hazardous industrial solid wastes in a MSWLF, the facility must ensure that the MSWLF is compliant with the terms of 40 CFR §258. However, if the facility elects to use a landfill that receives *only* industrial solid waste, the facility must ensure that the landfill is in compliance with the other applicable Subtitle D regulations such as 40 CFR §§241 and 257, but is not required to ensure compliance with the requirements of 40 CFR §258. (55 FR 30856)


Generator and Transporter Requirements
See Submodule 7-1-1
Waste Characterization
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Public Participation and Community Relations
See Submodule 7-1-6
Subtitle D - Solid Waste Management
See Submodule 7-l -5

Submodule 7-1-6: Public Participation and Community Relations

Under RCRA §7004, public participation in the development, revision, implementation, and enforcement of any regulation, guideline, information or program shall be provided for, encouraged, and assisted by EPA. The regulatory requirements supporting this statutory provision are found in 40 CFR Parts 124 and 270, and the general public involvement procedures for conducting public hearings and meetings found in 40 CFR Part 25. The proposed Subpart S rule includes additional requirements intended to promote active and effective communication between the public, the EPA, and the owner/operator of the facility (55 FR 30858). In addition, the facility may be required to comply with public participation requirements of other laws, such as the National Environmental Policy Act (NEPA), or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see Modules 7-2 through 7-9 for additional information). The public involvement activities presented in this submodule reflect EPA-administered corrective action programs, as well as DOE guidance on public participation.

When a RCRA permit application is submitted, among other activities, EPA assembles a mailing list for the community in which the facility is located. After developing a draft permit and fact sheet, which will include corrective action requirements, EPA provides public notice that the draft permit has been prepared and is available for public review. This notice must be published in a major newspaper and broadcast over local radio stations. Also there is a requirement for a 45-day public comment period, and if requested, a public hearing. The comment period and public hearing provide the public an opportunity to comment on the terms and conditions of the permit. When a final decision is reached on whether to issue or deny a permit, EPA must respond to all significant comments received and must send a notice of the decision to each person who submitted written comments on the draft decision or who requested such a notice.

For corrective action, requirements for conducting a RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS), and for implementing a corrective measure will be included in the permit schedule of compliance through the permit modification process, which is subject to the same public participation requirements. In addition to these activities, the proposed Subpart S rule provides EPA the authority to require additional effort to keep the public informed of corrective action activities at the facility. EPA can require the establishment of an information repository near the facility for documents pertinent to the corrective action activities at the facility (e.g., RFI plans and reports, CMS plans and reports, relevant RCRA regulations). Such a repository would generally be required where the RCRA facility is similar (in terms of the magnitude of contamination and potential for exposure to hazardous wastes) to sites listed on the National Priorities List

(NPL) under CERCLA.[20] In addition, EPA will specify requirements that the permittee must satisfy in informing the public of the existence of any required repository. At a minimum, a written notice about the existence of the repository is sent to all individuals on the facility's mailing list. The permittee must also mail a summary of the final report of the RFI to all individuals on the facility's mailing list.

The proposed Subpart S rule establishes the selection of the corrective measure as a major permit modification, and, under proposed 40 CFR §270.36, requires opportunity for public involvement in addition to the public participation procedures under 40 CFR §124 (55 FR 30834). Other permit modifications initiated by EPA or the owner/operator will be classified on the basis of their potential effect on the owner/operator, the affected public, and the environmental impact of the proposed changes. Modifications not classified as major will follow the procedures proposed in 40 CFR §270.34(c) or those issued on September 28, 1988 (53 FR 37912) for owner/operator initiated modifications. These modifications may be pursuant to RCRA Corrective Action. Generally, such modifications will not include requirements for a public comment period or a public hearing.

For 3008(h) corrective actions, there are currently no regulatory public involvement requirements. However, EPA's Office of Solid Waste and Emergency Response issued "Guidance for Public Involvement in RCRA Section 3008(h) Actions" in the form of a memorandum dated May 5, 1987. This memo discusses the minimum public involvement requirements for EPA to follow once a facility has performed the RFI and the CMS and has submitted the CMS report and proposed remedy to EPA. Further, EPA expects to use the proposed Subpart S regulations as interim guidelines and may thus require preparation of a public involvement plan and an information repository for corrective action at interim status facilities.

There are also specific public involvement activities associated with modifications to corrective action compliance schedules. Proposed 40 CFR § 270.34(c) outlines specific procedures for modifying corrective action schedules of compliance for the purpose of implementing Subpart S requirements. These procedures will be applied only in modifying corrective action schedules of compliance; they will not be used to modify terms or conditions of the permit that are outside the scope of the schedule. Therefore, a modification made according to these regulations would not constitute a reissuance of the permit.

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[20] EPA policy is to list on the National Priorities List (NPL) all Federal facilities subject to RCRA Corrective Action that are eligible for such listing. This creates special requirements for community relations. See Module 7-3 for details.

DOE Policy on Public Participation

The DOE Environmental Restoration and Waste Management (EM) program is committed to fulfilling DOE's policy to conduct its programs in an open, responsive and accountable manner. EM's policy is outlined in *Public Participation Policy for Environmental Restoration and Waste Management, U.S. Department of Energy (October 1992).* The following discussion is from this document.

> It is EM's policy that the public will have the opportunity to participate in the EM decisionmaking process for program planning, design, and implementation. It is EM's policy to support an aggressive, substantive, EM-wide public participation program in which the public is provided with accurate, complete, and timely information and early, meaningful participation opportunities. EM's overall goal is to create an open and accessible decisionmaking process that results in decisions that are technically and economically feasible, environmentally sound, health and safety conscious, address public values and concerns, and can be implemented. Providing for public participation in the decisionmaking process in one key means to achieve this goal. EM's public participation objectives include:
>
> - Soliciting the public's help in identifying EM-related problems and issues and environmental, economic, social, and cultural values that relate to those problems and issues.
> - Soliciting the public's involvement in identifying a full range of alternative approaches for addressing those problems and issues.
> - Increasing public understanding of the complex environment in which DOE operates, the legal, regulatory, political, technical, funding, and resource constraints it faces, and the need to balance a variety of interests and considerations.
> - Facilitating the clarification of issues and alternative approaches and the resolution of conflict, working toward the development of broad-based consensus, both on EM's objectives and on how to achieve those objectives.
> - Coordinating, integrating, and communicating information about EM public participation activities such that the public is not confronted with multiple, overlapping, disconnected participation opportunities.
> - Providing a range of EM public participation opportunities tailored to meet the needs and interests of various segments of the public.
> - Providing the public with timely feedback on how and why their input was or was not incorporated into decisionmaking.
> - Fulfilling the letter and the spirit of legal, regulatory, negotiated, and policy requirements relating to EM public participation.

An effective public participation program is essential to the success of the EM program. An active public participation program will:

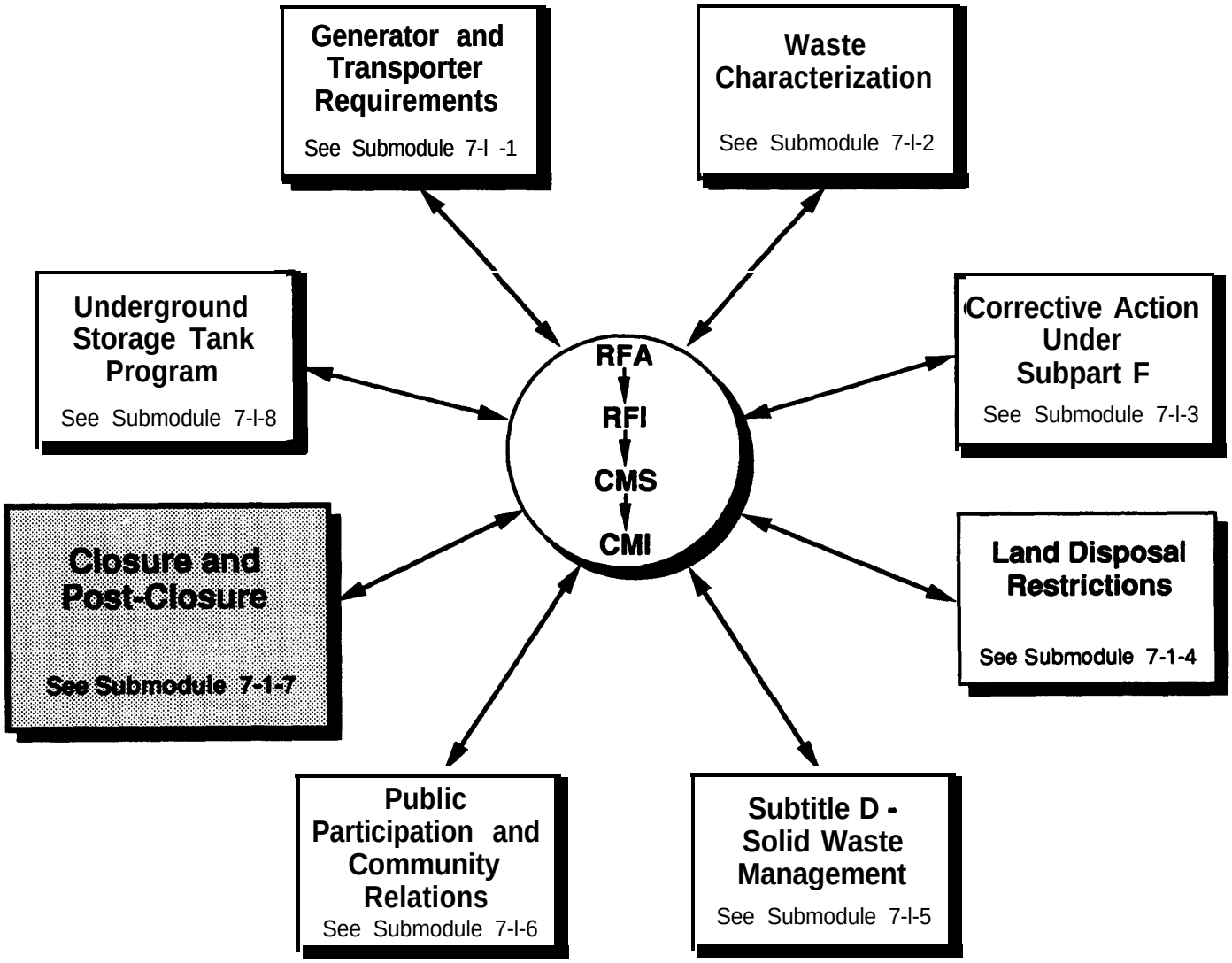
- Enable the public to participate in public policy decisions about matters that affect them.
- Help DOE make better decisions that incorporate legal, technical, economic, environmental, social factors, and that address public values and concerns.
- Provide a means for DOE to build consensus among the various interests in addressing major issues and problems.
- Assist DOE in building credibility with the public by demonstrating openness, responsiveness, and accountability.
- Encompass activities necessary to comply with applicable laws, regulations, negotiated agreements, and DOE policy, including meeting the requirements of the NEPA, RCRA and CERCLA.

To accomplish the goals for public participation, a facility conducting RCRA Corrective Action should develop and implement a public involvement plan (PIP). This is especially appropriate for:

- Large facilities;
- Facilities with a history of releases;
- Facilities with a history of public opposition;
- Facilities receiving credit for remediation of contamination; and
- Facilities located in or near residential areas.

There are several guidance documents available that address public participation. These include:

- *Guidance on Public Involvement in the RCRA Permitting Program (January 1986)* (developed by EPA):
- *Public Participation in Environmental Restoration (November, 1991)*;
- *Public Participation Guidance for Environmental Restoration and Waste Management (March 1993)*;
- *Public Participation Policy for Environmental Restoration and Waste Management (October, 1992)*;
- *Administrative Record (November 1991);* and
- *Information Repository (November 1991)*.



Chapter Seven - Integration with RCRA and Other Environmental Laws
Module 7-1-7 - Closure and Post-Closure

Submodule 7-1-7: Closure and Post-closure

Closure

When a hazardous waste treatment, storage, or disposal facility (TSDF) ceases waste management activities at a unit, the unit must be closed according to the requirements of 40 CFR §264-Subpart G (for permitted facilities) or 40 CFR §265-Subpart G (for interim status facilities). Under these regulations there are two options for closure, "clean closure" and closure with wastes left in place.

The first option, "clean closure," requires that a unit must not contain contaminants that will impact any environmental media in excess of EPA-recommended risk-based limits or factors such as Maximum Contaminant Levels (MCLs), Ambient Water Quality Criteria (AWQC), reference dose limits (RfDs), or carcinogenic potency factors (CPFs). "Clean closure" also requires demonstration that direct contact (e.g., dermal exposure, inhalation) will not pose a threat to human health or the environment.

The other option, closure with wastes left in place, requires the owner/operator to close the unit in such a manner as to:

- Protect human health and the environment;
- Minimize the need for further maintenance; and
- Control, minimize, or eliminate the release of hazardous waste, hazardous waste constituents, leachate, contaminated runoff, or hazardous waste decomposition products.

In the case of groundwater contamination, the facility must comply with the requirements for closure with the wastes left in place.

Each type of unit (e.g., landfill, surface impoundment, waste pile) has specific closure requirements, detailed in the appropriate Subparts of 40 CFR §264 and 40 CFR §265.

All TSDFs are required to develop, submit, and have approved a closure plan for the facility as part of the RCRA Part B permit application. The closure plan must be updated 60 days prior to any planned change in the facility operating plan or 60 days (30 days if closure is occurring) following any unexpected event which affects the closure plan. A permit modification is required to amend the closure plan at a permitted facility. Interim status facilities are required to submit to EPA a written request for amendment of an approved closure plan. Under 40 CFR §264.112(b), the specific requirements of a closure plan include discussion of:

- How and when the facility will be closed;
- The plans for compliance with the applicable closure requirements for each type of unit;
- The maximum quantity of hazardous wastes which the facility may contain prior to closure;
- The methods for removing, transporting, storing, or disposing of all hazardous wastes;
- The procedures for the removal or decontamination of all facility equipment;
- The planned year of, and a proposed schedule for, closure; and
- An estimate of the cost for closure (not required for Federal facilities).

A facility must provide EPA with a written notice of intent to begin closure and must adhere to various timetables for final acceptance of waste. Facilities with approved closure plans under 40 CFR §264 are required to:

- Notify EPA of the intent to close either 45 days (facilities with only container storage, treatment of storage tanks, or incinerators) or 60 days (all other units) prior to the date when closure activities are expected to begin (§264.112(d)(1));
- Begin closure activities no later than 30 days after the last volume of hazardous waste is received, or, if the facility might receive additional waste, no later than one year after the most recent receipt of hazardous waste (§264.112(d)((2)(i));
- Treat, remove, or dispose of onsite all hazardous wastes from the unit undergoing closure within 90 days after receiving the final volume of hazardous waste (§264.113)(a)); and
- Complete all other closure activities within 180 days after receiving the final volume of hazardous waste (§264.113(b)).

Interim status facilities must:

- Submit a closure plan to EPA 45 days prior to closure of container storage, tanks, or incineration units, and 180 days prior to closure of any other unit (§265.112(d)(i));
- If the facility has an approved closure plan, the owner/operator must notify EPA 45 days prior to the closure of container storage, treatment or storage tanks, or incinerators and 60 days prior to closure of any other unit (§265.112(d)(1));

- Begin closure activities no later than 30 days after the last volume of hazardous waste is received, or, if the facility might receive additional waste, no later than one year after the most recent receipt of hazardous waste (§265.112(d)(2)(i));

- Treat, remove, or dispose of onsite all hazardous wastes from the unit undergoing closure within 90 days after receiving the final volume of hazardous waste or within 90 days after approval of the closure plan (§265.113(a)); and

- Complete all other closure activities within 180 days after receiving the final volume of hazardous waste or approval of the closure plan (40 CFR §265.112 (d) and (e) and (40 CFR §265.113(b)).

All closure activities must be certified by an independent registered professional engineer (for land treatment units a qualified soil scientist) within 60 days after completion of the closure activities at a surface impoundment, waste pile, land treatment unit, or landfill and within 60 days after final closure of a facility (§264.115). Within 90 days after the completion of closure, the owner/operator must submit a survey plat to EPA and the local zoning authority showing the size and location of the hazardous waste disposal areas within the facility. In addition, a notation must be placed in the deed of the property which provides details of the hazardous waste management activities which occurred at the facility, any land use restrictions, and information on the availability of the survey plat (40 CFR §264.116).

Post-Closure

If the facility is closed with the waste left in place, the facility must comply with the post-closure requirements. Post-closure begins upon completion of the closure activities and lasts for 30 years, though this time limit may be shortened or increased if EPA determines that such a change provides adequate protection of human health and the environment. Post-closure care requirements under 40 CFR §264.117 include:

- Compliance with facility monitoring, maintenance, and reporting requirements of Subpart F, and the applicable unit-specific requirements of Subparts K, L, M, N, and X;

- Providing security at facilities closed with wastes left in place, or where access by the public or livestock presents a threat to human health; and

- Ensuring that subsequent uses of the properties where hazardous wastes remain do not disturb the integrity of the final containment system or disturb the functioning of the monitoring systems in a manner that will increase any potential hazard to human health and the environment.

Permitted TSDFs are required to submit a post-closure plan as part of the RCRA Part B permit application for the facility. Interim status facilities are also required to have a post-

closure plan. A post-closure plan has similar requirements for both permitted and interim status facilities (§264.118 and §265.118, respectively) and includes requirements for:

- Descriptions of the monitoring activities to be performed in compliance with the unit-specific post-closure requirements;
- Descriptions of the post-closure maintenance activities to be performed; and
- Descriptions of how the maintenance activities ensure the integrity and function of the containment and maintenance systems.

If the post-closure plan requires amendment, a permitted facility must request a permit modification from EPA (40 CFR §264.118). Interim status facilities must notify EPA of the proposed amendments to the plan (40 CFR §265.118(d)).

A post-closure permit is included in the overall RCRA permit for a TSDF, and can be required of land-based units at interim status facilities. Completion of all post-closure activities must be certified by both the owner/operator and an independent registered professional engineer within 60 days after completion of the post-closure period (40 CFR §264.120 and 40 CFR §265.120).

Interaction of Corrective Action With Closure and Post-Closure

The most significant interaction between corrective action and closure is in the ability of a facility to comply with the regulatory time frames. EPA has proposed to amend the regulations governing extension of these deadlines at facilities conducting corrective action.

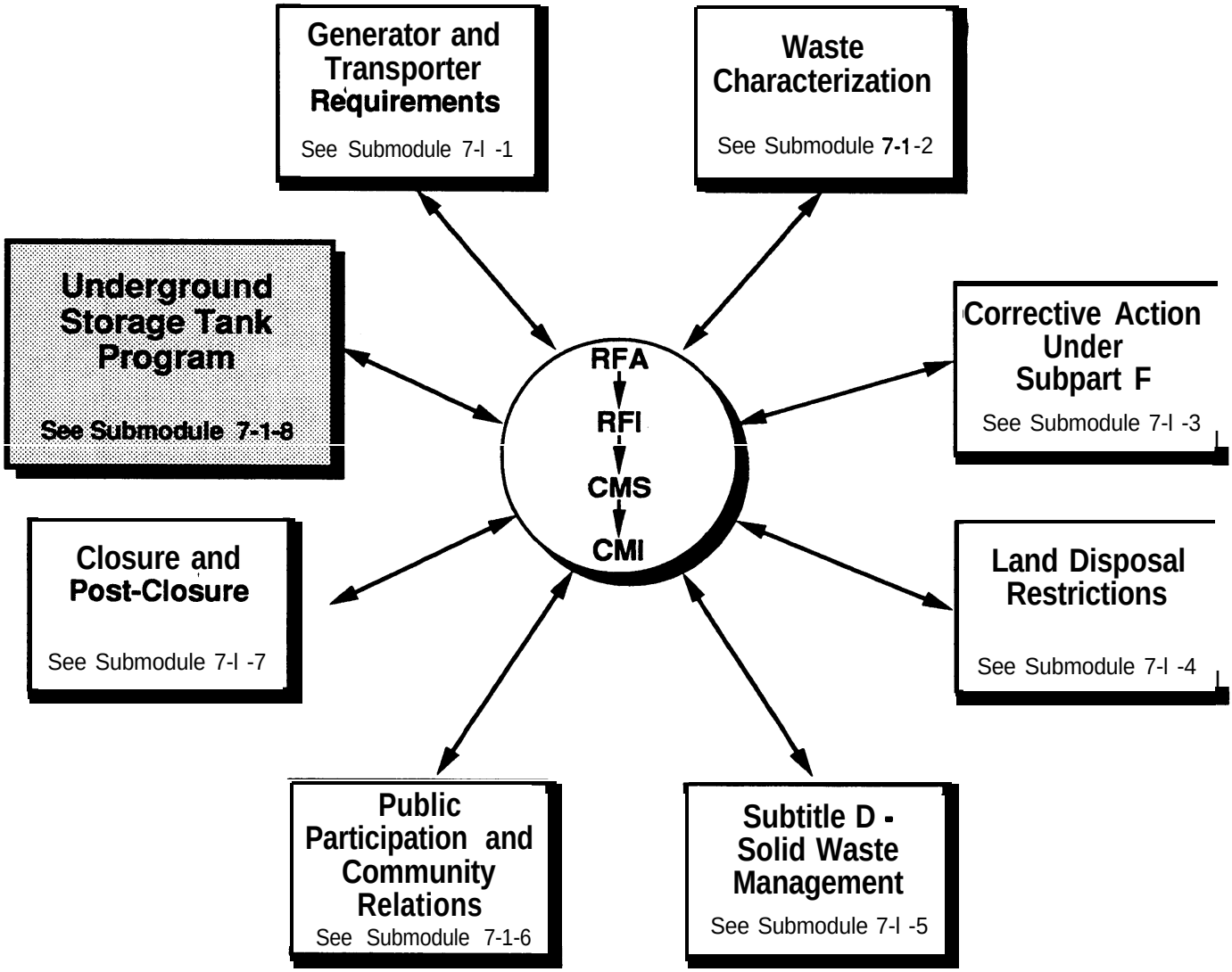
As discussed above, when a unit ceases to receive hazardous waste, the owner/operator is required to notify EPA and initiate closure of the unit. However, temporary suspension of waste acceptance by the facility may be required to minimize the potential for encountering problems during corrective action activities. The present regulations allow EPA to grant an extension to the deadline for beginning closure if the acceptance of waste is suspended only temporarily and additional hazardous waste capacity remains in the unit (40 CFR §264.113(a)(1)). The key requirement for issuance of such an extension appears to be the potential for use of the unit for disposal of wastes generated during corrective action at units located within the facility boundaries.

For units requiring corrective action prior to or in conjunction with closure, the owner/operator may find it difficult to comply with the requirement that within 90 days after receiving the final volume of hazardous waste at a unit, the owner/operator must treat, remove, or dispose of the waste offsite, and that closure of the unit be completed within 180 days after receiving the final volume of hazardous waste. EPA has proposed to amend the current regulations to include provisions for extension of these deadlines for purposes of conducting corrective action (see proposed 40 CFR §264.113(a)(i) and (ii) and proposed 40 CFR §265.113(a)(i) and (ii)).

EPA also proposed expansion of the 40 CFR §265 closure plan to require submission of information regarding all solid waste management units (SWMUs) at a facility subject to corrective action under Subpart F or the proposed Subpart S programs. However, such a requirement appears subject to challenge. In the preamble to the proposed Subpart S rule, EPA states that SWMUs that are not used to manage hazardous waste are not subject to the closure requirements of 40 CFR §264 or 40 CFR §265 - Subpart G, so it would appear there is no authority for a requirement for inclusion of these non-hazardous waste SWMUs in the Subpart G closure plan (55 FR 30851).

The proposed Subpart S rule also proposes providing EPA the authority to waive the Subpart G requirements (except 40 CFR §264.111) for units created for the purpose of managing wastes generated during corrective action (55 FR 30841 and 30851).

The DOE Office of Environmental Guidance has developed a guidance document entitled *Closure of Hazardous and Mixed Radioactive Waste Management Units at DOE Facilities (June, 1990)*, which provides detailed information on the process and requirements for closure and post-closure.


Generator and Transporter Requirements
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Public Participation and Community Relations
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Subtitle D - Solid Waste Management
See Submodule 7-l -5

Submodule 7-1-8: Underground Storage Tank Program

The Hazardous and Solid Waste Amendments (HSWA) created a new regulatory program, RCRA Subtitle I - Underground Storage Tanks, governing the design, construction, installation, operation, and closure of underground storage tanks (USTs).[21] Specifically, RCRA §9003(c) required EPA to promulgate regulations governing:

- Standards for the design, construction, and installation of new USTs;
- Standards for maintenance of a leak detection system;
- Standards for reporting of releases from USTs;
- A corrective action program for such releases; and
- Requirements for the closure of existing tanks.

An underground storage tank (UST) is one that stores "regulated substances" and that has at least 10% of its volume below the surface of the ground, including piping connected to the tank. Regulated substances are petroleum products (e.g., gasoline and crude oil) that are liquid at standard conditions of temperature and pressure, and hazardous substances as defined under CERCLA §101(14), but not including hazardous waste regulated under RCRA Subtitle C.[22] Underground tanks containing RCRA hazardous waste are considered

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[21] The DOE Office of Environmental Guidance (EH-231) has developed a detailed graphic guidance titled *Regulated Underground Storage Tanks (June 1992)* discussing the UST regulations promulgated under the authority of RCRA Subtitle I.

[22] CERCLA 101(14) defines the term "hazardous substance" as: (A) any substance designated pursuant to section 311 (b)(2)(A) of the FWPCA, (B) any element, compound, mixture, solution, or substance designated pursuant to section 102 of this Act, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (SWDA) (but not including any waste the regulation of which under the SWDA has been suspended by Act of Congress), (D) any toxic pollutant listed under section 307(a) of the FWPCA, (E) any hazardous air pollutant listed under section 112 of the CAA, and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act (TSCA). The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under sub-paragraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas

(continued...)

a hazardous waste management unit used to treat, store, or dispose of hazardous wastes, and are regulated under Subtitle C.

Both the statute and EPA regulations excluded USTs based upon size, function, or contents. Examples of tanks excluded from the definition of UST include:

- Farm and residential tanks holding 1,100 gallons or less of motor fuel used for noncommercial purposes;
- Tanks storing heating oil used on the premises where it is stored;
- Tanks on or above the floor of underground areas, such as basements, shafts, and tunnels;
- Septic tanks and systems for collecting wastewater and storm water;
- Flow-through process tanks;
- Emergency spill and overflow tanks;
- Liquid traps or associated gathering lines directly related to oil or gas production and gathering operations; and
- Surface impoundments, pits, ponds, and lagoons.

Corrective Action Under RCRA Subtitle I

On September 23, 1988, EPA issued technical standards which included release detection, reporting, and corrective action requirements for petroleum and CERCLA hazardous substance USTs regulated under Subtitle I (see 40 CFR §280). These standards require the owner/operator of a leaking UST to do the following:

- Report confirmed releases to EPA, the State, or local authorities;
- Immediately start remedial activities, including mitigation of safety and fire hazards, initiation of free product recovery; and
- Begin assembling information on the nature and quantity of the release and site characteristics.

The owner/operator must submit reports describing these steps as well as submit the design and implementation plan for the free product recovery system. A corrective action plan would be required for longer term cleanups addressing soil and groundwater contamination.

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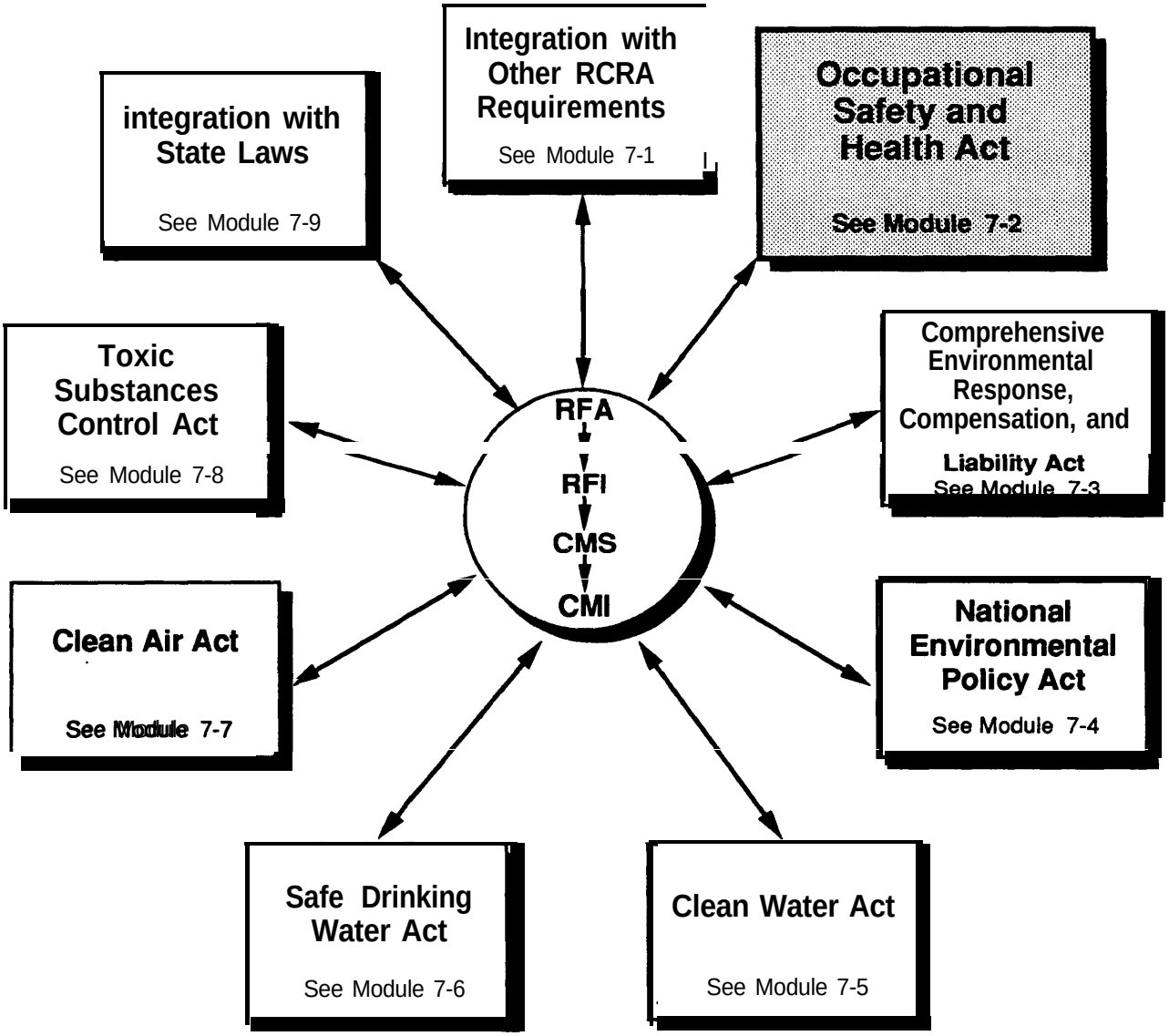
[22](...continued)
and such synthetic gas).

Under the Subtitle I program, a corrective action for an UST is similar to a corrective action under the proposed Subpart S rule. The steps that are similar include the following:

- Source control;
- Determining the extent of the contamination;
- Determining the extent of the remediation required; and
- Performing the necessary remedial activities (40 CFR §280.60-67).

Corrective Action Under RCRA Subtitle C

A RCRA permitted TSD facility operating USTs containing hazardous waste must comply with the Subtitle C regulations and the terms of the facility permit for release reporting, contingency plans, and inspections of these units. Further, as described in the preamble to the proposed Subpart S rule, USTs at RCRA-permitted TSDFs which contain solid or hazardous waste will be subject to corrective action under the more complex and rigorous requirements of the proposed Subpart S rule rather than under RCRA Subtitle I (see 55 FR 30857). EPA believes that close oversight of corrective action for releases from USTs used to manage solid or hazardous waste is appropriate, and that the permitting process provides an opportunity for such oversight. USTs used to manage regulated substances will continue to be regulated under the provisions of the RCRA Subtitle I program.


Integration with Other RCRA Requirements
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Toxic Substances Control Act
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Comprehensive Environmental Response, Compensation, and Liability Act
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Clean Air Act
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Safe Drinking Water Act
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Clean Water Act
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Module 7-2: Occupational Safety and Health Act

The Occupational Safety and Health Administration (OSHA) was created in 1970 by the enactment of the Occupational Safety and Health Act (OSH Act). The primary goal of this Act is to "assure so far as possible, every working man and woman in the Nation safe and healthful working conditions." The principal role of the OSHA is setting health and safety standards and the enforcement of these standards through Federal and State programs. In general, the coverage of the Act extends to all employers and their employees in the 50 States, the District of Columbia, and all territories under jurisdiction of the Federal government.

The Occupational Safety and Health Administration established final regulations (effective March 6, 1990) that are applicable to RCRA-regulated generators and treatment, storage, or disposal facilities (TSDFs). These regulations, found at 29 CFR §1910.120, require employees at generator and TSDF facilities to be trained to perform their "assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees" as part of an overall health and safety program.

The regulations applicable to the operation of RCRA treatment, storage, or disposal facilities (TSDFs) are found at 29 CFR §1910.120(p), and require that a RCRA TSDF have:

- A Health and Safety Program;
- A Hazard Communication Program (required by 29 CFR §1910.1200 Hazard Communication Standard - Worker Right-to-Know);
- A medical surveillance program;
- A decontamination program;
- A program for introducing new technologies;
- A program for training employees in materials handling;
- A 24-hour course to train employees in safe work practices related to the hazardous waste operations at the TSDF; and
- An emergency response program.

The OSHA regulations also directly affect all phases of RCRA Corrective Action, from the RCRA Facility Assessment through completion of the corrective measure. These

regulations, also found at 29 CFR §1910.120, require all employees engaged in onsite corrective action activities who might be exposed to hazardous substances, health hazards, or safety hazards to receive training before engaging in those onsite operations. The regulations for onsite activities require:

- A written health and safety plan (HASP);
- Site characterization and hazard analysis;
- Employee training necessary to successfully fulfill the HASP;
- The use of appropriate personal protective equipment (PPE);
- A medical surveillance of employees engaged in onsite activities;
- The use of environmental monitoring equipment;
- Site control through engineered or administrative practices;
- Decontamination of persons and equipment;
- An emergency response plan;
- Procedures for confined space entry; and
- Spill containment procedures.

General site workers engaged in corrective action activities which can expose them to hazardous substances and health hazards are required to receive a minimum of 40 hours of instruction off the site and at least three days of field experience under direct supervision of a trained, experienced supervisor. A 24-hour training course is required for employees who enter the site on an occasional basis for the purpose of conducting a clearly defined task, such as sampling groundwater. In addition, supervisory personnel directly responsible for supervising employees engaged in operations are required to receive an additional 8 hours of training. All employees are required to receive 8 hours of refresher training annually.

The DOE Office of Environmental Guidance has published a Guidance titled *OSHA Training Requirements for Hazardous Waste Operations (December, 1991)*. This Guidance provides additional details on the OSHA requirements.

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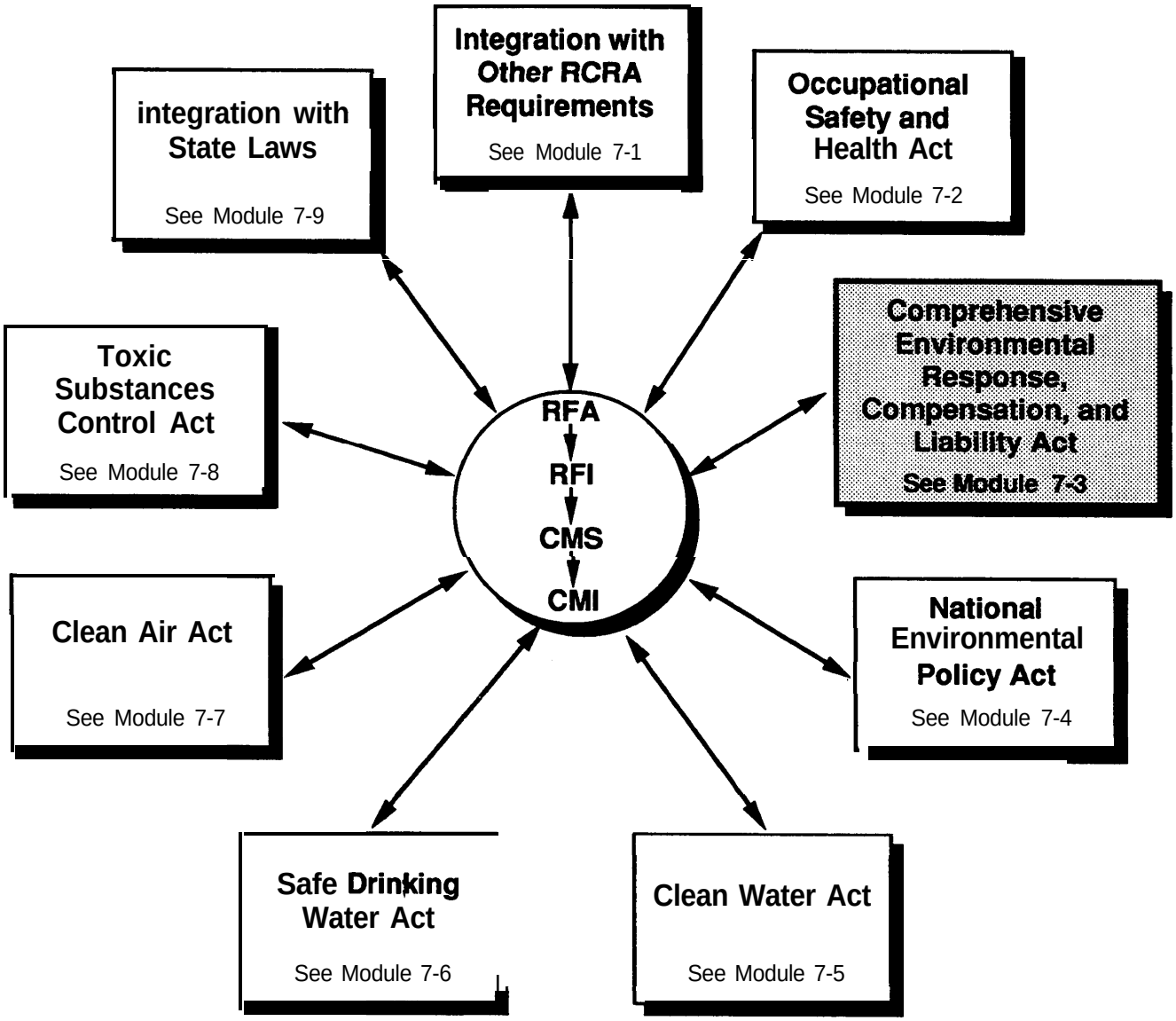
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Module 7-3: Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)) authorizes the President to take response actions, including removal or remedial actions, when an uncontrolled release of a hazardous substance, pollutant or contaminant presents a threat or potential threat to human health or the environment. Through Executive Order 12580 - Superfund Implementation, the President delegated these responsibilities to EPA for responses at non-Federally owned sites. For Federally-owned sites, E.O. 12580 delegated the responsibility for emergency responses or responses at non-NPL sites to the heads of the various Federal agencies. E.O. 12580 also delegates responsibility for all types of CERCLA response at DOD facilities to the Secretary of Defense and for DOE facilities to the Secretary of Energy.

In general, CERCLA authority is used to address problems of uncontrolled releases usually at inactive or abandoned waste management facilities, or at facilities that are not currently being operated under interim status or under a RCRA permit. However, if the facility or a portion of the facility managed hazardous waste after November 19, 1980 (after which all hazardous waste management facilities were required to have a RCRA permit or interim status) both RCRA and CERCLA may apply (often both apply at Federal facilities), and EPA may require compliance with both statutes.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the administrative and procedural requirements for conducting hazardous substance release response actions under CERCLA, and predates the proposed Subpart S rule. In developing the proposed Subpart S rule, EPA elected to parallel the NCP process.

It is important to understand that CERCLA addresses a larger number of materials than does RCRA. In addition to addressing releases of hazardous wastes (a subset of hazardous substances, which are also addressed under Subpart S), CERCLA addresses releases of a large number of materials which are not hazardous wastes, such as radionuclides, production feedstocks, or special studies wastes (wastes specifically exempted from regulation as hazardous wastes).

Response under CERCLA follows the following steps.

Site Discovery

Discovery of a site where a release of a hazardous substance or pollutant or contaminant is threatened is similar to discovery of releases or threatened releases of hazardous wastes and hazardous waste constituents at RCRA facilities. Site discovery may occur through a variety of means including:

- Reporting of releases of hazardous substances under CERCLA §103;
- Reporting sites where hazardous wastes have been disposed of in a manner that poses a threat of release (as required by CERCLA §103(c) or CERCLA §120(b) and (c));
- Investigation by governmental authorities;
- Citizen suits; or
- Incidental discovery.

All sites where an uncontrolled release at or above a reportable quantity, unless federally permitted, of a hazardous substance or pollutant or contaminant occurs fall under CERCLA authority, and are listed on the EPA's CERCLIS database. Section §120(c) of CERCLA also requires all Federal facilities falling under CERCLA authority, where a RCRA §3106 report is required, or where a RCRA permit or RCRA §3010 notice was required, to be listed on the Federal Agency Hazardous Waste Compliance Docket ("the Docket").

Removal Actions and Remedial Responses Under CERCLA

Response to releases of hazardous substances under CERCLA is broken into two classes, removal actions and remedial responses. The key difference is that removal actions are rapid responses used to reduce any immediate or short-term threat, and do not necessarily result in a final, permanent solution to the contamination problems at the facility. A remedial response, on the other hand, establishes a final solution to the contamination resulting from the release.

Removal Actions

Removal actions taken under CERCLA are similar to interim measures under the RCRA Corrective Action program. However, due to the wide scope of the CERCLA removal authority, CERCLA removal actions are far more common and can be used in a wider variety of cases. A CERCLA removal action involves a removal Preliminary Assessment (PA) and if warranted, a removal Site Inspection (SI). Depending upon the time frame available before onsite activities must commence, and the duration of the onsite activities, a CERCLA removal action may require a community relations plan and/or an Engineering Evaluation/Cost Analysis (EE/CA).

Remedial Response

The first two phases of a CERCLA remedial response, the remedial Preliminary Assessment (PA) and the remedial Site Inspection (SI), are similar to the RCRA Facility Assessment (RFA). The most notable difference is that in most cases EPA conducts the RFA (DOE does, upon occasion, conduct RFAs), while the owner/operator of a Federal facility is usually required to conduct a PA or SI. Further, at a Federal facility, CERCLA §120(d) requires completion of the PA within 18 months after listing the Docket, and a final NPL listing decision within 30 months after listing on the Docket. A remedial PA involves a review of available information on a site, and eliminates from further consideration those sites not posing a risk to human health or the environment. A remedial SI may be required to further evaluate site conditions and often involves sampling of environmental media, collection of demographic information, and characterization of the environmental setting at the site.

Once the initial site evaluation is complete, the site is scored using the Hazard Ranking System (HRS). The HRS is a model for assessing the relative threat to human health and the environment posed by a site. If a site scores above 28.5 (an arbitrary cut-off point established by EPA), the site will be placed on the National Priorities List (NPL). Under CERCLA a Remedial Investigation/ Feasibility Study (RI/FS) is required for all NPL sites. This process of HRS scoring and NPL listing is analogous to the permit modification process for requiring a RCRA Facility Investigation (RFI) under the RCRA Corrective Action program in that both create a requirement for detailed investigations to characterize the extent and nature of a release. Under DOE Order 5400.4, DOE enters into a CERCLA §120(e) Inter-Agency Agreement (IAG) with EPA six months after the NPL listing. If the site is not placed on the NPL, DOE Order 5400.4 also requires that any remedial activity at the site be not inconsistent with the requirements of the NCP.

A Remedial Investigation/Feasibility Study (RI/FS) is analogous to the RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS). The principal difference is that the RFI and CMS are usually performed sequentially, whereas the RI and FS are required to be conducted concurrently. The RI/FS characterizes the nature and extent of risks posed by releases of hazardous substances, and provides an evaluation of the remedial options for the site. The RI focuses on collection of data to characterize site conditions, determining the nature and extent of the contamination, and evaluation of risk to human health and the environment posed by the site. The RI/FS process may include assessing a given remedial option through treatability testing. The FS focuses on development, screening, and detailed evaluation of each remedial option.

The RI/FS leads to the selection of the remedial action, development of a proposed plan describing the preferred remedial action, the development of the Record of Decision (ROD), and signing of a consent decree. These steps are analogous to the process established under the proposed Subpart S rule for selection of the corrective measure, development of a Statement of Basis, and permit modification requiring implementation of a corrective measure. The general performance standards and criteria for selecting a remedy under CERCLA are very similar to those under the proposed Subpart S rule, in that both require implementing cleanup activities that provide a long-term solution to the release, and that both provide long-term protection of human health and the environment.

Once the ROD is complete, the owner/operator, EPA, and the State create a binding agreement to conduct the remedial action through a consent decree. For DOE, the ROD or consent decree, once completed, becomes a part of the IAG with EPA.

Once the remedy is selected for the facility, and the necessary agreements/orders are in place, the Remedial Design/Remedial Action (RD/RA) phase of the CERCLA response process begins. The RD/RA process is similar to Corrective Measures Implementation (CMI) under the proposed Subpart S rule. The RD/RA involves the design, construction, and operation of the remedy, and the environmental monitoring required to demonstrate that the site has been remediated to the required levels.

The final requirement for CERCLA response is deleting the site from the NPL. In addition, the Superfund Amendments and Reauthorization Act (SARA) requires a review of the site conditions every 5 years, if any contamination remains at the site following completion of the remedy.

Integration of CERCLA Responses with RCRA Corrective Action

In the preamble to the proposed Subpart S rule, EPA states that a substantial number of CERCLA response actions are likely to be undertaken at facilities with RCRA permits. EPA establishes the position that response actions taken under CERCLA authority which are consistent with the NCP will fulfill any requirement for RCRA Corrective Action. However, EPA also anticipates CERCLA response actions failing to address some releases of a hazardous waste or hazardous waste constituent from solid waste management units (SWMUs) at a facility. In such cases, EPA will require a RCRA Corrective Action at those SWMUs. Under DOE Order 5400.4, the IAG between DOE, EPA, and the State must specify which authority will be applied, and the specific requirements for compliance if more than one authority is used to address the release.

Depending upon site conditions, CERCLA authorities may be, and often are, used in conjunction with RCRA Corrective Action authorities.[23] A common example is the use of CERCLA removal actions at RCRA facilities. Any use of a CERCLA authority must comply with the administrative, procedural, and technical requirements of the NCP. Similarly, EPA expects to use CERCLA authorities to require remediation of area-wide contamination problems, to address contamination at units which are not SWMUs, and to address releases of materials which are hazardous substances but which are not hazardous wastes or hazardous waste constituents. In these cases, the requirement for a CERCLA response action would be referenced in the facility permit.

An additional issue facing Federal facilities is EPA's policy to list all Federal facilities with RCRA Corrective Action requirements on the NPL, if the site meets the NPL listing criteria (i.e., the site would have an HRS score over 28.5). Under CERCLA §120(e)(2)-(e)(4),

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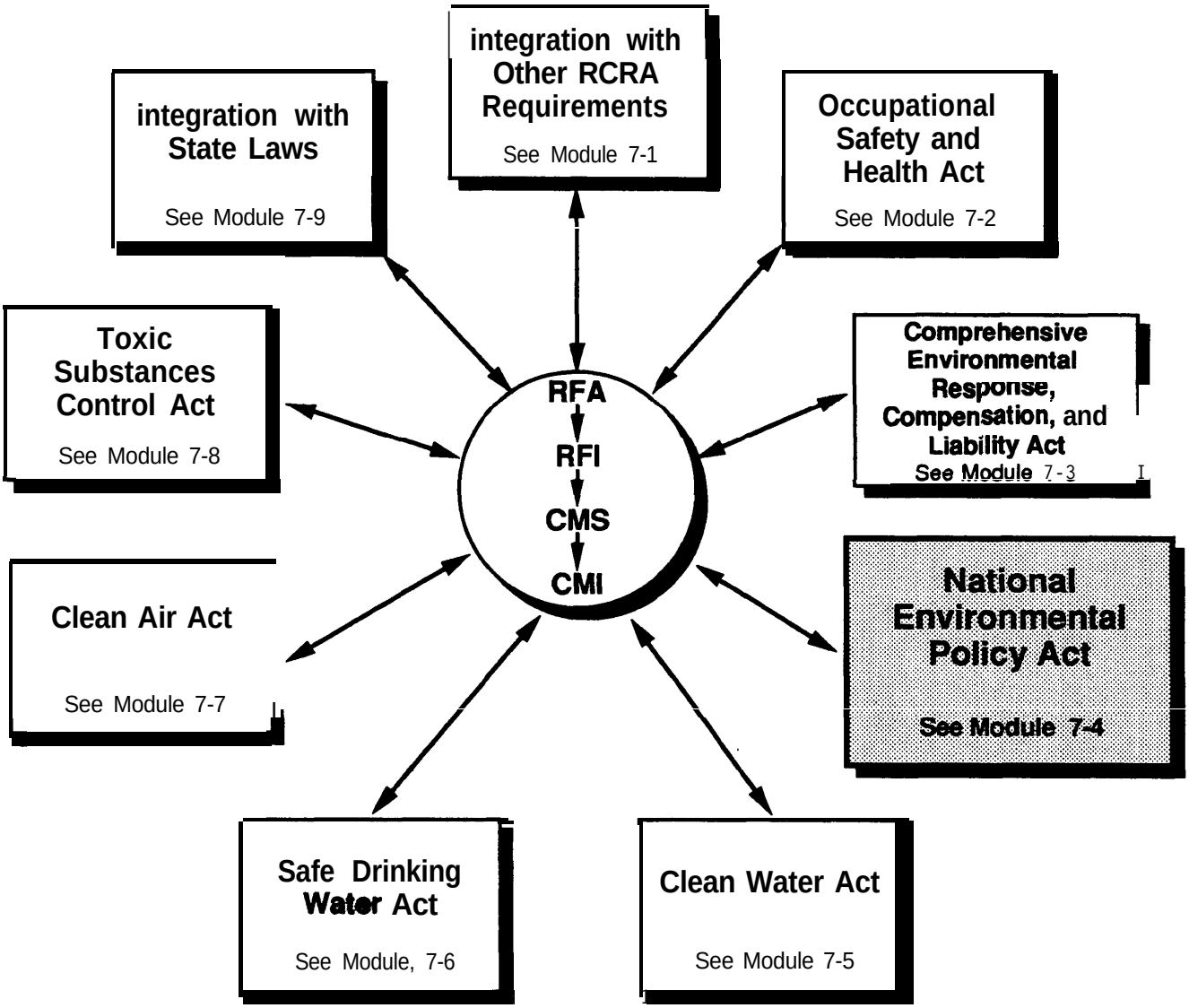
[23] This use of both RCRA and CERCLA authorities to address releases at a single facility is unique to Federal facilities.

Federal facilities listed on the NPL must enter into an IAG with EPA, and, if possible and where appropriate, the State. The purpose of the IAG is to clearly define the responsibilities of each party, to establish specific compliance requirements, and to provide for a dispute resolution process. Negotiation of the IAG is often a difficult process, reflecting differences in agency missions, policies, and positions.

The DOE Office of Environmental Guidance (EH-231) is currently developing a graphic guidance document which provides a comparison overview of the CERCLA remedial process and RCRA Corrective Action.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Module 7-4: National Environmental Policy Act

The Congress enacted the National Environmental Policy Act (NEPA) in 1969. NEPA directs Federal agencies to consider the impacts of their actions on human health and the environment during their decision-making processes. Section 102(2)(c) of NEPA states that all "agencies of the Federal government shall...include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, and (iii) alternatives to the proposed action..." This detailed statement is presented in an Environmental Impact Statement (EIS) and Record of Decision (ROD).

Section 102(2)(C) of NEPA requires that all Federal agencies prepare an EIS for all "…legislative proposals, or other major Federal actions significantly affecting the quality of the human environment." The concept of a major Federal action includes actions performed directly by the Federal government as well as actions which are potentially subject to Federal control or responsibility.

There are six phases an agency undertakes to implement NEPA. These phases are:

- Determining whether an action is a major Federal action significantly affecting the quality of the human environment and thereby requiring an EIS. Agencies are required to identify those actions for which an EIS is not required (i.e., categorical exclusions). If an action is not categorically excluded, the agency must prepare an environmental assessment (EA), which is a limited-scope assessment to determine whether there is no significant impact or whether an EIS is required. Alternatively, an agency can prepare an EIS without preparing an EA.;
- Scoping the EA or EIS to determine the range of actions (connected actions, cumulative actions, and similar actions), the alternatives (no action, reasonable courses of action, and mitigation measures), and impacts to be considered (i.e., direct, indirect, and cumulative impacts);
- Conducting the impact study and preparing an EA or a draft EIS;
- Providing a public comment and response period;
- Approving the EA or the final EIS; and
- Preparing a Finding of No Significant Impact for the selected alternative (if appropriate).

The DOE policy established in DOE Order 5440.1E is for DOE "to ensure that consideration is given to the environmental values and factors in federal planning and decision making, and to comply fully with the letter and spirit of NEPA." In addition, the DOE Order on CERCLA requirements, DOE 5400.4, states DOE's policy to integrate the procedural and documentation requirements of CERCLA and NEPA, wherever practical, when remedial actions under CERCLA trigger the procedures set forth in NEPA. DOE has produced guidance on the implementation of this NEPA/CERCLA integration policy (November 15, 1991). The guidance indicates that there is no similar policy for integration of NEPA with the RCRA Corrective Action process although one is being considered. However, the CERCLA response action and RCRA Corrective Action processes are similar, and therefore this guidance may be applicable to RCRA Corrective Action if a NEPA/RCRA integration policy is formulated. Note, that since there is no policy memorandum addressing RCRA/NEPA integration this section is a brief overview. For further information on this issue the NEPA oversight office should be contacted and on specific questions on CERCLA/NEPA integration, the Waste Activities Division (EH-251) should be contacted.

The guidance is based on a tiered approach to NEPA documentation. The highest tier is the Programmatic EIS on Environmental Restoration and Waste Management, which is addressing major DOE-wide policy issues such as cleanup priorities and alternative cleanup and waste management technologies. Notice of Intent for this EIS was issued on October 22, 1990. Site-wide EISs comprise the next tier of documentation. They address individual and cumulative impacts of site activities, including those associated with all reasonably foreseeable cleanup actions at a site. Finally, the lowest tier of NEPA documentation addresses impacts of individual cleanup actions. The majority of site-specific cleanup actions are expected to be addressed by EAs to determine the significance of potential environmental impacts. Because CERCLA response action and RCRA Corrective Action documentation is similar to NEPA documentation, the guidance recommends that the two should be combined. For example, EA and EIS documents are to be integrated into remedial investigation/feasibility study (RI/FS) reports or engineering evaluations/cost analyses (EE/CAs) in the case of CERCLA, or into RCRA facility investigations/corrective measures studies (RFI/CMSs) in the case of RCRA Corrective Action if such an integration policy is formulated.

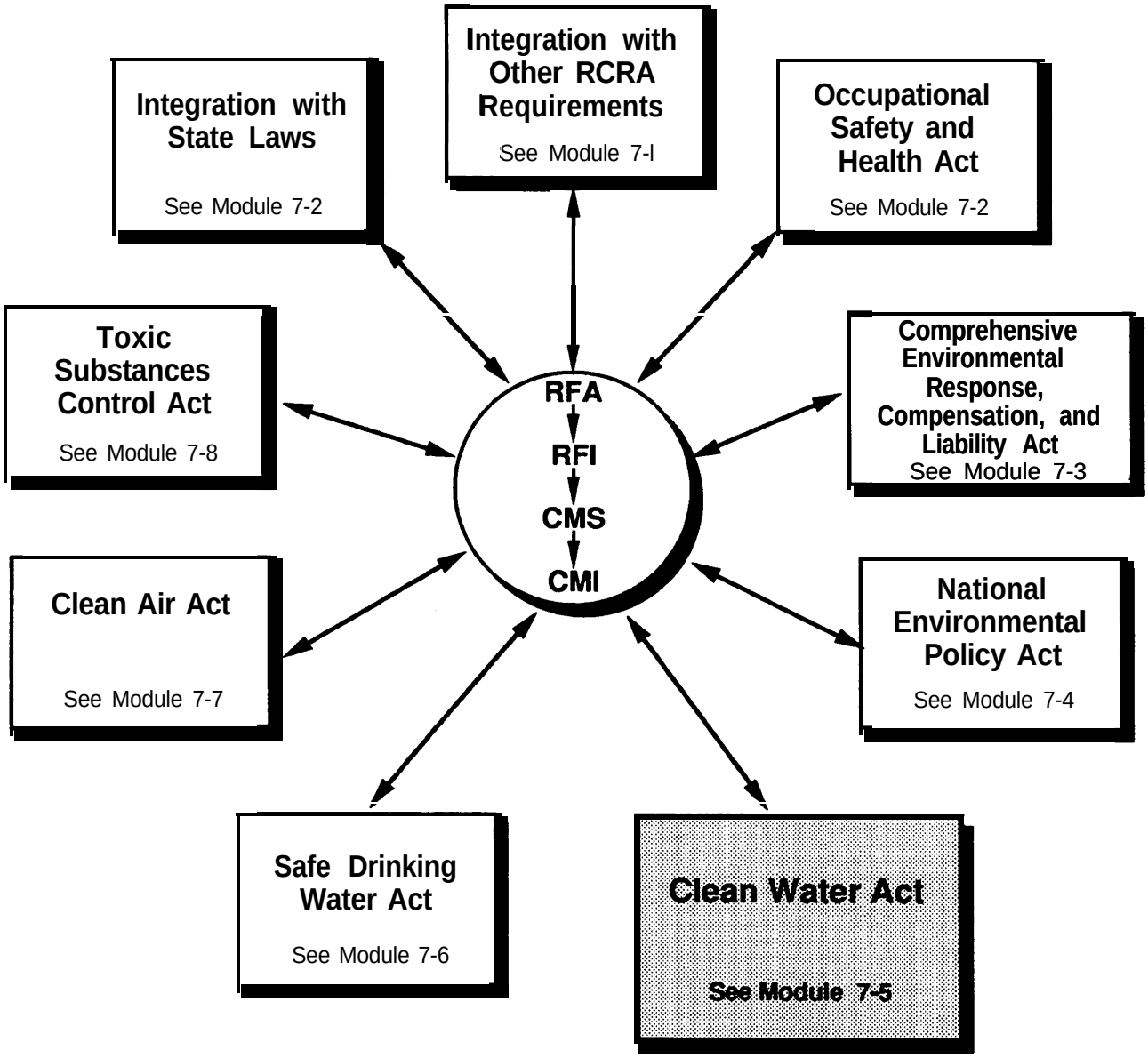
DOE has established procedures for compliance with NEPA (10 CFR §1021). The procedures are to be used in conjunction with and as a supplement to the implementing regulations of NEPA (40 CFR 1500-1508). Of particular note are the appendices to Subpart D, which identify DOE actions that:

- Normally are categorically excluded (do not require the preparation of an EIS or EA);
- Require the preparation of an EA, but not necessarily an EIS; or
- Require the preparation of an EIS.

Only three classes of actions are listed within the appendices that are directly related to RCRA Corrective Action, that are categorically excluded:

- Site characterization/environmental monitoring (Appendix B, item 3.1);
- CERCLA removals/similar actions under RCRA or other authorities meeting CERCLA cost/time limits or exemptions (Appendix B, item 6.1); and
- Siting/construction/operation of pilot-scale waste collection/treatment/ stabilization/containment facilities (Appendix B, item 6.2).

Proposed actions not categorically excluded require either an EA or an EIS.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Module 7-5: Clean Water Act

In 1972, the Congress created the basic framework for Federal regulation of surface water pollution by enacting the Federal Water Pollution Control Act (FWPCA). In 1977, the Congress renamed the FWPCA the Clean Water Act (CWA) and incorporated a new regulatory focus, the control of "toxic" water pollutants, and included a list of 129 specific chemicals considered "toxic." In 1987, the Congress passed extensive amendments to improve water quality in areas where compliance with nationwide minimum discharge standards was insufficient to ensure attainment of CWA's water quality goals.

The CWA imposes legal obligations (and substantial penalties for failure to comply) on those who:

- Discharge wastewater into lakes or streams;
- Discharge non-domestic wastewater into public sewers or sewage treatment plants;
- Place dredged or fill material in or on the banks of lakes, streams, and wetlands;
- Spill oil or hazardous substances into surface waters (or store significant quantities of oil which could be spilled into surface waters); or
- Handle domestic sewage sludge.

As with RCRA, it is important to note that the CWA allows State regulations to be more stringent than the Federal regulations. Therefore, many States have adopted statutes and regulations for the control of water pollution, and those statutes and regulations usually contain different or additional requirements.

Discharging Wastes Under the Clean Water Act

The CWA requires a permit for any point source discharge (also called direct discharges) into the nations's waterways. Such permits are issued under the National Pollutant Discharge Elimination System (NPDES) program. An NPDES permit is granted on a case-by-case basis and the terms of the permit depend on a number of variables. In general, the NPDES permit limits the concentration of toxic constituents or conventional pollutants in effluents discharged to a waterway. In addition, the discharger must treat the wastewater with the Best Available Technology that is Economically Achievable (BATEA) to reduce the concentrations of pollutants in the water. The need for an NPDES permit, or the effects of RCRA Corrective Action

(especially implementation of a corrective measure) on NPDES-permitted discharges must be considered when conducting the Corrective Measures Study (CMS).

The other option for discharges is an indirect discharge to a publicly owned treatment works (POTW). In this process, the waste is treated at the facility in a manner which meets the pretreatment standard, and then the waste is sent via the sanitary sewer system to the POTW. The waste is treated by the POTW and discharged pursuant to the POTW's NPDES permit. The facility will not require an NPDES permit for this type of discharge.

The major interactions between proposed RCRA Corrective Action and the CWA are in the Corrective Measures Study and Corrective Measures Implementation phases, as it is during these phases that corrective measure alternatives are being evaluated, selected, and implemented. Corrective measures must be planned by identifying and knowing the permitting requirements. Factors that need to be considered are:

- Point source discharges from a RCRA-permitted facility must be pursuant to an NPDES permit;

- The impact of the additional discharge from the corrective measure on the facility's ability to comply with the terms of an existing NPDES permit or with pretreatment standards;

- Sludge resulting from wastewater treatment and pretreatment under CWA may be a RCRA waste and must be managed according to the appropriate RCRA requirements; and

- The ability of the receiving POTW to treat the waste.

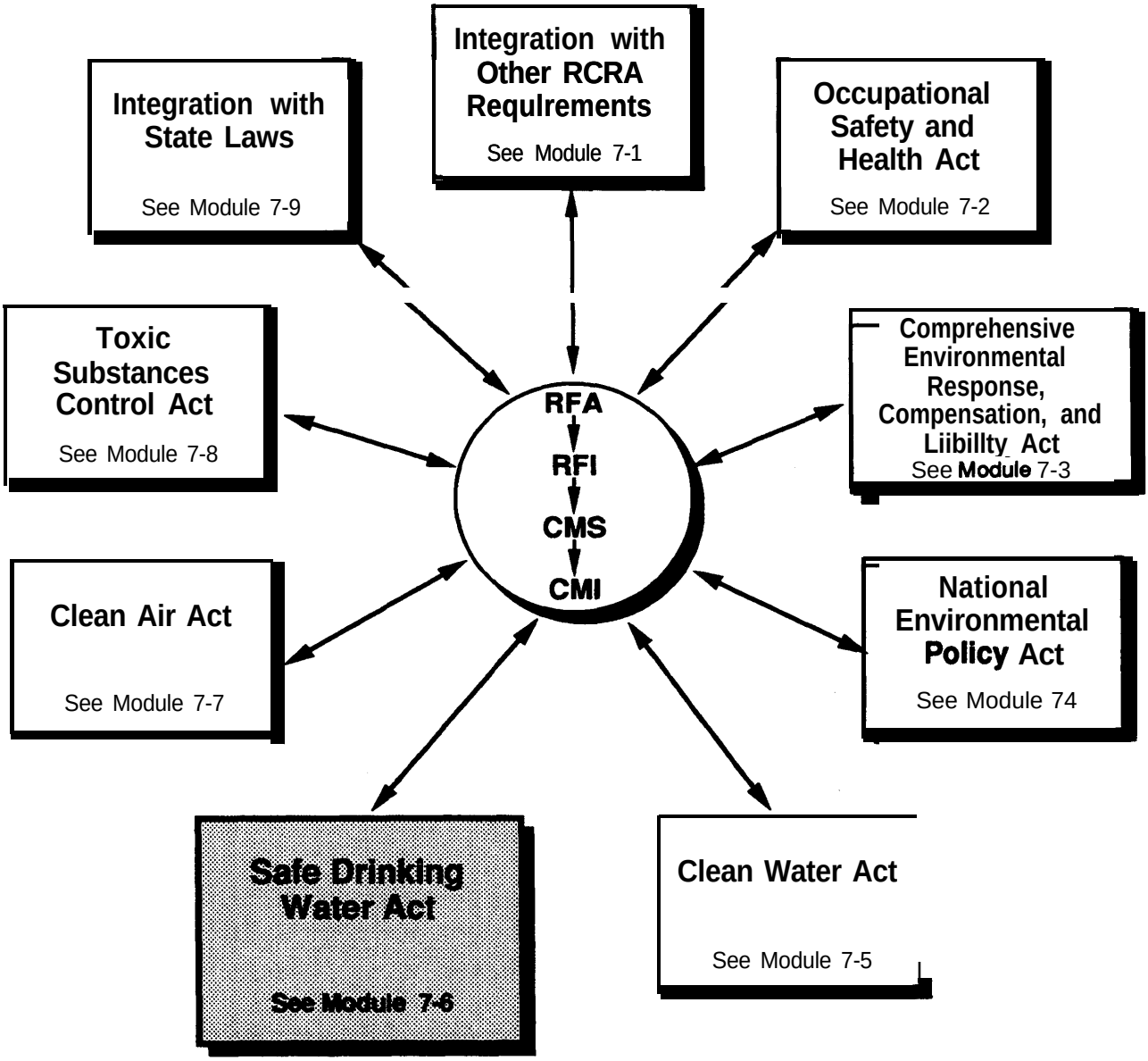
Storm Water Discharges

Discharges of storm water that run off a solid waste management unit (SWMU) are also subject to the Clean Water Act. Recently, EPA published a Final Rule (55 FR 47990, November 16, 1990) establishing the requirements for permitting discharges of storm water. Under these rules, industrial facilities (including waste management facilities) are required to apply for a storm water discharge permit (a type of NPDES permit) before October 1, 1992. In addition, such facilities are required to treat the storm water by BAT in the same manner as if it were any other point source discharge.

Section 404 Permits for Dredge and Fill Operations

The CWA §404 controls dredging activities and the disposal or placement of dredged or fill material in all waters of the U.S., including areas designated as wetlands. The CWA §404 permit program is administered by the Army Corps of Engineers. If a

RCRA corrective measure involves dredging contaminated sediments or an area of land classed as a wetland, or if the corrective measure involves disposal or placement of fill in such an area, the owner/operator will be required to apply for a CWA 0404 permit. Obtaining a CWA §404 permit usually requires preparation of an Environmental Impact Statement (EIS) for compliance with the National Environmental Policy Act (NEPA), and may take several months to be issued. If the corrective measure requires a CWA §404 permit, the time and resources to obtain the permit must be considered when developing the facility schedule of compliance.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Module 7-6: Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was enacted in 1974 and extensively amended in 1986. The SDWA (as amended) created a program of Federal regulation of drinking water systems, established national standards for the quality of drinking water supplies, established a State-run program to regulate underground injection wells, and provided for the protection of sole source aquifers.

Regulation of Drinking Water Supplies

The regulation of drinking water supplies and the creation of drinking water standards led to the promulgation of Maximum Contaminant Levels (MCLs) for various chemicals. The 1986 amendments to the SDWA revised the MCL program, and required EPA to establish National Primary Drinking Water Standards as well as Maximum Contaminant Level Goals (MCLGs). The National Primary Drinking Water Standards include establishment of MCLs for 83 compounds, including organics, inorganics, radionuclides, microbial populations, and turbidity. EPA has also established Secondary Drinking Water Standards for 13 additional parameters. The relationship of SDWA to RCRA Corrective Action is that the standards established under SDWA may be used to set action levels (the trigger for a CMS) and media cleanup standards (MCS). When conducting corrective action, the facility must consider these standards, and will undoubtedly use these limits in setting action levels and MCS.

Underground Injection Control (UIC)

Under the UIC program, EPA was required to identify those States where regulation of underground injection was required to protect groundwater supplies. Underground injection is defined as the subsurface placement of a fluid through a well or dug hole that has a depth greater than its width. Each identified State was required to develop a program that would:

- Prevent underground injection unless authorized by permit or rule;
- Authorize underground injection only in areas where a permit applicant can establish that such actions will not endanger a drinking water supply; and
- Create a program for required records, reports, and inspections.

The program must protect aquifers that are, or may be reasonably expected to be, a source of drinking water from contamination in excess of an MCL. There are several restrictions on the implementation of the UIC programs, most notably those to prevent the UIC program from impacting the exploration and development of oil, gas, and geothermal energy.

At the center of the UIC program is a well classification system based upon the type of material injected. These classes are:

- Class I — Industrial and municipal disposal wells and nuclear storage and disposal wells that inject below all underground sources of drinking water in the area, and all hazardous waste injection wells other than Class IV wells;

- Class II — Wells which inject fluid for oil or gas recovery, and for storage of liquid hydrocarbons;

- Class III — Wells which inject fluid for the extraction of minerals or energy;

- Class IV — Wells which inject hazardous waste or radioactive waste into or above underground sources of drinking water; and

- Class V — Wells associated with energy development and all other injection wells, including septic tanks.

Currently Class IV injection wells are prohibited. Class V wells are not regulated at the Federal level, but certain States require permits.

A UIC permit is similar to a RCRA permit, in that it contains specific design, construction, operation, closure, and post-closure requirements. Since underground injection wells are often used for the management of solid waste, these wells are SWMUs and are subject to RCRA Corrective Action. Further, a facility seeking to dispose of hazardous wastes must determine if underground injection is a permissible means of disposal.

State Programs Under SDWA

SDWA requires States to implement the national drinking water and underground injection control programs. EPA reviews each State's program for consistency and equal stringency and grants "primacy" to each State agency.

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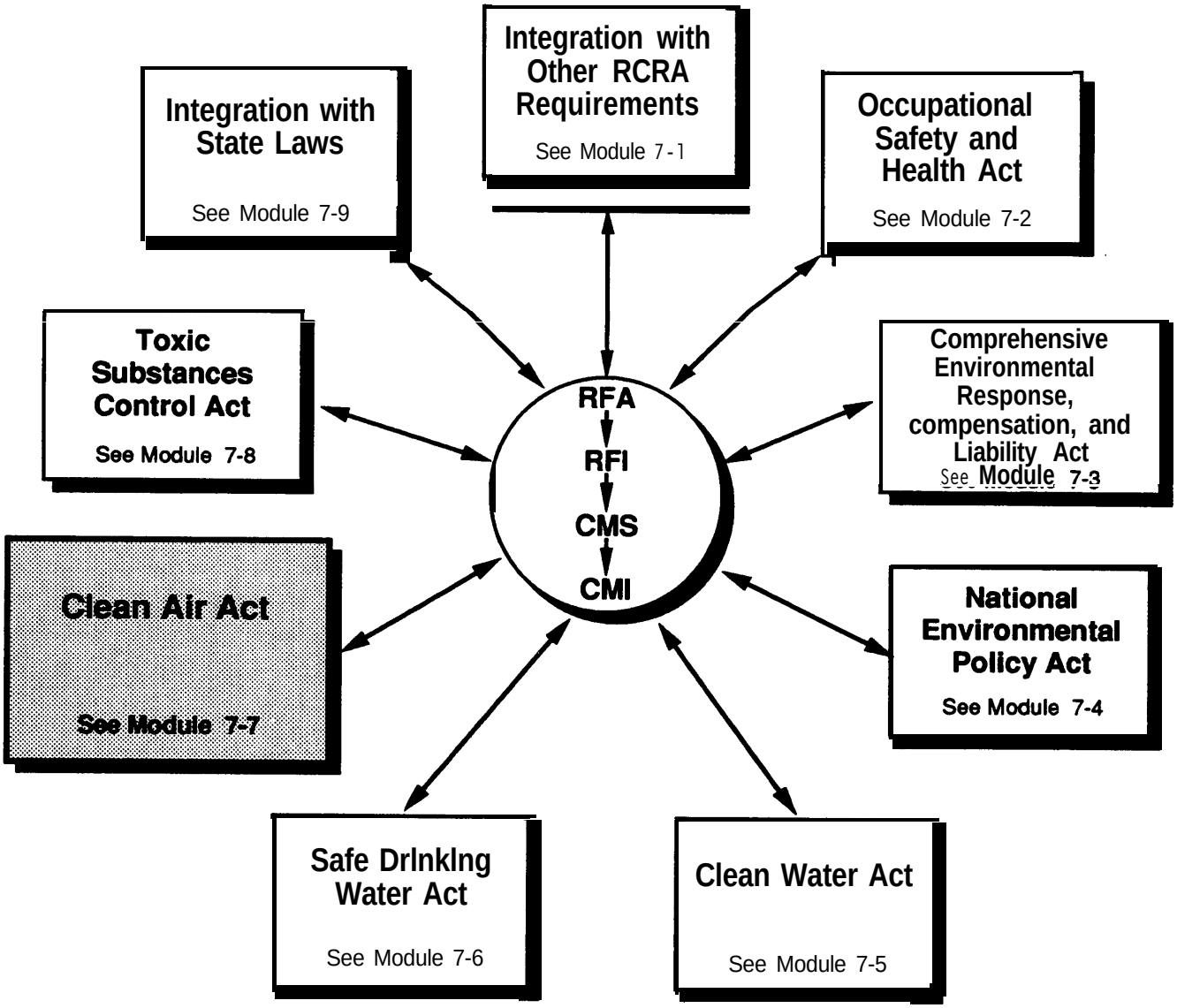

Chapter Seven - Integration with RCRA and Other Environmental Laws
Module 7-7 - The Clean Air Act

Module 7-7: Clean Air Act

The 1990 amendments to the Clean Air Act (CAA) were far reaching in nature, and impact heavily on the RCRA Corrective Action program. Until the regulations to implement the 1990 CAA are promulgated, the existing regulations remain in effect. Any facility with RCRA Corrective Action requirements must carefully assess the applicable regulations to determine if any revisions to the regulations for the Clean Air Act have been finalized. Rather than focus on the existing regulations (which will soon be revised) or the statutory requirements of the 1990 CAA, this discussion will focus on significant compliance issues.

It is incumbent on the owner/operator of any facility with RCRA Corrective Action requirements that may result in releases to air to coordinate with both the EPA RCRA program and the EPA Air program to determine areas of responsibility and the applicable requirements. This process will take place during the development of the Federal Facility Compliance Agreement (FFCA). All specific compliance issues should be resolved and the applicable requirements established in the FFCA.

Permit Requirements

Unlike the remedial response program established under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), neither the Resource Conservation and Recovery Act (RCRA) nor the proposed Subpart S rule exempts facilities implementing RCRA Corrective Action from requirements for permitting under other authorities, in particular the Clean Air Act (CAA). Under the 1990 amendments to the CAA, any facility which has *any* emission of a hazardous air pollutant falls under the CAA authority.[24] The 1990 CAA amendments also increased the list of hazardous air pollutants from 8 to 189. This list includes many compounds which are hazardous wastes or hazardous waste constituents under RCRA. Further, the 1990 CAA requires major sources to implement the Maximum Achievable Control Technologies (MACT) to reduce the quantity of hazardous air pollutants emitted at the facility. For area sources, EPA is required to study the problem of hazardous air pollutant emissions, and to assess which classes of area sources are of the greatest concern. EPA may then require area sources to implement Generally Available Control Technologies (GACT) to control emissions from this class of facilities.

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[24] Under the 1990 amendments to the Clean Air Act there are two classes of facilities. "Major sources" are stationary sources which emit over 10 tons/year of a single hazardous air pollutant, or over 25 tons/year of a combination hazardous air pollutants. "Area sources" are all stationary sources which are not "major sources." Thus any stationary source emitting any quantity of a hazardous air pollutant appears to fall under the requirements of the 1990 CAA.

Definition of Facility

Currently EPA is considering a number of issues regarding the implementation of the statutory requirements for hazardous air pollutants in the 1990 CAA. One issue of great concern is the definition of "facility." The regulatory provisions of the CAA and the requirements of a CAA permit are generally applied to specific sources (e.g., an individual stack, process unit). However, EPA is considering adopting a RCRA-like definition of facility, based upon the concept of contiguous property. If EPA elects to adopt this definition, the total quantity of hazardous air pollutants emitted at a facility (resulting from corrective action and activities traditionally considered under the CAA) would be considered when determining the source category applicable to that facility.

Implications

There are two implications for facilities with RCRA Corrective Action requirements or which are implementing a corrective measure under RCRA where emissions of hazardous air pollutants are possible. First, because there is no exemption from the CAA permitting requirements under RCRA it appears the facility may be required to obtain an air permit for emissions of hazardous air pollutants associated with a RCRA Corrective Action. Second, if the facility is classified as a major source, all RCRA Corrective Action activities (especially RCRA corrective measures) must meet the MACT requirements.

In addition, DOE facilities must comply with the specific requirements of 40 CFR §61 Subpart H - *Emissions Standards for Radionuclides Other Than Radon from DOE Facilities*. If a DOE facility's RCRA Corrective Action requirements involve radioactive or mixed waste, the impact of the corrective action on compliance with the CAA must be carefully assessed to prevent non-compliance.

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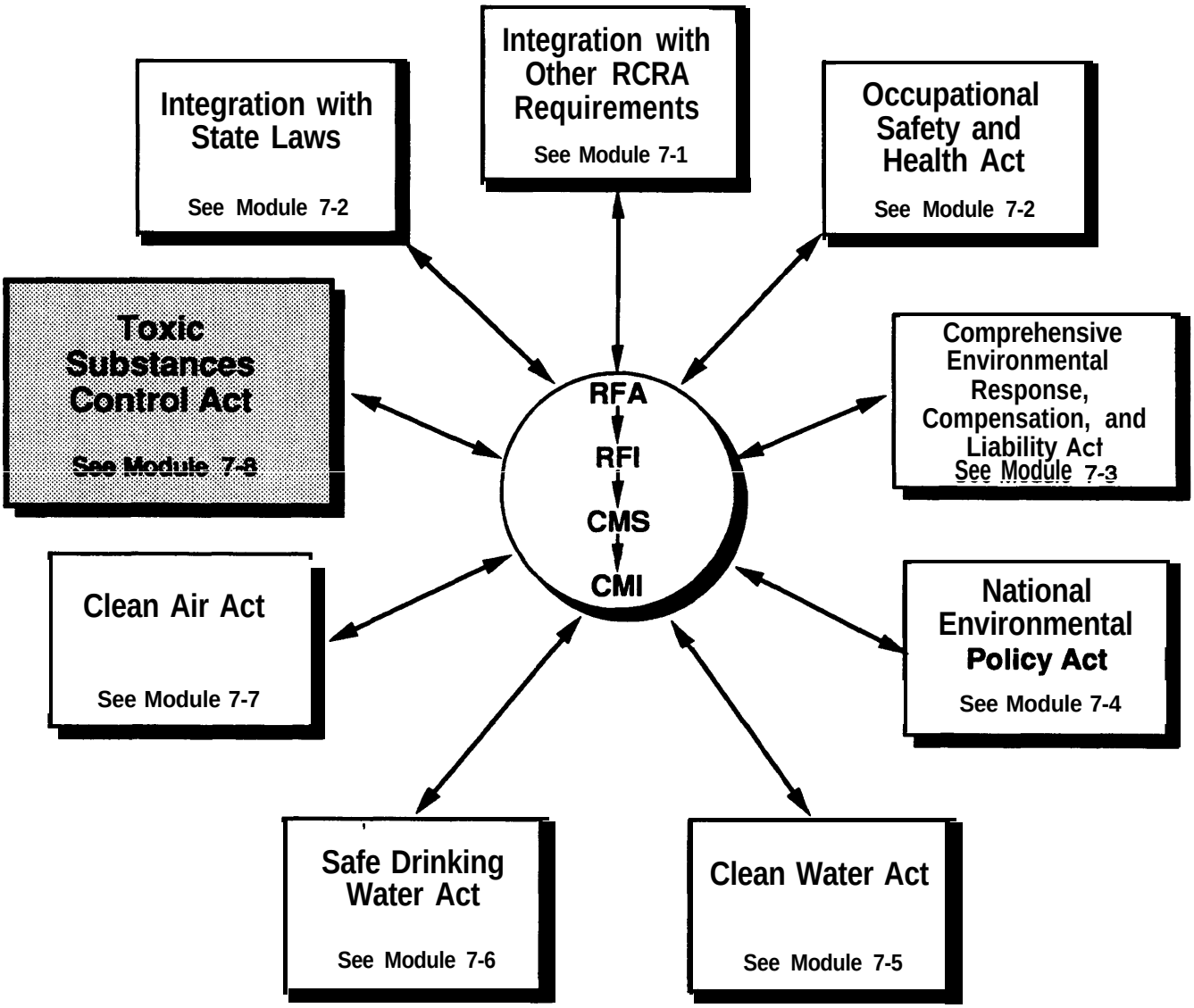
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Clean Air Act
See Module 7-7
National Environmental Policy Act
See Module 7-4
Safe Drinking Water Act
See Module 7-6
Clean Water Act
See Module 7-5

Module 7-8: Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) of 1976 gave EPA the authority to require testing of chemical products currently in use and proposed for use, and provides EPA the authority to regulate chemicals where necessary. There are two principal program areas in TSCA: the premanufacture testing and notice process, in which chemicals are tested for potential impacts prior to their distribution in commerce; and the regulation of certain chemicals shown to pose a threat to human health or the environment. The most widely known chemical falling under the latter aspect of TSCA is polychlorinated biphenyls (PCBs).

PCB Corrective Actions

The current TSCA regulations outline the provisions for the cleanup and disposal of PCBs and PCB-contaminated soils, sludges, and other debris at 40 CFR 761. However, the specific requirements for cleanup of a contaminated site are highly dependent upon the date of disposal of the PCB material. [For purposes of the TSCA regulations, a spill is considered disposal.] The following paragraphs describe the cleanup requirements for releases of PCBs as dictated under 40 CFR 761.

TSCA does not regulate contamination resulting from releases of PCBs before April 18, 1978, the date that the TSCA PCB disposal regulations became effective. For example, a spill of hydraulic fluid containing PCBs greater than 50 ppm onto soil that occurred in 1977 could be left in place and be considered properly disposed *under TSCA*. However, if the soil was excavated it would have to be properly disposed of (i.e., in a PCB chemical waste landfill or incinerator) within one year from the date of "removal from service" (i.e., excavation)). It is important to note that, although TSCA does not regulate spills occurring prior to April 18, 1978, other statutes do regulate such spills and may require cleanup according to the regulations established under that authority, for example, the regulations established under CERCLA or the RCRA corrective action or closure regulations.

For releases occurring after April 18, 1978, TSCA regulates the cleanup and disposal of PCB-contaminated media. Currently the TSCA regulations require that any PCB or PCB-containing item containing 50 ppm or greater PCB materials contaminated with PCBs from an original source containing 50 ppm PCB or greater must be disposed of in a chemical waste landfill or incinerator as specified in 40 CFR §761.60(a). The TSCA regulations (40 CFR §761(e)) also provide for alternate destruction methods for liquids containing PCBs at greater than 500 ppm, so long as they achieve a level of performance equivalent to incineration and they have been approved by EPA in writing. For liquids containing less than 500 ppm PCBs, the regulations allow the use of alternate destruction methods as long as they achieve destruction efficiencies at least equivalent to high efficiency boilers and have also been approved by the Regional Administrator(RA) in writing. There are other disposal provisions for dredged materials and municipal treatment sludges which also

require application to the RA. Based on the application, the RA may find that the prescribed disposal method for dredged materials and municipal treatment sludges will provide adequate protection to human health and the environment and if so, shall approve the use of the disposal method in writing. There are currently no provisions for alternate disposal methods for other solid PCB wastes.

Another consideration in the cleanup and disposal of PCB contaminated media is the effect of the "anti-dilution" provision (40 CFR 761.1(b)). This provision became effective on May 31, 1979, and applies to all PCB spills occurring after that date. This provision states that "No provision specifying a PCB concentration may be avoided as a result of any dilution, unless otherwise specifically provided." This means that the PCB disposal requirements for materials containing 50 ppm PCBs and greater may not be avoided by either accidental or intentional dilution. This provision does not prohibit dilution, but clearly does require diluted material to be disposed as if it was not diluted. If the PCB contaminated materials result from intentional or unintentional unauthorized disposal or a spill, where the original spilled PCB material was known to be greater than 50 ppm PCB, then all of the contaminated materials with measurable PCBs are regulated for disposal as though they contained 50 ppm or greater PCBs. For example, if a particular site was contaminated with PCBs at concentrations ranging from 20-35 ppm PCBs, but the source of the contamination was a spill of hydraulic fluid containing greater than 1000 ppm PCBs, the contaminated media must be considered to have PCBs at greater than 50 ppm and must be disposed of in a chemical waste landfill or incinerator as specified in 40 CFR 761.60(a). The "soils, rags, and other debris" provisions in the disposal regulations at 40 CFR §761.60(a) allows the disposal of these materials at any concentration in a PCB chemical waste landfill.

PCB Spill Cleanup Policy

On April 2, 1987 (52 FR 10686), EPA published the nationwide TSCA spill cleanup policy encouraging rapid and effective cleanup and restoration of sites resulting from the release of materials containing PCBs at concentrations greater than 50 ppm. All spills occurring after this date are subject to the policy. The policy broadly defined the term "disposal" as including intentional as well as unintentional spills or releases and requires differing degrees of remediation depending on the:

- Spill location;
- Potential exposure to residual PCBs after cleanup;
- Concentration of the PCBs initially spilled; and
- Nature and size of the population potentially at risk of exposure.

The policy imposes the most stringent requirements on areas where there is the greatest potential of direct human exposure and less stringent requirements where there is little potential for any direct human exposure. The policy provides for exceptional situations that

may require additional cleanup or less cleanup at the direction of the EPA Regional offices.

Some spills are outside the scope of the policy, such as spills directly into surface water, drinking water, sewers, grazing lands, and vegetable gardens. "Old spills," those spills or releases occurring prior to the effective date of the PCB policy (May 4, 1987) are also excluded, and are handled on a case-by-case basis by the EPA Regional Offices.

Impact on RCRA Corrective Action

If a RCRA treatment, storage, or disposal facility (TSDF) conducting corrective action discovers a PCB release from a SWMU, EPA will require that the release be addressed under the "old spills" provisions of the TSCA PCB spill cleanup policy unless it is documented that the "spill" occurred after April 2, 1987. If the "spill" occurred after that date, EPA will require cleanups as directed in the spill cleanup policy. The cleanup levels and practices discussed in the PCB policy are likely to be required; however, when necessary, EPA will conduct site-by-site evaluations. In addition, because PCBs are hazardous waste constituents listed at 40 CFR §261 Appendix VIII and 40 CFR 264 Appendix IX, EPA retains the authority to, and most likely will, impose requirements of the proposed Subpart S rule in addition to, or in place of, the PCB spill policy. In addition, a DOE Office of Environmental Guidance Memorandum titled *Remedial Actions at DOE Environmental Restoration Sites Contaminated with Polychlorinated Biphenyls (PCBs)* should be consulted. This guidance summarizes the existing regulations of TSCA pertaining to the remediation of PCB contaminated sites.

Regulation of Asbestos

Asbestos is regulated under a variety of Federal environmental laws, including, but by no means limited to, the Toxic Substances Control Act (TSCA) (through the provisions of the Asbestos Hazard Emergency Response Act (AHERA)), the Clean Air Act (CAA), the Clean Water Act (CWA), the Occupational Safety and Health Act (OSHA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Resource Conservation and Recovery Act (RCRA). The important provisions of each Act as related to asbestos are summarized below.

Under AHERA, EPA was required to establish a program to regulate the inspection, management, planning, operations and maintenance, and abatement of asbestos in public schools. The regulatory framework for this program was set forth in an October 17, 1987 rulemaking often called "The AHERA-in-Schools Rule." In addition, EPA was required to conduct a study on the ramifications of asbestos in public and commercial buildings, and to submit a report to Congress on the findings of that study. EPA issued this report in 1988. In the report, EPA recommended that a regulatory program to address asbestos in public and commercial buildings not be developed at that time.

Employee exposure to asbestos fibers is regulated by OSHA. Under 29 CFR §1910.1001 and 29 CFR §1926.58, the permissible exposure limit for an 8-hour time-weighted average

exposure to asbestos in air is set at 0.2 fibers/cm^3 of air and the short-term exposure limit (STEL), averaged for a 30-minute sampling period, is 1 fiber/cm^3. The OSHA regulations also govern other aspects of asbestos exposure in the workplace, and should be consulted as part of developing a health and safety plan (HASP) for any corrective action activities where asbestos exposure may occur.

Asbestos is also regulated under the CAA through the National Emission Standards for Hazardous Air Pollutants (NESHAPs). These regulations apply to those parties involved in manufacturing, building demolition or renovation, and waste disposal operations where asbestos might be released to the air. Under this program, asbestos is not regulated through specified emissions concentrations, but rather those parties conducting activities involving asbestos (e.g., removal of asbestos from buildings, or excavation of buried asbestos-containing wastes) must:

- Inform EPA of the activities;
- Follow specified procedures when removing asbestos;
- Adopt work practices that will prevent the release of asbestos; and
- Dispose of asbestos in waste disposal units that meet certain requirements.

Discharge of wastewaters contaminated with asbestos is regulated under the CWA. This probably will not create a compliance issue during corrective action, as few DOE facilities are likely to be discharging asbestos-laden wastewaters.

Under RCRA, asbestos is not a listed or characteristic waste. However, because the proposed Subpart S rule uses the statutory definition of hazardous wastes, and because asbestos has been shown to cause a variety of illnesses (e.g., asbestosis and mesothelioma), facilities with releases of asbestos fibers are potentially subject to RCRA Corrective Action to address those releases. A similar logic applied to the regulation under CERCLA, where asbestos was determined to meet the regulatory definitions of "hazardous substance" and "pollutant or contaminant." The proposed Subpart S rule establishes action levels and media cleanup standards for asbestos which will be applied to investigations and cleanups at RCRA facilities undergoing corrective action. In addition, asbestos wastes are solid wastes under RCRA, and must be managed in accordance with applicable Subtitle D waste management requirements.

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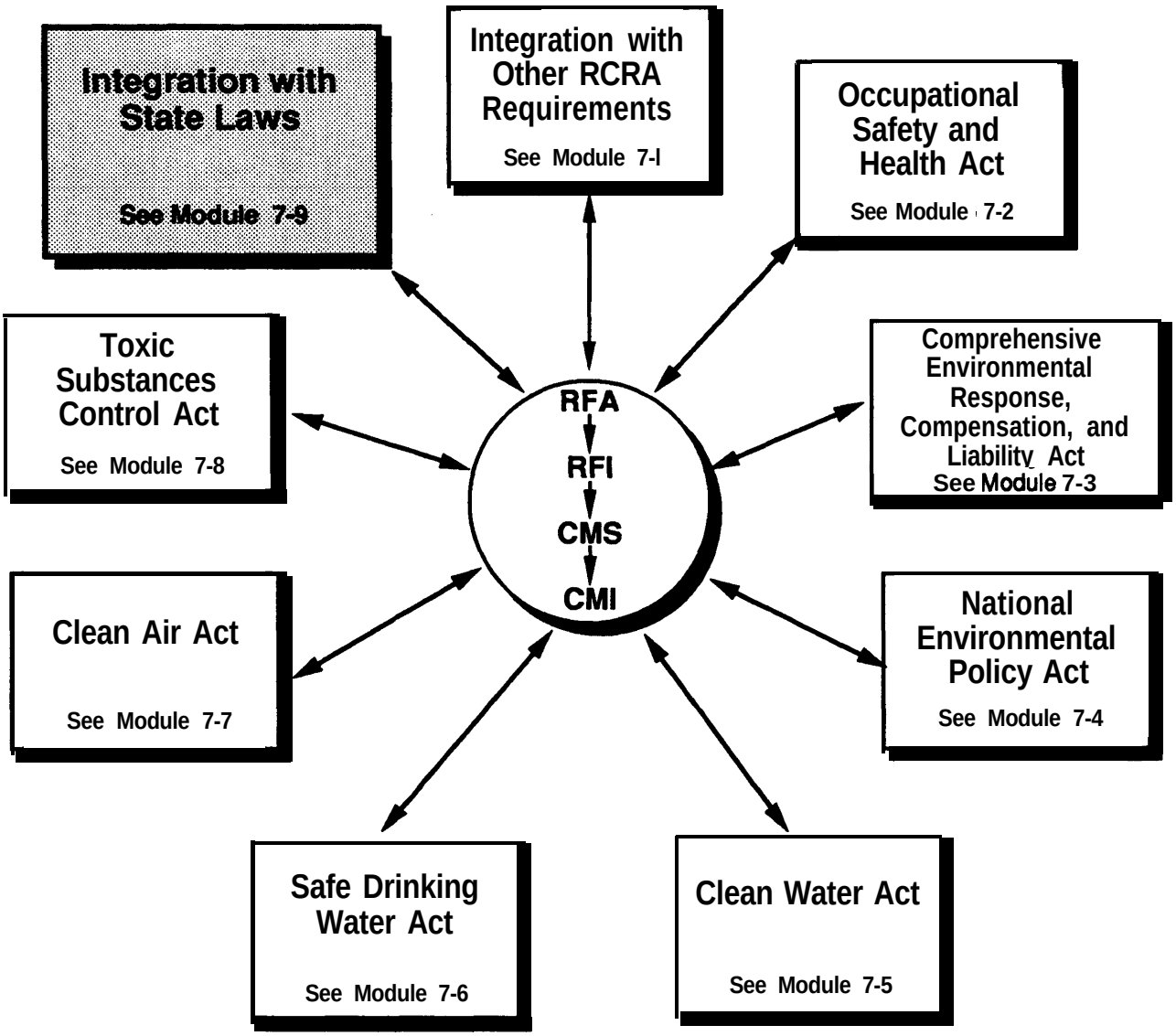

Chapter Seven: Integration with RCRA and Other Environmental Laws
Module 7-9 - Integration with State Laws

Module 7-9: Integration with State Laws

Authorization of State Programs

Section 3006 of RCRA provides a mechanism through which EPA can authorize States to administer and enforce the RCRA program within the State. These provisions are codified at 40 CFR §271. However, EPA retains significant enforcement authority under RCRA §§3008, 7003 and 3013.

Prior to the passage of HSWA in 1984, a State with final authorization administered the RCRA hazardous waste program through State laws and regulations entirely in lieu of EPA administering the Federal program in that State. The Federal requirements did not apply in the authorized State, and EPA could not issue RCRA permits for any facilities in that State if the State had a permit authority that applied. As new or more stringent Federal requirements were enacted, the State had to enact an equivalent requirement under the State law to retain this authorization. Any new Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

Following the passage of HSWA, this last provision was changed. Under RCRA §3006(g)(1), new requirements and prohibitions imposed by HSWA (or subsequent changes) take effect in authorized States at the same time as in States without authorization. EPA is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State program is granted authorization to do so. The net result is that while a State must adopt HSWA-related provisions as State law to retain final authorization, any new requirement would apply under Federal authority in the interim.

Under the Federal Facilities Compliance Act (FFCA), States can now levy fines and penalties of a punitive or coercive nature against Federal facilities that fail to comply with State laws governing the management of hazardous or solid wastes.[25] In addition, States will also have the ability to charge oversight fees to Federal facilities that operate under State-issued permits.

State Authorization for Subpart S

Once Subpart S is promulgated as a final rule, EPA will implement regulations in authorized States until:

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[25] Section 102(c) of the Federal Facility Compliance Act contains a provision that for a period of 3 years from enactment (i.e., until October 6, 1995), under specific circumstances, fines and penalties cannot be assessed against Federal facilities for violations of the storage requirements of RCRA §3004(j) — *Storage of hazardous waste prohibited from land disposal* which involve radioactive mixed waste.

- The State modifies its program to adopt a program that is at least as stringent as the Federal Subpart S regulations, and the State receives final authorization from EPA to begin implementing the corrective action program; or

- The State receives interim authorization for the Corrective Action Program.

Because the proposed Subpart S rule stems from a HSWA requirement, a State submitting a program modification may apply to receive either interim or final authorization under RCRA §§3006(g)(2) or 3006(b), respectively, on the basis of requirements that are equivalent to the final Subpart S rule. EPA has proposed an expedited process for granting this interim authorization to States already authorized for corrective action as a result of the initial codification of RCRA §3004(u) (see 50 FR 28747, July 15, 1985). This expedited process does not involve a detailed review of the State regulations, but is based on determining that the State's regulations are equivalent to the Subpart S rule. Any State applying for interim authorization would be required to implement a corrective action program according to the Subpart S requirements. Of particular importance is the requirement that permits issued by the State must reflect the Subpart S requirements, even if the State has not adopted regulations equivalent to the Subpart S requirements.

40 CFR §271.21(e)(2) requires that authorized States must modify their program to reflect changes in the Federal program, and that these modifications are subject to EPA approval. The deadline by which a State must modify its program to adopt Subpart S hinges on the date of promulgation of the final rule. In addition, under 40 CFR §271, a State seeking authorization for corrective action under Subpart S must demonstrate the ability to implement the base RCRA program as well as the additional HSWA elements. Those States that received authorization for HSWA corrective action pursuant to the initial codification of RCRA §3004(u) will no longer be authorized when the final Subpart S rule is promulgated, unless the State receives interim or final authorization before the effective date of the final rule.

Some States with an authorized base RCRA program, but which lack corrective action authorization, may have requirements under State law similar to those in the proposed Subpart S rule. These States are allowed to continue to administer and enforce these standards as a matter of State law.

Corrective Action and Radioactive Mixed Waste Authorization

On July 3, 1986, EPA published a notice that, to obtain and maintain authorization to administer and enforce a hazardous waste program under RCRA Subtitle C, States must also have authority to regulate the hazardous component of radioactive mixed wastes (51 FR 24504). Radioactive mixed wastes are those wastes that contain hazardous waste subject to RCRA and radioactive wastes subject to the Atomic Energy Act (AEA). Radioactive mixed waste (except for the component subject to AEA) is considered to be a solid waste for purposes of corrective action at SWMUs. Therefore, in order to have an authorized corrective action program, a State's program must define

solid waste in such a way as not to exclude the non-AEA components of radioactive mixed waste. This requirement thus enables States to apply their corrective action authorities to radioactive mixed waste containing SWMUs.

Implementing Subpart S Under State Programs

Facilities conducting corrective action are required to comply with all applicable State requirements under State and local statutes, regulations, and ordinances. As described above, States may have authorization to implement the corrective action requirements of HSWA. These States (as of January, 1993) include:

- Arizona
- Arkansas
- California
- Colorado
- Georgia
- Idaho
- Illinois
- Minnesota
- Nevada
- New York
- North Carolina
- North Dakota
- South Dakota
- Texas
- Utah
- Wisconsin

It is beyond the scope of this document to provide a detailed discussion of how a facility integrates State corrective action requirements into its environmental restoration programs. However, it is imperative that the facility consult with State and local officials to determine what actions, if any, must be undertaken to ensure compliance.

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The Clean Air Act 42 U.S.C. §7401 et seq.

The Clean Water Act 33 U.S.C. §1401 et seq.

The National Environmental Policy Act (NEPA) 42 U.S.C. §4321 et seq.

The Occupational Safety and Health Act (OSHA) 29 U.S.C. §651 et seq.

The Resource Conservation and Recovery Act (RCRA) (as amended by the Hazardous and Solid Waste Amendments (HSWA))
42 U.S.C. §6901 et seq.

The Toxic Substances Control Act (TSCA) 15 U.S.C. §2601 et seq.

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Appendix I

Definitions

Alternate Concentration Limit (ACL) -
Under 40 CFR §264 Subpart F - Releases from Solid Waste Management Units, an ACL is a concentration of hazardous waste constituents in groundwater other than (1) background or (2) those concentrations specified in 40 CFR §264.94 which EPA determines, based upon site-specific conditions, to be protective of human health and the environment.

Area of Concern (AOC) -
Any suspected release of a hazardous waste or hazardous waste constituent which is not associated with a solid waste management unit.

Best Demonstrated Available Technology (BDAT) -
The technology EPA considers the most effective in reducing the toxicity, mobility, or volume of a hazardous waste. Those hazardous wastes subject to the RCRA Land Disposal Restrictions (LDRs) must be treated by BDAT before placement in a land-based unit.

Characteristic Wastes -
Those hazardous wastes demonstrating any one, or more, of the following characteristics: Corrosivity, Ignitability, Reactivity, or Toxicity. The specific evaluation methods for characteristic wastes are found in 40 CFR §261 Subpart C - Characteristics of Hazardous Wastes.

Community Relations -
A program to inform and encourage public participation in the RCRA Corrective Action process and to respond to community concerns.

Conditional Remedy -
Under the proposed Subpart S rule, a type of RCRA Corrective Action where contamination is allowed to remain within the facility boundary, provided the facility can meet certain conditions. These conditions include: (1) remediation of offsite contamination as soon as practical; (2) implementing of source controls to control continuing releases; (3) controlling further migration of onsite contamination; and (4) providing financial assurances for the ultimate cleanup (not applicable to Federal agencies). (Proposed 40 CFR §264.525(f))

Corrective Action -
Those actions taken to control, remediate, or prevent releases from hazardous waste management units, solid waste management units, or other sources at treatment, storage, or disposal facilities.

Corrective Action Management Unit (CAMU) -
A contiguous area within a facility, as designated by EPA for the purpose of implementing corrective action, which is contaminated by hazardous wastes (including hazardous waste constituents) and which may contain discrete, engineered land-based subunits. Note that only land-based units can be included in a CAMU. Units such as incinerators and tanks, which are not land-based, are not eligible for inclusion in a CAMU. (Proposed 40 CFR §264.501)

Data Collection Quality Assurance Plan (DCQAP) -
A written document, associated with all RCRA Corrective Action sampling activities, which presents in specific terms the organization, objectives, functional activities, specific quality assurance (QA) and quality control (QC) activities and sampling and analytical practices designed to achieve the data quality objectives established for the project or operation.

Disposal -
The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid or hazardous waste into or on any land or water so that such solid waste or hazardous waste or constituent of such waste may enter the environment or be emitted to the air, or discharged into the water, including groundwater. (40 CFR §260.10)

Environment -
As defined by Section 101(8) of CERCLA, means 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 United States under the Magnuson Fishery Conservation and Management Act; and any other surface water, groundwater, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States.

Facility -
Under the proposed Subpart S rule, all contiguous property under the control of the owner/operator of a facility seeking a permit under RCRA Subtitle C to treat, store, or dispose of hazardous wastes. (Proposed 40 CFR §264.501)

Federal Facility Compliance Agreement -
A formal agreement between a Federal agency and EPA which establishes the procedural and technical requirements for resolving non-compliance with environmental laws and regulations at a Federal facility.

Hazardous Waste -
Any solid waste which: (1) meets the RCRA §1004(5) definition of hazardous waste; (2) is a listed waste; (3) demonstrates a characteristic of a hazardous waste; or (4) is mixed with a hazardous waste, provided it is not specifically excluded from the definition of a hazardous waste. Under the proposed Subpart S rule, EPA intends to include in the definition of hazardous waste all hazardous waste constituents listed in 40 CFR §261 Appendix VIII and the compounds listed in 40 CFR §264 Appendix IX. (Proposed 40 CFR §264.501)

Hazardous Waste Constituent -
Under the proposed Subpart S rule, hazardous waste constituents are those compounds listed in 40 CFR §261 Appendix VIII and the compounds listed in 40 CFR §264 Appendix IX. (Proposed 40 CFR §264.501)

Interim Status -
The period during which a hazardous waste treatment, storage, or disposal facility, which was in existence as of November 19, 1980, may continue to operate without an approved RCRA permit. To qualify for interim status a facility must have filed a Part A of the RCRA permit application. New facilities are, by definition, ineligible for interim status. (40 CFR §265.1)

Land Disposal -
Includes, but is not limited to, placement of wastes in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground cave or mine, or concrete vault or bunker intended for disposal purposes.

Listed Waste -
Those wastes listed as hazardous wastes in 40 CFR §261 Subpart D - Lists of Hazardous Wastes. Hazardous wastes are listed based upon the process generating the waste and/or upon the constituents in the waste.

Management or Hazardous Waste Management -
The systematic control of the collection, source separation, storage, transportation processing, treatment, recovery, and disposal of hazardous waste.

Miscellaneous Unit -
A hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, or underground injection well, with appropriate technical standards under 40 CFR Part 146, or a unit eligible for a research, development, and demonstration permit under 40 CFR §270.65. (40 CFR §260.10)

Operator -
The party responsible for the day-to-day operation of a facility, for example the contractor operating a Government Owned/Contractor Operated (GOCO) facility.

Owner -

The party who owns or holds the title of the facility. In the case of a Federal facility, the owner is the responsible Federal agency.

Phased Remedy -
In many instances implementation of a RCRA corrective measure requires sequential operations at the same unit or at different units. When EPA approves the sequential implementation of a corrective measure (without any conditions placed on the implementation), such actions are referred to as a "phased remedy." If there are conditions placed upon a phased approach to implementation of the corrective measure, the action is referred to as a "conditional remedy."

Point of Compliance -
Under the proposed Subpart S rule, the point of compliance is the point(s) or areas where a facility must demonstrate compliance with the media cleanup standards established for the corrective measure. Under Subpart F the point of compliance is the vertical surface located at the hydraulically downgradient limit of the waste management area, extending down from the surface to the bottom of the uppermost aquifer underlying the regulated unit. (40 CFR §264.525(e))

Public -
Those citizens directly affected by the site, other interested citizens or parties, organized groups, elected officials, and potentially responsible parties.

Radioactive Mixed Waste -
A mixture of a low-level radioactive waste and a listed or characteristic hazardous waste.

RCRA §3008(h) Corrective Action Order -
An administrative order to compel compliance with the applicable regulations which is issued by EPA to a facility operating under interim status.

RCRA Permit -
A permit issued by EPA to any facility which treats, stores, or disposes of hazardous wastes. The RCRA permit consists of two parts. The Part A application discusses general information about the facility. The Part B application is a detailed discussion of how the facility intends to comply with the applicable regulations. (40 CFR §270.1)

Release -
Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous waste constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous waste or hazardous waste constituent). (Proposed 40 CFR §264.501)

Solid Waste -
Any material (other than those specifically exempted or granted a variance) that is discarded, abandoned, recycled, or inherently waste-like. (40 CFR §260.10)

Solid Waste Management Unit -
Any discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous wastes. Such units include any area at a facility where solid wastes have been routinely and systematically released. (Proposed 40 CFR §264.501)

Source Control Action -
The construction, installation, start-up, or operation of those actions necessary to reduce or eliminate, to the extent practicable, the further release of hazardous wastes or hazardous waste constituents into the environment.

Temporary Unit -
A unit intended for the short-term (several days to a few months) management of hazardous wastes generated during a RCRA Corrective Action. Under the proposed Subpart S rule (at 40 CFR §264.551(b), EPA will be able to approve modifications to the 40 CFR Part 264 regulatory requirements for design, operation, and closure of a temporary unit, so long as the alternative standard is protective of human health and the environment.

Treatment -
Any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste or hazardous waste constituent so as to:
(1) Neutralize the waste;
(2) Recover energy or material resources;
(3) Render the waste non-hazardous or less hazardous;
(4) Make the waste safer to transport, store, or dispose of;
(5) Make the waste amenable for recovery or storage; or
(6) Reduce the volume of the waste. (40 CFR §260.10)

Treatment, Storage, or Disposal Facility -
Any facility (other than those facilities exempted) where hazardous wastes are treated, stored, or disposed of.

Treatment Technology -
Any unit operation or series of unit operations that alters the composition of a hazardous waste or hazardous waste constituent through chemical, biological, or physical means so as to reduce toxicity, mobility, or volume of the contaminated materials being treated.

Underground Storage Tank (UST)-
Any tank containing a regulated substance (a CERCLA hazardous substance, petroleum, or hazardous waste) with greater than 10% of its volume (including connective piping) below the surface of the ground. USTs containing hazardous wastes are regulated under RCRA Subtitle C and are subject to RCRA Corrective Action. USTs containing CERCLA hazardous substances or petroleum are regulated under RCRA Subtitle I. (40 CFR §280.12)

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The Toxic Substances Control Act (TSCA) 15 U.S.C. §2601 et seq.

Appendix III

EPA Corrective Action Contacts

EPA Headquarters

Permits Branch	(202) 260-2223
Office of Solid Waste	(202) 260-4740
Corrective Action Programs Branch	(202) 260-4740
Federal Agency Liaison Division	(202) 260-5054
Office of Federal Facilities Enforcement	(202) 260-9801

Region I

Waste Management Division	(617) 573-5700
Environmental Services Division	
Technical Support	(617) 860-4320

Region II

Hazardous Waste Programs Branch	(212) 264-3384
Hazardous Waste Compliance Branch	(212) 264-8356
Hazardous Waste Facilities Branch	(212) 264-0504
Environmental Services Division	
Technical Support	(908) 321-6706

Region III

RCRA Programs Branch	(215) 597-0980
RCRA Enforcement and UST Branch	(215) 597-2809

Region IV

RCRA and Federal Facilities Branch	(404) 347-3016
Environmental Services Division	
Environmental Compliance	(404) 546-3117

Region V

Waste Management Division	(312) 886-7579
Office of RCRA	(312) 886-7437

Region VI

RCRA Enforcement Branch	(214) 655-6745
RCRA Permits Branch	(214) 655-6770
RCRA Programs Branch	(214) 655-6655
Federal Activities Office	(214) 655-2260

Region VII

Waste Management Division	(913) 551-7050
RCRA Branch	(913) 551-7051

Region VIII

Hazardous Waste Management Division	(303) 293-1720
RCRA Management Branch	(303) 293-1513
RCRA Implementation Branch	(303) 293-1663
Federal Facilities Remedial Branch	(303) 294-1979

Region IX

Hazardous Waste Management	(415) 744-1730
State Programs Branch	(415) 744-2090
Permits and Solid Waste Branch	(415) 744-2138
Waste Compliance Branch	(415) 744-2120

Region X

Hazardous Waste Division	(206) 553-1261
Waste Management Branch	(206) 553-2782
Hazardous Waste Policy Branch	(206) 553-2871
Environmental Services Division	
Technical Support	(206) 553-0404
Hanford Project Office	(509) 376-6623

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Appendix V

The Corrective Action Management and Temporary Unit Final Rule

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federal register

Tuesday
February 16, 1993

Part II

Environmental Protection Agency

40 CFR Part 260, et al.

Corrective Action Management Units and Temporary Units; Corrective Action Provisions; Final Rule

58 FR 8658 - 8685, February 16, 1993

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 264, 265, 268, 270 and 271

[FRL-4555-7]

RIN 2050-AB80

Corrective Action Management Units and Temporary Units; Corrective Action Provisions Under Subtitle C

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency is promulgating today certain corrective action-related regulations under Subtitle C of the Resource Conservation and Recovery Act (RCRA). The specific provisions finalized in this rulemaking address two new units that will be used for remedial purposes under RCRA corrective action authorities: corrective action management units (CAMUs), and temporary units (TUs). These specific provisions were proposed as part of a more comprehensive corrective action rulemaking on July 27, 1990.

EFFECTIVE DATE: These final regulations are effective on April 19, 1993.

ADDRESSES: The official record for this rulemaking is located in the RCRA Docket, located in room 2427 at the U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. The telephone for the RCRA Docket is (202) 260-9327. The record is available for inspection, by appointment only, between the hours of 9 a.m. and 4 p.m., Monday through Friday, excluding legal holidays. As provided in 40 CFR part 2, a reasonable fee may be charged for copying services.

FOR FURTHER INFORMATION CONTACT: Questions relating to the technical content of this rule should be directed to Anne Price or David

Fagan, Corrective Action Programs Branch, Office of Solid Waste (5303W), U.S. Environmental Protection Agency, at (703) 308-8657 or (703) 308-8620. Other inquiries should be directed to the RCRA/Superfund Hotline, at (800) 424-9346 or at (202) 260-3000.

SUPPLEMENTARY INFORMATION:

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II. Background

A. Purpose and Context of Today's Final Rule

B. Summary of Today's Rule
III. Section-by-Section Analysis

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b. Conforming Changes to §264.3 and §265.1

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D. Effective Date

V. Relationship to Other Programs

VI. Regulatory Impact Analysis

I. Authority

These regulations are issued under the authority of sections 1006, 2002(a), 3004(u), 3004(v), 3005(c), 3007 and 3008(h) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984.

II. Background

The RCRA Hazardous and Solid Waste Amendments of 1984 established a broad new mandate for EPA and the States to implement corrective action at hazardous waste treatment, storage, and disposal facilities (TSDFs) regulated under subtitle C of RCRA. Under section 3004(u), permits issued to such facilities must address corrective action for all releases from solid waste management units at the facility. Under section 3008(h), EPA may issue administrative orders to compel corrective action at facilities authorized to operate under section 3005(e) of this subtitle (i.e., interim status facilities). Section 3004(v) established the authority to compel remediation of releases that have migrated beyond a facility's boundary.

On July 27, 1990, EPA issued a proposed rulemaking to establish, under subpart S of 40 CFR part 264, a comprehensive regulatory framework for implementing corrective actions at RCRA facilities under these new statutory authorities. 55 FR 30796-884 (July 27, 1990). The proposal established a detailed set of technical requirements and procedures for investigating and responding to environmental releases at RCRA facilities.

EPA received numerous public comments on the Subpart S proposal, many of which raised substantial issues which must be resolved prior to a final rulemaking. In addition, EPA is currently conducting a comprehensive new Regulatory Impact Analysis (RIA) to more thoroughly assess the costs and benefits of the Subpart S proposal, and to analyze specific regulatory alternatives for the final rule. EPA will make the results of the RIA available for public review and comment prior to promulgating the remainder of the proposed subpart S rules.

The proposed subpart S regulations contained several key remediation waste management provisions. These provisions were designed to reduce or eliminate certain waste management requirements of the current RCRA subtitle C regulations which, when applied to remediation wastes, impede the ability of the Agency to select and implement reliable, protective and cost-effective remedies at RCRA facilities. These impediments also occur at sites being remediated under CERCLA authorities, since RCRA requirements are often applicable or relevant and appropriate requirements

(ARARs), as defined in CERCLA and in the CERCLA National Contingency Plan.

Therefore, EPA believes that pending the promulgation of the comprehensive subpart S rules, it is useful and necessary to expedite the promulgation of these key provisions of subpart S, and thereby realize the benefits that they will provide in an accelerated time frame.

The Agency remains committed to promulgating final comprehensive rules governing RCRA corrective actions. Today's rule is intended to advance that process by putting into place certain key provisions that will produce immediate benefits for these important remedial programs. Specifically, today's rule promulgates provisions under subpart S for corrective action management units (CAMUs) and temporary units (TUs) to be used for the purpose of facilitating remediation waste management activities at RCRA facilities. The requirements for these units will also become RCRA ARARs for hazardous waste management activities at CERCLA sites.

A. Purpose and Context for Today's Final Rule

Today's rule finalizes provisions for corrective action management units (CAMUs) and temporary units under subpart S of 40 CFR part 264. Both of these units function solely to manage wastes that are generated at a RCRA facility for the purpose of implementing remedial actions required at that facility (i.e., remediation wastes, as defined in this rule). As explained elsewhere in this preamble, these units will not and cannot be used to manage "as-generated" hazardous wastes; as used in this preamble, as-generated wastes means those wastes generated from ongoing production processes or other industrial activities.

In creating the CAMU as a remediation waste management unit, EPA is providing remedial decisionmakers with an added measure of flexibility in order to expedite and improve remedial decisions. Although the CAMU provision does provide some additional flexibility, it is important to recognize that other existing requirements, policies, and guidelines for establishing site-specific cleanup goals and for selecting remedies remain in effect. EPA does not intend for this rule to replace existing state and federal requirements, guidelines, and standards that define the necessary level of protectiveness for remedies and the factors to be considered in selecting site-specific remedies.

For example, as is discussed more fully later, existing closure regulations and requirements for RCRA-regulated units, which require closure to occur in a manner that is protective of human health and the environment, remain in effect. Similarly, EPA

guidance (most notably, the subpart S proposal) and state regulations and guidance documents provide information on the appropriate conduct of cleanup actions. The Subpart S proposal defines the process for establishing cleanup goals, defines the process for and principles of remedy selection, and, requires that remedies meet the statutory standard of "protective of human health and the environment".

In addition, several years ago, EPA developed treatability guidelines for contaminated soil (the "Superfund 6A" guidance) for making site-specific decisions regarding treatability variances from the land disposal restriction standards. Today's CAMU rule does not specifically address the issue of what specific treatment standards or technologies should be applied in remediating RCRA facilities using CAMUs. However, EPA's Regulatory Impact Analysis for this final rule strongly suggests that promulgation of this CAMU provision, with appropriate criteria to guide the designation of CAMUs, will result in more treatment, greater use of innovative technologies and less incineration. Further, EPA expects that such treatment will often follow the treatment guidelines in the Superfund 6A guidance. The Agency's experience with this guidance has been that the treatment levels prescribed in the guidance are generally workable and practicable for remediation purposes. Thus, EPA expects that the 6A guidance will continue to be used in a variety of remedial situations involving management of contaminated soils, even when such soils are not explicitly subject to LDR requirements.

Finally, today's rule is only one component of what the Agency intends as a comprehensive regulatory framework under RCRA that will apply to the Agency's remedial programs. Today's rule for CAMUs and temporary units should be viewed in the context of the Agency's overall strategy to establish comprehensive remediation regulations under RCRA subtitle C, and is one of the first steps EPA is taking in developing a comprehensive risk-based regulatory framework. EPA is committed to proceed expeditiously to develop a complete regulatory framework for RCRA Corrective Action under subpart S and to develop new proposed regulations governing the status of contaminated media as hazardous waste. EPA is also committed to conducting these rulemakings in a manner which ensures ample opportunities for public dialogue to discuss appropriate regulatory requirements for the cleanup of contaminated media. EPA expects the dialogue to include discussions of risk-based cleanup standards for contaminated groundwater, soils, and other media, remedy selection decision criteria, and other specific cleanup requirements.

The Agency therefore wishes to emphasize that the scope and

intent of today's final rules for CAMUs and temporary units is limited to establishing certain regulatory provisions relating to the management of remediation wastes. As is clarified in §264.552(h), today's rule does not address the many important issues relating to "how clean is clean", or where compliance with cleanup standards must be achieved (i.e., points of compliance for remediation of ground water and other media). These are issues that will be addressed in the final Subpart S corrective action rule. Thus, for example, under today's rule the RA's designation of a CAMU at a facility, pursuant to the enumerated criteria, does not have any relevance to where the point of compliance for ground water remediation will be specified for that facility.

CAMU decisions will generally be made based on extensive discussions and consultations with the owner/operator. Once the preliminary decisions are made, the Agency will incorporate the CAMU designation into the permit or order, through a modification process that allows the owner/operator, and the public, the opportunity to comment on the specifics of the CAMU designation.

It is possible that in certain cases the owner/operator of a facility may disagree with the Agency regarding how the CAMU concept should be applied for purposes of implementing the CAMU. Such disagreements are usually resolved by informal discussions. In the rare event that such disagreements persist after the permit has been modified to incorporate the CAMU selected by the Agency, the owner/operator may file an administrative appeal to contest the CAMU decision. Under this appeal process, the provisions being appealed are not effective until a decision on the appeal is rendered by the Environmental Appeals Board. EPA believes that this process serves to protect the due process rights of the owner/operator.

In the proposed subpart S rule, EPA recognized that the existing regulatory structure of RCRA subtitle C, when applied to management of hazardous wastes for remedial purposes, can often seriously hamper the ability of decisionmakers to select and to implement effective, protective and cost effective remedies. CAMUs and temporary units, as finalized today, are expected to address these problems in several important ways.

The basis for establishing a separate regulatory framework for these new remediation waste management units is the premise that remediation of existing contamination problems is inherently different from the management of as-generated industrial hazardous waste, and that applying "as-generated" regulatory requirements to remediation wastes does not always result in implementation of the best remedies. In fact, EPA's preliminary analysis indicates

that better remedies, in terms of increased environmental benefits, are likely under a regulatory framework tailored to remediation wastes.

The original RCRA subtitle C program, which was established beginning in 1980, was designed to be a "cradle-to-grave" system of controls governing the generation and subsequent transportation, storage, treatment and disposal of hazardous wastes from ongoing industrial processes. Thus, RCRA was first and foremost a "prevention" oriented program, with the primary objective to prevent new releases (e.g., new Superfund sites) resulting from management of hazardous wastes. Following this objective, a stringent set of standards were developed to ensure protection of human health and the environment from such ongoing waste management. For the most part, the subtitle C regulations are specified as uniform, national standards that must be complied with at all RCRA-regulated facilities. These standards are generally considered very stringent; in order to ensure an adequate level of protection nationally, the standards must be adequate in preventing or minimizing environmental releases over a wide range of hazardous wastes types, environmental conditions, operational contingencies and other factors. Although there are certain limited provisions for waivers from the subtitle C regulations based on site-specific factors, the regulated community's experience has been that it is difficult and time-consuming to modify RCRA standards through site-specific waivers.

The 1984 HSWA amendments to RCRA strengthened the RCRA prevention program by adding several important statutory provisions governing the treatment and disposal of hazardous wastes. In particular, the RCRA land disposal restrictions (LDRs) and the minimum technology requirements (MTRs) have become central features of the RCRA prevention program. One of the important objectives of Congress in mandating the 1984 amendments (including LDRs and MTRs) was to provide increased incentives for generators of hazardous wastes to minimize the amounts of wastes being generated. See RCRA section 1003(b). EPA's experience in implementing the LDR program has shown that the costs associated with meeting the stringent, technology-based LDR standards actually have resulted in substantial reductions in the volumes of hazardous wastes generated from many industrial sectors.

In addition to these prevention-oriented provisions, the HSWA corrective action provisions created a very different, new mandate for the RCRA program: Cleaning up releases from solid waste management units (SWMUs) at over 4,000 RCRA TSDFs. RCRA is now both a prevention program and a cleanup program. These two basic elements of the RCRA program have markedly different objectives and incentives, and are impacted in very different

ways by regulatory controls on waste management. As discussed below, therein lies the basic problem that today's final rule is intended to address.

EPA has found that subtitle C requirements, when applied to remediation wastes, can act as a disincentive to more protective remedies, and can limit the flexibility of a regulatory decisionmaker in choosing the most practicable remedy at a specific site. In contrast, RCRA subtitle C regulations, when applied to as-generated wastes, ensure that the wastes are handled according to stringent national standards; due to the cost of subtitle C management, they also create a significant incentive for process changes to minimize hazardous waste generation. Yet these same requirements, when applied to existing contamination problems, provide a strong incentive for leaving wastes in place, or for selecting remedies that minimize regulation under subtitle C.

EPA recognizes, of course, that both Superfund and RCRA provide it the authority to compel specific remedies, as long as the remedies are consistent with the goals of the statutes. Under the current programs, the Agency can require facility owner/operators or responsible parties to excavate wastes and manage them fully in compliance with Subtitle C. Similarly, in a fund-financed remedy under Superfund, EPA can use CERCLA funds to effect a similar remedy. Thus, through its regulatory authority, EPA can, at least in theory, override any regulatory disincentive against a given remedy. In its conduct of the Superfund and RCRA programs, however, EPA has come to recognize the fact that RCRA subtitle C requirements may make more sense when applied to some remedies than to others, and can influence the remedy selection process in undesirable ways. For example, compliance with LDR requirements may completely eliminate from consideration remedies that would otherwise meet Superfund or RCRA remedial standards, and that might be the most sensible remedy from a technical point of view. In such cases, the regulatory decisionmaker might be faced with the dilemma of choosing between two or more extreme options, such as a remedy involving containment in place versus removal of the wastes and management according to full RCRA subtitle C standards, without having the opportunity to consider a middle option that might be fully protective, in compliance with Superfund or RCRA cleanup goals, and acceptable to the local community. In such cases, practical considerations and the need for prompt action may often force the decisionmaker to select the less protective of the available extremes.

More broadly, under Superfund and RCRA corrective action, the regulatory decisionmaker must address a situation that is already unacceptable-that is, a situation which needs remediation.

The decisionmaker's goal in each case is to select a remedy that is fully protective, yet that reflects the technical and practical realities of the site. In addressing this situation, the decisionmaker needs the flexibility to consider a full range of strategies so that one may be selected that promptly and effectively addresses the problem. EPA believes that constraining this range of strategies by requiring compliance with subtitle C standards for wastes "generated" during remediation can often lead to remedies that are not cost-effective and that in some cases may actually be less protective solutions than the remedies that otherwise would be chosen.

This is reflected in the results of the preliminary CAMU analysis ("Supplemental Information of Corrective Action Management Units (CAMUs)", October 16, 1992) and in the Regulatory Impact Analysis (summarized in section VI. of today's preamble). According to these analyses, the "expanded" CAMU concept, which has been adopted in today's rule, is estimated to result in more treatment of wastes using more effective treatment technologies than would occur under the other regulatory options considered by the Agency. In addition, today's rule is predicted to result in more on-site waste management (vs. off-site management); lesser reliance on incineration; greater reliance on innovative technologies; and a lower incidence of capping waste in place without treatment.

Another reason for instituting a regulatory approach for management of remediation wastes that differs from the base Subtitle C program is the type and amount of Agency oversight that is given to cleanup activities under RCRA and CERCLA, as opposed to ongoing generated waste streams. Remedial actions under these statutes are typically conducted with substantial Agency oversight; remedial decisions are made by the Agency based on a thorough study of the nature and extent of the contamination problems at the site. In contrast, most RCRA subtitle C regulations for as-generated waste streams are uniform, national standards, and as such must require a level of protection sufficient for a highly diverse universe of facilities and environmental settings, so as to be implemented with little Agency oversight.

One final difference between as-generated wastes and remediation wastes is that remediation often involves management of large volumes of contaminated media, such as soils or ground water. The physical characteristics of contaminated media can be quite different from those of as-generated wastes. Contaminated soils, for example, are highly variable in their composition and handling characteristics. Treatment of such soils can thus be particularly difficult. This is not to say that remediation wastes are always different; some remediation wastes, such as sludges, may be

essentially identical to as-generated wastes. As a general matter, however, remediation wastes pose unique waste management issues.

The above considerations-the level of Agency oversight over remedial actions, the counterproductive constraints and disincentives that subtitle C requirements can impose on the remedy selection process, and the physical and chemical differences that are often found between remediation wastes and as-generated wastes-suggest that it is sensible and necessary to develop regulations under RCRA for management of remediation wastes that are better tailored to the realities of remediation actions. As a result, under today's rule, regulatory requirements for remediation wastes will differ from the standards applied to as-generated wastes.

Today's final rule for CAMU and temporary units is consistent with that policy objective. As explained earlier, these rules will create a markedly different regulatory framework for applying subtitle C requirements, particularly the LDRs and MTRs, to remediation waste management.

B. Summary of Today's Rule

Today's rule promulgates regulations for CAMUs and temporary units. These regulations will provide the Regional Administrator with the authority to designate and approve such units for the purpose of managing remediation waste. The final CAMU provisions are an expansion of the proposed CAMU concept, and are intended to provide even greater flexibility for decisionmakers in implementing protective, reliable and cost-effective remedies. CAMU is a tool that can be used by an owner/operator when implementing corrective action at a facility. It is available to those owner/operators compelled to take corrective action under RCRA or those who initiate corrective action and seek Agency approval under RCRA. The temporary unit provisions in today's rule are changed little from the proposal, except that the time limit for temporary units has been increased from 180 days to one year.

Today's regulations will apply to corrective action implemented under RCRA permits (as provided under RCRA section 3004(u) and in §264.101) and under section 3008(h) actions. In the subpart S proposal, EPA fully intended that the CAMU and TU regulations would apply to interim status facilities under section 3008(h). See 55 FR 30,802 (July 27, 1990). However, the proposed regulatory language did not contain explicit requirements for the use of CAMUs and TUs under section 3008(h). Several commenters requested clarification as to how and to what extent the substantive subpart S requirements would actually be applied under section 3008(h).

Today's rule clarifies, in §264.552 and in other conforming changes, that these rules for CAMUs and TUs will be applicable to corrective actions under section 3008(h). The Agency has also provided the opportunity for public comment through both the permit modification and order processes.

Under the final CAMU provisions, remediation waste management will be subject to LDRs and MTRs in a much more limited way than has been the case under existing regulations. For example, remediation wastes, including hazardous remediation wastes, may be placed into a CAMU without triggering applicability of LDRs or any other unit-specific requirements applying to hazardous waste land disposal units. Thus, remediation wastes generated at a facility, but outside a CAMU can be consolidated into the CAMU, and remediation wastes may be moved between two or more CAMUs at that facility, without triggering LDRs. Likewise, the "replacement" scenario, where remediation wastes are excavated from a CAMU, treated in a separate unit (which could be located inside or outside the CAMU at the facility), and redeposited into the CAMU, is not a new "disposal" event which triggers LDRs or other hazardous waste land disposal unit requirements. As explained in the proposal, MTRs would not apply to CAMUs, since by definition a CAMU is not subject to MTRs under 3004(o) and 3015. These regulatory features of CAMUs are described in more detail later in today's preamble.

Today's final rules for CAMUs grow out of the proposed approaches for defining the CAMU and the comments received by the Agency on those approaches. In the July, 1990 notice, the Agency discussed in detail several important proposed limitations on the scope of the CAMU. 55 FR 30843-44. First, a CAMU could only be designated by the Agency or the authorized State, and such designations would be subject to the public review and comment process as part of remedy selection. Second, the CAMU could only contain contaminated areas. Third, the CAMU was a land area and non-land-based units, such as incinerators or tanks, could not be considered part of the CAMU. Fourth, remediation waste from outside the CAMU that would be placed within the CAMU would be subject to the land disposal restriction requirements.

In the preamble, EPA also discussed several alternatives to the proposed CAMU, including options under which the CAMU would not have the second, third, or fourth restrictions noted above. 55 FR 30844. The Agency cited several problems with these options, noting that (1) including uncontaminated areas in the CAMU could be viewed as contradicting its remedial purpose, (2) including non-land-based units could be viewed as inconsistent with the land-based concept of the CAMU, and (3) including non-

land-based units would complicate the application of relevant 264 standards to the non-land-based units.

Many of the comments on the proposed CAMU were critical of these proposed limitations and requested that EPA adopt an expanded type of CAMU as discussed in the preamble to the proposal. In response, EPA evaluated regulatory options for defining a CAMU and provided supplemental information for public comment summarizing the relative environmental benefits of the proposed CAMU and expanded CAMU options. 57 FR 48195 (October 22, 1992).

In light of EPA's 1992 supplemental information and the public comments received on the July, 1990 proposal and the October, 1992 supplemental information notice, EPA has decided to adopt a CAMU definition which is broader than the proposed CAMU, but is consistent with the options for expanding the CAMU discussed in the July, 1990 preamble and in the October, 1992 supplemental notice. As explained below, EPA believes that the CAMU definition adopted today better achieves the policy goal of facilitating timely, protective, and effective cleanups at RCRA facilities than does the proposed CAMU. Moreover, EPA has structured the final CAMU definition to avoid the problems relating to expanding the CAMU concept, as noted in the July, 1990 preamble and in comments received by the Agency.

The principal difference between the proposed CAMU and the CAMU definition in today's final rule is that, under today's rule, the CAMU has been structured so that any waste managed within the CAMU which was generated as part of the corrective action at that facility (i.e., remediation waste) would not be subject to RCRA regulatory disposal requirements. Thus, waste generated from the corrective action at the facility may be placed within the CAMU without pre-treatment to the technology-based levels established under the RCRA land disposal restrictions (LDR) program.

EPA believes that Congress left ample authority for the Agency to modify, where appropriate, the regulatory requirements for as-generated hazardous waste under RCRA when applying those requirements to wastes generated during cleanup activities, so long as the requirements for these remediation wastes remain protective of human health and the environment. With respect to LDRs in particular, Congress defined the term "land disposal" to include the placement of hazardous waste in certain types of units historically used by the Agency to establish land disposal requirements for non-remediation wastes. See section 3004(k). Congress did not address in that provision how the LDRs would apply to wastes managed in newly-created types of land-based units or to units created solely for the management of remediation

wastes, rather than as-generated hazardous wastes. Congress did, however, recognize the special problems that might be created by applying the LDRs to remediation wastes in the same manner as to as-generated wastes and provided some relief for remediation wastes placed in the units enumerated in section 3004(k). See e.g., RCRA sections 3004(d)(3) and 3020.

For the reasons outlined above, the application of regulatory requirements designed for as-generated wastes to remediation wastes has proven problematic. In essence, standards designed to prevent releases from occurring and to force hazardous waste generators to internalize the costs posed by hazardous waste management can be highly counterproductive when applied to wastes generated during remediations, where the release has already occurred and the desired incentive is to increase, rather than decrease, waste production. Cf. H.Rep. 98-198, Part 1, 98th Cong., 1st Sess. at 37 (1983) (noting that one of the primary Congressional purposes in establishing the comprehensive LDR program was to "compel generators to internalize the costs of disposal and treatment of hazardous wastes.") In addition, a primary goal of Congress in establishing the land disposal restrictions program was to ensure that hazardous wastes are managed properly in the first instance, thereby reducing the need for costly corrective action. See RCRA section 1003(5); H.Rep. 98-198, Part 1, 98th Cong., 1st Sess. at 30, 32 (1983). Remediation wastes are, however, waste which, by definition, were not managed properly "in the first instance," and for which corrective action is now necessary.

That Congress recognized, but did not fully resolve, the dilemma of applying preventive standards to remediation wastes when enacting remediation-related amendments to RCRA in 1984 is not surprising, since EPA's principal remedial programs, under CERCLA and RCRA subtitle C, were at that time in their early stages of development or sharply limited in scope.

Since 1984, the Agency also has struggled to determine exactly how the regulatory units described in section 3004(k) should apply to remediation situations, where the areas in question do not easily fit within the unit definitions referenced in that provision, and where the unit concepts themselves were designed with as-generated and managed wastes in mind. For example, a RCRA permitted disposal facility managing hazardous wastes will typically have one or more well-defined land areas constructed and operated for the purpose of a single type of hazardous waste land disposal practice (e.g., landfilling of containers, or treatment of liquid hazardous wastes in a surface impoundment). A typical RCRA corrective action, in contrast, involves scattered

and diverse land and/or water areas with both "hot spots" of wastes and highly contaminated soils and generally dispersed contamination. In addition, such areas typically include a variety of historical land disposal practices, many of which are far different from the management practices authorized for ongoing hazardous waste management in land disposal units (e.g., pipeline leaks, product spills, dewatered surface impoundments). Since 1988, the Agency has used the definition of "landfill" to describe these remediation land areas simply because EPA had no unit definition that applied to these areas, and the "landfill" definition served as a catchall. See 55 FR 8760 (March 8, 1990). With today's rule, EPA intends to provide a more appropriate set of standards and definitions tailored to remediation areas.

Today's rule addresses the ambiguity in the application of RCRA preventive standards to remediation wastes generated at RCRA facilities, especially the LDRs. Because Congress did not provide direction under section 3004(k) on how the LDRs should apply to areas that are used solely for the management of remediation wastes, and consequently, do not fit within the unit definitions constructed by EPA for as-generated wastes, EPA interprets the definition of "land disposal" in section 3004(k) to exclude the placement of remediation waste in CAMUs under today's rule. EPA believes that this interpretation is reasonable since remedial areas are not a listed regulatory unit under section 3004(k), because Congress recognized that the application of LDRs to remediation wastes might require a different framework than that developed for the application to as-generated wastes, and, as discussed above, because the direct application of preventive standards to remediation wastes is often inappropriate and counterproductive.

Today's rule is thus designed to address RCRA's ambiguity with respect to remediation wastes in a manner which best meets the twin Congressional objectives of minimizing reliance on land disposal by encouraging proper treatment of hazardous remediation wastes and by facilitating prompt and effective corrective action at RCRA facilities. As a result of today's rule, remediation wastes placed in CAMUs will not be subject to LDRs or other hazardous waste disposal requirements.

III. Section-by-Section Analysis

A. Definitions

Today's final rule defines three key terms related to the implementation of CAMUs: Corrective Action Management Unit,

Facility, and Remediation Wastes. In addition, certain conforming changes have been made to several §260.10 and §270.2 definitions, to §264.3, to §264.101, to §265.1, and to §268.2.

1. Corrective Action Management Unit (CAMU) (§260.10 and §270.2)

The proposed rule defined CAMU as "a contiguous area within a facility as designated by the Regional Administrator{1} for the purpose of implementing corrective action requirements of this subpart, which is contaminated by hazardous wastes (including hazardous constituents), and which may contain discrete, engineered land-based sub-units." The definition of CAMU in today's final rule modifies the proposed definition in several ways:

|{1} The term Regional Administrator, as used in today's
|rule, refers to the EPA Regional Administrator or the
|State Hazardous Waste Program Director (or equivalent)
|in a State authorized for this rule.

(1) The final definition is promulgated under §260.10, rather than under §264.501, as proposed;

(2) The definition specifies that CAMUs may be used for corrective actions under section 3008(h) orders, as well as at permitted facilities under section 3004(u);

(3) The new definition does not specify CAMUs as being contiguous areas of contamination; and

(4) The definition specifies that CAMUs are to be used for the purposes of managing remediation wastes only.

These changes to the proposed definition are intended to clarify and provide a more complete description of what a CAMU is and how it may affect management of wastes in the context of implementing corrective actions. As such, the definition includes certain provisions that were not included in the actual definition as proposed, but were presented in the proposed regulations for CAMUs under §264.551(c). The definition also reflects the substantive changes that have been made in "expanding" the CAMU concept under today's final rule. Each of these modifications from the original proposed CAMU definition is discussed below.

The definition of CAMU has been finalized in §260.10 and in §270.2, rather than under §264.501. As proposed, §264.501 specified definitions that would apply only to subpart S of 40 CFR part 264. However, EPA is promulgating in today's rule only the CAMU and temporary unit provisions of subpart S. Rather than create a section under subpart S that would only contain the definition of CAMU, EPA believes that it will be clearer and more straightforward to codify this definition under the general definitions sections of parts 260 and 270. These definitions

apply to the part 264 CAMU provisions, as well as other parts of 40 CFR. However, the new locations of the CAMU definition will not affect either the applicability or the substance of the definition.

In the proposal, the regulations for CAMUs did not explicitly state that CAMUs could be implemented under section 3008(h) orders, as well as at permitted facilities under section 3004(u) authority. However, as stated in the July 27, 1990 preamble, EPA intended that the subpart S regulations would be implemented at interim status facilities through section 3008(h) orders, as well as at permitted facilities. 55 FR 30802. In addition, the general applicability of subpart S to section 3008(h) orders was raised as a question by several commenters to the proposal. Thus, in order to make clear that the final CAMU provisions will apply under section 3008(h) and section 3004(u), the CAMU definition contains an explicit reference to 3008(h) orders.

As mentioned earlier, the definition in today's final rule does not specify that a CAMU is a "contiguous area of contamination". This change reflects the basic change in the nature of the CAMU as related to the applicability of LDRs. Under the proposal, the CAMU was in essence linked to where existing contamination was located at the facility. As provided in the final rule, a CAMU instead is linked primarily to where remediation wastes are to be managed. In other words, decisions for designation of CAMUs will now be more related to the function and purpose they will serve in facilitating management of remediation wastes during cleanup, rather than to the areal extent and "contiguousness" of surficial contamination at the facility prior to cleanup. Although these changes to the CAMU definition have provided the discretion for the Regional Administrator to include uncontaminated land areas in a CAMU, the decision factors specified in §264.552(c) (see §264.552(c)(3), in particular) make clear that inclusion of uncontaminated areas in a CAMU is only allowed when necessary to achieve the overall remedial goals for the facility, and when such inclusion will enhance the protectiveness of the remedial actions.

In addition to other advantages, this new definition will eliminate many of the drawbacks of the proposed definition that were identified by numerous commenters. For example, many commenters requested clarification as to what was to be considered "contaminated" or "uncontaminated" in the context of defining the areal extent of a CAMU. Such issues could potentially have been contentious and technically difficult to resolve. Likewise, some commenters suggested that the remedial advantages provided by CAMUs would actually create an incentive to contaminate additional areas

of facilities. These issues have been effectively eliminated by the final CAMU definition.

The proposed definition also stated that CAMUs could contain "discrete, engineered land-based sub-units". This was intended to make clear that contaminated areas could include solid waste management units (e.g., pre-RCRA impoundments or landfills); it also provided that remediation within a CAMU could involve construction of land-based "sub-units", where wastes could be managed during remediation, or left in place with long-term monitoring and maintenance. Although such sub-units might still be located within a CAMU, today's definition does not explicitly refer to them because, as explained above, CAMUs are now designated with regard to where remedial wastes will be managed, rather than what areas of the facility are "contaminated".

As mentioned in section II of this preamble, EPA outlined in the subpart S proposal an alternative regulatory option for CAMUs that would have broadened the concept in ways similar to today's final CAMU provisions. In addition, EPA received many comments that identified the shortcomings of the proposed CAMU, as well as the advantages that an expanded CAMU would provide in implementing protective, timely and cost-effective remedies. The results of the RIA developed for this rulemaking, in the Agency's estimation, corroborate many of these comments. As a policy matter, therefore, EPA believes that its decision to promulgate today's CAMU definition is amply justified. As explained in detail in section II of this preamble, the Agency also believes that there is ample legal support for today's expanded CAMU definition.

The final CAMU definition also specifies that CAMUs must be used only for the management of remediation wastes. One commenter on the proposal requested that the Agency clarify that only wastes that are generated as part of a facility's corrective action cleanup would be eligible for management within a CAMU. The commenter noted that this restriction was explicitly provided in the temporary unit provisions of the proposal. The Agency's intention, under both the proposed CAMU provisions and under today's final rule is that only wastes that are generated pursuant to implementing corrective actions for a facility can be managed within a CAMU. Today's CAMU definition thus clarifies this important limitation, by specifying that a CAMU "shall only be used for the management of remediation wastes." (See the following discussion of the definition of remediation waste).

2. Facility for the Purpose of Corrective Action (§260.10)

As clarification, today's rule codifies, in §260.10, the definition of facility for the purposes of corrective action. Under this definition, a facility is "all contiguous property under the control of the owner or operator seeking a Subtitle C permit." This definition is the same as was proposed in the July, 1990 proposal, presented in the First Codification Rule (50 FR 28702, Codification Rule, July 15, 1985), and upheld in a decision of the U.S. District Court of Appeals (United Technologies v. U.S. EPA, 821 F.2d 714 (DC Cir. 1987).

As explained in the proposed rule and in the Codification Rule, this definition applies only in the context of implementing HSWA-mandated corrective actions. As such, this definition is distinct from the other facility definition in §260.10 that is narrower in scope, and applies to the non-corrective-action-related provisions of RCRA subtitle C. EPA believes that codifying this definition is important to the clear understanding of today's CAMU and temporary unit rules. Both types of units are restricted to managing wastes that are generated in implementing corrective action at a "facility". Finalizing this facility definition, therefore, will ensure that this key concept is clear within the definitions of CAMU and remediation wastes (see following discussion).

Although the July, 1990 definition of facility did not explicitly state that this definition applied to facilities undergoing corrective action pursuant to section 3008(h) authority, as with the definition of CAMU, this definition was always intended to apply both to facilities with a RCRA permit and to those operating under interim status. This has been clarified by adding a phrase stating that this definition also applies to facilities implementing corrective action under section 3008(h).

In the July, 1990 proposal, EPA addressed several issues associated with this facility definition, including the concept of "contiguous" property, and EPA's interpretation of "owner or operator". These subsidiary issues will be addressed in the final subpart S rulemaking, and/or in subsequent guidance.

3. Remediation Wastes (§260.10)

Today's rule defines remediation wastes as "* * * all solid and hazardous wastes, and all media (including ground water, surface water, soils and sediments) and debris that contain listed hazardous wastes, or which themselves exhibit a hazardous waste characteristic, that are managed at a facility for the purpose of implementing corrective action requirements under §264.101 and RCRA section 3008(h). For a given facility, remediation

wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA section 3004(v) or section 3008(h) for releases beyond the facility boundary."

This new definition provides clarification as to the types of wastes that may be managed in CAMUs or temporary units. The proposed temporary unit provisions specified that such units would be used only for treatment or storage of wastes "* * * that originated within the boundary of the facility." However, a similar provision was not specified in the proposed CAMU regulations, although the Agency clearly intended that CAMUs would function only for the purpose of implementing corrective action at facilities. 55 FR 30843. One commenter, citing the language in the proposed temporary unit provisions, requested that EPA make clear that CAMUs may be used only to manage wastes that are part of implementing corrective actions under section 3004(u), 3004(v) or 3008(h) authorities. Thus, for the sake of clarity, EPA is promulgating in §260.10 a definition for remediation wastes; both the CAMU and temporary unit sections of today's rule specify that only remediation wastes can be managed in these units.

Today's definition of remediation waste excludes "new" or as-generated wastes (either hazardous or non-hazardous) that are generated from ongoing industrial operations at a facility. In addition, remediation wastes must have originated from the facility (including waste managed as a result of section 3004(v) or section 3008(h) corrective action). Wastes generated as part of the site investigations (e.g., drilling muds, etc.) are considered to be remediation wastes.

In limiting remediation wastes to those that have "originated" from the facility, it should be clear that this term refers to wastes that originate from remedial activities at the facility, rather than where such wastes might first have been produced. For example, some facilities, such as commercial waste management facilities, may have accepted wastes from off-site, but which have subsequently contributed to contamination problems at the facility, and thus need remediation. Such waste would be considered remediation wastes for that facility when they are managed in the course of conducting corrective action requirements under §264.101 or 3008(h).

Although the definition of remediation wastes includes non-hazardous solid wastes, it should be noted that management of such wastes would not require the designation of a CAMU or a temporary unit, since subtitle C requirements would not apply to management of those wastes.

Contaminated media in the context of this rule includes groundwater, surface water, soils and sediments that contain listed hazardous

wastes or that themselves exhibit a hazardous waste characteristic. Like other remediation wastes, these media can be managed within the CAMU even if they were originally located at the facility, but outside of the CAMU, or if they were associated with a release that had migrated beyond the facility boundary, and that was being remediated under section 3004(v) or section 3008(h) authorities. Debris, for the purpose of this rule, is as defined in §268.2. (See 57 FR 37270).

The definition of remediation wastes does not include wastes from outside the facility undergoing remediation, other than those associated with off-site releases being managed under section 3004(v) or section 3008(h). If wastes are transported to the facility from an outside source, they would not be considered remediation waste for that facility, regardless of whether those wastes were the result of some type of remedial action conducted at another facility. Therefore, those wastes could not be managed in a temporary unit or in a CAMU at that facility. Similarly, wastes that are excavated, transported to an off-site treatment facility, and returned to the facility are not remediation wastes under this rule.

EPA believes that restricting the definition of remediation wastes in today's rule is important to preserving the concept of CAMUs and temporary units as units to be used only for the purpose of remediating the facility at which these units are located. Wastes which leave a facility for off-site treatment are no longer subject to direct oversight, and it may be difficult to ensure that the wastes that are returned after treatment are actually the same wastes that left the facility originally. Fundamentally, the Agency is concerned that allowing wastes from off-site to be managed in CAMUs or temporary units could create an undesirable incentive for such units to "attract" wastes that are not legitimately linked to the objective of remediating that facility.

4. Conforming Changes

a. Conforming change to §264.101. The proposed subpart S regulations were to have replaced the current corrective action regulatory provisions codified in §264.101. However, since the Agency is not finalizing all of subpart S in today's final rule, §264.101 is being retained and the amendment to §264.101 promulgated today creates a link between the general corrective action requirements of §264.101 and the CAMU and temporary unit provisions of subpart S. This is necessary to make clear that these sections together now constitute the regulatory provisions for corrective action

under sections 3004(u) and (v), and section 3008(h).

b. Conforming changes to §264.3 and §265.1. As discussed earlier in this section of today's preamble, the definitions of CAMU and remediation waste specify, as a clarification of the subpart S proposal, that the final CAMU and temporary unit provisions apply to interim status facilities undergoing corrective action according to section 3008(h) authority, as well as to permitted facilities. In effect, these corrective action provisions promulgated under subpart S of part 264 will be the only part 264 requirements that actually apply to interim status facilities; heretofore, technical requirements for interim status facilities were specified only under part 265. Therefore, conforming changes are necessary for the regulatory provisions of §264.3, so as to address the relationship of the part 264 standards to interim status facilities, and to §265.1, so as to specify the applicability of part 265 regulations. In effect, these two conforming changes create a bridge between the interim status regulations and the regulations for permitted facilities, for the purpose of implementing today's CAMU and temporary unit regulations.

c. Conforming changes to Definitions in §260.10, §268.2 and §270.2. Today's rules also make several conforming changes to existing regulatory definitions that are specified in various sections of the subtitle C regulations. The specific definitions being modified are:

- The definition of "disposal facility" in §260.10 and §270.2;
- The definition of "land disposal" in §268.2;
- The definition of "landfill" in §260.10; and
- The definition of "miscellaneous units" in §260.10.

The changes to the definitions of "disposal facility" and "land disposal" are for the purpose of clarifying how LDRs apply to CAMUs. As discussed earlier in this preamble, LDRs will not apply to hazardous remediation wastes that are placed into a CAMU, since such placement is not considered "land disposal" for the purposes of section 3004(k). These existing definitions must therefore be modified to reflect this important concept. The conforming changes to the definitions of "landfill" and "miscellaneous units" are both intended to clarify that such units do not include CAMUs.

B. Corrective Action Management Units (CAMUs) (§264.552)

1. General Authority (§264.552(a))

The general authority for allowing the Regional Administrator

to designate a CAMU for remedial purposes is presented in §264.552(a). This provision is analogous to the CAMU provision specified at §264.551(c) in the proposed subpart S regulations. This final provision specifies, for clarification, that CAMUs may be designated for purposes of implementing corrective action under section 3008(h) authority, as well as at permitted facilities under section 3004(u) and §264.101. This explicit reference to section 3008(h) order authority conforms with similar references in other provisions of today's rule (see, e.g., the definitions of CAMU and remediation waste). The provisions of today's rule that delineate the relationship of the subpart S regulations to section 3008(h) orders are in response to commenters who requested a general clarification of the relationship of the subpart S proposed rules to section 3008(h) orders.

In the July, 1990 proposed rule, CAMUs were identified as areas of contiguous contamination. Today's rule in §264.552(a) has eliminated the provision that a CAMU must be a contiguously contaminated area of a facility. As explained earlier in today's preamble (see discussion of the CAMU definition in §260.10), the expanded CAMU concept is linked primarily to where remediation wastes will be managed at the facility, rather than where there may be contiguous, surficially contaminated land areas prior to cleanup. Specific criteria regarding how CAMUs must be designated, and how the existence of contaminated land areas may affect CAMU decisions, are specified under §264.552(c) of today's rule.

The language of §264.552(a) specifies that the Regional Administrator may designate a CAMU "in accordance with the requirements of this section" (i.e., 264.552). This language, which did not appear in the proposal, simply clarifies that the requirements for CAMUs have been consolidated into a separate section. In the proposed rule, CAMUs were addressed as part of a section that dealt generally with management of hazardous wastes.

Section 264.552(a) also specifies that one or more CAMUs may be designated at a facility. This statement is included for clarification; the Agency received a number of comments on the proposal which queried how CAMUs might address situations where several non-contiguous areas of a facility were contaminated. In addition, given the expanded CAMU concept promulgated in today's rule, EPA believes that this explicit statement in the CAMU regulations will be useful in clarifying that two or more CAMUs may be necessary and appropriate to implementing remedial solutions for a given facility.

As discussed earlier in this preamble, the CAMU provisions in today's final rule codify an expanded version of the CAMU concept that was presented in the proposed subpart S rule. In

particular, §264.552(a) (1) and (2) specify the essential regulatory basis for the expanded CAMU:

(1) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes; and

(2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to MTRs.

These provisions are derived from those in the proposed CAMU regulations. The primary difference reflected in today's rule is that placement "into" a CAMU does not trigger LDRs or MTRs, whereas the proposal stated only that those requirements would not apply when hazardous wastes were moved or consolidated within the CAMU. This important distinction primarily derives from the fact that under these final CAMU rules, placement of hazardous remediation wastes into a CAMU is not "land disposal," under RCRA section 3004(k). A detailed explanation of the Agency's rationale for adopting this expanded CAMU concept is presented in section II of this preamble.

The final CAMU regulations will greatly enhance the waste management flexibility provided by CAMUs, and thereby will enhance EPA's ability to select and implement effective, protective, reliable and cost-effective remedies for RCRA facilities. These general conclusions regarding the positive remedial results that the CAMU will provide are supported by the preliminary analyses developed by the Agency that were made available for public review and comment as part of this rulemaking process (57 FR 48195 (Oct. 22, 1992)), and that are summarized in section VIII of today's preamble.

The following is a discussion of some specific waste management scenarios (and limitations) that will be operative under today's CAMU provisions.

a. As with the proposed CAMU, movement and consolidation of remediation wastes within a designated CAMU will not be subject to LDRs or other hazardous wasteland disposal unit requirements. Likewise, the CAMU would not be subject to MTRs, since it is not a landfill, surface impoundment or waste pile and thus is not subject to MTRs under sections 3004(o) and 3015. (See e.g., §264.301(c)).

b. Placement of remediation wastes into a CAMU from an area or unit at the facility, but outside the CAMU, will not trigger LDRs or MTRs, for the reasons cited above.

c. Movement and subsequent placement of remediation wastes from one CAMU at a facility into another CAMU at the facility will also not trigger LDRs or MTRs.

d. Excavation of remediation wastes from a CAMU, and placement

of those wastes into a land-based unit that is not a CAMU (either at the facility or off-site) will be subject to applicable LDRs and MTRs.

e. Excavation of remediation wastes from a CAMU, treatment on-site in another unit (such as a tank, temporary unit or an incinerator), and redeposition of those wastes or residuals into the CAMU will not trigger LDRs or MTRs.

f. Non-land-based units, such as tanks, may be physically located within the boundaries of a CAMU. However, the tank will not actually be a part of the CAMU; it would maintain its separate regulatory identity, and all applicable subtitle C requirements will continue to apply to the tank.

g. Temporary units (as provided under §264.553 of today's rule) can also be located either inside or outside the physical boundaries of a CAMU. However, such location will not affect the requirements that apply to the temporary unit, for the same reasons as for non-temporary tanks or container storage areas. (See further discussion of the relationship between TUs and CAMUs in section III.C.)

In addition to the waste management activities outlined above, under today's CAMU rule, land-based waste management activities within a CAMU that may otherwise be subject to unit-specific standards under part 264 or 265, may be considered as part of the CAMU, rather than as a distinct and separate "unit". For example, wastes are often excavated and staged in piles before being transported to a treatment unit. Under a CAMU, the area where the wastes are piled would not be considered a separate "waste pile" unit for RCRA purposes; rather, the Regional Administrator will specify technical standards for that area of the CAMU (e.g., liners, wind dispersion controls, closure requirements) according to the decision criteria in §264.552(c). Similarly, areas of a CAMU could also be used for land-based treatment processes, such as bioremediation systems that involve structures or equipment to maintain optimal treatment conditions.

2. Inclusion of Regulated Units Into CAMUs (§264.552(b))

Given the remedial flexibility afforded by the CAMU provision in today's final rule, EPA anticipates that there may be situations where a CAMU would be useful in promoting effective remedial actions involving "regulated units", as well as SWMUs and other contaminated areas of a facility. Regulated units, as defined in §264.90(a)(2), are landfills, surface impoundments, waste piles and land treatment units that received hazardous wastes after July 26, 1982. These units are subject to full subtitle

C design, operating, closure and post-closure, and financial responsibility requirements under subparts F, G and H, and the unit specific requirements of part 264 or 265. Regulated units thus have a well defined regulatory identity, and can be either operating, closing, or closed units.

Although the 1990 CAMU regulations, as proposed, provided for the incorporation of regulated units into the corrective action remedy at the facility (see proposed §264.526(c)), the proposal did not explicitly address how and under what circumstance regulated units could be incorporated into CAMUs. One commenter on the proposal suggested that regulated units should be able to be included within CAMUs, if it were to make practical sense. Another commenter suggested that, while it might be advantageous to include one regulated unit within a CAMU, allowing more than one regulated unit to be included within a CAMU could create improper incentives for owner/operators to mismanage wastes so as to create contamination between regulated units, and thereby obtain a larger CAMU. The same commenter also argued that all permitted regulated units should remain separate units throughout the corrective action.

EPA believes that in certain circumstances, inclusion of one or more regulated units as part of a CAMU may be appropriate, and may enhance implementation of sensible remedial actions for a facility. One example could involve a situation where a closing regulated unit (e.g., a surface impoundment) contained a volume of hazardous waste sludges. Under the existing subtitle C closure regulations, the owner/operator could be required to remediate the surface impoundment (e.g., by removing and treating some or all of the sludges). However, by designating the surface impoundment as a CAMU or as part of a CAMU, EPA could allow treatment of the sludges and redeposition of the treatment residuals back into the impoundment without triggering LDRs. Thus, use of a CAMU could provide for more flexibility in selecting among effective and protective waste management options for closing regulated units.

Another example might be a facility undergoing remediation, that also includes a closing regulated landfill unit that was constructed in accordance with the RCRA minimum technology standards. By designating the regulated unit as a CAMU or as part of a CAMU, remediation wastes from elsewhere at the facility could be placed into the unit, which would then be closed. Thus, use of this existing MTR unit would be a highly protective, cost-effective, and expeditious remedial solution for the facility.

EPA believes that the Regional Administrator should have the discretion, in certain well defined circumstances, to designate

a regulated unit as a CAMU, or to include a regulated unit as part of a larger CAMU. Today's final rule provides this authority, under §264.552(b). In addition, this provision specifies two important limitations to this authority. First, only closed or closing units (i.e., those units required to begin the closure process under §264.113 or §265.113), would be able to be so designated. Operating regulated units, including regulated units continuing to operate under delay of closure provisions (in §264.113 or §265.113), would not be eligible for designation as CAMUs. Such units will continue to receive and manage non-remediation wastes, and EPA does not believe that designating, as a CAMU, a regulated unit that would subsequently continue operating, is consistent with the general concept of a CAMU being a unit that functions solely for the purpose of facilitating management of remediation wastes.

Second, the Regional Administrator will have the authority to designate a regulated unit as a CAMU, or as a part of a larger CAMU, only if doing so will enhance implementation of an effective, protective and reliable remedy for the facility (see §264.552(b)(1)(ii)). As illustrated in the examples described above, EPA believes that there may be a number of situations where this would be the case. This requirement is consistent with the overall objective of CAMUs in implementing corrective actions, as outlined in the decision criteria for CAMUs specified in today's rule (see §264.552(c)).

Today's rule also provides that for any regulated unit that is designated by the Regional Administrator as a CAMU or as part of a CAMU, the applicable part 264 or 265 ground-water monitoring, closure and post-closure, and financial responsibility requirements would continue to apply to the unit as before. (See §264.552(b)(2).) Inclusion of a regulated unit within a larger CAMU, however, would not cause the entire CAMU to become subject to the standards applicable to the regulated unit. In this case, the part 264 and 265 requirements would apply only to that portion of the CAMU that was originally the regulated unit.

EPA believes that maintaining the applicability of part 264 or 265 standards to regulated units that are included in CAMUs is a logical and conservative approach, which will provide substantial remedial benefits while ensuring that the stringent prevention-oriented requirements of parts 264 and 265 will continue to apply to such units.

EPA expects, on the other hand, that there could be situations in which it would be appropriate in remediating a facility to include a regulated unit in a CAMU, but where it would not make

sense to continue treating that specific portion of the CAMU separately according to the applicable part 264 or 265 regulated unit standards. In some situations, therefore, it might be sensible to allow the Regional Administrator the discretion to prescribe requirements for ground-water monitoring and closure/post closure for that portion of the CAMU in the context of the overall remediation of the CAMU, rather than continuing to strictly apply the part 264 or 265 requirements. However, there are a number of issues associated with this particular scenario that EPA believes merit further consideration, and thus EPA has not, in this final rule, provided for such discretion. However, the Agency intends to address this issue and request comment in an upcoming proposed rule addressing changes to certain RCRA closure regulations for regulated units, entitled "Standards Applicable to Owners and Operators of Closed and Closing Hazardous Waste Management Units; Post-Closure Permit Requirement; Definition of Unit for Closure; Closure Process."

In situations where regulated units are located within an area that has been designated as a CAMU, but the regulated unit will not be used for remedial purposes and was therefore not designated part of the CAMU, the regulated unit will remain a distinct and separate unit subject to all applicable subtitle C requirements.

For situations where a regulated unit is designated as or is incorporated into a CAMU, issues may arise as to the respective roles of EPA and the State with regard to oversight and enforcement of part 264 or 265 standards that remain applicable to that portion of the CAMU. As a general rule, the State would retain implementation responsibility for the State analogues to parts 264 and 265, that continue to apply with respect to that area of the CAMU that, prior to the CAMU designation, was identified by the State as the regulated unit. Further discussion of Federal and State roles in implementing CAMUs, and this role in particular, is presented in section IV.C. of this preamble.

3. Decision Criteria for CAMU Designation (§264.552(c))

Section 264.552(c) specifies decision criteria which will apply to CAMUs and which will be the basis for the Regional Administrator (RA) to make CAMU determinations. These criteria in today's rule are either clarifications of the decision factors for CAMUs in the proposed rule (in §264.551(c)(3)) or are outgrowths of the proposed subpart S remedy selection decision framework (in §264.525(a)-(c)).

In the proposed subpart S, EPA identified four main factors

that an RA would consider in designating a CAMU. (Sections 264.551(c)(3)(i)-(iv), as proposed.) In addition, under the proposal, CAMUs would have been subject to the overall remedy selection decision framework. As proposed, the remedy selection decision framework presented four standards that remedies must meet, five additional decision factors, and six factors for review in setting the remedy schedule. (Sections 264.525(a)-(c), as proposed.) A key element of a selected remedy is the decision as to how wastes are to be managed during remediation. The CAMU, as promulgated in today's rule, is an important concept in implementing remediation waste management. Therefore, because the remedy selection standards and factors proposed in subpart S are not being finalized today, the Agency believes it is necessary to explicitly incorporate or to capture the intent of several of the proposed rule remedy selection factors in today's rule so as to guide CAMU designations. A number of commenters voiced support for the remedy selection standards and factors. One commenter stated that EPA should retain the factors in the final rule because they are a reasonable and comprehensive mix of considerations. The specific factors addressed in today's rule are discussed under each criterion as applicable.

Of the four CAMU decision factors presented in the July, 1990 proposal, three are not explicitly delineated in this final rule (only the second factor remains). (See proposed §264.551(c)(3)(i), (iii), and (iv).) The first factor specified in the proposal was that the RA consider the nature, extent, and location of surficial contamination at the facility. As mentioned in today's preamble discussion of the CAMU definition, designation of a CAMU is not determined by the presence of contiguously contaminated areas at the facility. Rather, CAMUs will be designated according to where remediation waste management will occur at the facility. Therefore, although the existing contamination may in some cases be relevant to CAMU decisions (see discussion of the third CAMU decision criterion, §264.552(c)(3)), there is no longer a need for a specific provision to dictate CAMU boundaries according to the presence of surficial contamination.

The third CAMU consideration in the proposal was that the RA would consider the practicability of alternative remedial approaches. This factor was originally included, because, in general, remedial alternatives which did not employ CAMUs would involve two basic choices-in situ remediation or excavation and treatment to best demonstrate available technology (BDAT) levels. In some cases, these alternatives might have been considered impracticable by the RA. However, given today's expanded CAMU definition, and the increased variety of remedial options that

will be enabled under this final rule, EPA believes that CAMU decisions will be more focused on selecting the most appropriate remedial alternative(s) for the facility from a wide range of potentially viable approaches, rather than choosing between CAMU vs. non-CAMU options. The decision criteria in today's rule provide a more comprehensive decision framework for CAMUs than the proposal; thus the third general factor proposed in §264.551(c)(3)(iii) is unnecessary and has been deleted in today's rule.

The fourth factor presented in the July, 1990 proposal was to allow the RA to consider "other relevant factors" in designating a CAMU. Several commenters requested that the Agency clarify what will be considered by the Regional Administrator in the designation of a CAMU. They requested that the Agency provide more information on the specific criteria that will be used to determine a CAMU designation and that these criteria be promulgated in the final regulation. The Agency agrees that replacing this general catch-all consideration with the more focused criteria presented today will better guide the designation of CAMUs. The Agency is therefore promulgating, in §264.552(c) of today's rule, the more specific criteria for designating CAMUs.

The RA will consider each of the decision criteria under §264.552(c) in designating a CAMU. These decision criteria are intended to clarify the objectives that CAMUs should serve, and the limitations that apply to their scope and use. The RA will document the rationale for designating a CAMU and will explain the basis for such designation. Such rationale will be incorporated as part of the permit or order modification documentation, or in the remedy selection documentation under a new order for that facility and will be available to the public (§264.552(f)). Documentation of CAMU decisions is analogous to the documentation the Agency must currently make to support the selection of a remedy. Therefore, if a CAMU is selected as part of a final remedy, such an explanation would be incorporated into the Statement of Basis for that remedy (See OSWER Directive Number: 9902.6). The rationale for a CAMU decision will generally address only those criteria that are considered determinative for a given CAMU designation. For example, when a CAMU includes uncontaminated land on which remediation waste management will occur, the rationale supporting this inclusion will be specified. However, if remediation wastes will only be managed on contaminated land as defined by the CAMU, this criterion need not be addressed.

Section 264.552(c)(1): Facilitation of Reliable, Effective, Protective, and Cost-Effective Remedies.

The first decision criterion requires that the Regional Administrator determine that the CAMU will facilitate the implementation of a reliable, effective, protective, and cost-effective remedy. This factor was specified in the July, 1990 proposal as a CAMU determination factor. (§264.551(c)(3)(ii)(B), as proposed.) No comments were received specifically on this factor as proposed. Therefore, the Agency is finalizing this factor as a criterion. By including this criterion, the Agency is emphasizing that a CAMU is not intended as a mechanism that will undercut the protectiveness of remedies; rather, CAMUs will facilitate the implementation of more reliable, effective, protective, and cost-effective remedies. If an owner/operator cannot provide information to support that a CAMU will result in remediation activities with these qualities, it will not be designated by the Regional Administrator. The Agency does not intend that evaluation of this CAMU decision criterion will require a detailed cost/benefit or other quantitative analyses. Protectiveness, effectiveness, reliability and cost information provided by the owner/operator will be considered along with other relevant information in making CAMU decisions.

Section 264.552(c)(2): Risks During Remediation

The second decision criterion specifies that remediation waste management associated with CAMUs cannot create unacceptable risks to human health or the environment from exposure to hazardous wastes or hazardous constituents. The basis for this factor is the remedy selection decision factor addressing "short-term effectiveness" (§264.525(b)(3)) as presented in the July, 1990 proposal. Remedies will often involve management, including treatment, storage or disposal, of large volumes of wastes that could potentially lead to exposure from windblown particulates, air emissions during excavation and transportation, or other short-term risks due to the implementation of CAMUs in densely populated areas, or where waste characteristics are such that risks to workers are high and special protective measures are needed. Since CAMUs are likely to actually increase the amounts of wastes that are remediated, this provision is intended to ensure that remediation waste management activities are conducted so as to control short-term risks that could potentially occur from remedial activities. This factor will ensure that potential short-term risks from remediation activities will be carefully examined as part of any CAMU designation, and will be carefully controlled during remedy implementation.

In response to a commenter who requested clarification, consideration

of this criterion does not require a quantitative risk assessment. As with the other criteria presented today, qualitative assessments will generally be sufficient unless the RA deems that more quantitative data are necessary.

Several commenters noted that the short-term effectiveness remedy decision factor in the proposal, and the proposed remedy selection standard of protectiveness of human health and the environment, are redundant. The first decision criterion in today's rule is meant to embody the general RCRA mandate of protection of human health and the environment by including the goal of facilitating protectiveness in CAMU designations. However, even though there may be some overlap between some of the other criteria finalized today and the general qualities of effectiveness, protectiveness, reliability and cost-effectiveness stated in the first criterion, both the general criterion and the clarification of particular aspects of CAMUs under the specific criteria are important and necessary. The general criterion specifies the critical objective of the decision, while the more specific criteria clarify the Agency's intent regarding particular important aspects of the decisionmaking process for CAMUs.

Section 264.552(c)(3): Uncontaminated Areas

The third decision criterion requires the Regional Administrator to ensure that any land area of a facility that is not already contaminated (i.e., where there is no soil contamination or where wastes are not already located) will be included within a CAMU only if remediation waste management at such an area will, in the RA's opinion, be more protective than management of such wastes at contaminated areas of the facility. As explained in the preamble to the proposed subpart S, EPA believes that it is generally inadvisable to extend a CAMU to include areas of facilities that have not been environmentally degraded by historic waste management practices. The proposed rule, in fact, prohibited the inclusion of uncontaminated land areas in CAMUs. Any waste management that occurred on such land would have needed to meet all applicable subtitle C standards, including the LDRs. However, EPA received comments on this proposed CAMU provision that offered explanations as to why, in some circumstances, the effectiveness of a remedial action could be enhanced by including such areas in CAMUs. These comments fell into two main categories. First, commenters noted that the Agency was not being realistic in the proposal by requiring contiguous contamination, because this would mean that two SWMUs with similar

wastes, if separated by a small strip of uncontaminated land, could not be considered one CAMU, thereby arbitrarily limiting effective remediation options. Second, commenters noted that the Agency should allow the inclusion of uncontaminated land areas within a CAMU if such areas are necessary to implement the remedial response.

The first category of comments has been largely addressed by the expanded definition of the CAMU being finalized today. That is, movement of wastes between CAMUs will not trigger the land disposal restrictions; therefore, either or both of the SWMUs, that are separated by a small amount of uncontaminated land area, could be designated as individual CAMUs. Thus, the transfer of waste from one CAMU (or a SWMU) into a CAMU would not be limited by application of RCRA disposal requirements. However, the Agency recognizes that the CAMU is a land-based unit that must be designated by actual physical boundaries identified in the permit or order (see §264.552(e)(1)). EPA expects that it will not always be realistic to designate a CAMU as an area that is "completely" contaminated. Small areas of uncontaminated land may often exist within a broader area of contamination. In such cases, as one commenter suggested, the RA will generally include permit or order conditions preventing contamination of this uncontaminated land during remediation.

The second category of comments addressed situations where it may be desirable to include uncontaminated land within a CAMU for the purpose of using that land for remediation waste management. For example, a SWMU at a facility may be located within a flood plain. The remedial option which makes most sense could be to move this SWMU to higher ground at the facility. However, if the higher ground was not historically "contaminated" (e.g., because it had been used only for general commercial activities), it could not have been designated under the proposal as part of a CAMU. Today's rule would allow the facility owner/operator and the Regional Administrator to consider options that involve movement of wastes out of the flood plain, and management of such wastes in an uncontaminated area of the facility.

It might also be appropriate to include small portions of uncontaminated land within a CAMU when remediation activity cannot be conducted on or within the contaminated area itself. For example, remediation of a lagoon containing sludges may not be possible within the lagoon. If the Regional Administrator included the lagoon and a small portion of uncontaminated land immediately adjacent to the lagoon within the CAMU, remediation activities, such as staging of wastes or bioremediation, could take place. This scenario may be especially relevant to facilities

composed of relatively small land areas, where there may be few options as to where remedial activities can be conducted.

The Agency agrees with commenters that the situations discussed above are realistic and today's rule allows the RA to consider such options on a case-by-case basis. To include previously uncontaminated land areas within a CAMU, for the purpose of remediation waste management, the Regional Administrator will be required to determine that such management in these areas is more protective than managing the remediation wastes in the flood plain (as in the above example) or in other areas of the facility that are "contaminated". In addition, the Agency may consider, as a part of this determination, that movement of wastes for remediation at contaminated areas of the facility could involve greater risks of exposure to human health and the environment than protective remediation options utilizing uncontaminated land directly adjacent to the contaminated area.

By specifying under this decision factor that uncontaminated areas of the facility may be included in a CAMU only when doing so is "more protective" than managing such wastes at contaminated areas of the facility, EPA does not intend that formal risk assessments or other quantitative analyses must be performed to support such decisions. As a general rule, EPA believes that more qualitative assessments of the relative protectiveness of remedial options will be sufficient to support such decisions. The Regional Administrator would have the authority, however, to require that more quantitative analyses be provided by the owner/operator, if necessary.

By clearly defining, under this decision factor, the circumstances in which uncontaminated areas of a facility may be included in a CAMU for remediation waste management purposes, EPA believes that the Agency has alleviated the concern raised in the July, 1990 proposal preamble, that uncontaminated land should not be included in a CAMU because it would frustrate the remedial purpose of the CAMU. Under today's rule, inclusion of such areas within CAMUs will be allowed only if doing so is consistent with the overall remedial objective of the CAMU and will, in fact, be more protective than management of such wastes at contaminated areas of the facility.

Section 264.552(c)(4): Minimizing Future Releases

The fourth decision criterion specifies that areas within a CAMU where wastes will remain in place after closure of the CAMU are to be managed and contained so as to minimize future releases, to the extent practicable. This is a logical outgrowth

from the closure provisions that were proposed in subpart S for CAMUs. (See proposed §264.551(c)(5)).

In the preamble to the proposed rule, the Agency stated that the closure and post-closure provisions were intended to ensure that adequate long-term controls are imposed for any wastes remaining within the CAMU. 55 FR 30844. This decision criterion is intended to make clear that the Regional Administrator must consider at the time of CAMU designation whether long-term reliability and effectiveness will be ensured through the implementation of a CAMU, particularly when it is necessary to leave wastes in place after implementation of remedial activities.

One commenter suggested that the Agency clarify the fact that final closure of the CAMU must be examined very carefully. Therefore, although this decision criterion closely parallels the closure provision for CAMUs, EPA believes that eventual closure of the CAMU is an important enough factor that it should be highlighted at the time the Regional Administrator is making the decision to designate a CAMU. Any CAMU decision must consider, as a primary objective, the long-term (i.e., post-closure) reliability and effectiveness of CAMU-related remedial actions.

Section 264.552(c)(5): Timing

The fifth decision criterion specifies that the CAMU will expedite the timing of remedy implementation, when appropriate and practicable. This criterion is an outgrowth of the requirement in the proposed rule that, in designating a CAMU, the Regional Administrator consider whether the CAMU would benefit remediation at the facility by expediting the timing of the remedy implementation. (See proposed §264.551(c)(3)(ii)(A)). No comments were received on this proposed CAMU decision factor. Therefore, the Agency is finalizing this factor as a CAMU designation criterion in today's rule.

The Regional Administrator is encouraged to utilize CAMUs if they will assist in eliminating unnecessary delays and will encourage a faster pace to remediation. However, it should be understood that CAMUs may not always result in remedies that take less time. By allowing for on-site waste management and use of innovative technologies, the resulting remedial actions may take longer to complete than, for example, excavating all wastes and transporting them to commercial treatment or disposal facilities. Thus, this decision criterion only requires that a CAMU expedite remedial timeframes when it is appropriate and practicable, in consideration of the other remedial objectives for the facility.

Section 264.552(c)(6): Enhancing Long-term Effectiveness

The sixth decision criterion requires the Regional Administrator to use, as appropriate, treatment technologies (including innovative technologies) to enhance the long-term effectiveness of the remedial actions at the facility by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU. This is an outgrowth from the remedy selection decision factors relating to reduction of toxicity, mobility and volume of wastes, and long-term reliability and effectiveness. (See proposed §264.525(b)(1) and (b)(2)). It is also analogous to the preference under CERCLA for treatment-based remedies (55 FR 8666, Mar. 6, 1990). The proposed rule preamble discusses two Agency preferences supporting this criterion: (1) "As a general goal, remedies will be preferred that employ techniques, such as treatment technologies, that are capable of permanently reducing the overall degree of risk posed by the wastes and constituents at the facility;" and (2) "Source control technologies that involve treatment of wastes, or that otherwise do not rely on containment structures or systems to ensure against future releases, will be strongly preferred to those that offer more temporary or less reliable controls." (55 FR 30824). EPA believes as a general rule that long-term reliability and protectiveness of remedial activities is directly tied to effective treatment of wastes that pose future release threats.

EPA received comments requesting clarification as to whether under this decision factor, EPA was disallowing caps or other forms of containment, stabilization/fixation or other technically sound remedies. The Agency responds by stating that this criterion does not preclude remedial actions that do not employ treatment, as long as they are capable of ensuring long-term effectiveness. As a general rule, the Agency believes that treatment provides greater long-term effectiveness than containment alone, but that in certain circumstances, the Agency may consider containment to be sufficiently effective. A commenter also suggested that the Agency add a new remedy decision factor-the ability of the remedy to leave hazardous wastes in their least environmentally threatening state. EPA believes the objective of such a factor is consistent with this sixth criterion, and therefore an additional factor is not necessary.

Another commenter requested that EPA clarify that there is no relative preference between toxicity reduction, mobility reduction or volume reduction. The Agency agrees with this commenter because the decision as to which characteristic of the waste (i.e., toxicity, mobility, or volume) can be reduced will be

a case-by-case determination. In some cases, for example, a reduction in volume will not be possible (e.g., with metals), however, mobility reduction may be possible. Therefore, any preference between such types of treatment will be determined by site and waste specific characteristics that will guide or limit remedial options.

One commenter stated that section 3004(u) provides no statutory basis to establish a preference for remedies that involve treatment or that otherwise do not rely on containment systems or structures. The Agency strongly disagrees with this comment. As noted in the preamble to the July 1990 proposal, EPA believes that long-term reliability of remedies is an essential element in ensuring that actions under sections 3004(u) and 3008(h) satisfy the fundamental mandate of RCRA to protect human health and the environment, and that the reduction of toxicity, mobility or volume is a primary means of achieving such long-term reliability. 55 FR 30824. Moreover, EPA's experience under the RCRA program, and the primary focus of Congress in enacting the 1984 amendments to RCRA, is that reliance on containment structures rather than treatment generally should be discouraged, since land disposal of untreated hazardous wastes cannot provide reliable protection of human health and the environment over the long term. See, e.g., RCRA section 1002(b)(7).

Another commenter noted that the factor addressing reduction in toxicity, mobility, and volume should not be applied to or should not be emphasized in situations which involve high volume, low toxicity wastes, e.g., broad area-wide contamination. As discussed earlier, the decision factor in the proposal that addressed reduction of toxicity, mobility, and volume was not intended to preclude remedial alternatives that did not employ treatment, so long as such options could ensure long-term effectiveness of the remedy. Given the example, therefore, of a situation involving large volumes of low concentration contaminated soils or other wastes, the RA would have the discretion to evaluate containment-based remedial approaches. However, the final decision as to whether treatment of such wastes is necessary and appropriate, and if so what kind of treatment should be done, will necessarily be made on a case-by-case basis.

EPA also encouraged, in the subpart S proposal, that facilities consider "utilizing emerging technologies not yet widely available which may offer significant advantages over currently available technologies." (55 FR 30825; proposed §264.525(c)(4).) CAMUs may be particularly helpful to the implementation of effective innovative treatment technologies, which in the past have had limited application due to the waste management constraints

imposed by the land disposal restrictions.

Several commenters were very supportive of EPA's encouragement of innovative technologies. One commenter, however, stated that the use of an emerging technology should not be compelled, because a particular technology may not have been field tested and may involve greater monetary and time commitment than is necessary to remediate a given facility. EPA did not intend that this criterion mandate the use of innovative technologies. However, an RA, in conjunction with the owner/operator, may decide to utilize the flexibility of the CAMU to implement an innovative technology that could not have been used given the waste management restrictions of subtitle C, most notably the LDRs. This criterion is intended to support and encourage the implementation of innovative technologies when they can be utilized to reach the overall remediation goals at the facility.

Section 264.552(c)(7): Minimizing Land Areas Where Wastes Will Remain in Place

The seventh decision criterion requires the Regional Administrator to determine that the CAMU will minimize the land area of the facility upon which wastes will remain in place after closure, to the extent practicable. The CAMU, as presented in today's rule, will promote consolidation of remediation wastes into smaller, discrete areas of the facility, that are suitable as long-term repositories for the wastes, and which can be effectively managed and monitored over the long term.

EPA believes that the objective of minimizing the land area at which remediation wastes will remain in place at a facility after closure of the CAMU is consistent with the overall goal of achieving effective, protective remedies with long-term reliability. In some cases, broad areas of a facility (such as a series of large impoundments) could be capped without consolidation of the wastes. However, this approach could complicate monitoring for ground-water releases and could require an extensive maintenance program (e.g., for the cap and for other containment systems). In addition, as a practical matter development of the facility property (for future beneficial uses or by the owner/operator) may be less constrained if a relatively small area of the facility were dedicated to continued long-term containment of remediation wastes.

EPA believes that the objective of minimizing the land-area in which wastes will remain in place is consistent with, and complements, the other objectives for CAMUs that are expressed in the other six CAMU decision factors. In particular, it is

consistent with one of the important objectives stated in the proposed subpart S regulations, which stated that "[t]he Agency intends to place special emphasis in selecting remedies on the ability of any remedial approach to provide adequate protection of human health and the environment over the long-term."(55 FR 30824) The comments received regarding long-term reliability and effectiveness did not oppose this overall objective, but raised issues as to how the Agency meant to implement it. These comments were discussed under the above criteria. With regard to this criterion, reducing the land area of wastes remaining in place, in conjunction with a reduction in toxicity, mobility, and volume, is intended to clarify this means of improving long-term effectiveness and reliability.

4. Information Required To Support CAMU Designation (§264.552(d))

An owner/operator must provide, as a result of facility investigations, remedial studies, or other site-specific analyses, information sufficient for the Regional Administrator to assess the decision criteria specified in §264.552(c) as they relate to the implementation of a CAMU at a given facility. This information can be requested under the authority the RA already possesses under §264.101.

This requirement of today's rule was not explicitly provided for in the proposed rule; under the proposal such information was to have been furnished to the RA as part of the documentation of the remedial studies (e.g., RCRA Facility Investigations, Corrective Measures Studies) required under the subpart S proposal. Since today's rule finalizes only a portion of the proposal, a specific requirement relating to submission of information to support CAMU decisions is necessary. As such, this requirement is simply an expression of the general authority under 3004(u) and 3008(h) to require information from owner/operators to support corrective action implementation decisions.

5. CAMU Requirements To Be Specified in Permits or Orders (§264.552(e))

The proposed subpart S CAMU provisions outlined explicit requirements for closure and post-closure of CAMUs that the Regional Administrator would be required to include in the permit or order. Some commenters on the proposal suggested that the regulation should provide a more comprehensive listing of the requirements that would have to be specified in the permit (or order). EPA agrees that a more comprehensive listing of these requirements will clarify the specific requirements that must be addressed for CAMUs in permits and orders. Thus, §264.522(d)

outlines additional features of CAMUs that will be contained in permits or orders.

Section 264.552(e)(1) clarifies that in designating a CAMU at a facility, the Regional Administrator will specify in the permit or order the actual areal extent or configuration of the CAMU. This is a logical outgrowth of one of the fundamental issues involved with designating CAMUs; that is, determining where at the facility the CAMU is to be physically located, and the specific configuration of the CAMU. EPA expects that permits and orders will generally identify the physical boundaries of CAMUs on a facility map, together with a specific description of the physical boundaries or dimensions of the CAMU.

Section 264.552(e)(2) clarifies that the permit or order will specify how remediation wastes will actually be managed in or as part of a designated CAMU, including specification of design, operating and closure requirements. This is also a logical outgrowth from the proposal. The subpart S proposal anticipated that these types of requirements would be specified for CAMUs in a permit modification as part of the overall remedy selected for the facility. Since that portion of subpart S is not being finalized in today's rule, EPA believes that it is appropriate to clearly specify in this rule that these types of requirements must be delineated in permits or orders which establish CAMUs.

As specified in §264.552(e)(2), requirements will generally be specified for those areas of a CAMU that are to be used for treatment or storage of remediation wastes. Thus, if wastes were to be excavated and bioremediated in an enclosure located within the CAMU, the permit or order would specify the requirements for the bioremediation technology, the design and operation of any structures used for the bioremediation process, the disposition of the treatment residuals, and other associated requirements for those wastes and the areas of the CAMU to be used in managing them. However, as the regulations specify, where a treatment or storage unit separate from a CAMU is already adequately regulated under a facility permit, it would not be necessary to repeat those requirements in the CAMU provisions of the permit.

Under §264.552(e)(3), the permit or order must also establish the ground-water monitoring requirements for each CAMU. This requirement also derives generally from the subpart S proposal; under the proposal, ground-water monitoring requirements were to be specified as part of the overall facility remedy (see proposed §264.525(e) and §264.526). Given that today's rule finalizes only specific portions of the proposal, the Agency believes that it is useful to specify in this rule that ground-

water monitoring requirements for CAMU must be specified in the permit or order.

EPA expects that CAMUs will typically be implemented following studies of surface and subsurface contamination at the facility, conducted as part of required remedial investigations. Thus, in most cases, ground-water monitoring systems will already have been installed to characterize releases to ground water at the facility. Section 264.552(e)(3) is intended to clarify that there will be a continuing responsibility for owner/operators to monitor ground-water quality in the vicinity of the CAMU to ensure that any releases of contaminants from within the CAMU are detected.

This provision does not address the responsibilities of the owner/operator to continue monitoring of releases that are not associated with CAMUs; nor does it address the question of whether ground-water remediation is necessary. Due to the limited scope of today's final rule, those broader remedial requirements (i.e., that are not specifically associated with CAMUs) have not been addressed. EPA expects that those requirements will be included in the final, comprehensive subpart S rulemaking.

The ground-water monitoring requirements as specified in today's rule are not detailed, specific requirements addressing the numerous technical elements of installing and operating an effective ground-water monitoring system. Rather, they provide a general standard of performance for such systems; detailed specifications or performance standards for ground-water monitoring will be specified in the permit or order, based on site-specific information and conditions.

Today's rule promulgates the provisions of the proposed rule that specified closure and post-closure requirements for CAMUs that must be incorporated in permits or orders, with few changes from the proposal. (See §264.552(e)(4).) This rule also finalizes the decision factors to be considered in making CAMU closure decisions, as proposed. The specific closure and post-closure provisions have been reorganized for the sake of clarity and to fit within the organization of this section of today's regulation.

The only significant difference between the final and proposed closure and post-closure provisions is that today's rule identifies certain specific requirements for CAMU closure to be included in permits or orders that were not explicitly identified in the proposal. (See 264.552(d)(4)(ii)). These requirements address such closure activities as excavation, removal, treatment, capping or containment of wastes, capping of areas where wastes will remain in place, and removal and decontamination of equipment, devices, and structures used for remediation waste management.

These provisions specify activities that are normally part of closure for other types of land-based units, and that would, in any case, be incidental to implementing CAMU closure activities under today's rule. This new provision is, thus, intended to clarify the specific types of activities that should be included in the permit or order encompassing CAMU closure.

6. Documentation for CAMUs (§264.552(f))

This provision requires the RA to document the rationale for designating a CAMU, and to make the documentation available to the public. (See also section III.B.3.) This will typically be done in a Statement of Basis in a permit, permit modification, order, or order modification. Further explanation of public participation requirements for CAMUs (and TUs) designated under orders, is presented in section IV.A. of this preamble.

7. Permit or Order Modification for CAMUs (§264.552(g) and §270.42)

As outlined in the subpart S proposal, remedies tentatively selected or approved by the Regional Administrator would be incorporated into the permit according to the Agency-initiated modification procedures of §270.41, which provide for thorough public review and comment. Thus, under the proposal, designation of a CAMU was presumed to be implemented as part of the overall remedy selection process, and incorporation of specific CAMU provisions into the permit would be done under the overall modification for the remedy (see proposed §264.526).

Several commenters on the proposal argued that there should be a provision for allowing CAMUs to be designated earlier in the corrective action process than at the time of the permit modification for final remedy selection. These commenters elaborated that in some cases remedial activities that may precede implementation of the final remedy could be facilitated by the use of a CAMU. EPA provided for and encouraged implementation of certain remedial activities prior to final remedy selection decisions under the proposed "interim measures" provisions of the subpart S proposal (§264.540). A number of comments were received regarding the appropriate permit modification provisions for interim measures, with several commenters suggesting that the Agency clarify the type of permit modification (i.e., Class I, II or III) that would be used to incorporate interim measures into permits.

EPA agrees with the commenters that the regulations should explicitly provide for situations where CAMUs may be appropriate for remediation waste management prior to final remedy implementation.

This is consistent with EPA's current implementation strategy for the corrective action program, which emphasizes early implementation of interim or "stabilization" measures at RCRA facilities, with relatively lesser emphasis over the next several years on pursuing "final" cleanups at all facilities.{2} Certain stabilization actions may involve extensive waste management activities, for which CAMUs may be useful and appropriate.

|{2} Guidance on EPA's Stabilization Initiative for the
|RCRA Corrective Action program may be obtained by contacting
|the RCRA/Superfund Hotline at 1-800-424-9346.

To facilitate early use of CAMUs designated pursuant to permits, today's final rule specifies (in §264.552(g)) that a CAMU may be approved under an Agency-initiated modification (§270.41), or according to the permit modification procedures of §270.42, for owner/operator initiated modifications. As discussed elsewhere in today's preamble, EPA is amending appendix I of §270.42 to specify that, when incorporation of a CAMU into a permit is initiated by an owner/operator, a CAMU will generally be approved (or disapproved) according to the Class III permit modification procedures. Class III permit modifications are similar to Agency-initiated modifications in terms of the amount and type of public review and comment that is provided. EPA believes that specifying Class III modifications for CAMUs under §270.42 is therefore consistent with the proposal, and addresses commenters' concerns that there be an explicit provision for approval of CAMUs, when appropriate, early in the corrective action process.

CAMUs may also be implemented through the use of section 3008(h) orders. Such orders will generally require the same information as required in permits under §264.552(e). The need to approve a CAMU early in the process (e.g., to support an interim measure or "stabilization" action) will pertain to facilities subject to section 3008(h) orders, as well as permitted facilities. Thus, to implement a CAMU under an existing section 3008(h) order, the order may need to be amended to reflect the addition of the CAMU. It is the Agency's current policy that order modifications regarding remedy selection VR/AP provide a level of public participation and comment comparable to that provided for permit modifications. Section IV.A. of this preamble provides further discussion of the public participation procedures that will be used for CAMU designation under orders.

EPA notes that, in today's rule, the only mechanism for designating a CAMU at interim status facilities is a section 3008(h) order (or possibly a §7003 order). The Agency recognizes that owner/operators of interim status facilities may prefer another mechanism (e.g., the closure plan approval process), which would allow accelerated

cleanups to proceed outside the context of an enforcement order. While EPA acknowledges that there may be advantages to such an approach, it raises issues that are outside the scope of today's rulemaking. EPA will consider possible options as it develops the final subpart S rulemaking.

8. Effect of CAMU Designations on Other Remedy Selection Decisions (§264.552(h))

As is discussed earlier in this preamble, the designation of a CAMU does not change EPA's authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions. This point is clarified in §264.552(h).

C. Temporary Units (TUs) (§264.553)

The temporary unit provisions (§264.551(b)) as proposed in July, 1990, would have provided the Regional Administrator with the authority to modify 40 CFR part 264 or 265 regulatory design, operating, or closure standards for units (except incinerators and non-tank thermal treatment units) used for the storage or treatment of hazardous waste during corrective action, as long as those alternative standards were protective of human health and the environment and complied with statutory requirements. Under this proposal, the operation of such units would have been restricted to 180 days; however, the Regional Administrator could grant extensions to the operating life of such unit(s) in situations where unforeseen, temporary, and uncontrollable circumstances occurred, and where the owner/operator was actively seeking alternatives to continued use of the unit. See 55 FR 30842 (July 27, 1990). If the owner/operator failed to seek alternatives to the continued use of the temporary unit, the Agency would deny further extensions and require the owner/operator to retrofit the unit to meet applicable part 264 and part 265 standards, or remove the waste and close the unit.

In modifying 40 CFR part 264 and part 265 design, operating, and closure regulatory standards for temporary units, proposed §264.551(b) required the Regional Administrator to consider certain factors relating to the length of time that the unit would be in place, the amount of wastes to be managed, the physical and chemical characteristics of the wastes, and the site characteristics that might influence the migration of any potential releases. The alternative standards developed based on these factors would be specified in the facility's permit or order.

Today's rule finalizes the temporary unit provisions in §264.553, with minor changes. EPA believes that the temporary unit concept is both sensible and practical within the context of remediation, and will facilitate implementation of RCRA sections 3004(u), 3004(v), and 3008(h). EPA believes that the site-specific review and oversight that is provided in the context of investigating and making remedial decisions for corrective action allows the Agency to ensure protection of human health and the environment for short-term operation of units that may not meet the full set of standards specified for long-term use of such units under current RCRA regulations.

As a general matter, EPA believes that the flexibility provided for in today's rules for CAMUs and temporary units will also encourage the development of new and innovative treatment technologies. In particular, this rule will help further the Administrator's commitment to remove barriers to the use of bioremediation. Consistent with this goal, in the Land Disposal Restrictions for Newly Listed Wastes and Hazardous Debris proposed rule (57 FR 958, Jan. 9, 1992), the Agency solicited comment on a temporary version (57 FR 981) of the containment building (later promulgated in the final Debris Rule on 8/18/92). As proposed, these temporary containment buildings would have allowed for the treatment of hazardous waste in temporary structures that would not have been subject to the same stringent design and construction requirements of the containment building promulgated on August 18, 1992. (See 57 FR 37268). Comments on the proposal were almost universally favorable. However, EPA decided to defer a final rule on such buildings pending further analysis.

The CAMU provisions promulgated today achieve most of the objectives of the temporary containment building proposal (e.g., within a CAMU, structures may be used to implement bioremediation systems as an integral part of a remediation). The design and operating plans for such systems will be approved on a case-by-case basis within the context of other waste management activities that will take place within a CAMU. The use of bioremediation technologies as part of CAMUs should greatly expand the base of experience with the use of these treatment technologies. EPA will consider whether separate regulations for temporary containment buildings, as a distinct type of RCRA unit, should be developed in the future.

1. Scope and Applicability of Today's Rule (§264.553(a))

Today's rule narrows the applicability of the temporary unit provision. The proposed rule for temporary units would have

allowed any unit (except incinerators and non-tank thermal treatment units) used for the treatment or storage of hazardous wastes during corrective action to be designated as a temporary unit. This would have included land-based units such as waste piles. Today's final rule specifies that only tanks and container storage units used for the treatment or storage of remediation wastes will be eligible for designation as temporary units.

EPA expects that land-based waste management activities are more effectively addressed under today's CAMU provisions. For example, under today's CAMU provisions, a waste pile could be designated as part of a CAMU. This would enable the Regional Administrator to specify protective liner requirements and other design/operating requirements for the pile that are appropriate to waste and site conditions, and the length of time the unit may operate. Further, remediation wastes could be placed into the pile without triggering LDRs, thereby enabling one of the most frequent uses of piles, the temporary staging of wastes prior to on-site treatment, or transportation to off-site disposal (in which case, the land disposal restrictions would apply). Thus, designating the pile as part of the CAMU will enable sensible and protective waste management actions to be implemented. Because the provisions already allow flexibility for waste management in land-based units, the temporary unit provisions for those units are unnecessary and thus have been omitted in the final rule.

In addition, the temporary unit provisions will not apply to subpart X units (e.g., "modu-tanks"). EPA believes that the subpart X standards already provide sufficient flexibility for the Regional Administrator to set conditions appropriate to short-term use of a miscellaneous unit at a remediation site. Also, some miscellaneous units involve land-based waste management activities; such activities could be addressed and included as part of a CAMU, in a manner similar to waste piles.

The temporary unit proposed rules specified that the Regional Administrator could modify standards applicable to such units "solely by regulation." Since today's rules for temporary units are limited to tanks and container storage units, and since these units are not subject to the statutory MTR and LDR requirements, the phrase "solely by regulation" has been omitted from §264.553(a) of today's final rule, as it is no longer applicable or necessary.

Several commenters requested clarification of the applicability of temporary units to corrective actions under 3008(h) orders. Section 264.553(a) of today's final rule clarifies that the temporary unit concept is applicable to these actions. This change parallels the clarifying change to the definition of

CAMU, as discussed previously in this preamble.

2. Restrictions on Temporary Units (§264.553(b))

The proposed temporary units provisions specified that such units could only be used for treatment or storage of waste "* * * that [had] originated within the facility boundary." Commenters on the proposal requested that EPA clarify more explicitly the types of wastes that could be managed in temporary units and CAMUs. Accordingly, EPA is promulgating in today's rule a definition of remediation waste, and, in §264.553(b)(2), a clarification that temporary units shall be used only for treatment or storage of remediation wastes. Although the definition of remediation wastes includes non-hazardous solid wastes, management of such wastes would not require the designation of a temporary unit, since subtitle C requirements would not apply to management of those wastes. The definition of remediation wastes is discussed in section II.A. of this preamble.

In addition, today's rule specifies that temporary units must be located at the facility. One individual who commented on the proposal, supported the restriction that temporary units not be allowed outside the facility, since the owner/operator would not have direct operational control over such units. EPA agrees with this commenter and believes that this requirement will ensure that the Agency maintains direct oversight control over the unit and that the alternate standards specified for the unit by the Regional Administrator are appropriate given the context of the site-specific assessment. EPA believes that allowing temporary units only within the facility is consistent with the overall intent of this provision and, thus, has finalized this requirement as proposed.

3. Temporary Unit Decision Factors (§264.553(c))

The proposed TU provisions specified seven factors that the Regional Administrator would consider in establishing standards for temporary units. These factors were:

(1) Length of time the unit will be in operation;

(2) Type of unit;

(3) Volumes of waste to be managed;

(4) Physical and chemical characteristics of the wastes to be managed;

(5) Potential for releases from the unit;

(6) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential

releases; and

(7) Potential for exposure of humans and environmental receptors if releases were to occur from the unit.

EPA did not receive any comment on these specific decision factors. The Agency believes that these factors are reasonable and will result in sound decisions for temporary units; these decision factors have, therefore, been finalized as proposed.

4. Permit or Order Specifications for Temporary Units (§264.553(d))

As required under §264.553(d), the Regional Administrator will specify requirements for temporary units in the permit or order. These requirements will include the design, operating, and closure requirements for such units, as determined by the Regional Administrator in accordance with the decision factors described above.

This section also specifies operating time limits for temporary units. The proposed provisions for temporary units specified a 180-day time limit for the operation of temporary units, with allowance for EPA to extend that time period in certain circumstances. EPA expects that in many cases 180 days would be sufficient for a temporary unit. However, EPA also recognizes that in many other cases involving the storage or treatment of large volumes of wastes, units may need to be operated for periods longer than 180 days. As argued by a number of commenters on the proposal, remediation of facilities will often be a lengthy process, and a 180-day limit for temporary units could impose an unnecessary and artificial constraint on units whose operation beyond 180 days could nevertheless be protective of human health and the environment. An example of such a unit might be a tank that is brought to a remedial site for the treatment of inorganic sludges and that meets or exceeds all part 264 requirements, except for secondary containment. The operation of that tank could be protective for considerably longer than 180 days, given frequent inspections, sound operating procedures, and extensive Agency oversight.

Many commenters argued that there should be no time limit for the operation of temporary units, and that the Regional Administrator should have the discretion to establish operational time frames for temporary units on a case-by-case basis. Other commenters believed that one to two years would be a more reasonable time limit.

EPA agrees with the commenters who argued that the proposed 180-day limit for temporary units may be unnecessarily restrictive in many cases, and would complicate the use of temporary units

for potentially beneficial waste management activities, such as certain treatment systems that often require timeframes longer than 180 days. Today's rule, therefore, specifies a one-year time limit for operation of temporary units. Based on an evaluation of the comments to the proposal, EPA believes that a one-year limit for temporary units is reasonable and appropriate. Such a time limit will allow the use of temporary tanks and containers for somewhat lengthier treatment technologies (e.g., bioremediation) while assuring the protectiveness of such units. In addition, the one-year time limit confirms EPA's intent that the alternate standards only be applied to units which are truly "temporary" in this context.

At the end of the specified time limit for a temporary unit, or at the end of an extension if granted by the Regional Administrator, the owner/operator will be required to cease management of remediation wastes in the temporary unit and to initiate the closure requirements prescribed for the unit under §264.553(d). In cases where it is necessary or desirable to continue the waste management activity that was conducted in the temporary unit, the owner/operator will be required to retrofit the unit to meet applicable part 264 or part 265 standards for that type of unit, arrange for an alternative unit in which to continue conducting the activity, or otherwise modify the remedial practices so that the unit is not used in the remediation at the facility. If the owner/operator chooses to retrofit the unit, but such changes to the unit cannot be made before the end of the extension period, the owner/operator will be required to cease management of the waste until the retrofitting has been completed. Changes to temporary units (e.g., retrofitting) or to other remedial operations at the end of the operating time limit for a temporary unit will be subject to approval through modifications to the permit or order.

5. Time Limit Extensions for Temporary Units (§264.553(e))

Section 264.553(e) specifies the criteria the RA must consider prior to approving an extension to the time limit originally specified for a temporary unit.

EPA recognizes that in some cases a temporary unit may have to remain in service beyond the limit originally specified in the permit or order by the Regional Administrator due to unexpected circumstances. Today's rule finalizes the provisions for extensions as proposed in §264.551(b)(3), with minor changes. Proposed §264.551(b)(3) specified that an extension to the operating period originally specified for the unit could only be granted if hazardous wastes had to remain in the unit due to "unforeseen,

temporary, and uncontrollable" circumstances. One commenter who suggested that the 180-day time limit was too restrictive also suggested that the regulation be revised to eliminate these criteria as a condition for approving an extension for a temporary unit. Today's final rule does not specify these criteria for the approval of an extension. EPA believes that decisions as to whether or not certain circumstances were unforeseen and uncontrollable could be difficult and contentious, could put the Agency in the position of having to speculate as to whether or not the owner/operator might have seen or might have controlled a circumstance relating to a temporary unit, and are ultimately irrelevant to the issue of the protectiveness of the unit.

Accordingly, §264.553(e) of today's rule specifies new criteria for approval of time extensions for temporary units. These new criteria are based on an evaluation of the comments received on the proposal. One commenter expressed concern that the standards applied to temporary units may be based on the time limit originally specified for the unit and therefore may not be adequately protective of human health and the environment if the operating life of the unit were extended. EPA agrees with this comment and has specified in §264.553(e)(1) of today's final rule that in order to grant an extension, the Regional Administrator must determine that continued operation of the unit will not pose a threat to human health and the environment. In addition, §264.553(e)(2) specifies that the Regional Administrator must also determine that continued use of the unit is necessary to ensure the timely and efficient implementation of remedial actions at the facility. This criterion is essentially a restatement of the overall objective of temporary units and a clarification that the overall objective should be a condition for the approval of an extension. Upon approval of an extension the Regional Administrator will identify the specific time limit for the extension in the permit or order or modification to the permit or order.

Proposed §264.551(b)(3) did not specify limits as to the time allowed under an extension or the number of extensions that could be approved. Under today's rule §264.553(e), the Regional Administrator has the authority to grant up to a one-year time extension beyond the time limit originally specified for the unit, in cases where it is necessary to ensure timely and efficient implementation of remedial actions at the facility, and where the continued operation of the unit will not pose a threat to human health and the environment. The Regional Administrator may grant only one extension of up to one year. Based on the comments received on the proposal, EPA believes that these limits are both reasonable and appropriate, and are consistent with

the Agency's intent to allow alternative standards under this provision only for truly "temporary" units. In addition, given the increased operational time limit for temporary units provided under today's rule, the need for an extension of more than one year should be eliminated. The Agency also believes that this limit to extensions will reduce the potential administrative burden that could be created by owner/operators seeking multiple extensions for temporary unit operations.

6. Permit and Order Modification Procedures (§264.553(f))

In the subpart S proposal EPA expected that in cases where a temporary unit is part of a selected remedy, the approval for that unit would normally be a part of the Agency-initiated major permit modification for the remedy. Similarly, in cases where a temporary unit is a part of a stabilization action or interim measure which requires a Class III modification or an Agency-initiated permit modification, the approval for that unit would also be included in the modification for that action. Thus, the language in the proposal concerning permit modifications only addressed the situation where approval for a temporary unit was included under a Class III or Agency-initiated permit modification for an overall remedy, or interim measure or stabilization action for a facility. EPA recognizes that there may be cases in which a temporary unit is not part of a larger permit modification procedure for a selected remedy, or interim measure or stabilization action (i.e., the unit will be used prior to remedy selection to handle investigation-derived waste or remediation waste generated from remedial activities that do not require a Class III or Agency-initiated permit modification). In such cases, the Agency believes that given the longer timeframes for temporary units provided for in today's rule, opportunity should be provided for the public to be informed of and participate in decisions that affect them and their communities. Thus the owner/operator of a permitted facility will be expected to request approval for a temporary unit as a Class II permit modification according to the procedures under §270.42. EPA also recognizes, however, that there may be cases where operation of the temporary unit is necessary to contain releases or otherwise protect human health and the environment, before action is likely to be taken on a modification request. In such cases, the Regional Administrator may approve a 180-day temporary authorization for the unit upon request by the owner/operator according to the procedures under §270.42. Today's rule modifies §270.42 to classify permit modifications for temporary units as Class II modifications (unless otherwise

addressed under a Class III or Agency-initiated permit modification).

The proposed temporary unit provision(s) specified that any extension to the operating period originally specified for a temporary unit would be processed as a Class I permit modification. One commenter suggested that such extensions should be given more thorough public review and comment than is provided by Class I permit modifications. EPA agrees, since temporary units may in some cases be used to manage large volumes of wastes, and could be a key feature of a selected remedy. In addition, the longer timeframes for temporary units allowed in today's rule support the idea of providing somewhat greater public review and comment of temporary unit decisions. Therefore, today's rule specifies that approval for extensions for temporary units that are not addressed under a Class III permit modification or are not part of an Agency-initiated permit modification, will be processed as Class II permit modifications. Section IV of this preamble provides further information regarding public participation procedures that will be used for approval of temporary units and time extensions for temporary units pursuant to corrective action orders.

7. Documentation of Temporary Unit Designations and Time Extensions (§264.553(g))

Section 264.553(g) requires the Regional Administrator to document the rationale for designating a temporary unit or time extension for a temporary unit and to explain the basis for such designation. This new requirement in §264.553(g) is intended simply to clarify and emphasize that temporary unit decisions must be documented and explained as part of the notice and comment procedures for orders and permits. The rationale for such decisions will be incorporated as part of the Statement of Basis in a permit or order modification. Documentation of temporary unit decisions is analogous to the documentation the Agency must currently make to support the selection of a remedy. Therefore, if a temporary unit is incorporated as part of a final remedy, such an explanation would be incorporated into the Statement of Basis for the remedy under a permit modification or under a new order.

IV. CAMU and TU Implementation

A. Public Participation in CAMU/TU Designations and TU Time Extensions Under Orders

The Agency is committed to providing a meaningful opportunity for the public to be informed of and participate in cleanup decisions that affect them and their communities. Public input on proposed facility-specific corrective action decisions at permitted facilities is obtained through the permit issuance and modification procedures prescribed in 40 CFR parts 124 and 270. Current Agency policy for final remedy selections at interim status facilities under corrective action orders outlines public participation procedures similar to those detailed in 40 CFR part 124. In conjunction with this rulemaking, the Agency is expanding its public participation requirements for corrective action decisions made under corrective action orders to address the proposed designation of CAMUs and temporary units.

Pursuant to this rulemaking, CAMU designations made through the permit process will generally be approved (or disapproved) according to Agency-initiated permit modifications (§270.41) or the Class III permit modification procedures under §270.42 (see section III.B.7.). The designation of CAMUs or temporary units, or the granting of a time extension for a temporary unit made pursuant to a corrective action order, will follow similar public participation procedures, although modified to suit the corrective action order process. Prior to designating a CAMU or temporary unit, or approving a time extension for a temporary unit in a corrective action order, the Agency will prepare draft CAMU and/or temporary unit specifications. The Agency will then notify and provide the public with an opportunity to comment on the CAMU, temporary unit, or time extension for a temporary unit. If a public hearing is requested, the Agency will hold a hearing and provide the public with a notice of the hearing. The Agency will also consider and respond to all significant comments received by the public on the CAMU or temporary unit.

As required in the permit process, the Regional Administrator will document the rationale used to designate CAMUs (§264.552(f)), temporary units (§264.553(g)), or time extensions for temporary units (§264.553(g)), when such designations are made through corrective action orders. A brief discussion of the applicable decision factors used to support the creation of a CAMU or temporary unit will be included in the documentation. If the CAMU or temporary unit is proposed as part of a final remedy, such documentation can be incorporated into the Statement of Basis presenting the Agency's justification for a proposed comprehensive remedy proposal.

Under orders, a 30-45-day public comment period generally will be provided to the public to comment on the designation of a CAMU, temporary unit, or time extension for a temporary unit. However, because corrective action orders may be issued

to address immediate threats, the public comment period may be reduced or eliminated if the Regional Administrator determines that even a short delay in the designation of a CAMU or temporary unit would adversely impact human health or the environment. The Agency anticipates needing to use this discretion in rare circumstances.

The Agency will provide additional guidance on public participation procedures for the designation of CAMUs and temporary units under orders. While guidance is pending, EPA will continue to use the guidance provided in RCRA Corrective Action Decisions Documents: The Statement of Basis and Response to Comments (Directive #9902.6).

B. Continuation of Permits for Corrective Action Purposes

Although EPA today is not finalizing most portions of the comprehensive proposed Subpart S rule, several issues have arisen in connection with that rule that deserve further discussion pending its completion. First, the proposed rule reflects Agency policy concerning facility-wide corrective action at RCRA facilities. As a result, EPA's Regional offices are following the proposal, where appropriate, as guidance pending development of the final rule. Several aspects of that proposal, however, require rule changes for implementation; those aspects of the proposal cannot be implemented even as guidance pending development of the final rule. Many of these rule changes are made through today's rulemaking and thus can now be implemented.

One important aspect of the proposal that EPA now believes is a clarification rather than a necessary rule change concerns the scope of the permit requirement. EPA had proposed to revise 40 CFR §270.1 specifically to require RCRA permittees to have permits during the course of any corrective action required under the permit. Upon further review, EPA believes that this rule change, while a desirable clarification, is not absolutely necessary and that section 3004(u) of RCRA and 40 CFR 264.101(b) and 270.33 already require that RCRA facilities complete any corrective action schedule of compliance prior to termination of permit responsibilities.

The clear intent of Congress in enacting Section 3004(u) was that the price for obtaining a RCRA permit for hazardous waste management is cleanup of the entire property at which the permitted activity occurs. (See HSWA Conference Report, H. Rep. 1133, 98th Cong., 2d Sess. at 92 (1984). See also definition of facility as defined in today's rule.) Congress allowed such cleanup to occur under a schedule of compliance only where such

cleanup could not be completed prior to permit issuance. As a result, section 3004(u) of RCRA (and 40 CFR 264.101) clearly require that a facility that obtains a schedule of compliance for corrective action must complete the corrective action prior to termination of permit responsibilities. Similarly, EPA's general regulations concerning schedules of compliance specify that a facility may not simply terminate its operations and thereby avoid compliance with applicable requirements (40 CFR 270.33; see also 45 FR 33310 (May 19, 1980)), including corrective action.

This means that a RCRA permitted facility that is undergoing corrective action under a schedule of compliance and that wishes to cease operations has two choices with respect to its corrective action responsibilities. First, the facility may choose to accelerate corrective action so that it is completed at the same time as hazardous waste operations at the facility cease, §270.33(b)(1)(i). Alternatively, where the regulated activities cease prior to termination of a permit which includes corrective action, the facility may complete corrective action under a permit schedule of compliance that extends beyond the date of cessation of hazardous waste operations, §270.33(b)(2). In the latter case, the facility must continue to comply with applicable permit conditions and requirements, including permit renewal requirements, even though hazardous waste activities at the facility have ceased. See 45 FR 33310-11 (May 19, 1980).

As part of the comprehensive final subpart S rule, EPA will determine whether further regulatory clarification of this issue is necessary. At that time, EPA will respond to comments received on the proposed regulatory changes addressing this issue, and the related issues discussed in the preamble. See 55 FR 30846-49.

In the meantime, EPA, on a case-by-case basis, can improve the clarity of the applicability of this requirement to maintain a permit through the completion of corrective action activities at a specific facility in several ways. First, at the time of permit issuance or when the CAMU or temporary unit is incorporated into the HSWA permit, EPA can establish a schedule of compliance that reflects the responsibility of the permittee to complete corrective action under the permit, even if the permit does not specifically identify the nature or timing of the corrective actions to be required. In addition, the permit as issued or modified could include an express condition requiring the facility owner/operator to submit a permit reapplication prior to permit expiration unless and until all corrective action obligations for the facility have been completed.

C. State and Federal Implementation

1. State Authorization

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR part 271 for standards and requirements for authorization.) Following authorization, EPA retains enforcement authority under sections 3008, 7003, and 3013 of RCRA, although authorized States have primary enforcement authority.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), EPA administered the RCRA hazardous waste program in individual States until the States were formally authorized by the Agency to implement their own programs. Once a State had final authorization, it administered its hazardous waste programs entirely in lieu of EPA. The Federal RCRA requirements no longer applied in the authorized State, and EPA could not issue permits in the State for any facilities that the State was authorized to permit. When new, more stringent Federal requirements were promulgated or enacted, the State was obliged to enact equivalent and consistent authority within specified timeframes. However, the new Federal requirements did not take effect in authorized States until the States adopted them as State law.

The HSWA amendments, however, altered this system. Under section 3006(g)(l) of RCRA as amended by HSWA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed under HSWA authority take effect in authorized States at the same time that they take effect in unauthorized States. EPA is directed to carry out these requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. To retain final authorization, States must still adopt HSWA-related provisions that increase the stringency of the RCRA program. However, such HSWA provisions apply in authorized States and are implemented Federally in the interim.

Today's rule is promulgated pursuant to section 3004(u), section 3004(v), and section 3005(c) of RCRA, all of which are provisions added through HSWA. (EPA will also use the standards of today's rule in implementing section 3008(h).) Therefore, the Agency is adding today's rule to Table l in 40 CFR 271.1(j), which identifies the Federal program requirements that are promulgated pursuant to HSWA. Because, in EPA's view, today's rule is integral to the HSWA corrective action program, EPA intends to implement it immediately in all States and territories in which the Agency now administers the HSWA section 3004(u) and (v) corrective

action authorities. Thus, the rule takes effect immediately in (l) States that are unauthorized for the RCRA base program, and (2) States that are authorized for the RCRA base program, but are not yet authorized for the HSWA corrective action program. (The issue of more stringent State standards in these States is discussed in the following section.)

Today's rule does not apply in States that are authorized for the HSWA corrective action requirements. (Fifteen States now fall into this category.) Under section 3009 of RCRA, States may impose more stringent or broader regulations than the Federal program. Because the regulations promulgated today reduce regulatory requirements for certain types of waste management conducted during corrective action, EPA considers them to be less stringent than or reduce the scope of the existing Federal corrective action requirements.{3} Therefore, they will not apply in States authorized for corrective action until those States have adopted comparable provisions under their own State law. Furthermore, because today's rule is less stringent than existing corrective action requirements, authorized States are not required to adopt the rule, and States not yet authorized for corrective action are not required to include its provisions in their programs when they seek authorization.

|{3} EPA is considering whether the concept of stringency
|should be reevaluated with respect to remediation wastes
|and will address this approach in a separate rulemaking.

Even though States are not required to adopt today's rulemaking, EPA strongly encourages them to do so. As already explained elsewhere in this preamble, today's rule is needed to expedite hazardous waste remediation at RCRA corrective action facilities. States are therefore urged to adopt today's rule and to submit to EPA the modification for approval on the schedule for mandatory program revisions, according to 40 CFR 271.21(e).

States are also encouraged to use existing authorities, where available, to allow comparable remedial activities prior to adopting and receiving authorization for today's rule. Some States may have authority comparable to section 7003, which allows EPA to order response action in the case of imminent and substantial endangerment to health or the environment "notwithstanding any other provision in this Act." An authorized State may use a comparable section 7003 authority to authorize activities consistent with today's rulemaking. Other States may have comparable authority under State Superfund programs or may have comparable flexibility for cleanups under their own hazardous waste regulations. EPA encourages States to make use of such flexibility to expedite cleanups. In addition, States with comparable authorities may

be eligible to receive interim authorization and to implement their provisions under 40 CFR 271.24.

2. Implementation of Rules in Unauthorized and Authorized States

The implementation of today's rule will vary, depending on the authorization status of the State in which a particular facility subject to cleanup requirements is located. Regardless of the situation in individual States, however, EPA's major goals in implementing today's rule are: (l) To enable the use of the CAMU and TU concepts as rapidly as possible for specific RCRA corrective actions, consistent with State requirements, (2) to encourage States to adopt these concepts promptly in their own cleanup programs and regulations, and (3) to work cooperatively with individual States, regardless of their authorization status, to promote the flexible approaches in today's rule. This section briefly discusses implementation of the rule in States at different stages of the authorization process.

A few States and territories have not yet been authorized for either the "base" (i.e., non-HSWA) RCRA program, or the RCRA section 3004(u) and (v) corrective action program under §264.101. In these States, permits and orders are issued by EPA under the Federal statute and implementing regulations. Any modifications to permits or orders to allow the use of CAMUs or TUs would also be the responsibility of EPA. Of course, it is possible that an unauthorized State has adopted standards addressing CAMUs or TUs that have independent effect. The possibility for a dual program always exists in States that have not applied for or obtained authorization. Although EPA's permit would establish the Federal RCRA standards applying to such a unit, State law might impose additional requirements.

Most States have been authorized for the RCRA base program, but are not yet authorized for HSWA corrective action. In these States, permits are generally issued jointly; that is, the State issues the portion of the permit that addresses compliance with base-program requirements, while the EPA Region issues the HSWA portion of the permit, including corrective action requirements. Together, the base-program and HSWA portions make up the RCRA permit for the facility.

Under this arrangement, EPA is responsible for implementing the HSWA corrective action requirements for permitted facilities. This includes the responsibility of requiring or approving modifications of the HSWA portion of the permit to incorporate new units (including CAMUs and TUs) that are necessary to implement corrective action at the facility. In this case, the new unit would be permitted

under the modification to the HSWA portion of the permit, and a separate State action would not be necessary. The process would work similarly for section 3008(h) orders, although procedures for changes in interim status, rather than for permit modifications, would apply. Thus, facility modifications to allow corrective action would not require State approval or use of State permit modification or interim status modification procedures. Rather, under section 3006(g), Congress authorized EPA to implement the corrective action program in each State prior to State authorization. If permit modification or interim status changes are necessary to implement corrective action in States not authorized for corrective action, the Federal rather than the State procedural requirements apply to the changes.

In some cases, a land-based regulated unit already subject to State interim status or permit conditions may be incorporated into a CAMU. In such cases, today's rule provides that the subpart F, G, and H requirements and the unit-specific requirements of 40 CFR part 264 or 265 previously applying to the regulated unit would continue to apply after designation of the CAMU. Authority for implementing and enforcing these requirements could fall either to EPA or to the State. Generally, EPA anticipates that the State would retain direct implementation authority, since it had previously been regulating the unit. However, in some cases it might be more efficient for EPA to assume overall authority over the entire cleanup.{4} In either case, EPA would seek to work out oversight authority with the State through formal or informal agreement. Because the State would retain authority over the regulated unit through its own permit or interim status requirements, unless it modified the permit or allowed a change in interim status, State agreement with EPA's approach to corrective action would be necessary.

|{4} In this case, the State might choose to modify the
|State permit or the facility Part A to remove the unit
|as a State-regulated unit. Alternatively, the unit could
|remain on the State permit or Part A, but EPA could be
|given lead oversight over the unit through a State-Regional
|agreement.

As in the case of unauthorized States, States authorized for the base program may have more stringent requirements (e.g., State land ban provisions) that would affect a particular remedy that EPA wished to implement under today's rule. In this case, EPA might modify the remedy so that it was consistent with State law, or structure it so that it mirrored an existing State waiver provision (e.g., waiver of land ban provisions for contaminated media); alternatively, the State might use a waiver authority

under its own laws or enforcement discretion to allow the remedy to proceed.

In any case, EPA emphasizes that its goal in implementing the CAMU and TU concepts in States not authorized for corrective action is to facilitate prompt and protective cleanups at RCRA facilities. This rule does not preempt existing State authorities, nor does EPA intend to impose cleanup requirements at specific sites under this rule that the State considers to be unprotective, inadequate, or inconsistent with the State's regulatory requirements. Rather, today's rule provides EPA (and States) greater flexibility in making use of a new type of remediation unit created during the course of corrective action. If a State not yet authorized for corrective action believed a different approach was preferable, either as a general rule or at a specific site, EPA would work with the State-for example, through a Memorandum of Understanding, joint order, or an informal agreement-to ensure that any remedies required were acceptable to the State.

As of October 1992, fifteen States were authorized for corrective action under §264.101. Until these States develop their own CAMU and TU regulations, these provisions would generally not be available to them in implementing their corrective action program. It is possible, however, that a State authorized for corrective action may wish to have a CAMU or a temporary unit approved for a facility cleanup. In some cases, the State may have a general waiver authority under its own State law, or State enforcement or State Superfund authorities that provide it some flexibility. If the State were to exercise this authority in a way that is consistent with today's rule, EPA would not consider the State's program to be less stringent than the Federal program. Alternatively, the State could request EPA to issue an order under RCRA section 7003, which could be used to override specific Federal or authorized State authorities where necessary to implement a cleanup. In any case, however, these approaches should be used only to cover the transition period during which the State amends its regulations and obtains formal authorization for today's rule.

Even though a State is authorized for §264.101 or (in the future) subpart S corrective action, EPA retains the authority to issue section 3008(h) orders at interim status facilities. If EPA were to issue such an order in a State authorized for corrective action, it would have the authority to require and approve modifications of the facility part A to accommodate a new CAMU or TU. EPA's authority in this case is analogous to its authority in States not yet authorized for corrective action. Just as in that case, however, EPA emphasizes once again

that its goal is to expedite cleanup, and it does not claim the authority to preempt existing State requirements.

D. Effective Date

RCRA section 3010(b)(1) allows EPA to promulgate an immediately effective rule where the Administrator finds that the regulated community does not need additional time to come into compliance with the rule. Similarly, the Administrative Procedures Act (APA) provides for an immediate effective date for rules which relieve a restriction. 5 U.S.C. 553(d)(1). Today's rule provides additional flexibility for facilities undergoing corrective action. As a result, the regulated community does not need significant additional time to come into compliance. In order to allow near term use of the less restrictive rules promulgated today, and yet to provide effective communication regarding the purpose and implementation of this rule, EPA has set an effective date of 60 days from today.

V. Relationship to Other Programs

A. CERCLA

The substantive requirements of today's regulations for CAMUs and temporary units are expected to be applicable or relevant and appropriate requirements (ARARs) for the remediation of many CERCLA sites, especially those sites where CERCLA remediation involves the management of RCRA hazardous wastes. In the CERCLA context, CAMU and temporary unit requirements that are designated to be ARARs would be incorporated into CERCLA decision documents, rather than RCRA permits or orders. Based on EPA's experience in managing the Superfund program, it is anticipated that the increased flexibility provided in today's rule will have an important and positive impact on the Agency's ability to expeditiously implement protective and cost-effective remedies at CERCLA sites. This would include remediation under CERCLA of RCRA hazardous wastes at Federal facilities that are listed on the National Priorities List.

B. State Remedial Programs

Many States have enacted remedial laws and programs to address environmental problems that may not be addressed under RCRA or CERCLA authorities. State remedial programs typically follow

a process similar to RCRA and CERCLA for investigating releases, and selecting and implementing remedial measures. As a general rule, since CAMUs are defined as units to be used in connection with §264.101 or 3008(h) actions, they can be employed only at a facility regulated under subtitle C of RCRA, or at CERCLA sites where determined to be ARARs. However, some states may have enforcement authorities analogous to RCRA section 7003 which provide an implied or explicit waiver from otherwise applicable State RCRA requirements. Thus, in such a State, where cleanup is being compelled at a non-RCRA or CERCLA facility, such enforcement authority could be used to approve and designate a CAMU or a TU in a manner consistent with today's final rules. Note, that a State cannot waive applicable federal requirements; thus, if a State is not authorized to implement the LDR program in the State, for example, then a CAMU will not operate to affect the scope of the LDRs at that site, when implemented under a State remedial program. However, if a State is authorized for LDRs, it may be able to waive such requirements under State law (as indicated above).

C. RCRA Section 7003

CAMUs and temporary units may be available, at the Regional Administrator's discretion, for the purpose of remediation under RCRA section 7003 authority, even if the remediation is not at a RCRA subtitle C regulated facility. Under section 7003, EPA has the discretion to waive any RCRA requirements at a site where appropriate to implementing remedial actions. Thus, the order could provide for and designate a CAMU with or without the use of today's rules, and regardless of the permit status of the facility. As mentioned previously, some States may have enforcement authorities analogous to RCRA section 7003 that would provide similar relief from administrative requirements in implementing cleanups.

D. Corrective Actions at Facilities not Currently Remediating Under Federal RCRA/CERCLA or State Authorities

Since a CAMU or a TU is a RCRA subtitle C unit, it can be utilized only at a facility that is regulated under subtitle C. Therefore, in order to manage hazardous remediation wastes in CAMUs or TUs, a responsible party would have to voluntarily seek regulation by subtitle C by obtaining either a corrective action order issued by the Agency (or by a State-see above), or a RCRA permit, which contains the necessary approvals from

the Regional Administrator.

E. RCRA Section 3004(n) Air Emission Standards

EPA is currently developing a comprehensive set of air emission regulations for RCRA hazardous waste management units, as mandated under section 3004(n) of RCRA. Phase I air emission standards for process vents and equipment leaks were promulgated on June 21, 1990. Phase II unit-specific standards are expected to be promulgated in 1993.

If remediation waste management activities associated with CAMUs will involve the use of non-land-based equipment or units for which air emission standards have been promulgated (e.g., air strippers or other treatment devices), such equipment or unit(s) would have to comply with those applicable standards. These requirements will be specified in the permit or order. However, EPA does not intend to promulgate air emission standards specific to CAMUs. EPA believes that the decision criteria for CAMUs in today's rule, and the site-specific oversight provided under the corrective action process, will ensure that adequate air emission controls are imposed on remediation waste management activities.

VI. Regulatory Impact Analysis

A. Executive Order Requirements

Under Executive Order 12291 (issued February 17, 1981), a Regulatory Impact Analysis (RIA) is required for every major Federal regulation. Executive Order 12291 defines a major rule as one that is likely to result in: (1) An annual effect on the economy of $100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, state, or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets. The Agency has determined that this rule is not a major rule because the rule does not negatively impact the economy, increase costs or prices, or adversely impact businesses. Nevertheless, EPA recognizes that this rule may have significant positive economic impacts and therefore, at the request of the Office of Management and Budget, has prepared a Regulatory Impact Analysis (RIA).

B. Background

In preparation for the final subpart S rulemaking, EPA is currently conducting a revised RIA that includes a comprehensive evaluation of the costs and benefits of regulatory alternatives for RCRA Corrective Action. As part of this comprehensive analysis, EPA has conducted a preliminary evaluation of the costs and benefits of the proposed rule provisions concerning CAMUs, and has evaluated several alternatives to the proposed rule CAMU provisions. On October 22, 1992, EPA published a notice of data availability in the Federal Register announcing the availability of a report, "Supplemental Information on Corrective Action Management Units," which summarized the preliminary results of EPA's analyses of the costs (expressed as cost savings) and expected environmental benefits of regulatory alternatives for the CAMU. The RIA prepared for this rulemaking provides additional detail on EPA's evaluation of the cost savings of key regulatory alternatives for the CAMU and the expected impacts of the alternatives on the human health and environmental benefits derived from cleanup under the Subpart S framework. (See sections II and III of this preamble for further discussion of the subpart S rule, the CAMU and temporary unit rule, and the notice of data availability.) Both the report summarizing preliminary results and the RIA for today's rule are available in the RCRA docket.

The Agency conducted the CAMU RIA in order to assess the costs and benefits of certain alternative approaches to regulating remedial waste management at facilities subject to RCRA corrective action. Discussion of the RIA is organized as follows: The CAMU regulatory alternatives that were analyzed are presented first, followed by the general methodology for the analysis, cost results, and finally a qualitative analysis of benefits.

Temporary units (TUs) were not addressed in the CAMU RIA. Based on the preliminary analyses conducted for the RIA, EPA believes that TUs will not be used with great frequency, and the resulting cost and benefit impacts of TUs are expected to be relatively minor compared to CAMUs.

C. Regulatory Alternatives

This RIA evaluates three CAMU regulatory alternatives: The Proposed subpart S CAMU, the Expanded CAMU (the CAMU alternative which EPA has decided to finalize), and, the No CAMU alternative. (The Proposed subpart S CAMU and the Expanded CAMU are defined and discussed further in section II of this preamble.) Based on the results of the analysis presented here and the anticipated

remedial benefits of the expanded CAMU option, the Agency has decided to finalize the expanded CAMU option.

The analysis of the No CAMU alternative was conducted using two different sets of assumptions. This means that the cost savings and effects on benefits associated with the Proposed and Expanded CAMU options are presented relative to a range of "baseline" No CAMU outcomes. EPA evaluated the No CAMU alternative in this manner because EPA recognized that under the No CAMU alternative remedial decisionmakers could either choose to maximize removal and treatment of hazardous wastes to LDR standards, or, alternatively, choose to minimize the extent to which wastes would be required to be removed from SWMUs and therefore treated to LDR standards prior to land disposal.

D. Approach to Analysis

To estimate the costs and benefits associated with the various aspects of the subpart S final rule, including the CAMU provisions, EPA selected a random sample of 79 facilities potentially subject to corrective action. The sampling frame was stratified and sampled in order to accurately reflect the composition of the potentially affected universe and to over-sample facilities likely to require corrective action.

As proposed, the subpart S rule provides a regulatory framework to guide site-specific remedial decisionmaking at RCRA facilities. The proposed rule provisions are not, however, overly prescriptive; EPA recognized the site-specific nature of remedial decisionmaking and sought to strike an appropriate balance in the proposed regulations between explicit regulatory standards and requirements and site-specific flexibility and discretion. To develop estimates of the costs and benefits of cleanup under the proposed rule and under different regulatory alternatives, EPA simulated remedy selection at the sampled facilities.

In order to simulate remedy selection at the sample facilities, EPA first collected facility-specific data from a wide variety of sources, including RCRA Facility Assessments (RFAs) and RCRA Facility Investigations (RFIs). RFAs and RFIs provided EPA with the following information: General facility descriptions; SWMU- and waste-specific characteristics; details about the environmental setting; and human exposure information. When facility sampling data were not available for a particular facility, an EPA contaminant fate and transport model, MMSOILS, was used to simulate releases to ground water, surface water, air, and off-site soils. EPA also used the MMSOILS model to simulate releases into the future in order to determine the nature and extent of contamination

over time, in the absence of corrective action.

Next, the available data on the nature and extent of contamination (present and future) and facility characteristics were presented to expert panels convened by EPA and comprised of regional EPA staff, state representatives, and experts in the fields of hydrogeology, geology, geophysics, soil science, engineering, and chemistry. Based on their evaluation of the data and their experience in making remedial policy decisions at the state and regional levels, the policy expert panel (made up of regional and state program policy representatives) developed remedial objectives under the proposed subpart S rule framework for each facility in the sample. Accordingly, the policy panel used the proposed subpart S CAMU definition and provisions and, where appropriate, designated areas of facilities as CAMUs.

The remedial objectives, including the policy decision on the use of a CAMU, were then transmitted to the technical expert panel, which was responsible for defining and determining specific remedial activities to meet these objectives. Where more than one alternative was available to meet the policy panel objectives, options were presented and the policy panel made their choice of preferred approach.

The remedial activities identified/selected by the expert panels, for the facilities in the sample that required corrective action, were the foundation for analyses of the proposed CAMU regulatory alternative. To assess the two other CAMU RIA regulatory alternatives (the Expanded CAMU and the No CAMU options), a CAMU expert panel (consisting of civil, chemical, and environmental engineers, risk assessors, RCRA policy analysts, and ecologists) was convened to determine objectives and select remedies.

E. Cost Analysis

In addition to defining and determining remedial activities to meet remedial objectives, the technical experts convened by EPA were also responsible for providing remedial cost estimates which served as the basis for calculating facility-level costs. As discussed above, the expert panels reviewed each facility in the RIA sample and selected remedies to address releases at the sample facilities. The panels then estimated a cost for each remedial activity at each SWMU addressed. The Agency compiled remedial costs at the SWMU and facility level under each of the three CAMU regulatory alternatives. After the total costs were adjusted to include design, oversight, and contingencies, the costs were discounted to account for the timing of remediation.

On a national basis, a total of approximately 5,800 facilities

are potentially subject to RCRA subpart S corrective action requirements. Under the Proposed CAMU alternative, CAMUs would be expected to be used at a total of 200 facilities in the course of remediating 1,360 SWMUs. Under the Expanded CAMU alternative, CAMUs would be expected to be used at 1,500 facilities in the course of remediating 6,000 SWMUs.

The use of CAMUs under the proposed CAMU option results in total present value cost savings of $15.2 billion to $25.2 billion (the range reflects the use of two different assumptions regarding the degree of waste removal and treatment to LDR standards under the No-CAMU option). The present value cost savings of the expanded CAMU option ranges from $16.6 to $26.6 billion. The cost savings under both of the CAMU options are primarily attributable to avoided costs of off-site incineration and disposal. The proposed CAMU option allows for protective management of waste on-site, possibly combined with in-situ treatment. The expanded CAMU option promotes even more protective on-site management by allowing ex-situ treatment of hazardous waste combined with protective on-site management.

F. Qualitative Analysis of Effects on Benefits

Several criteria can be used to qualitatively analyze the relative benefits of the CAMU regulatory alternatives: Expectations regarding the long-term effectiveness of remedies; short-term impacts of implementing the remedies; and, effects on corrective action program implementation.

1. Expectations Regarding Long-Term Effectiveness

Under either the proposed CAMU or the Expanded CAMU alternatives CAMUs may be permitted by the Regional Administrator only if the RA decides that designation of a CAMU would be protective of human health and the environment. However, the types of remedies selected under the different CAMU regulatory alternatives may differ with regard to expectations of long-term effectiveness.

For example, ex-situ treatments (which were selected much more frequently under the Expanded CAMU alternative than under the proposed CAMU alternative) generally provide greater certainty of long-term effectiveness than do in-situ treatments or management without treatment. Treatments, such as stabilization for wastes or media containing inorganic constituents, are employed much more effectively ex-situ than in-situ due to improved mixing and the ability to ensure through sampling that all waste and contaminated media are thoroughly treated. Incineration (which

was used much more frequently under the No CAMU alternative than under the CAMU alternatives) provides a high degree of long-term effectiveness for remediation of wastes or media containing organic constituents.

In contrast, containment of wastes without treatment (e.g., by capping the unit) is generally viewed as providing less certainty of long-term effectiveness than alternatives which involve actual removal from the unit and/or treatment. Although EPA believes that engineered containment structures can be highly effective, assuming adequate monitoring and maintenance, few would dispute the general conclusion that there is less certainty regarding long-term effectiveness with remedies which rely solely on containment in contrast to those which involve some degree of removal and/or treatment.

As shown in Exhibit 1, the Expanded CAMU alternative is expected to employ ex-situ treatment at more SWMUs and to employ in-situ treatment or no treatment at fewer SWMUs than is the case for the two other CAMU regulatory alternatives. As a result, the Expanded CAMU alternative appears likely, in actual implementation, to provide greater long-term certainty of remedy effectiveness.

Exhibit 1.-National Estimates of the Number of SWMUs by Type of Treatment Under CAMU Regulatory Alternatives

Type of treatment	No. of SWMUs affected			
	Expanded CAMU	Proposed CAMU	No CAMU-(assumes more LDR treatment)	No CAMU-(assumes more management in place)
Ex-Situ	4,400	2,800	2,800	2,200
In-Situ	700	1,700	1,400	1,900
Ex-Situ and In-Situ.	130	570	920	920
No Treatment	730	1,000	910	1,000
Total	6,000	6,000	6,000	6,000

Notes:

- Numbers may not total due to rounding.
- CAMU regulatory alternatives discussed in text.

╖ There are 6,000 SWMUs affected by expanded CAMUs under the Expanded CAMU alternative. The same group of SWMUs was examined under the other CAMU alternatives for comparability.

The Agency developed more detailed comparisons of remedies selected under the three CAMU regulatory options. These comparisons are presented in the document "Supplemental Information on Corrective Action Management Units" and in the Regulatory Impact Analysis for today's final rule; both documents are available in the RCRA docket. A few key findings are discussed in the sections below.

Incineration is estimated to be employed most often (at 3,100 SWMUs) under the No CAMU alternative, when EPA assumes that LDR treatment is required and occurs; least often (at 1,400 SWMUs) under the Expanded CAMU alternative; and in between (at 1,900 SWMUs) under the Proposed CAMU alternative. Incineration is employed at 2,300 SWMUs under the No CAMU alternative when EPA assumes that less LDR treatment occurs and more wastes are left in place and contained.

Reliance on LDR treatments such as incineration, would theoretically provide the greatest degree of certainty regarding long-term effectiveness. However, in practice the high costs of incineration, the public opposition to incineration, and the transportation-related implications of shipping large quantities of wastes off-site to commercial incinerators may discourage its use and instead may often encourage greater reliance on in-situ treatment or containment without treatment, in the absence of a CAMU rule. This scenario is best represented by the results of the analysis for the No CAMU alternative where EPA has assumed much more management of wastes in place than removal and treatment to the LDR standards.

Thus, while the Expanded CAMU alternative would not result in incineration as frequently as under the No CAMU-LDR Treatment scenario, it would likely provide a greater degree of certainty of long-term effectiveness than the No CAMU-Management in Place scenario by encouraging greater use of ex-situ treatments other than incineration and reduced use of management in place.

2. Short-Term Impacts of Remedies

As discussed above, CAMUs could be employed only if they are protective of human health and the environment. However, the remedies selected under the three CAMU regulatory alternatives

could differ to some degree with regard to the short-term risks created by truck traffic and by management of wastes and contaminated media during remediation. Remedies which maximize excavation, transport, and off-site management of wastes and contaminated media would pose greater risks of release from transportation-related accidents. In-situ treatment, ex-situ treatment on-site, and containment remedies do not involve transport of wastes off-site.

Management of wastes and contaminated media during remediation could also potentially pose short-term risks to workers on-site and to nearby households off-site. Remedies involving extensive excavation or certain in-situ treatments (such as bioremediation), where wastes are actively managed, could potentially pose more short-term risk than remedies involving only capping in place. However, Occupational Safety and Health Administration standards would act to prevent on-site exposures for workers conducting remediations, and corrective action remedies are required to be designed and implemented to prevent short-term exposures at off-site exposure points. As a result, the Agency believes that the CAMU regulatory alternatives would potentially differ very little with regard to short-term risk from waste management activities.

3. Effects on Corrective Action Program Implementation

The Expanded CAMU and Proposed CAMU regulatory alternatives would provide additional flexibility, relative to the No CAMU alternative, in implementing remedies at RCRA facilities. In increasing this flexibility, EPA would expect to expedite cleanups, achieve better quality remedies at facilities which are operating under financial constraints, avoid situations where remedies would drive owner/operators into bankruptcies and their facilities into the CERCLA queue, and, reduce the number of long-term management units that must be monitored and maintained at remediated facilities.

Further, EPA expects that remedies selected under the Expanded and Proposed CAMU alternatives would likely be more publicly acceptable, relative to those selected under the No CAMU alternative, due to reduced reliance on incineration (as discussed above) and off-site transportation and disposal. Under the Expanded CAMU alternative, wastes from approximately 1,600 SWMUs would go to off-site disposal, compared with wastes from 2,700 SWMUs under the Proposed CAMU. The No CAMU alternative is estimated to result in off-site disposal for wastes from 3,000 to 3,700 SWMUs.

The Expanded CAMU alternative is also likely to have other

implementation-related benefits. It may reduce the cost and/or enhance the environmental effectiveness of closing regulated units that are included in CAMUs. For example, a regulated unit that would otherwise be capped with waste in place could be incorporated in a CAMU where the waste would be excavated, treated ex-situ, and replaced in the unit, thus providing a greater degree of long-term effectiveness.

G. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires that whenever an agency publishes a notice of rulemaking, it must prepare a Regulatory Flexibility Analysis (RFA) that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). However, pursuant to section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Administrator certifies that this rule will not have a significant economic impact on a substantial number of small entities, because the rule provides relief to the regulated community. As a result of this finding, EPA has not prepared a formal RFA in support of the rule.

H. Paperwork Reduction Act

This rule does not contain any new information collection requirements subject to OMB review under the Paperwork Reduction Act, 44 U.S.C. 3501, et. seq.

List of Subjects

40 CFR Part 260

Administrative practice and procedure, Hazardous waste.

40 CFR Part 264

Hazardous waste, Reporting and recordkeeping requirements.

40 CFR Part 265

Hazardous waste, Reporting and recordkeeping requirements.

40 CFR Part 268

Hazardous waste, Reporting and recordkeeping requirements.

40 CFR Part 270

Administrative practice and procedure, Hazardous materials transportation, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 271

Administrative practice and procedure, Hazardous materials transportation, Indian lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control.

Dated: January 14, 1993.

William Reilly,
Administrator.

For the reasons set out in the preamble, title 40, chapter I, of the Code of Federal Regulations, is amended as follows:

PART 260-HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

1. The authority citation for part 260 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921-6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974.

2. Section 260.10 is amended adding, in alphabetical order, definitions for "Corrective action management unit" and "Remediation waste," and by revising the definitions for "Disposal Facility," "Facility," "Landfill," and "Miscellaneous Unit" to read as follows:

§260.10 Definitions.

* * * * *

Corrective action management unit or CAMU means an area within a facility that is designated by the Regional Administrator under part 264 subpart S, for the purpose of implementing corrective action requirements under §264.101 and RCRA section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

* * * * *

Disposal facility means a facility or part of a facility at which hazardous waste is intentionally placed into or on any land or water, and at which waste will remain after closure. The term disposal facility does not include a corrective action management unit into which remediation wastes are placed.

* * * * *

Facility means:

(1) All contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations of them).

(2) For the purpose of implementing corrective action under §264.101, all contiguous property under the control of the owner or operator seeking a permit under subtitle C of RCRA. This definition also applies to facilities implementing corrective action under RCRA Section 3008(h).

* * * * *

Landfill means a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

* * * * *

Miscellaneous unit means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR part 146, containment building, corrective action management unit, or unit eligible for research, development, and demonstration permit under §270.65.

* * * * *

Remediation waste means all solid and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under §264.101 and RCRA section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004(v) or 3008(h) for releases beyond the facility boundary.

* * * * *

PART 264-STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

3. The authority for part 264 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, and 6925.

4. Section 264.3 is amended by revising the first paragraph (and the comment remains unchanged) to read as follows:

§264.3 Relationship to interim status standards.

A facility owner or operator who has fully complied with the requirements for interim status-as defined in section 3005(e) of RCRA and regulations under §270.70 of this chapter-must comply with the regulations specified in part 265 of this chapter in lieu of the regulations in this part, until final administrative disposition of his permit application is made, except as provided under 40 CFR part 264 subpart S.

* * * * *

5. Paragraph (b) of §264.101 is revised to read as follows:

§264.101 Corrective action for solid waste management units.

* * * * *

(b) Corrective action will be specified in the permit in accordance with this section and subpart S of this part. The permit will contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.

* * * * *

6. 40 CFR part 264 is amended by adding subpart S to read as follows:

Subpart S-Corrective Action for Solid Waste Management Units

Sec.

264.552 Corrective Action Management Units (CAMU).
264.553 Temporary Units (TU).

Subpart S-Corrective Action for Solid Waste Management Units

§264.552 Corrective Action Management Units (CAMU).

(a) For the purpose of implementing remedies under §264.101 or RCRA Section 3008(h), the Regional Administrator may designate an area at the facility as a corrective action management unit, as defined in §260.10, in accordance with the requirements of this section. One or more CAMUs may be designated at a facility.

(1) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes.

(2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.

(b)(1) The Regional Administrator may designate a regulated unit (as defined in §264.90(a)(2)) as a CAMU, or may incorporate a regulated unit into a CAMU, if:

(i) The regulated unit is closed or closing, meaning it has begun the closure process under §264.113 or §265.113; and

(ii) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.

(2) The subpart F, G, and H requirements and the unit-specific requirements of part 264 or 265 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.

(c) The Regional Administrator shall designate a CAMU in accordance with the following:

(1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;

(2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;

(3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility;

(4) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;

(5) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and practicable;

(6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and

(7) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place

after closure of the CAMU.

(d) The owner/operator shall provide sufficient information to enable the Regional Administrator to designate a CAMU in accordance with the criteria in §264.552.

(e) The Regional Administrator shall specify, in the permit or order, requirements for CAMUs to include the following:

(1) The areal configuration of the CAMU.

(2) Requirements for remediation waste management to include the specification of applicable design, operation and closure requirements.

(3) Requirements for ground water monitoring that are sufficient to:

(i) Continue to detect and to characterize the nature, extent, concentration, direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and

(ii) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which wastes will remain in place after closure of the CAMU.

(4) Closure and post-closure requirements.

(i) Closure of corrective action management units shall:

(A) Minimize the need for further maintenance; and

(B) Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere.

(ii) Requirements for closure of CAMUs shall include the following, as appropriate and as deemed necessary by the Regional Administrator for a given CAMU:

(A) Requirements for excavation, removal, treatment or containment of wastes;

(B) For areas in which wastes will remain after closure of the CAMU, requirements for capping of such areas; and

(C) Requirements for removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU.

(iii) In establishing specific closure requirements for CAMUs under §264.552(e), the Regional Administrator shall consider the following factors:

(A) CAMU characteristics;

(B) Volume of wastes which remain in place after closure;

(C) Potential for releases from the CAMU;

(D) Physical and chemical characteristics of the waste;
(E) Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual releases; and
(F) Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.
(iv) Post-closure requirements as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system.
(f) The Regional Administrator shall document the rationale for designating CAMUs and shall make such documentation available to the public.
(g) Incorporation of a CAMU into an existing permit must be approved by the Regional Administrator according to the procedures for Agency-initiated permit modifications under §270.41 of this chapter, or according to the permit modification procedures of §270.42 of this chapter.
(h) The designation of a CAMU does not change EPA's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.

§264.553 Temporary Units (TU).

(a) For temporary tanks and container storage areas used for treatment or storage of hazardous remediation wastes, during remedial activities required under §264.101 or RCRA section 3008(h), the Regional Administrator may determine that a design, operating, or closure standard applicable to such units may be replaced by alternative requirements which are protective of human health and the environment.
(b) Any temporary unit to which alternative requirements are applied in accordance with paragraph (a) of this section shall be:
(1) Located within the facility boundary; and
(2) Used only for treatment or storage of remediation wastes.
(c) In establishing standards to be applied to a temporary unit, the Regional Administrator shall consider the following factors:
(1) Length of time such unit will be in operation;
(2) Type of unit;
(3) Volumes of wastes to be managed;

(4) Physical and chemical characteristics of the wastes to be managed in the unit;

(5) Potential for releases from the unit;

(6) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential releases; and

(7) Potential for exposure of humans and environmental receptors if releases were to occur from the unit.

(d) The Regional Administrator shall specify in the permit or order the length of time a temporary unit will be allowed to operate, to be no longer than a period of one year. The Regional Administrator shall also specify the design, operating, and closure requirements for the unit.

(e) The Regional Administrator may extend the operational period of a temporary unit once for no longer than a period of one year beyond that originally specified in the permit or order, if the Administrator determines that:

(1) Continued operation of the unit will not pose a threat to human health and the environment; and

(2) Continued operation of the unit is necessary to ensure timely and efficient implementation of remedial actions at the facility.

(f) Incorporation of a temporary unit or a time extension for a temporary unit into an existing permit shall be:

(1) Approved in accordance with the procedures for Agency-initiated permit modifications under §270.41; or

(2) Requested by the owner/operator as a Class II modification according to the procedures under §270.42 of this chapter.

(g) The Regional Administrator shall document the rationale for designating a temporary unit and for granting time extensions for temporary units and shall make such documentation available to the public.

PART 265-INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

7. The authority citation for part 265 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, 6925, and 6935.

8. Section 265.1(b) is amended by adding the phrase ", and of 40 CFR 264.552 and 40 CFR 264.553," immediately after the phrase "standards of this part" in the first sentence.

PART 268-LAND DISPOSAL RESTRICTIONS

9. The authority citation for part 268 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, and 6924.

10. Section 268.2 is amended by revising paragraph (c) to read as follows:

§268.2 Definitions applicable in this part.

* * * * *

(c) Land disposal means placement in or on the land, except in a corrective action management unit, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

* * * * *

PART 270-EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

11. The authority citation for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6924, 6925, 6927, 6939, and 6974.

12. Section 270.2 is amended by adding, in alphabetical order, a definition for "Corrective action management unit," and by revising the definition for "Disposal facility" to read as follows:

§270.2 Definitions.

* * * * *

Corrective Action Management Unit or CAMU means an area within a facility that is designated by the Regional Administrator under part 264 subpart S, for the purpose of implementing corrective action requirements under §264.101 and RCRA section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

* * * * *

Disposal facility means a facility or part of a facility

at which hazardous waste is intentionally placed into or on the land or water, and at which hazardous waste will remain after closure. The term disposal facility does not include a corrective action management unit into which remediation wastes are placed.

* * * * *

13. Appendix I to §270.42 is amended by adding a new section N, to read as follows:

§270.42 Permit modification at the request of the permittee.

* * * * *

Appendix I to §270.42-Classification of Permit Modification

Modification	Class
* * * * *	
N. Corrective Action:	
1. Approval of a corrective action management unit pursuant to § 264.552.	3
2. Approval of a temporary unit or time extension for a temporary unit pursuant to §264.553.	2
* * * * *	

PART 271-REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

14. The authority citation for part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), and 6926.

15. Section 271.1(j) is amended by adding the following entry in Table 1 in chronological order by date of publication:

§271.1 Purpose and scope.

* * * * *

(j) * * *

Table 1.-Regulations Implementing the Hazardous and Solid Waste Amendments of 1984

Promulgation date	Title of regulation	Federal Register reference	Effective Date
* * * * * * *			
Feb. 16, 1993.....	Corrective Action Management Units and Temporary Units; Corrective Action Provisions under Subtitle C	58 FR	Apr. 19, 1993.

* * * * *

[FR Doc. 93-3154 Filed 2-12-93; 8:45 am]
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