ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 264, 265, 270, and 271

[FRL-3403-8; EPA/OSW-FR-90-012]

RIN 2050-AB42

Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency is today proposing requirements under the Resource Conservation and Recovery Act (RCRA) for corrective action for solid waste management units (SWMUs) at facilities seeking a permit under section 3005(c) of RCRA. This proposal will establish procedures and technical requirements for implementing corrective action under section 3004(u) of RCRA.

Today's proposal would create a new subpart S in the RCRA part 264 regulations to define requirements for conducting remedial investigations, evaluating potential remedies, and selecting and implementing remedies at RCRA facilities. It also proposes to amend the RCRA part 270 permit requirements, make conforming changes to part 264 and 265 facility closure information requirements, and establish standards for States to become authorized to administer corrective action requirements.

DATES: Written comments on this proposed rule should be submitted on or before September 25, 1990.

Public hearings on this proposed rulemaking are scheduled as follows:

- October 9, 1990 in San Francisco, CA.
- October 12, 1990 in Washington, DC.

ADDRESSES: The public hearings will be held at the following locations:

- October 9, 1990 at the Hyatt Regency San Francisco in Embarcadero Center, 5 Embarcadero Center, San Francisco, CA 94111 (415-788-1234); and
- October 12, 1990 at the Omni-Shoreham Hotel, 2500 Calvert Street NW., Washington, DC 20008 (202-234-0700).

Those individuals who wish to present oral testimony at either of the public hearings must request an opportunity to be heard. Requests must be made in writing to Thea McManus, Hearings Clerk, Office of Program Management (OS-305), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. The request should reference the RCRA Corrective Action Proposed Rule, Regulatory Docket No. F-90-CASP-FFFFF. Unless otherwise requested in writing, individuals will be scheduled 10-minute time segments to present oral testimony. Time segments will be allotted based on the order in which the written requests are received. Written requests must be received by the end of the written comment period.

Written comments on today's proposal should be addressed to the docket clerk at the following address: U.S. Environmental Protection Agency, RCRA Docket (OS-305), 401 M Street SW., Washington, DC 20460. One original and two copies should be sent and identified by regulatory docket reference number F-90-CASP-FFFFF. The docket is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. Docket materials may be reviewed by appointment by calling (202) 475-9327. Copies of docket materials may be made at no cost, with a maximum of 100 pages of material from any one regulatory docket. Additional copies are $0.15 per page.

FOR FURTHER INFORMATION CONTACT: General questions about the regulatory requirements under RCRA should be directed to the RCRA/Superfund Hotline, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, DC 20460, (800) 424-9346 (toll-free) or (202) 382-3000 (local). For the hearing impaired, the number is (800) 553-7672 (toll-free), or (202) 475-9652 (local).

Specific questions about the issues discussed in this proposed rule should be directed to David M. Fagan, Office of Solid Waste (OS-341), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-4740.

SUPPLEMENTARY INFORMATION:

Outline

I. Authority

These regulations are issued under the authority of sections 1003, 1006, 2002(a), 3004(u), 3004(v), 3005(c), and 3007 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, 42 U.S.C. 6924 (a), (u), and (v), and 6925(c).

II. Background

Prior to passage of the Hazardous and Solid Waste Amendments of 1984 (HSWA), statutory authorities and promulgated regulations for compelling corrective action at facilities regulated under subtitle C of the Resource Conservation and Recovery Act (RCRA) were limited to the following: (1) Section 7003 of RCRA, which provides EPA enforcement authority to take action where solid or hazardous waste may present an imminent and substantial endangerment to human health or the environment; (2) section 3013 of RCRA, which provides authority for requiring investigations where the presence of hazardous waste or releases of hazardous waste may present a substantial hazard to human health or the environment; and (3) 40 CFR part 264, subpart F, which provides a regulatory program to address releases of hazardous wastes and hazardous constituents to ground water 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 26, 1982.) Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), provides a broad authority, similar to RCRA section 7003, to take abatement actions to remediate any actual or potential imminent and substantial endangerment caused by actual or threatened releases of hazardous substances.

The 1984 HSWA amendments substantially expanded corrective action authorities for both permitted RCRA facilities and facilities operating under interim status. Section 3004(u) of HSWA requires that any permit issued under section 3005(c) of RCRA to a treatment, storage, or disposal facility after November 8, 1984, address corrective action for releases of hazardous wastes or hazardous constituents from any solid waste management unit (SWMU) at the facility. These permits will contain schedules of compliance where corrective action activities cannot be completed prior to permit issuance. In addition, facility owners or operators must demonstrate assurances of financial responsibility for completing the required corrective actions. Section 3004(v) authorizes EPA to require corrective action beyond the facility boundary where appropriate. Section 3008(h) provides EPA with authority to issue administrative orders or bring court action to require corrective action or other measures, as appropriate, when there is or has been a release of hazardous waste or hazardous constituents from a RCRA facility operating under interim status.

III. Purpose of Today's Rule

The purpose of today's rule is to establish a comprehensive regulatory framework for implementing the Agency's corrective action program under RCRA. This rule defines both the procedural and substantive requirements associated with sections 3004(u) and 3004(v). While the new corrective action authorities became effective on their date of enactment (November 8, 1984), today's proposed rule is intended to establish a comprehensive regulatory framework for these statutory authorities. The proposal should serve to promote national consistency in implementing this important component of the RCRA

program, and will establish standards to which States seeking authorization for section 3004(u) corrective action must demonstrate equivalence. In addition, this rulemaking provides a procedural vehicle for the regulated community and other interested parties to comment on the Agency's regulatory intentions for this program.

The following sections of this preamble provide a detailed explanation of the background and specifics of today's proposed rulemaking. Section IV discusses implementation of the corrective action program to date. Section V provides an overview of the regulatory program proposed today and the management philosophy which led to this proposal. Section VI provides a section-by-section analysis of the proposed rule. Section VII examines the relationship of today's rule to other environmental programs. Section VIII discusses public involvement in the corrective action program, while section IX provides information on State authorization for the new program.

IV. EPA's Implementation of the Corrective Action Program To Date

Since 1982, the RCRA program has been implementing the subpart F corrective action requirements for releases to ground water from regulated units through permits. Since November 1984, the HSWA corrective action requirements, which were effective immediately, have been implemented on a case-by-case basis in individual facility permits or section 3008(h) corrective action orders. To implement the HSWA corrective action program to date, EPA has issued several regulations and guidance documents. This section describes those rules and guidance documents, the current status of corrective action activities in the permitting and enforcement programs, and the availability of technical guidance documents pertaining to corrective action.

A. Pre-HSWA RCRA Corrective Action

EPA's base permit regulations, promulgated under pre-HSWA authority, establish a program for monitoring and remediating releases to ground water from regulated hazardous waste management units (40 CFR part 264, subpart F, discussed below), and reporting of releases from permitted units (under 40 CFR part 270). These regulations were established in 1982 under the general statutory authority in section 3004(a) of RCRA.

Under current subpart F regulations, the corrective action requirement (§ 264.100) is the third step of a three-phase program for detecting, characterizing, and responding to releases to the uppermost aquifer from regulated units. The first phase, called detection monitoring, requires facility owners or operators to monitor ground water at the downgradient edge of the waste management boundary for indicator parameters or constituents that indicate the likelihood of a release. If a release is detected, the owner/operator tests for all appendix IX (of 40 CFR part 264) constituents, and a ground-water protection standard (GWPS) is established for every appendix IX constituent detected above background levels. Under the second, or compliance monitoring phase of the program (which is triggered when the release is confirmed), the owner/operator is required to perform additional investigations to characterize the nature and extent of contamination. In the third and final stage—corrective action—the owner/operator is required to remove or treat in place all contaminants present in concentrations above the ground-water protection standard beyond the compliance point.

The ground-water protection standards established under subpart F are set at either the background levels, maximum contaminant levels (MCLs) for 14 specific constituents, or alternate concentration limits (ACLs). MCLs are contaminant concentration levels which represent the maximum permissible level in drinking water supplies as promulgated by the EPA under the Safe Drinking Water Act. ACLs are contaminant concentration levels determined by the Agency to be protective of human health and the environment based on site-specific circumstances. Proposed revisions to the existing subpart F regulations to create a program consistent with today's proposal for subpart S are expected to be published shortly in the **Federal Register**. A discussion of the relationship between this proposal and the proposed amendments to subpart F is included in section VII.C of this preamble.

B. July 15, 1985, Codification Rule (50 FR 28702)

On July 15, 1985, EPA promulgated regulations that codified the statutory language of the new section 3004(u) corrective action authority of HSWA (see 50 FR 28702, 40 CFR 264.90(a)(2) and 264.101). In particular, the July 1985 Codification Rule amended 40 CFR part 264, subpart F by adding new § 264.101, which essentially reiterated the statutory language of section 3004(u).

In addition, the preamble to the July 1985 Codification Rule defined the Agency's jurisdiction under the new authorities by interpreting a number of key terms in the statutory language. Specifically, the preamble discussed EPA's interpretations of the terms "facility," "solid waste management unit," and "release," in relation to the new corrective action authorities. (EPA is proposing to codify these definitions, with some modifications, in today's rule.) The preamble also provided the Agency's interpretation of the authority conferred on it through section 3008(h), the interim status corrective action authority. A detailed discussion of the Agency's interpretation of the section 3008(h) authority was provided in a December 16, 1985, guidance memorandum entitled "Interpretation of section 3008(h) of the Solid Waste Disposal Act." A copy of that memorandum may be found in the docket established for this rulemaking.

C. December 1, 1987, Codification Rule (52 FR 45788)

On December 1, 1987, EPA issued a companion to the July 1985 Codification Rule that further modified the part 264 and part 270 hazardous waste management regulations to implement the new statutory provisions of HSWA (see 52 FR 45788). This Second Codification Rule addressed issues arising from the new amendments rather than codifying requirements imposed directly by the statute. Three elements of that rule relate to the new HSWA corrective action requirements: Permit application requirements for solid waste management units (SWMUs), corrective action beyond the facility boundary, and corrective action for injection wells with permits-by-rule.

The Second Codification Rule amended the existing part B permit application requirements of § 270.14 by adding a new provision (§ 270.14(d)) that requires certain information pertaining to solid waste management units at the facility applying for a RCRA permit. The new provision requires descriptive information on all solid waste management units at the facility, and all available information pertaining to any past or current releases from these units. The provision also requires facility owner/operators to perform sampling and analysis as required by EPA to assist in determining whether or not releases have occurred from solid waste management units at the facility.

The Second Codification Rule also amended §§ 264.100 and 264.101 of the RCRA part 264 regulations to codify section 3004(v) of RCRA. This statutory provision requires facility owner/operators to address corrective action for releases that have migrated beyond

the facility boundary, unless the owner or operator demonstrates to EPA that, despite his or her best efforts, s/he was unable to obtain the necessary permission to undertake the required actions (see §§ 264.100(e) and 264.101(c)). This new provision applies to releases from all solid waste management units, including releases to the uppermost aquifer from regulated units. Moreover, section 3004(v) makes it clear that the provision applies to certain interim status units (section 3004(v)(2)), as well as units at permitted facilities (section 3004(v)(1)). Where access to off-site property is denied, EPA may require that certain measures be taken on site to mitigate the off-site contamination (*e.g.*, source control measures). As will be discussed later, EPA is today proposing changes to these regulatory provisions.

The Second Codification Rule also included new provisions governing the implementation of corrective action requirements through RCRA permits-by-rule for Class I hazardous waste injection wells (see §§ 270.60(b)(3), 144.1(h), 144.31(g)). Under 40 CFR 270.60, the corrective action requirements of § 264.101 must be addressed in order to obtain a permit-by-rule for a hazardous waste injection well. Since today's proposal will replace § 264.101, these facilities will be required to comply with today's proposed subpart S regulations in the same manner as other facilities which receive permits under section 3005(c) of RCRA.

The Second Codification Rule also clarified that a Class I hazardous waste injection well with a UIC permit issued after November 8, 1984, does not have a RCRA permit-by-rule until the corrective action requirements are imposed at the entire facility. Further, the Second Codification Rule clarified that a Class I injection well that received a UIC permit retains interim status under RCRA until corrective action requirements (if necessary) are imposed through a RCRA rider permit.

D. Proposed Rule, Financial Assurance for Corrective Action (51 FR 37854)

On October 24, 1986, EPA proposed new amendments to the financial responsibility standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities (hereinafter referred to as FACA—see 51 FR 37854). This proposed rule provided a regulatory framework for implementing the statutory requirement of section 3004(u) (codified in §§ 264.101 and 264.90(a)(2)) for demonstrating financial assurance for the costs of corrective actions.

The 1986 FACA proposal set out a detailed set of procedures implementing the section 3004(u) financial assurance requirements. These procedures addressed: (1) The timing of financial assurance demonstrations; (2) cost-estimating procedures, including the periodic adjustment of cost estimates, for determining the amounts of required financial assurance; and (3) permissible financial assurance mechanisms, including their required wording and allowable combinations of mechanisms. EPA is today proposing specific language which will clarify when financial assurance for corrective action must be demonstrated and when adjustments to the coverage levels will be required. With respect to all other procedural aspects associated with the FACA requirements (*e.g.*, the set of acceptable mechanisms or use of a mechanism for multiple financial responsibilities), EPA intends to use the FACA proposal as general guidelines for examining, on a case-by-case basis, the adequacy of the financial assurances. Financial assurance for corrective action is discussed more fully in section VII.C.5 of this preamble.

E. National RCRA Corrective Action Strategy (51 FR 37608) and the RCRA Corrective Action Outyear Strategy (Fall, 1989)

In October 1986, EPA issued a draft "National RCRA Corrective Action Strategy" to inform the Regions, States, regulated community, and the public of the Agency's overall plans for implementing the HSWA corrective action authorities. The Strategy provided an overview of the HSWA corrective action authorities and the universe of RCRA facilities subject to these authorities, and described the basic process for identifying, investigating, and remediating releases at RCRA facilities. It also discussed the Agency's plans for establishing priorities for corrective action, the relationship between permitting and enforcement authorities, factors influencing the management of corrective action, and the relationship between EPA and the States in implementing this program.

The Agency received a number of comments on the draft strategy, many of which are reflected in the content of today's proposed rule. Today's proposal, which addresses in detail most of the elements of the draft strategy, effectively finalizes the strategy.

Although some portions of the draft strategy, such as the Agency's plans for prioritizing RCRA facilities for corrective action, are not fully addressed in today's proposal, they are the subjects of recommendations contained in the RCRA Corrective Action Outyear Strategy (CAOS), published in the Fall of 1989. These recommendations outline a management approach for the corrective action program that is realistic and workable in light of the many challenges that EPA and the States will face in implementing this program over the next several years. While some of the CAOS recommendations can be directly implemented, others will be addressed in detail in forthcoming guidance.

F. Implementation of the HSWA Corrective Action Program

To implement the corrective action program to date, EPA has developed a general process to assure that actions taken are commensurate with the problem presented. In this process, each stage serves as a screen, sending forward to the next step those facilities or units at a facility which the Agency has found to be a potential problem, and eliminating from further consideration units and facilities where the Agency has discovered no current environmental problem. The Agency intends to provide sufficient flexibility in this process to facilitate timely abatement of environmental problems.

RCRA facilities are generally brought into the corrective action process at the time the Agency is considering a permit application for the facility, or when a release justifying action under section 3008(h) is identified. The process begins with an Agency-conducted RCRA Facility Assessment (RFA), which is analogous to the Superfund Preliminary Assessment/Site Investigation (PA/SI). The RFA includes: (1) A desk top review of available information on the site; (2) a visual site inspection to confirm available information on solid waste management units at the site and to note any visual evidence of releases; and (3) in some cases, a sampling visit, to confirm or disprove suspected releases. If, after completion of the RFA it appears likely that a release exists, the Agency typically develops a schedule of compliance, to be included in a facility's RCRA permit, for further studies and actions the permittee must undertake to fulfill the responsibilities imposed by section 3004(u). Alternatively, the Agency might issue an order pursuant to section 3008(h) to compel corrective action.

The second stage of the corrective action process is the RCRA Facility Investigation (RFI). The RFI is undertaken when a potentially significant release has been identified in the RFA; its purpose is to characterize

the nature and extent of contamination at the facility, and it is analogous to the Remedial Investigation (RI) process of the Superfund program. Typically, the RFI will be focused on specific concerns identified in the RFA and will be staged to avoid unnecessary analysis. When the Agency determines, on the basis of data generated during the RFI or other information, that cleanup is likely to be necessary, the owner/operator will be required to conduct a Corrective Measure Study (CMS) to identify a solution for the problem at the site. Once the Agency selects the remedy for the facility, the Agency will either issue a followup section 3008(h) order (in the case of an interim status facility), or modify the permit, and the remedy will be implemented by the owner/operator with Agency oversight.

In certain situations, the Agency may require an "interim measure" at the facility without waiting for the final results of the RFI or the CMS. Interim measures are actions required to address situations which pose a threat to human health or the environment or to prevent further environmental degradation or contaminant migration pending final decisions on required remedial activities. Superfund generally uses the removal authority provided under section 104 of CERCLA to accomplish this same objective where expedited response and/or emergency actions are needed.

Currently, implementation of the corrective action program is being undertaken by EPA, with assistance from State agencies. Six States have been authorized to date to implement the HSWA corrective action program.

The general corrective action process described above is carried forward in today's proposal. However, today's proposal will describe the requirements in greater detail, and will provide the public an opportunity to comment on this approach.

More detailed information about each of the phases of the corrective action program as implemented to date can be found in the guidance documents referenced below. Additional guidance will be developed in the future.

1. *RCRA Facility Assessment Guidance* (Final, October, 1986). This document can be obtained through the National Technical Information Services (NTIS), 5285 Port Royal Rd., Springfield, VA—(703) 487–4650. Document Number PB87–107769.

2. *RCRA Facility Investigation Guidance* (Interim Final, May, 1989). For further information, contact: Jon Perry—(202) 382–4663.

3. *Corrective Action Plan* (Interim Final, May, 1988). For further information, contact: (202) 382–4460.

4. *Interim Measures Guidance* (Interim Final, May, 1988). For further information, contact: Tracy Back—(202) 382–3122.

V. Approach to Corrective Action in Today's Rule

Together with the National Contingency Plan (NCP), which EPA recently promulgated (March 8, 1990, 55 FR 8666), today's proposal defines EPA's overall approach to the cleanup of environmental contamination resulting from the mismanagement of hazardous and solid waste. Today's proposal will establish a regulatory framework for corrective action under section 3004(u) of RCRA and will provide guidelines for corrective action orders imposed through administrative orders under section 3008(h) of RCRA. Substantive provisions of the rule, when promulgated, generally will be applicable to response actions under CERCLA involving releases of hazardous waste (including hazardous constituents). These provisions may also be "relevant and appropriate" to other CERCLA response actions.

This section of the preamble briefly summarizes EPA's basic approach to RCRA corrective action, the fundamental cleanup goals of the program, and the major elements of today's rule.

A. Priorities and Management Philosophy for RCRA Corrective Action

Approximately 5,700 facilities are currently in the RCRA subtitle C universe, and therefore are potentially subject to corrective action requirements. These facilities are likely, together, to have as many as 80,000 SWMUs. Many of these facilities, EPA believes, will require some level of remedial investigation and corrective action to address past or current releases.

The level of investigation and subsequent corrective action will vary significantly across facilities. This regulation would ensure that variation can be accommodated by recognizing that the necessary scope of investigations and studies may be different depending upon the situation presented. It is the Agency's intention that State and Regional personnel have the ability to require investigations sufficient to fully characterize the facility and assess necessary actions. In many cases the problem will pose less risk or be less complex than a major Superfund site listed on the National Priorities List. Therefore, the Agency expects that, for the most part, RCRA cleanups will be less complex and less expensive than those under CERCLA, and less detailed study will be required before remedial action begins. In some cases, however, the Agency also recognizes that the situation could be comparable to that of a major CERCLA site. In such cases, the Agency will require more detailed analysis and more rigorous oversight. There will also be cases where immediate action is required, while at many other sites, current exposure will be limited and action can be safely deferred. Not only will the nature of cleanup required vary widely, but so too will the characteristics of the facility owner/operators. Some facilities will be sites controlled by financially viable owner/operators, while others will be weak financially; some will be under active long-term management, but at others the owner/operator will be seeking to leave the site; some will be simple facilities with one or two storage tanks, yet others will be major complexes, such as large Federal facilities, with thousands of solid waste management units.

Because of the wide variety of sites likely to be subject to corrective action, EPA believes that a flexible approach, based on site-specific analyses, is necessary. No two cleanups will follow exactly the same course, and therefore the program has to allow significant latitude to the decision maker in structuring the process, selecting the remedy, and setting cleanup standards appropriate to the specifics of the situation. At the same time, a series of basic operating principles guide EPA's corrective action program under RCRA. These principles, which are reflected in today's proposal, are described briefly below.

In managing the corrective action program, the Agency will place its highest priority on action at the most environmentally significant facilities and on the most significant problems at specific facilities. EPA is committed to directing its corrective action resources first to the most environmentally significant problems. The level of threat posed by each of the 5,700 facilities now subject to corrective action varies widely—some are a major concern and require prompt attention; others will require eventual cleanup but do not currently pose a threat; still others have no significant releases and will not require corrective action at all. At some of these facilities, EPA will automatically address corrective action because of its permitting priorities. Under HSWA, statutory deadlines were established for issuance of RCRA

permits to the various types of treatment, storage, and disposal facilities. Each of these permits must, to the extent necessary, require a schedule of compliance for corrective action. However, a substantial universe of facilities that will not receive permits must also be addressed for corrective action. EPA, through its Environmental Priorities Initiative, will review and set priorities for action among these facilities, to ensure that it addresses the most significant first.

It will also be important for EPA to set priorities and focus its efforts within facilities undergoing corrective action through the permitting process. Facilities receiving permits will present the full range of remedial problems; EPA and authorized States must carefully manage their resources at these facilities to ensure that the program effectively focuses on the most pressing problems. The Agency's first priority will be to require interim measures to address sites posing an immediate threat to human health and the environment, and to pursue engineering remedies to control or eliminate further migration of environmental releases. In addition, the Agency will expect prompt remediation of all significant off-site contamination, regardless of whether human or environmental exposure to the contamination is currently occurring. On the other hand, sites where current exposure is low and releases have been effectively controlled will be a lower priority. This is particularly likely to be the case where a site is controlled by a financially viable owner/operator who can ensure that releases are adequately contained and exposure eliminated and who will be capable of undertaking eventual cleanup.

The Agency may rely on "conditional" remedies where prompt remedial action can reduce risk to levels acceptable for current uses, or where final cleanup is impracticable. As a general principle, EPA believes that cleanups must achieve a level appropriate for all actual and reasonably expected uses (The question of cleanup goals is discussed more fully in the next section of this preamble.) RCRA sites subject to corrective action, however, will typically be facilities seeking permits to manage hazardous waste, rather than sites that are widely open to the public and subject to a broad range of uses. As long as the permit is in place and the facility is under the management of the owner/operator, exposure to contaminated media within the facility boundary, such as contaminated soils, would be significantly less than it would be in an area of unrestricted access, where future uses might include residential or agricultural development. In such controlled use situations, EPA believes that it will often be reasonable to require prompt cleanup to levels consistent with current use, but to defer final cleanup as long as the owner/operator remains under a RCRA permit.

In other cases, it may be readily apparent that cleanup of a site to levels appropriate for unrestricted use will be impracticable. RCRA will have to address a number of intractable problems, such as the cleanup of large, complex sites like municipal landfills, or ground-water cleanup where the bedrock is heavily fractured. In these cases as well, it may be appropriate to rely on "conditional" remedies that control risk during the life of the permit, and rely on institutional controls to prevent future exposure.

EPA expects that these conditional remedies will play a significant role in the implementation of RCRA corrective action, and will enable the Agency and the regulated community to focus their resources most effectively on the most pressing problems. Further discussion of "conditional" remedies is contained in section VI.F.8 of this preamble.

The Agency intends to remove regulatory disincentives to independent action by facility owner/operators and will encourage voluntary cleanups. EPA recognizes that it is important to allow willing and responsible owner/operators to begin corrective action promptly without unnecessary procedural delays. In many cases, the Agency believes that owner/operators will wish to take source control measures, begin ground-water pumping, or take other measures to reduce or eliminate a problem. EPA encourages these activities, and in many cases may find it appropriate to incorporate owner/operator. initiated corrective action into permits as interim measures. In addition, the Agency has taken steps to simplify RCRA permit modification procedures for corrective action in its final rule on RCRA permit modifications (53 FR 37912, September 28, 1988). The issue of voluntary corrective action is discussed more fully in section VI.A of this preamble.

Facility investigations and other analyses will be streamlined to focus on plausible concerns and likely remedies, and to expedite cleanup decisions. While remedial investigations must be thorough enough to identify any serious problems, EPA recognizes that its own resources and those of the regulated industry are finite, and therefore that these investigations must be focused on plausible concerns and conducted in a step-wise fashion, with early screens to determine whether further investigation is necessary. Similarly, although it will be necessary in some cases—particularly at facilities with large and complex cleanup problems—for the owner/operator to analyze a wide range of cleanup alternatives, at most RCRA facilities a more limited analysis will be appropriate. For example, when the appropriate remedy is self-evident (*e.g.*, drum removal and treatment to best demonstrated available technology (BDAT)), it may be unnecessary to evaluate alternatives that would not be adopted. Similarly, where an owner/operator proposes a remedy that is effective and protective, it may be appropriate to approve the remedy and avoid continued studies that would serve only to delay cleanup. In either case, the permit would establish performance standards in the form of cleanup levels. If the remedy failed to achieve these standards, it would have to be modified accordingly. Section VI.H.5 of the preamble discusses in further detail the issue of the technical impracticability of achieving a remedial requirement given a specified remedy.

In managing the corrective action program, the Agency will emphasize early actions and expeditious remedy decisions. One of the Agency's overriding goals in managing the corrective action program will be to expedite cleanup results by requiring sensible early actions to control environmental problems on an interim basis, and using flexible and pragmatic approaches in making final remedy decisions. EPA believes that in many cases it will be possible to identify early in the corrective action process actions which can and should be taken to control exposure to contamination, or to stop further environmental degradation from occurring. Such interim measures may be relatively straightforward, such as erecting a fence or removing small numbers of drums, or may involve more elaborate measures such as installing a pump and treat system to prevent further migration of a ground-water contaminant plume. In another example, where it is obvious that the eventual remedy will require excavation and treatment or removal of contaminated "hotspots," such action should be initiated as an interim measure, rather than deferring it until after final remedy selection.

Final remedy decisions must be based on careful judgments and sound technical information. However, today's proposed rule provides for considerable flexibility in structuring studies and

selecting remedies. It is EPA's intention to use that flexibility to streamline the remedy development/decision process whenever feasible. Corrective Measure Studies should focus on plausible remedial options, and should be scaled to fit the complexity of the remedial situation. Obvious remedial solutions should not be impeded by unnecessary studies. Voluntary cleanup initiatives by owner/operators that are consistent with EPA's cleanup goals will be encouraged as a means of expediting the remedial process.

B. Cleanup Goals for Corrective Action

EPA's goal in RCRA corrective action is, to the extent practicable, to eliminate significant releases from solid waste management units that pose threats to human health and the environment, and to clean up contaminated media to a level consistent with reasonably expected, as well as current, uses. The timing for reaching this goal will depend on a variety of factors, such as the complexity of the action, the immediacy of the threat, the facility's priority for corrective action, and the financial viability of the owner/operator. However, the final goal of cleanup would remain the same.

It should be recognized that EPA's emphasis in today's rule on minimizing further releases means that corrective action will frequently require source removal, source control, and waste treatment. In this respect, today's rule reflects a shift in emphasis from current RCRA corrective action requirements for ground-water releases from regulated units. These requirements currently focus on cleanup of the ground water, but not on control of the source. However, EPA believes that it will frequently be impossible to control releases and ensure the long-term effectiveness of remedies without significant source control. For example, a response action that focuses entirely on remediation of the contaminated medium may meet acceptable cleanup standards in the short term, but continued leaking could lead to unacceptable releases in the future as the source continues to leak. Therefore, today's rule explicitly provides EPA authority to require source control.

One of the more controversial issues related to corrective action is the cleanup goals for contaminated media, or "how clean is clean." EPA has not attempted in this rule or elsewhere to establish specific cleanup levels for different hazardous constituents in each medium. Instead, EPA believes that different cleanup levels will be appropriate in different situations, and that the levels are best established as part of the remedy selection process. Generally, however, the cleanup must achieve protective levels for future as well as current uses. This is the approach taken in today's proposal.

To be "protective" of human health, EPA believes that cleanup levels for carcinogens must be equal to or below an upperbound excess lifetime cancer risk level of 1 in 10,000 (1×10^{-4}). As proposed today, cleanup levels would be selected within the upper bound 1×10^{-4} to 1×10^{-6} risk range during the selection of remedy process; however, remedies at the more protective end of the range would ordinarily be preferred. For non-carcinogens, cleanup levels would be set at a level at which adverse effects would not be expected to occur. The application of this approach to specific media is described below.

Ground water. Potentially drinkable ground water would be cleaned up to levels safe for drinking throughout the contaminated plume, regardless of whether the water was in fact being consumed. Where maximum contaminant levels (MCLs) established under the Safe Drinking Water Act are available for specific contaminants, these limits generally will be used; otherwise, the levels would be set within the protective range. Alternative levels protective of the environment and safe for other uses could be established for ground water that is not an actual or reasonably expected source of drinking water.

Soil. Contaminated soil would be remediated to levels consistent with plausible future patterns of use. For example, where access to an area would be unrestricted, cleanup would generally be required to levels appropriate for residential development. At industrial sites or sites dedicated to long-term hazardous waste management, cleanup to less stringent levels might be appropriate, although institutional controls could be necessary to ensure that the use pattern did not change.

Surface water. Releases to surface water should be remediated to levels consistent with potential uses. For example, where surface water is designated for drinking water or is a potential drinking water source, cleanup to drinkable levels would be required. In the case of surface water, environmental effects are likely to be particularly important, because levels protective for humans may often be insufficient for protection of aquatic organisms.

Air. Like soil, air releases from solid waste management units would be of concern where they posed a threat to humans or the environment under plausible current or future use patterns. Typically, corrective action involving air concerns would involve source control to minimize further releases.

C. Major Elements of Today's Proposal

The principles described above will shape EPA's general approach to corrective action, and they serve as operating assumptions behind today's notice. Today's proposal will establish the basic framework for the corrective action program, both for EPA and authorized States. More specifically, it codifies the procedures for identifying problems and selecting remedies at RCRA facilities; the standards for cleanup, including the establishment of cleanup levels; and the standards for managing cleanups and the wastes generated by cleanups. The major elements of the proposal are summarized below.

Permitting procedures and permit schedules of compliance. Today's proposal, which implements section 3004(u), addresses corrective action at facilities seeking RCRA permits. Corrective action requirements will be imposed on these facilities directly through the permitting process and will be incorporated into permits through schedules of compliance. Typically, before a permit is issued, EPA or an authorized State would conduct an RFA at the facility to determine whether a potential problem existed. Where a likely release was found, the permit would contain a schedule of compliance, as specified in proposed § 264.510, requiring a remedial investigation focusing on the specifics of the likely release. This schedule of compliance would be a part of the permit, and would be successively modified, as necessary, as studies and corrective actions at the facility proceeded.

Trigger or "action levels." Where contamination is identified during the facility investigation, EPA or an authorized State will have to make a decision on whether further analysis, including analysis of potential remedies, is appropriate, or whether the contamination is at an insignificant level. For this reason, the rule incorporates the concept of "action levels"—levels that, if found in the environment, will typically trigger a Corrective Measure Study. Under today's proposal, action levels would be established in the initial permit, or, in some cases, through a permit modification after a release has been identified.

Section 264.521 of the proposal establishes the general principles by which action levels would be established for each medium. To provide

guidance for RCRA permit writers, industry, and the public, today's proposal includes in Appendix A of this preamble values that the Agency believes may be appropriate as action levels for a number of hazardous constituents in different environmental media. These levels would be incorporated individually into permits through the permitting process.

If environmental levels were found to be below the action levels, no further action would ordinarily be required. However, even if an action level has been exceeded, the proposal in § 264.514 would allow the owner/operator to demonstrate that no action was necessary. For example, if ground water were not a potential source of drinking water because of high levels of natural contamination, an owner/operator might successfully argue that cleanup was unnecessary. In this way, action levels would constitute rebuttable presumptions. This issue is discussed in more detail in section VI.E.2 of this preamble.

Corrective Measure Study and remedy selection. Typically, if an action level has been exceeded, the facility owner/operator would be required under the proposal to conduct a Corrective Measure Study (CMS). The purpose of the CMS is to identify and evaluate potential remedies. EPA anticipates that, in a few cases, owner/operators of larger sites with complex environmental problems may need to evaluate several alternative remedial approaches in determining the most appropriate remedy for the facility. For most RCRA facilities, however, it will be possible to abbreviate the analysis, and frequently it may be appropriate for the owner/operator to propose a single alternative, which EPA would approve or disapprove. The proposed regulation in § 264.522 gives the Agency the necessary flexibility to vary the scope of the Corrective Measure Study, depending on the specifics of the situation.

EPA would approve or select the remedy under the standards and criteria proposed in § 264.525. Proposed § 264.525(a) would require the remedy to be protective of human health and the environment, to achieve media cleanup standards, to minimize further releases, and to comply with subtitle C and other waste management standards. In selecting the remedy, the Agency would be required to consider a wide range of factors, such as the remedy's short- and long-term effectiveness and its practicability. These factors are generally comparable to the factors considered by the Agency in selecting Superfund remedies under § 300.430 of the NCP. (See 55 FR 8666, March 8, 1990.)

Remedies selected under § 264.525 would require formal permit modifications, with opportunity for public comment and rights of appeal. After public comment, the proposed permit schedule of compliance would be amended, (if necessary) and approved, to require that the owner/operator develop a specific remedial design and, after approval of the design, carry out the remedy.

Cleanup levels. The Agency's goal is that remedies clean up to levels determined to be protective of human health and the environment. EPA's general cleanup goals are described in section B above and in section VI.F.5 of this preamble. Specific levels for each facility, consistent with these goals, would be established during the remedy selection process and would be incorporated into the permit and made available for public comment.

Where protective levels could not be attained, or where wastes were left on site in disposal units, long-term management would be required through the permit.

Standards for management of corrective action waste. Proposed §§ 264.550–264.552 would establish standards for conducting corrective action and handling wastes generated during corrective action. If corrective action waste meets the RCRA regulatory definition of hazardous it would have to be handled under the proposal as hazardous waste. With some limited exceptions, new units built to treat, store, or dispose of this waste on-site would have to comply with 40 CFR part 264 performance standards for hazardous waste units. Similarly, hazardous waste shipped off site would have to be sent to RCRA subtitle C facilities.

The rule would also establish more flexible standards for temporary treatment and storage units developed during the course of corrective action.

Completion of remedy. Proposed § 264.530 would establish requirements for remedy completion. Similar to RCRA closures, an independent engineer or other qualified professional would have to certify completion of the remedy, and, in addition, public notice and comment would be required before the Agency made a final decision on whether the remedy had been completed.

In some cases, it might become clear in the course of a remedy that it was not technically practicable to reach the cleanup levels specified in the permit. In this case, proposed § 264.531 would allow termination of the remedial action and waiver of the cleanup standard. However, if environmental contamination remained at unprotective levels, long-term institutional or other controls would be required to prevent human and environmental exposure.

These requirements and alternatives that the Agency considered are discussed in more detail in the following sections.

VI. Section-by-Section Analysis

A. Purpose/Applicability (Section 264.500)

1. *Conforming Changes to Previous Codification of § 3004(u) and General Discussion.* In today's proposal, EPA is establishing a new subpart S to 40 CFR part 264. This section of the proposed rule sets forth the general applicability of the proposed subpart S regulations. The procedures and technical requirements of subpart S apply to any facility seeking a permit under section 3005(c) of RCRA.

The language of § 264.500(a) through § 264.500(d) reiterates the statutory language of section 3004(u) and section 3004(v). Proposed §§ 264.500 (b), (c), and (d) have already taken effect as a final rule following public notice and comment, and are codified at 40 CFR 264.101 (on July 15, 1985, 50 FR 28702; and December 1, 1987, 52 FR 45788). It is not the Agency's intention to reopen for public comment the substance of these pre-existing provisions. The Agency seeks comment only on the minor language changes reflected in § 264.500 (*e.g.*, compare the first sentence of § 264.101(b) with the first sentence of § 264.500(c)), and its proposal to move these provisions from § 264.101 to § 264.500.

Proposed § 264.500(a) clarifies that subpart S applies to corrective action for all SWMUs, including regulated units (defined in § 264.90(a)(2) as any landfill, surface impoundment, waste pile, or land treatment unit that received hazardous waste after July 26, 1982). Corrective action for releases to ground water from regulated units is currently governed by § 264.100. Subpart S will apply to the investigation of releases to ground water from other SWMUs. Releases to other media (air, soil and surface waters) from both regulated units and other SWMUs will also be governed by subpart S.

The Agency intends to modify the § 264.100 standards to be consistent with the applicable sections of subpart S. Thus, regulated units and other SWMUs would be subject to the same standards for identifying and

implementing necessary remedial action. However, regulated units will continue to be subject to slightly different standards for identifying and confirming unacceptable releases to ground water. EPA believes that this distinction between regulated units and the larger universe of SWMUs is justified by the slightly different function of investigating procedures in the context of regulated units; the purpose of the ground-water detection and compliance monitoring programs in subpart F is primarily preventive, rather than essentially responsive like the subpart S program.

The statutory language of section 3004(u), repeated in §§ 264.500 (b) and (c), allows EPA to issue a RCRA permit with a schedule of compliance for investigating and correcting releases, rather than delay issuance of the permit until cleanup has been completed. This will allow more prompt permitting both of interim status facilities, bringing them under the more stringent 40 CFR part 264 standards sooner, and of new facilities, allowing more rapid expansion of treatment, storage, and disposal capacity.

Schedules of compliance, which are enforceable components of the permit, will thus be the primary vehicle by which EPA will specify the procedural and technical requirements that owner/operators must follow to achieve compliance with their subpart S responsibilities. EPA is proposing specific procedural requirements for corrective action schedules of compliance, including requirements associated with modifications to the schedules, in today's rule as amendments to the existing 40 CFR part 270 permit regulations.

As specified in proposed § 264.500(b), subpart S regulations will apply to all facilities seeking permits under subtitle C of RCRA (with the exception of the specific permits identified in proposed § 264.500(f)). Permits subject to subpart S include post-closure permits, as well as permits issued to operating hazardous waste management facilities. Further discussion of the applicability of post-closure permit requirements and their relationship to section 3004(u) corrective action is discussed in the preamble to the Second Codification Rule (December 1, 1987, 52 FR 45788).

2. *Exceptions to Applicability.* Today's proposed § 264.500(f) lists four types of RCRA "permits" to which the subpart S regulations would not apply. Each is discussed below.

a. *Permits for Land Treatment Demonstrations.* Current RCRA regulations for hazardous waste land treatment units (see § 270.63(a) and § 264.272) provide for a two-phased permit process in certain circumstances. A "permit" can be issued to a facility with permit conditions which cover only the activities needed to demonstrate that the hazardous waste constituents can be completely degraded, transformed, or immobilized in the treatment zone. Such a permit does not address the full RCRA standards (*e.g.*, financial assurance, general facility standards) that apply to land treatment facilities. In the absence of permit conditions addressing full RCRA facility standards, this first-phase demonstration permit is not considered a full RCRA permit issued under the authority of section 3005. Once the demonstration is successfully completed and the actual operating permit (*i.e.*, second part of the two-phased permit) for the land treatment unit is issued, the subpart S corrective action requirements will apply.

b. *Emergency Permits.* Section 270.61 of the RCRA regulations provides for issuance of emergency permits, not to exceed 90 days in duration, where immediate actions that involve treatment, storage, or disposal of hazardous waste are necessary to protect human health and the environment. The emergency permit provision was included in the RCRA regulations as a way to provide a mechanism for responses by an owner/operator in true emergency situations which could not be delayed until a full RCRA permit could be issued. In some cases, emergency permits can be issued orally when followed by a written permit within a specified time frame. EPA does not believe it is appropriate to apply subpart S requirements to emergency permits, since such a requirement would render this permit mechanism unworkable for the quick-response situations it was designed to address. If a facility is required to continue to operate under a RCRA permit beyond the allowable time limit for emergency permits, a full operating permit would be required and the facility would be subject to subpart S requirements.

c. *Pemits-by-Rule for Ocean Disposal Barges or Vessels.* Ocean disposal barges and vessels are regulated primarily under the Marine Protection, Research and Sanctuaries Act (MPRSA) The applicable RCRA regulations (40 CFR 270.60(a)) provide that operation of vessels accepting hazardous waste for ocean dumping are deemed to have a RCRA permit if they have obtained and comply with an ocean dumping permit issued under the MPRSA, and comply with certain RCRA administrative requirements. The RCRA permit-by-rule functions primarily to ensure that certain administrative requirements of the RCRA system—in particular, waste manifest requirements—apply to owner/operators of such vessels. Furthermore, as of November 1988, the Ocean Dumping Ban Act has in effect banned the ocean dumping of industrial waste. While corrective action requirements under subpart S do apply to underground injection control (UIC) facilities and publicly-owned treatment works (POTWs) with National Pollutant Discharge Elimination System (NPDES) permits subject to RCRA permits-by-rule under 40 CFR 270.60, such requirements are necessary to ensure that corrective action requirements apply to releases from all solid waste management units at these facilities not regulated under other laws. MPRSA permits, however, cover all portions of ocean-dumping vessels. (Any onshore storage or treatment facility that may be associated with the ocean disposal operation is required to obtain a separate RCRA permit.) Thus there are no unregulated units within an ocean dumping barge "facility." Furthermore, unauthorized releases from such vessels are subject to regulation under the MPRSA. EPA does not believe it is appropriate to apply subpart S to these vessels because the substantive requirements of section 3004(u) of RCRA are already effectively satisfied by MPRSA requirements.

d. *Research, Development and Demonstration Permits.* EPA does not believe that RCRA requires the application of section 3004(u) requirements to facilities seeking a research and development demonstration permit under section 3005(g) of RCRA. The conference report on section 3004(u) expressly states that the provision is intended to apply to facilities seeking a permit under section 3005(c) of RCRA. Accordingly, facilities seeking a permit under section 3005(g) would not automatically be encompassed by section 3004(u). Moreover, the reading of section 3004(u) suggested by the conference report is supported by the statutory language of section 3005(g). Section 3005(g)(1) provides that the Regional Administrator shall include such terms and conditions in research and development demonstration permits as s/he deems necessary to protect human health and the environment, including provisions related to monitoring, financial responsibility and remedial action. Section 3005(g)(1) further provides that these provisions may be established case-specifically in each permit without the establishment of

separate regulations. Accordingly, the plain language of section 3005(g)(1), and the legislative history of section 3004(u) both suggest that research and development demonstration permits can be subject to case-specific remedial conditions in the permit as determined to be necessary, and need not be subject to the general corrective action regulations developed under section 3004(u).

3. *Voluntary Corrective Action.* Today's proposal for corrective action under the authority of RCRA section 3004(u) applies to RCRA facilities which are seeking permits under RCRA subtitle C. Certain facilities where RCRA hazardous wastes are present, and where corrective action may be needed, are not required to obtain subtitle C permits, and, therefore, are not subject to today's rule. For example, facilities which generate hazardous wastes and accumulate and store the wastes on site for less than 90 days prior to shipment to another facility are not subject to permits or to today's proposed rule.

In a number of cases, owner/operators not subject to a RCRA permit have expressed an interest in proceeding with corrective action in an attempt either to reduce their liability or to preclude subsequent Agency or State actions. Some activities conducted during voluntary corrective action may require a permit if hazardous waste is involved (*e.g.*, excavated waste is placed into a disposal unit or stored on site for more than 90 days).

Current regulations, however, provide significant flexibility for non-permitted facilities to undertake corrective action without a RCRA permit. For example, 40 CFR 262.34 allows generators to accumulate hazardous waste on site in tanks or containers for up to 90 days without a permit or interim status, as long as certain conditions—most importantly compliance with tank and container standards of 40 CFR part 265—are met. In addition, this authority allows generators to treat hazardous waste in tanks during the accumulation period. Under RCRA regulations, a facility owner/operator conducting voluntary corrective action involving hazardous waste could often be considered a generator. One approach to achieving cleanup without triggering the need to obtain a subtitle C permit would be to store or treat such generated wastes in tanks within the accumulation period, so long as the wastes remained on site for less than 90 days, and other conditions of § 262.34 were met.

In addition, voluntary corrective action could take place under a consent decree issued under section 7003 of RCRA. This authority allows EPA (or an authorized State with comparable authority) to require remedial action in the case of an imminent and substantial threat to human health or the environment, "notwithstanding any other provisions of this Act." Thus, under this authority, EPA could order a facility to take corrective action, while at the same time waiving permit requirements. Any facility interested in taking corrective action under this authority should consult with the appropriate Region or authorized State to explore the possibility of a section 7003 consent order.

The concept of "voluntary" corrective action may also apply to owner/operators who have been issued permits with corrective action schedules of compliance. Some facilities, such as those with small or low-risk contamination problems, will be of relatively low priority for expending the substantial resources required to oversee investigations and studies and make remedy decisions. For those facilities, EPA's oversight attention could be deferred for several years while the program focuses on high priority facilities with major environmental problems. However, owner/operators of lower priority facilities may wish, for various reasons, to expeditiously initiate cleanup actions, rather than wait for EPA to begin actively pursuing corrective action for the facility. EPA strongly encourages owner/operator cleanup initiatives at permitted facilities, and intends to facilitate such actions by minimizing any administrative obstacles which may impede cleanup.

Owner/operators may take a wide range of remedial-type activities at RCRA permitted facilities without triggering the need for formal approval by the Agency or modification of the permit. Such activities include, for example, treatment, storage, or disposal of any non-hazardous solid wastes; excavation of hazardous wastes for disposal off site; less-than-90-day storage or treatment of hazardous wastes in tanks; and treatment of contaminated ground water in an exempt wastewater treatment unit. However, some activities which may be necessary to achieve corrective action goals at the facility would require a permit modification. Such activities might include creation of a new hazardous waste land disposal unit, consolidation and/or movement of hazardous wastes between SWMUs at the facility, or construction (or movement on site) of a new hazardous waste incinerator to manage corrective action wastes.

The Agency intends to pursue an approach to this type of "voluntary" corrective action which will provide sufficient Agency oversight over cleanup activities to prevent possible adverse effects of cleanup actions without creating disincentives to owner/operators who wish to take a proactive position vis-a-vis their corrective action responsibilities. This approach would encourage the owner/operator to notify EPA and the State of any remedial-type activities being undertaken at the facility, even though the activities are not subject to formal Agency approval. For proposed cleanup activities that are subject to permit modification requirements, the owner/operator would be required to submit a request for a Class I, II or III permit modification, or a request for temporary authorization for the activities. (See the final permit modification regulations at 53 FR 37912, September 28, 1988.) In the request for a permit modification (or temporary authorization), the owner/operator would be expected to include: (1) A description of the remediation initiative, including details of the unit or activity that is subject to permit requirements; and (2) an explanation of how the proposed action is consistent with overall corrective action objectives and requirements outlined in today's proposed regulation. EPA expects that the corrective action regulations proposed today will offer owner/operators clear guidance in fashioning acceptable remedies and making such showings of consistency.

EPA's review of the application would focus on the units or actions subject to the permit modification requirements; it would not, however, focus on whether the proposed cleanup action as a whole satisfies the subpart S requirements. Rather, EPA will screen the cleanup proposal to ensure that it would not pose unacceptable risks to human health and the environment (*e.g.*, by producing undesirable cross-media impacts) or interfere with attainment of the final remedy at the site (*e.g.*, by creating a new unit over an area of soil contamination which may later need to be treated or removed to health-based levels). Following this review, the Agency would approve or disallow the application.

Where a permit modification is approved under these circumstances, the modification will make clear that the voluntary activities initiated for corrective action purposes may not be the final remedy, and that those activities, when completed, will not necessarily absolve the owner/operator from further cleanup responsibilities at a

later date. This will also hold for cleanup actions reviewed by the Agency that are not subject to permit modifications. It is not possible for the Agency to delegate to owner/operators the ultimate responsibility for ensuring that remedial activities fully satisfy RCRA's statutory requirement for protection of human health and the environment.

The Agency solicits comments on the approach to voluntary corrective action described above.

B. Definitions (Section 264.501)

EPA is today proposing to define five key terms which apply specifically to this subpart.

1. *Facility.* In the July 15, 1985, Codification Rule, EPA interpreted the term "facility" in the context of section 3004(u) to mean all contiguous property under the control of the owner/operator of a facility seeking a permit under subtitle C. This interpretation was upheld in a decision of the U.S. District Court of Appeals (*United Technologies Corporation* vs. *U.S. EPA*, 821 F2d. 714 (DC Cir. 1987)). Thus, by proposing this interpretation as the definition of facility in today's rule, EPA is not modifying its basic interpretation as previously elaborated for the purpose of implementing section 3004(u). There are, however, several aspects of this definition which merit further clarification.

The definition of facility in today's proposal at § 264.501 is not intended to alter or subsume the existing—and narrower—definition of "facility" that is given in 40 CFR 260.10. That definition describes the facility as "* * * all contiguous land and structures * * * used for treating, storing or disposing of hazardous waste * * *" EPA intends to retain this definition for the purposes of implementing RCRA subtitle C requirements, with the exception of subpart S corrective action (including those provisions governing corrective action for regulated units). At the same time, however, the Agency is reviewing its uses of the term "facility" in other parts of the subtitle C regulations to ensure consistent usage.

Today's proposed definition refers to "contiguous property" under the control of the owner/operator. Several questions have been raised as to the Agency's interpretation of "contiguous property" in the context of defining the areal limits of the facility. Clearly, property that is owned by the owner/operator that is located apart from the facility (*i.e.*, is separated by land owned by others) is not part of the "facility." EPA does intend, however, to consider property that is separated only by a public right-of-way (such as a roadway or a power transmission right-of-way) to be contiguous property. The term "contiguous property" also has significant additional meaning when applied to a facility where the owner is a different entity from the operator. For example, if a 100-acre parcel of land were owned by a company that leases five acres of it to another company that, in turn, engages in hazardous waste management on the five acres leased, the "facility" for the purposes of corrective action would be the entire 100-acre parcel. Likewise, if (in the same example) the operator also owned 20 acres of land located contiguous to the 100-acre parcel, but not contiguous to the five-acre parcel, the facility would be the combined 120 acres. EPA invites comment on these interpretations of contiguous property.

In some cases, adjacent properties may be separately owned by two different subsidiaries of a parent company, where only one of the subsidiaries' operations involves management of hazardous wastes. In such cases, EPA intends to consider the ownership to be held by the parent corporation. Thus, in the example provided, the facility would include both properties.

EPA acknowledges that, in some situations, "ownership" of property can involve a complex legal determination. EPA solicits comment and information on the interpretation offered in general, and specifically on the issue of how ownership or "control" of property should be determined in the context of subsidiary-parent companies.

2. *Release.* Today's proposal includes the definition of "release" articulated in the preamble to the July 15, 1985, Codification Rule. This definition essentially repeats the CERCLA definition of release. Today's proposed definition also includes language from SARA which extended the concept of "release" to include abandoned or discarded barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents.

Although this definition of release is quite broad, section 3004(u) is limited to addressing releases from solid waste management units. Thus, there may be releases at a facility that are not associated with solid waste management units, and that are therefore not subject to corrective action under this authority. (See discussion below which defines solid waste management unit.)

Many facilities have releases from solid waste management units that are issued permits under other environmental laws. For example, stack emissions from a solid waste refuse incinerator at a RCRA facility are likely to be authorized under a State-issued air permit. Another example would be NPDES (National Pollutant Discharge Elimination System, under the Clean Water Act), or State-equivalent, permits for discharges to surface water from an industrial wastewater treatment system. EPA does not intend to utilize the section 3004(u) corrective action authority to supersede or routinely reevaluate such permitted releases. However, in the course of investigating RCRA facilities for corrective action purposes, EPA may find situations where permitted releases from SWMUs have created threats to human health and the environment. In such a case, EPA would refer the information to the relevant permitting authority or program office for action. If the permitting authority is unable to compel corrective action for the release, EPA will take necessary action under section 3004(u) (for facilities with RCRA permits) or section 3008(h) (for interim status facilities), as appropriate, and to the extent not inconsistent with certain applicable laws (see section 1006(a) of RCRA).

3. *Solid Waste Management Unit (SWMU).* Today's rule proposes the following definition of solid waste management unit:

> 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.

This definition is also derived from the Agency interpretation discussed in the July 15, 1985, Codification Rule. A discernible unit in this context includes the types of units typically identified with the RCRA regulatory program, including landfills, surface impoundments, land treatment units, waste piles, tanks, container storage areas incinerators, injection wells, wastewater treatment units, waste recycling units, and other physical, chemical or biological treatment units.

The proposed definition also includes as a type of solid waste management unit those areas of a facility at which solid wastes have been released in a routine and systematic manner. One example of such a unit would be a wood preservative "kickback drippage" area, where pressure treated wood is stored in a manner which allows preservative fluids routinely to drip onto the soil, eventually creating an area of highly contaminated soils. Another example might be a loading/unloading area at a

facility, where coupling and decoupling operations, or other practices result in a relatively small but steady amount of spillage or drippage, that, over time, results in highly contaminated soils. Similarly, if an outdoor area of a facility were used for solvent washing of large parts, with amounts of solvent continually dripping onto the soils, that area could also be considered a solid waste management unit.

For clarification purposes it may also be useful to identify certain types of releases that the Agency does not propose to consider solid waste management units using the "routine and systematic" criterion. A one-time spill of hazardous wastes (such as from a vehicle travelling across the facility) would not be considered a solid waste management unit. If the spill were not cleaned up, however, such a spill would be illegal disposal, and therefore subject to enforcement action under section 3008(a) or section 7003 of RCRA. Similarly, leakage from a chemical product storage tank would generally not constitute a solid waste management unit; such "passive" leakage would not constitute a routine and systematic release since it is not the result of a systematic human activity. Likewise, releases from production processes, and contamination resulting from such releases, will generally not be considered solid waste management units, unless the Agency finds that the releases have been routine and systematic in nature. (Such releases could, however, be addressed as illegal disposal under section 3008(a) or section 7003.) EPA solicits comment on these interpretations, and on the overall definition of solid waste management unit.

EPA recognizes that these interpretations have the effect of precluding section 3004(u) from addressing some environmental problems at RCRA facilities. However, EPA intends to exercise its authority, as necessary, under the RCRA "omnibus" provision (section 3005(c)(2)), or other authorities provided in RCRA (*e.g.*, section 3008(a) and section 7003) or CERCLA (*e.g.*, CERCLA section 104 or section 106), or States, under State authorities, to correct such problems and to protect human health and the environment.

The RCRA program has identified certain specific units and waste management practices at facilities about which questions have been raised concerning applicability of the definition of a solid waste management unit. One such question relates to military firing ranges and impact areas. Such areas are often potentially hazardous, due to the presence of unexploded ordnance. EPA has decided that such areas should not be considered solid waste management units. There is a strong argument that unexploded ordnance fired during target practice is not discarded material which falls within the regulatory definition of "solid waste." Ordnance that does not explode, as well as fragments of exploded ordinance, would be expected to land on the ground. Hence, the "ordinary use" of ordnance includes placement on land. Moreover, it is possible that the user has not abandoned or discarded the ordnance, but rather intends to reuse or recycle them at some time in the future. In addition, a U.S. District Court decision (*Barcello* vs. *Brown*, 478 F. Supp. 646, 668–669 (D. Puerto Rico 1979)), has suggested that materials resulting from uniquely military activities engaged in by no other parties fall outside the definition of solid waste, and thus would not be subject to section 3004(u) corrective action.

Another issue which raises questions regarding the definition of "solid waste management unit" relates to industrial process collection sewers. Process collection sewers are typically designed and operated as a system of piping into which wastes are introduced, and which usually discharge into a wastewater treatment system. The Agency believes that there are sound reasons for considering process collection sewers to be solid waste management units. Such sewers typically handle large volumes of waste on a more or less continuous basis, and are an integral component of many facilities' overall waste management system. Program experience has further indicated that many of these systems, especially those at older facilities, have significant leakage, and can be a principal source of soil and ground-water contamination at the facility. Although process collection sewers are physically somewhat unique in the context of the types of units which have traditionally been regulated under RCRA, EPA believes that including them as solid waste management units for purposes of corrective action is well within the discretion provided under the statute for EPA to determine what "units" should be subject to RCRA standards.

EPA recognizes that there may be technical problems associated with investigating releases from process collection sewers, and with correcting leakage. Information and comment are specifically solicited on EPA's tentative decision to treat process collection sewers as solid waste management units, and on technical approaches and limitations to investigating and correcting releases from such systems.

For essentially the same reasons as described above for process sewers, EPA also proposes to include open (or closed) ditches that are used to convey solid wastes as solid waste management units; comment is also solicited on this interpretation.

4. *Hazardous Waste and Hazardous Constituents.* Section 3004(u) requires corrective action for releases of "hazardous wastes or constituents." The Agency believes that use of the term "hazardous waste" denotes "hazardous waste" as defined in section 1004(5) of RCRA. Accordingly, today's proposed rule repeats the statutory definition of "hazardous waste" found in that section. The term "hazardous waste" is distinguished from the phrase "hazardous waste listed and identified," which is used elsewhere in the statute to denote that subset of hazardous wastes specifically listed and identified by the Agency pursuant to section 3001 of RCRA. Thus, the remedial authority under section 3004(u) is not limited to releases of wastes specifically listed in 40 CFR part 261 or identified pursuant to the characteristic tests found in that section. Rather, it extends potentially to any substance meeting the statutory definition. However, EPA believes that use of the phrase "hazardous wastes or *constituents*" (emphasis added) indicates that Congress was particularly concerned that the Agency use the section 3004(u) authority to address a specific subset of this broad category, that is, hazardous constituents.

The term "hazardous constituent" used in section 3004(u) means those constituents found in appendix VIII to 40 CFR part 261. See H. Rep. No. 98–198, 98th Cong., 1st Sess. 60–61, May 17, 1983. In addition, the Agency proposes to include within the definition those constituents identified in appendix IX to 40 CFR part 264. Appendix IX generally constitutes a subset of appendix VIII constituents particularly suitable for ground-water analyses. However, it also includes additional constituents not found on appendix VIII, but commonly addressed in ground-water analysis conducted as a part of Superfund cleanups.

It is EPA's intention that investigations of releases under subpart S focus on the subset of hazardous waste (including hazardous constituents) that is likely to have been released at a particular site, based on the available information. Only where very little is known of waste characteristics, and where there is a

potential for a wide spectrum of wastes to have been released, would the owner/operator be required to perform extensive or routine analysis for a broader spectrum of wastes.

5. *Corrective Action Management Unit (CAMU).* The definition of CAMU is provided in section VI.J 3.b of today's preamble. This section also provides a thorough discussion of the CAMU concept and of how the Agency intends to define CAMUs in the context of implementing remedies.

C. Remedial Investigations (Sections 264.510–264.513)

1. *General.* The RCRA Facility Investigation (RFI) is the second phase of the RCRA corrective action process, and will typically be preceded by a RCRA Facility Assessment (RFA), conducted by EPA or the State prior to issuance of the permit or section 3008(h) order. The RFA is the first step in the RCRA corrective action process, and is analogous to the Preliminary Assessment/Site Investigation (PA/SI) stage of the Superfund program. The RFA serves as a screen, eliminating solid waste management units (SWMUs), environmental media, or entire facilities from further consideration where the Agency determines that there is no evidence of a release 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 remedial investigations by identifying those releases or areas that are of the most environmental concern at the facility. The RCRA RFI is comparable to the Remedial Investigation in the Superfund program. Because of the similarity of the two processes and because of their common goals, the RFI is referred to in this section and in the rule by the more generic term, remedial investigation.

As described above, EPA would require a remedial investigation under proposed § 264.510 if the RFA indicated that a release 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 remedial investigation would be specified by the Agency 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; it would also typically require the owner/operator to develop a plan for conducting these investigations. The permit would also include "action levels" for specific constituents in specific media under investigation. If subsequent investigation indicated that these action levels had been exceeded, a Corrective Measure Study could be required by the Agency.

EPA has recently issued a guidance document entitled *RCRA Facility Investigation Guidance,* which describes a menu of technical investigations that may be appropriate to conducting remedial-type investigations at RCRA facilities. EPA wishes to emphasize that the nature and scope of remedial investigations for RCRA facilities under proposed § 264.510 will be tailored to the specific conditions and circumstances at the facility. Investigations will be focused on the specific units, releases, and exposure pathways that have been identified by EPA to be of concern. In some cases, the scope of a remedial investigation could be limited to taking several soil samples of a particular area of discolored soils. Likewise, for inactive units that do not contain substantial volumes of volatile organic compounds, remedial investigations will rarely need to address air releases. In defining the nature and scope of remedial investigations at RCRA facilities, EPA will endeavor to minimize unnecessary and unproductive investigations, and to focus resources on characterizing actual environmental problems at facilities.

Today's rule, in §§ 264.511 through 264.513, proposes a regulatory framework (both procedural and substantive) for conducting remedial investigations. For more information on technical approaches to these investigations, readers should refer to the *RFI Guidance,* which has been included in the public record of this rulemaking.

EPA also anticipates that remedial investigations will typically be phased, to avoid unnecessary investigations where a concern can be quickly eliminated. Because of the importance of accurate data, and the likely need to extend or modify the analysis as data are developed, the remedial investigation will often, in addition, require a high level of interaction between the permittee and the Agency. The specific contents and scope of the investigations are described below.

2. *Scope of Remedial Investigations (§ 264.511).* Proposed § 264.511 defines in general terms the scope of remedial investigations which may be required under § 264.510. Proposed § 264.511(a) states the general performance objective that remedial investigations characterize the nature, extent, direction, rate, movement, and concentration of releases, as required by the Agency. The scope and complexity of remedial investigations will depend on the nature and extent of the contamination, whether the releases have migrated beyond the facility boundary, the amount of existing information on the site, the likely risk at the site, and other pertinent factors. The proposed general performance standard gives considerable flexibility to the Agency in defining the specific scope, level of detail, and data requirements for each remedial investigation. The specific investigation requirements deemed to be appropriate at a given facility will be included in the permit as part of the schedule of compliance.

Proposed §§ 264.511(a)(1)–(7) provide a menu of more specific types of information that may be required in remedial investigations: (1) Characterization of the environmental setting; (2) characterization of solid waste management units; (3) description of the humans and environmental systems which are, have been, or may potentially be exposed to the release; (4) information that will assist the Agency in assessing the risk posed to humans and environmental systems by the release; (5) extrapolations of future contaminant movement; (6) 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 (7) statistical analyses to aid in the interpretation of data required in the investigation.

The *RFI Guidance* describes in detail technical approaches to characterizing the releases and environmental settings in remedial investigations. In addition, the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (September 1986) provides specific guidelines for characterizing ground-water releases. Therefore, this preamble will not describe in detail these technical procedures.

Section 264.511(a)(1)(i)–(v) describes five types of information that may be required in a characterization of the environmental setting: Hydrogeologic conditions; climatological conditions; soil characteristics; surface water characteristics including sediment quality; and air quality and meteorological conditions. This information would be required as appropriate to address the concerns identified in the RFA. Specific requirements for the facility will be included in the permit schedule of compliance.

Section 264.511(a)(2) would allow EPA to require a characterization of any SWMU from which releases may be

occurring or may have occurred. This characterization, which could include chemical and physical analyses, will often be important in making decisions as to potential source control measures that may be needed. Characterization of wastes contained in SWMUs may involve generation of chemical and physical data about the wastes, their constituent breakdown, volumes, concentrations, and other relevant data. In some cases, unit characteristics such as materials of construction, age, or type and thickness of liners may be relevant to remedy decisions.

Section 264.511(a)(3) proposes that the Agency may require a full "* * * description of human and environmental systems which are or may be exposed to release(s)." The proximity and distribution of exposed populations may indicate the need for interim measures as proposed under § 264.540 of today's rule. Useful exposure information will generally be available at facilities with landfills or surface impoundments, in the form of Exposure Information Reports required under section 3019 of RCRA. The RFA report may also provide useful information on human and environmental systems which may potentially be exposed. Where information available prior to permit issuance does not adequately identify potentially exposed populations, EPA will require this information, as appropriate, to be generated as part of the remedial investigation.

The Agency is also concerned with the potential exposure of sensitive environmental species or systems to releases from SWMUs. As in the Superfund program, the Agency intends to carefully evaluate effects on sensitive environmental systems, including wetlands, estuaries, and habitats of endangered or threatened species.

Section 264.511(a)(4) would provide the Agency with the authority to require information that will assist the Regional Administrator in the assessment of risks to human health and the environment from releases from solid waste management units. Information collected under § 264.511(a)(3) also would be used in the assessment of risk. The risk assessment would integrate information on exposed human and environmental systems and information on contaminant concentrations to assess the magnitude of threats to exposed populations. The Agency may perform a risk assessment to determine whether interim measures are appropriate prior to selecting the final remedy or to evaluate whether a determination is warranted so that no further action is necessary (under proposed § 264.514). The permittee should refer to chapter VIII of the *RFI Guidance* for information regarding the Agency's expectations for data that may be needed to conduct a risk assessment.

Section 264.511(a)(5) would provide the authority for the Agency to require a permittee to submit information that extrapolates future contaminant movement. Such information could be important in determining whether interim measures will be required to prevent further migration of contamination and what measures are likely to be effective in doing so. In addition, extrapolated contaminant movement will be important in assessing the adequacy of proposed schedules of implementation of the remedy.

Section 264.511(a)(6) would provide the Agency with the authority to require "* * * laboratory, bench-scale, or pilot-scale tests or studies to determine the feasibility or effectiveness of treatment technologies * * * that may be appropriate in implementing remedies at the facility." It is often difficult, and sometimes impossible, to predict the effectiveness of treatment technologies accurately without data from bench- or pilot-scale studies. Experience in the Superfund program has shown that bench-scale and pilot-scale studies can be useful both in developing potential remedies and in predicting the effectiveness of alternative approaches. Typically, such studies would be performed during the Corrective Measure Study (CMS) (which may be required after a contaminant concentration level specified in the permit as an "action level" is exceeded). However, in some cases such studies may need to be initiated during the remedial investigation to prevent delays in cleanups, and the Agency should have the regulatory authority to require this. For example, at SWMUs at facilities where confirmed releases have occurred over a long period of time and where wastes placed in those SWMUs were highly toxic or mobile, it should not be necessary to wait for the CMS phase of the corrective action process to begin to evaluate, on a small scale, the effectiveness of various treatment technologies in achieving protective concentration levels in the contaminated medium.

Section 264.511(a)(7) would provide the authority for the Agency to require a permittee to perform statistical analyses to aid in the interpretation of data collected through remedial investigations required under § 264.510. For example, such statistical analyses may be needed to determine whether measured concentrations of contaminants exceed action levels.

Section 264.511(b) would authorize the Regional Administrator to specify the constituents and parameters for which samples collected during remedial investigations would be analyzed. Generally, analyses required will be limited to certain hazardous wastes or hazardous constituents listed in appendix VIII of 40 CFR part 261 or appendix IX of 40 CFR part 264 that are known or suspected to have been released from the unit. However, in some cases, where the wastes disposed in the unit are unknown to the owner/operator, or the unit is known to contain a hazardous substance(s) not included on either appendix VIII or IX, referenced above, additional analyses may be required. In the first case, it may be necessary to have an initial analysis which is designed to scan, for example, for all appendix IX constituents. Further analyses may then be limited to constituents which are found to be present in the initial sample. In addition, EPA may stipulate a requirement to analyze for substances not on either appendix VIII or IX (see preamble discussion on the definition of "hazardous waste"). Authority to specify the analyses to be performed, and for which constituents, will be important in ensuring that quality data are developed to accurately characterize releases, and to support no further action decisions that may be appropriate.

3. *Plans for Remedial Investigations (§ 264.512).* Under today's proposed § 264.512, permittees may be required to submit a plan for conducting the remedial investigation if an investigation is determined to be necessary. The Agency considered, but is not proposing, making submittal of such plans an absolute requirement; that is, expressing it as a "shall" rather than a "may". In some cases the Region or State may have extensive knowledge of the facility prior to permit issuance, and may be able to specify, in detail, how the investigations should be conducted. In this situation, it would not be necessary to require the owner/operator to submit a workplan for approval. Likewise, in some other cases the permittee may have begun remedial investigations under an interim status corrective action order, under CERCLA, or on a voluntary basis. Where the workplan developed for investigations prior to permit issuance is determined by the Regional Administrator to be adequate, it will not be necessary to require submission and approval of the current plan—that plan would simply be

incorporated into the permit. In the great majority of cases, however, the Agency believes that plans for remedial investigations will need to be submitted by the permittee. The permit would specify a schedule for submission of the plan, as well as the elements the plan must include. These requirements will generally reflect the complexity of the situation to be addressed. The Agency considered a requirement that would impose a definite deadline for every owner/operator required to submit an RFI plan (*e.g.*, 90 days after permit issuance). Typically 90 days would be sufficient time for an owner/operator to develop and submit a plan for the investigation. However, the circumstances at some facilities may be highly complex (*e.g.*, location above a Karst formation) and may mean that more than 90 days would be required to develop an adequate plan. Further, where the Agency must set priorities to manage a heavy work load, facilities suspected of having serious contamination may be required to submit plans more quickly. Therefore, EPA has not proposed a specific time period within which the plan must be submitted, but the Agency is soliciting comment on whether such an approach is preferable to the more flexible approach in today's proposal.

Plans for conducting remedial investigations would be subject to review and approval or modification by the Regional Administrator. When a workplan submitted for the Regional Administrator's approval does not adequately address all elements of the investigation, the Regional Administrator may either disapprove the plan and return it to the permittee for revision, or make modifications to the plan and return the modified plan to the owner/operator as the approved plan. The latter approach is analogous to the discretion provided the Regional Administrator to modify closure plans submitted by an owner/operator pursuant to § 265.112 during interim status, or through a Notice of Deficiency during the permitting process. An approved plan will establish both requirements applicable to the conduct of the investigation and a schedule for its implementation. Section 264.512(b) would provide regulatory authority for enforcing compliance with the approved plan, which becomes an enforceable part of the permit schedule of compliance. In most cases, it is expected that the initial permit will specify that the plan becomes an enforceable component of the permit upon approval. Alternatively, the permit may be modified to incorporate the provisions of the approved plan.

Proposed § 264.512(a) lists items that the Regional Administrator may require in the work plan. Such plans should generally call for focused, staged investigations, the scope and emphasis of which will be refined as releases are verified and/or found not to have occurred. The work plans would generally include: A description of overall approach; technical and analytical approaches and methods; quality assurance procedures; and data management procedures and formats to document and track the results of investigations. In addition, the Regional Administrator may impose other elements, as necessary, to assure that work undertaken will be of an adequate quality (and an appropriate level of detail) to serve as the primary basis for decisions on further stages of the corrective action process that may be necessary at the facility.

The description of the overall approach, which could be required under proposed § 264.512(a)(1), would generally include a description of the objectives of the investigation, its schedule, and the qualifications of the persons conducting the investigation. The schedule is particularly important because, when approved, it will become enforceable as part of the schedule of compliance.

A requirement to specify the technical and analytical approaches to be employed (under proposed § 264.512(a)(2)) might include specifications for the location, construction, and frequency of sampling of ground-water monitoring wells. This would be analogous to the types of specifications for wells that are typically in permits for land disposal units.

Submissions of proposed quality assurance procedures under § 264.512(a)(3) would be evaluated to ensure that data generated during the investigation are accurate, and that they can be used with confidence to support the next steps of the corrective action process. Guidance on appropriate quality assurance procedures may be found in the RCRA Facility Investigation Guidance.

Data management procedures and formats for documenting results of the investigation are included in proposed § 264.512(a)(4) to ensure that RFI data and summary results are presented in a clear and logical manner. Studies such as the RFI typically produce large amounts of data, such as laboratory analyses of numerous waste constituents from numerous samples. Effective data management and presentation will be necessary to ensure that the data can be properly interpreted.

4. *Reports of Remedial Investigations (§ 264.513).* Proposed § 264.513 would establish the Regional Administrator's authority to require periodic reports that summarize results of remedial investigations. Timing of the reports, as well as specific content requirements, would be detailed in the permit schedule of compliance. The report format may be specified by the Regional Administrator where necessary to ensure presentation of data in an orderly and easily comprehensible fashion.

The Agency considered, but is not requiring in today's proposal, specifying intervals for reports (*e.g.*, such as every 180 days). The Agency believes that there should be flexibility in the timing of submission of reports to reflect the nature of the investigations which may be required at specific facilities. For example, where extensive monitoring-well construction and sampling are necessary, months may pass before significant results are gathered. On the other hand, where limited soil sampling of a few SWMUs is required to confirm or disprove suspected contamination, meaningful results may be achieved more quickly.

Where data generated during the investigation (or which are newly available from other sources) indicate that the investigation should be modified, the Regional Administrator may require such modifications either by negotiation with the facility owner/operator, or through a modification to the schedule of compliance. Modifications could occur, for example, if the investigation revealed that contamination had migrated, or would soon migrate, off site. In such a case, additional activities may be imposed as interim measures to contain the contamination until active, longer term remediation could begin. Further, new information may indicate the need for additional investigations, or the Regional Administrator may need to modify the investigation requirements based on preliminary analytical results.

Proposed §§ 264.513(b) and 264.513(c) would require the permittee to submit a final report of the investigation to the Regional Administrator for approval, and would allow the Agency to require the permittee to add to or otherwise revise the report if it did not fully and accurately summarize the results of the remedial investigation. This authority to require revisions should ensure that adequate information (both in quality and level of detail) is presented to

support further corrective action decisions for the facility.

In addition to the final report, the permittee would be required to submit a summary of the report under proposed § 264.513(b)(2). This summary would also be subject to the approval of the Regional Administrator, and would be mailed to all individuals on the facility's mailing list by the owner/operator. (The facility mailing list, which is required under 40 CFR 124.10(c)(1)(viii), is developed and maintained by EPA as part of the permitting process.) This proposed requirement is an important element of the Agency's overall public involvement strategy for corrective action, which is described in further detail in today's preamble under section VIII. Distribution of the summary in this manner will provide notice to interested parties as to the general nature of the environmental problems at the facility, what releases have been found, and other results of investigations.

Section 264.513(e) would require that the permittee maintain all raw data (such as laboratory reports, drilling logs, and other supporting information) at the facility for the duration of the corrective action activities and any permit period unless the Regional Administrator approves maintaining this information in a different location. Although such data will often be required to be submitted along with investigation reports, this requirement will ensure that when questions do arise concerning interpretation of data or the adequacy of procedures used to obtain and analyze data, the original records will be available for inspection.

D. Determination of No Further Action (Section 264.514)

EPA anticipates that at some facilities releases or suspected releases that are identified in a RCRA Facility Assessment (RFA), and subsequently addressed as part of required remedial investigations, will be found to be non-existent, or otherwise of such a nature that they do not pose a threat to human health or the environment. EPA proposes providing a mechanism by which a permittee may request a permit modification to effectively terminate further requirements in these cases.

Section 264.514 proposes the procedures to be followed by both the permittee and the Regional Administrator when a determination of no further action for the facility is requested. The request for an Agency determination that no further action is required, and the corresponding permit modification request, must be accompanied by supporting documentation that demonstrates that there are no releases of hazardous waste (including hazardous constituents) from SWMUs at the facility which pose a threat to human health or the environment. (See proposed § 264.514(a)(2).)

Under proposed § 264.514(a) the permittee may request a modification of the facility permit to terminate the schedule of compliance for corrective action based on the findings of remedial investigations. The request would be initiated according to the procedures of a Class III permit modification. (See the September 1988 final permit modification rule.) These procedures would require the permittee to notify all persons on the facility mailing list of the proposed change and publish a newspaper notice concerning the request; both notices must announce the initiation of a 60 day comment period as well as the time, date, and location of an informational public meeting. In addition, a copy of the proposed modification and supporting documentation must be placed in a location accessible to the public in the vicinity of the permitted facility. (In the case of proposed modifications at facilities required to establish an information repository under § 270.36 of today's proposal, this location would be the information repository.) More detailed information concerning the requirements for a Class III permit modification may be found in the rule for permit modifications cited above and the preamble discussion which accompanies it.

Under proposed § 264.514(b), if the Regional Administrator, using all available information (including comments received during the comment period required for Class III modifications), determines that releases or suspected releases investigated either do not exist or do not pose a threat to human health or the environment, the Regional Administrator will grant the requested permit modification.

This determination will be straightforward where the permittee can demonstrate that no release has occurred; however, such a determination may still be supported when a release has occurred, whether the release(s) is either below or above action levels. For example, such a determination may be made when concentrations of hazardous constituents exceed action levels but the contamination is in a highly saline (Class III) aquifer, or where contamination in ground water can be shown to have originated from a source outside the facility. Such a determination would be consistent with the provision made in today's proposal at § 264.525(d)(2)(ii), which allows certain cleanup exemptions when contamination is present in ground water that is neither a current or potential source of drinking water nor potentially usable for other human purposes. Another example where a no further action determination might be made is where it can be determined that contaminant levels (and the risks posed by them) from a release from a SWMU are insignificant as compared to existing "background" levels (*e.g.*, levels that are naturally occurring, or that have resulted from releases from outside the facility). This determination would be consistent with the provision made in today's proposal at § 264.525(d)(2)(i).

A determination that no further action is required under § 264.514, and the subsequent termination of the permit schedule of compliance for corrective action, does not affect other responsibilities or authorities of the Regional Administrator. For example, responsibilities to include requirements in a permit for air emissions control and monitoring under section 3004(n) are not affected by a determination that no further action is required under § 264.514 (see preamble section VII.C.3 on relationship to section 3004(n) standards). In addition, the authority of the Regional Administrator to modify the permit under § 270.41 at a later date to require corrective action investigations or studies based on new information is not affected. Furthermore, despite a determination under § 264.514, EPA may require continuing or periodic monitoring when site-specific circumstances indicate that releases are likely to occur in the future. For example, for a particular SWMU from which releases have not occurred, it may be reasonable to conclude, based on site-specific circumstances, that releases to ground water might be expected within the next several years (*i.e.*, the term of the permit). In these situations, continued monitoring requirements could be imposed.

Where the permit schedule of compliance has been terminated and the Regional Administrator subsequently determines that a new investigation or remediation is required, the Regional Administrator will initiate a major permit modification under § 270.41 to require further action by the permittee.

E. Corrective Measure Study (Sections 264.520–264.524)

1. *Purpose of Corrective Measure Study (§ 264.520).* Proposed § 264.520 would establish the authority of the Regional Administrator to require the permittee to perform a Corrective Measure Study (CMS). The remedial

investigation should serve to 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; in this respect it is analogous to the Feasibility Study (FS) conducted for CERCLA remedial actions.

2. *Trigger for Corrective Measure Study (§ 264.521)—a. Use of Action Levels.* Action levels are defined in proposed § 264.521. Under proposed § 264.520(a), the Regional Administrator may require the permittee to conduct a Corrective Measure Study whenever concentrations of hazardous constituents in an aquifer, surface water, soils, or air exceed action levels for any environmental medium.

Action levels are health- and environmental-based levels determined by the Agency to be indicators for protection of human health and the environment. The Agency proposes to set action levels for hazardous constituents, a subset of hazardous wastes. Many hazardous wastes, such as some of the wastes listed in 40 CFR 261.32, are not specific constituents at all, but rather are complex mixtures comprised of many constituents. EPA believes that it would not be feasible in most cases to set action levels for such wastes. Conversely, other hazardous wastes are individual constituents that do not appear on appendix VIII to 40 CFR part 261 or appendix IX to 40 CFR part 264. When such wastes (*e.g.*, asbestos) are of concern at a facility, an action level would be specified for that waste.

Where appropriate, action levels are based on promulgated standards (*e.g.*, maximum contaminant levels established under the Safe Drinking Water Act). In other cases, action levels are established by the Regional Administrator on the basis of general criteria (see following discussion). Appendix A provides examples of concentrations derived by EPA according to these criteria for some appendix VIII and IX constituents.

The Agency is proposing the use of action levels because active remediation may not be necessary at all facilities required to perform a remedial investigation under proposed § 264.510. For instance, a remedial investigation may indicate that a suspected release identified in the RFA had, in fact, not occurred, or may indicate that levels of contamination from a past release are unlikely to present a threat to human health and the environment. Therefore, the Agency believes it should establish a trigger that will indicate the need for a CMS, and below which a CMS would not ordinarily be required.

Action levels will, whenever possible, be incorporated in the permit. The Agency believes it is advantageous to identify action levels in the permit so that the public and the permittee will know in advance what levels will trigger the requirement to conduct a CMS. This approach also minimizes the need for permit modifications later in the process, which could delay ultimate cleanup.

In some cases there may be sufficient information on the nature and levels of contamination at the time of permit issuance to establish the need for a Corrective Measure Study. In such cases, it might not be necessary to include action levels in the permit. However, it is more often likely that remedial investigations conducted after permit issuance will yield the data needed to determine if action levels are exceeded; hence the need to generally include the action levels in the original permit.

A determination that action levels have been exceeded may occur at any point during the RFI, or may not become evident until the RFI is completed. In either case, when such data become available, the permit schedule of compliance will provide for notification of the permittee that the action levels specified in the schedule have been exceeded. The notification, as provided in proposed § 264.520(d) would specify which hazardous constituents exceed action levels, for which media, and when initiation of a CMS is required.

It is the Agency's intention that the action level "trigger" approach as outlined in this proposal serves to identify early in the process the need for initiating a Corrective Measure Study; such studies should typically not be delayed pending completion of all remedial investigations. In many instances it will be appropriate to conduct simultaneously the RFI and CMS for the facility.

Action levels should be distinguished from cleanup standards, which are determined later in the corrective action process. Contamination exceeding action levels indicates a potential threat to human health or the environment which may require further study. Action levels also inform the permittee of the levels below which the Agency is unlikely to require active remediation of releases, and provide a point of reference for suggesting and supporting alternative remedial levels.

Section 264.520 allows, but does not require, the Regional Administrator to require a CMS when contamination exceeds action levels. In some cases, the permittee may rebut the presumption that a CMS is required when action levels are exceeded. For example, the permittee may establish that the contamination is not due to releases from solid waste management units at the facility. In other instances, the permittee may demonstrate that a CMS is not required (or only a limited CMS is required) if the release is confined to a Class III aquifer meeting the criteria of § 264.525(d)(2)(ii) or to ground water other than Class III for which the actual and reasonably expected uses do not merit further action. In addition, a CMS might not be required if the CMS is triggered by a carcinogenic hazardous constituent that slightly exceeds the action level but is within the 1×10^{-4} to 1×10^{-6} risk range that is protective for the site (see preamble section VI.F.5.b for discussion of risk range). This "rebuttal" of the need for a CMS would generally be made through the process for determination of no further action, proposed in § 264.514.

Conversely, the fact that no contaminants are found to exceed action levels does not preclude the Regional Administrator from requiring a CMS. Section 264.520(b) would allow the Regional Administrator to require a CMS if concentrations below action levels may pose a threat to human health or the environment, due to site-specific exposure conditions. (See discussion in section VI.E.2.h of today's preamble, below.)

In some situations it may not be obvious from the available data whether concentrations in media truly exceed action levels. This situation would arise when some data on a hazardous constituent indicate that it is present at a concentration less than the action level, while other data indicate that it is present at a concentration greater than the action level. In such situations, the Regional Administrator may require the permittee under § 264.511(a)(7) to provide additional data or statistical analyses to aid in the determination under § 264.520 of whether action levels are exceeded. For example, a tolerance, prediction, or confidence interval procedure may be required, in which the action level is compared to the upper limit established from the distribution of the data for the concentration of the constituent.

The Agency considered the alternative of establishing a mandatory requirement to perform a statistical analysis as part of the determination under § 264.520 that action levels have been exceeded. However, the Agency believes that it is unnecessary to make this requirement mandatory, since in

many cases contamination from SWMUs will greatly exceed action levels. The Agency believes that the diversity of SWMUs and contamination scenarios calls for some discretion in the requirement to perform statistical analyses. For example, in some situations, contamination from a SWMU may be known to be extensive in size and concentration. In such situations, statistical analyses are not needed to determine that an action level has been exceeded. In other situations, a contaminant release at a SWMU may not be extensive enough (either in size or concentration) to clearly indicate contamination. In these cases, a statistical test may be required to determine if a release has actually occurred in excess of action levels. The Agency requests comment on its proposed approach of providing discretion to the Regional Administrator in requiring statistical analyses, and on the alternative of making such analyses mandatory in determining whether action levels have been exceeded.

The Agency examined but did not propose two alternatives to requiring the Corrective Measure Study which did not involve the use of action levels. Under one approach, the Agency would have required the permittee to conduct a Corrective Measure Study concurrently with the remedial investigations conducted pursuant to § 264.510. Under this option, the Agency would have used the same trigger for requiring a CMS as is used to require an RFI—the finding of an existing or likely release pursuant to an RFA. This alternative was rejected because of its potential for requiring unnecessary studies.

The second alternative considered by the Agency would have required the permittee to conduct a Corrective Measure Study only after completion of the remedial investigation conducted pursuant to proposed § 264.510 and a determination of the need to protect human health and the environment. If the Agency had adopted this approach, it would not have required the permittee to conduct a CMS until all contamination and contaminant sources at the facility were fully characterized and the need for corrective measures at the facility was established. The Agency rejected the alternative because of the delay that would be associated with conducting these phases of the investigations sequentially even in cases where early data indicate that remediation is highly likely to be required.

The Agency also examined alternative approaches for setting action levels. One alternative would have required a Corrective Measure Study whenever background levels of contaminants were exceeded. Experience in the subpart F program has demonstrated that the determination of background levels can be a lengthy, controversial process. Furthermore, background levels will often be much lower than health-based levels. Thus, this alternative was rejected, since it might delay the initiation of the CMS and ultimate cleanup, and might often require Corrective Measure Studies even where levels were significantly below health and environmental-based standards.

A second alternative would have required a CMS whenever detection limits were exceeded. This alternative was also rejected, since detection limits can be difficult to define and do not directly relate to the goal of corrective action; that is, protection of human health and the environment.

The Agency also considered but did not adopt an alternative for requiring the Corrective Measure Study that would involve the use of a range of action levels. Under this approach, the Agency would select constituent-specific action levels within the 1×10^{-4} to 1×10^{-6} risk range based on the exposure scenarios proposed under §§ 264.521 (a)(2), (b), (c)(3), and (d), depending on the likelihood that exposure would in fact occur. For example, if the Agency could be convinced that there is a minimal opportunity for human exposure through one medium or several media, an action level could be established at the 1×10^{-2} risk level. This alternative was considered because the Agency is concerned about the possibility that some SWMUs might be triggered into a CMS at the 1×10^{-6} level even though they do not pose a threat to human health and the environment due to a lack of current and low probability of future exposure. Although it is the Agency's view that the proposed regulations have enough flexibility to avoid requiring a Corrective Measure Study where it is not necessary, the Agency is requesting comment on the use of a range of action levels.

The Agency believes the approach proposed in today's rule provides it with the flexibility to require the permittee to investigate corrective measures sufficiently early (whether simultaneously with the RFI or sequentially) in the corrective action process, while minimizing the potential for unnecessary investigations. Experience in the Superfund program suggests that early consideration of potential remedies allows focused investigations and prevents delays without imposing unnecessary resource burdens on either the permittee or the Agency.

b. *Criteria for Determining Action Levels.* In several cases, EPA has promulgated health-based standards appropriate for action levels for specific media. Where these standards are available, EPA intends to use them as action levels. The most obvious of these are maximum contaminant levels (MCLs), which establish drinking water standards under the Safe Drinking Water Act (SDWA). EPA will use these standards to set action levels for ground water, and, in some cases, for surface water.

In the overwhelming majority of cases, however, promulgated standards will not be available. Nevertheless, health-based levels that have undergone extensive scientific review, but which have not been formally promulgated, are available for many chemicals. The Agency is proposing today in § 264.521(a)(2) (i)–(iv) criteria which enable the Regional Administrator to use such non-promulgated health-based levels to derive action levels.

Concentrations derived from non-promulgated health-based levels that meet the following four criteria included in today's proposal could be used for action levels. First, the concentration must be derived in a manner consistent with principles and procedures set forth in Agency guidelines for assessing the health risks of environmental pollutants, which were published in the Federal Register on September 24, 1986 (51 FR 33992, 34006, 34014, 34028). Second, toxicology studies used to derive action levels must be scientifically valid, conducted in accordance with the Good Laboratory Practice Standards (40 CFR part 792), or equivalent. The Good Laboratory Practice Standards prescribe good laboratory practices for conducting studies related to health effects, environmental effects, and chemical fate testing, and are intended to assure quality data of integrity. The guidelines are for ensuring scientifically valid studies, and also may be useful as guidance. In addition, the Agency guidelines for assessing the health risks of environmental pollutants (cited above) cite several publications which outline procedures for evaluating studies for scientific adequacy and statistical soundness. Third, concentrations used as action levels must (for carcinogens) be associated with a 1×10^{-6} upperbound excess cancer risk for Class A and B carcinogens, and a 1×10^{-5} upperbound excess cancer risk for Class C carcinogens. Finally, for systemic toxicants (referring to toxic chemicals

that cause effects other than cancer or mutations), the action level must be a concentration to which the human population (including sensitive subgroups) could be exposed on a daily basis that is likely to be without appreciable risk of adverse effects during a lifetime. These criteria are similar to those upon which promulgated health-based standards and criteria are based. Action levels derived according to these criteria represent valid, reasonable estimates of levels in media at or below which corrective action is unlikely to be necessary.

As mentioned previously, guidance levels are available for many chemicals. Appendix A of this preamble lists concentrations for selected hazardous constituents in water, soil, and air which the Agency believes meet these four criteria. EPA established these concentrations by an assessment process which evaluated the quality and weight-of-evidence of supporting toxicological, epidemiological, and clinical studies, and which relied on the exposure assumptions in appendix D of this preamble.

The Agency's approach to assessing the risks associated with systemic toxicity is different from that for the risks associated with carcinogenicity. This is because different mechanisms of action are thought to be involved in the two cases. In the case of carcinogens, the Agency assumes that a small number of molecular events can evoke changes in a single cell that can lead to uncontrolled cellular proliferation. This mechanism for carcinogenesis is referred to as "nonthreshold," since there is essentially no level of exposure for such a chemical that does not pose a small, but finite, possibility of generating a carcinogenic response. In the case of systemic toxicity, organic homeostatic, compensating, and adaptive mechanisms exist that must be overcome before the toxic end point is manifested. For example, there could be a large number of cells performing the same or similar function whose population must be significantly depleted before the effect is seen.

The threshold concept is important in the regulatory context. The individual threshold hypothesis holds that a range of exposures from zero to some finite value can be tolerated by the organism with essentially no chance of expression of the toxic effect. Further, it is often prudent to focus on the most sensitive members of the population; therefore, regulatory efforts are generally made to keep exposures below the population threshold, which is defined as the lowest of the thresholds of the individuals within a population.

Thus, for the chemicals on appendix A which cause systemic toxic effects, the Agency has estimated reference doses (RfDs). The RfD is an estimate of the daily exposure an individual (including sensitive individuals) can experience without appreciable risk of health effects during a lifetime, and is consistent with the threshold concept described above.

For the chemicals on appendix A which are believed to cause cancer, the Agency has estimated carcinogenic slope factors (CSFs). Since the Agency assumes that no such threshold exists for carcinogens, the issue to be resolved in health assessments of carcinogens is the probability of the occurrence of an effect. The CSF, or unit cancer risk, is an estimate of the excess lifetime risk due to a continuous constant lifetime exposure from one unit of carcinogenic concentration (*e.g.*, mg/kg/day by ingestion, ug/m^3 by inhalation). Chemicals which cause cancer and mutations also commonly evoke other toxic effects. Thus, an RfD and CSF may both be available for a single chemical. In these cases, the level which is lower (more protective) should be used as an action level. Generally, the protective level for cancer will be lower.

For carcinogens, EPA believes that action levels corresponding to a 1×10^{-6} risk level (or 1×10^{-5} for Class C carcinogens) generally are appropriate. This is at the higher protective end of the 10^{-4} to 10^{-6} risk range. (See discussion in section VI.F.5 of today's preamble.) Using a value from the high end of this range ensures that the hazardous constituents screened out at this point are those for which corrective measures are unlikely to be necessary.

In adopting the 1×10^{-4} to 1×10^{-6} risk range for this proposed rule, the Agency recognized that 1×10^{-4} risk levels of constituents may not be protective at all sites, due to multiple constituents, multiple exposure pathways, or other site-specific factors.

Thus, the alternative of establishing actions levels at the lower protective end of the risk range (*e.g.*, 1×10^{-4}) was rejected since it would be too insensitive a trigger—*i.e.*, it would fail to require a Corrective Measure Study at some sites which may pose a threat to human health and the environment. The Agency believes that the selected risk levels are reasonable points to establish action levels for carcinogens.

Section 264.521(a)(2)(iii) provides some flexibility to the Regional Administrator to consider the overall weight of evidence of carcinogenicity in setting action levels for carcinogens. EPA has explained its classification scheme for carcinogens based on the weight of evidence for carcinogenicity in its cancer guidelines (51 FR 33992). The constituent concentrations provided as example action levels in appendix A reflect this approach. In this table, known or probable human carcinogens (known as Class A and Class B carcinogens, respectively, under the Agency guidelines) are listed at a 1×10^{-6} risk level, whereas concentrations listed for constituents for which the weight of evidence of carcinogenicity is weaker (known as Class C, or possible human carcinogens under the Agency's guidelines), correspond to a 1×10^{-5} risk level. Some experts have argued that it is inappropriate to weight Class C carcinogens in this way, and that all substances classified as carcinogens should be weighted equally, whereas others argue that Class C carcinogens should be weighted more heavily (*i.e.*, more stringently) because of the greater uncertainty associated with the limited evidence of their carcinogenicity. The Agency solicits comments on how it should handle Class C carcinogens in setting action levels.

Many of the RfDs and CSFs used to derive the concentrations listed in appendix A are available through the Integrated Risk Information System (IRIS), a computer-housed, electronically communicated catalogue of Agency risk assessment and risk management information for chemical substances. IRIS is designed especially for Federal, State, and local environmental health agencies as a source of the latest information about Agency health assessments and regulatory decisions for specific chemicals. (To establish an IRIS account, call Dialcom at (202) 488–0550.) The risk assessment information (*i.e.*, RfDs and CSFs) contained in IRIS, except as specifically noted, has been reviewed and agreed upon by intra-agency review groups, and represents an Agency consensus. As EPA working groups continue to review and verify risk assessment values, additional chemicals and data components will be added to IRIS. IRIS hardcopy will be available through the National Technical Information Service (NTIS). In addition, EPA will routinely update appendix A as new data on hazardous constituents are developed.

c. *Action Levels for Ground Water.* Proposed § 264.521(a) establishes action levels for ground water in aquifers. By specifying the term "aquifer" in this context, the Agency intends to define broadly the type of ground-water

contamination situations that may require Corrective Measure Studies, while triggering such studies only in situations where actual ground-water cleanup is a reasonable remedial approach.

The Agency considered using the term "uppermost aquifer," but decided that this would limit its flexibility in addressing contamination in lower aquifers that are not hydraulically connected with the uppermost aquifer. Such a situation could arise if waste were leaked from the casing of an underground injection well. Thus, the wording of § 264.521(a) will explicitly allow the Agency to address any such unusual instances where solid waste management units have contaminated ground water that is not in an "uppermost" aquifer as defined in § 264.510.

The Agency also considered not using the term "aquifer" in § 264.521(a). This would have required Corrective Measure Studies for ground water to be performed even when the ground water is of negligible use as a resource, such as a small pocket of soil which becomes saturated only episodically. Although contamination in any saturated zone that could act as a pathway transporting contaminants to aquifers could be a concern, the Agency would intend to address those situations in the context of setting action levels for soils (see § 264.521(d)), including "deep soils" that could act as a ground-water contaminant pathway.

EPA has, under a number of statutes, promulgated standards and criteria relevant to protection of environmental media. Among the most important of these are maximum contaminant levels (MCLs) promulgated under the Safe Drinking Water Act (42 U.S.C. section 300(f) *et seq.*), which have been incorporated into this rule as action levels for ground water under § 264.521(a)(1). MCLs promulgated under the Safe Drinking Water Act are maximum concentrations of contaminants allowed in water used for drinking (see appendix B). The use of MCLs for action levels is consistent with current RCRA ground-water protection standards (40 CFR part 264, subpart F), which set the interim primary drinking water standards (MCLs) for 14 constituents (which existed at the time subpart F regulations were promulgated) as ground-water protection standards in the absence of another Agency decision. Currently there are 34 MCLs promulgated, of which six are microbiological contaminants, three are radionuclides, and 25 are organic and inorganic contaminants; the MCLs for the chemical contaminants are listed in appendix B.

Where MCLs are available for a particular constituent but the ground water 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 as action levels (*i.e.*, to require a CMS); however, cleanup to the MCL might not be required (see section VI.F.5 for discussion of media cleanup standards). The Agency is persuaded that, in cases where ground water is contaminated at levels above action levels, further study is necessary (*e.g.*, to make sure that sources of releases are controlled).

Where MCLs have not been promulgated for hazardous constituents, EPA would develop levels according to the criteria specified in proposed § 264.521(a)(2)(i)–(iv) and described in detail above in this preamble (see section VI.E.2.b). In this analysis, the Agency would use the standard exposure assumptions of two liters a day for a 70 kilogram adult over a 70 year lifetime (see appendix D), assumptions that are used extensively throughout EPA and other agencies. Appendix A lists levels that were developed for water by the Agency according to these principles and which the Agency believes would be appropriate for ground-water action levels. In addition, proposed (but not yet promulgated) MCLs would also typically meet the criteria proposed in § 264.521(a)(2)(i)–(iv) and could serve as ground-water action levels.

Where data are insufficient to develop action levels according to these criteria, the Agency would establish levels according to the procedures in proposed § 264.521(e), which are described in more detail in section VI.E.2.g of this preamble. The Agency solicits comment on the proposed approach and alternative approaches to establishing action levels for ground water.

d. *Action Levels for Air.* Proposed § 264.521(b) identifies criteria for establishing action levels for air, assuming exposure through inhalation of air contaminated with the hazardous constituent. Appendix A lists possible action levels that meet these criteria. The Agency used the following procedures to develop concentrations in air listed in appendix A:

Note: Appendix A action levels are currently taken exclusively from the IRIS data base, and developed using only procedures 1 and 4; this appendix will be modified to include other health-based numbers not currently on IRIS, derived from procedures 2 and 3. This is consistent with current Superfund practices and policy.

1. Where an Agency-verified health-based intake level for inhalation (*e.g.*, RfD) was available, that level was used to calculate the concentration in air.

2. Where an Agency-verified level (as in (1), above) was not available, a level based on a valid inhalation study was used, even if it had not yet gone through the formal intra-Agency verification process.

3. If a level based on an inhalation study (as in (1) or (2) above) was not available, a health-based intake level (*e.g.*, RfD) based on an oral study was used, with a conversion factor of one for route-to-route extrapolation to calculate the concentration in air—except where such an extrapolation factor was determined to be inappropriate. For example, it is not appropriate where a constituent that is a systemic toxicant through the oral route of exposure causes local adverse effects on the lung through the inhalation route. A constituent might also be determined to be an inappropriate candidate for route-to-route extrapolation due to significant differences in metabolism or absorption. Where the extrapolation from oral route to inhalation route of exposure is determined to be inappropriate, and a level based on an inhalation study (as in (1) or (2) above) is not available, appendix A does not list a concentration in air (see section VI.E.2.g for a discussion of how to set action levels where health- and environment-based levels are not available). While the concentrations in air listed in appendix A (and C) are being evaluated further by the Agency with regard to the appropriateness of this route-to-route extrapolation, they will be used only as an interim measure. The Agency will adopt RfDs based on actual inhalation toxicity data as soon as the data become available.

4. The standard exposure assumption for air typically used in Agency risk assessments (i.e., $20m^3$/day for a 70 kilogram adult for a 70 year lifetime) was used (see appendix D).

Under proposed § 264.521(a)(2), action levels would be measured or estimated at the facility boundary, or another location closer to the unit if necessary to protect human health and the environment.

The Agency has chosen the facility boundary as the location where air action levels are proposed to be typically measured, for several reasons. Measuring at the facility boundary will have the effect of requiring Corrective Measure Studies to be conducted whenever potentially health-threatening levels of airborne constituents that originate from waste management units

are being released to areas outside the facility property. The Agency recognizes that in some cases this could require owner/operators to study potential remedial solutions where actual remediation of air releases will not be required—under today's proposal, the requirement actually to remediate air releases is tied to actual exposure; *i.e.*, exceedence of health-based levels at the most exposed individual (see the discussion of air cleanup standards in section VI.F.7.a of today's preamble). However, under this scenario, if exposure conditions were to subsequently change and trigger the need for corrective action for air emissions, the owner/operator would be able to more expeditiously implement the remedy that had already been developed in the Corrective Measure Study. The Agency believes that measuring action levels at the facility boundary, while environmentally conservative, will not represent an undue burden on owner/operators.

Under today's proposal, the Regional Administrator could, when necessary, require action levels to be measured at one or more locations within the facility. An example would be if individuals were actually residing on the facility property, as might be the case at a Federal facility (*e.g.*, a military base). On-site worker exposure would not generally be a determining factor in establishing locations for action levels, since such exposure is regulated by the Occupational Safety and Health Administration (see further discussion in section VI.F.7.a(2) of today's preamble).

The Agency considered, but did not propose, other locations for establishing action levels for air releases. These alternative locations would have involved determining action levels at (1) the unit boundary, or (2) the most exposed individual. The alternative of determining action levels at the unit boundary was rejected as unnecessarily stringent, since it would likely have the effect of very often triggering the need for a Corrective Measure Study, where no actual or potential threat to human health and the environment existed. The option of measuring action levels at the most exposed individual was not chosen because in some cases a CMS would not be triggered based on current locations of receptors, even though future residential development close to the facility were planned and could result in exposure above action levels. The Agency specifically requests comment on the most appropriate location for measuring action levels for the air medium.

e. *Action Levels for Surface Water.* Proposed § 264.521(c) identifies action levels for surface water. Notwithstanding these action levels, some releases from solid waste management units to surface water may be subject to the National Pollutant Discharge Elimination System (NPDES) pursuant to section 402 of the Clean Water Act (CWA). The CWA prohibits the unregulated discharge of any pollutant to waters of the United States from any point source. Releases to surface waters that are nonpoint sources may be subject to the Nonpoint Source Management Program established under sections 208 and 319 of the CWA. If the Agency discovers releases from solid waste management units which are point sources, but lack an NPDES permit, CWA authorities will generally be used to address the release. It should be understood that the term surface water in this context includes wetlands, as prescribed under section 404 of the CWA. Section 404 permits are required for dredge and/or fill into wetlands.

Proposed § 264.521(c) specifies that State water quality standards established pursuant to section 303 of the CWA that are expressed as numerical values will be used as action levels, where they have been established for the surface water body in question. However, EPA anticipates that such numerical standards may, in some cases, not have been established at the time when remedial investigations are being conducted at RCRA facilities. In these cases, action levels may be established as numeric interpretations of State narrative water quality standards.

Water quality standards both establish water quality goals, and serve as a basis for establishing treatment controls, based on the use or uses which the State designates for the receiving water (*e.g.*, recreation or public water supply). The standards consist of a designated use or uses, and the water quality criteria which will protect such uses. Criteria are expressed as either numeric constituent concentration levels or narrative statements that represent a quality of water that supports a particular use.

In applying narrative standards to specific water bodies, some States have prescribed methods for calculating numeric values for the water body. Such methods vary from State to State in their complexity, the time required to establish the numeric values, and the procedures involved. Although deriving these numeric interpretations from narrative standards will often be straightforward, the Agency expects that in some situations the derivation of such values could be relatively complex and time-intensive. In such cases, the Regional Administrator could determine that the use of numeric interpretations of narrative water quality standards was not appropriate for the purpose of establishing action levels. EPA emphasizes that the use of such narrative standards must not delay the corrective action process.

Where numeric water quality standards have not been established by the State, and where numeric interpretations of narrative standards are either unavailable or inappropriate (for reasons described above), proposed § 264.521(c)(3) provides that maximum contaminant levels (MCLs) promulgated under the Safe Drinking Water Act will be used as action levels, if the surface water has been designated as a drinking water source by the State (see discussion in previous section on the use of MCLs as action levels in ground water).

In situations where a numerical water quality standard, a numeric interpretation of narrative standards, or an MCL is not available for a particular hazardous constituent in surface water designated by the State for drinking, proposed § 264.524(c)(4) specifies that the criteria under § 264.521(a)(2) (i)-(iv) be used for establishing action levels in surface water, assuming exposure through consumption of the water contaminated with the hazardous constituent. The standard exposure assumptions of two liters/day for a 70 kg adult over a 70 year lifetime in appendix D should be used, unless people also consume aquatic organisms from the surface water. In these cases, the Agency suggests that Federal Water Quality Criteria be used as action levels since they satisfy the criteria for action levels established under § 264.521(a)(2) (i)-(iv). Federal Water Quality Criteria are concentrations of contaminants determined to be protective of human health and/or aquatic organisms. Criteria for protection of human health are based on exposure through drinking water, as well as exposure through drinking water and ingesting aquatic organisms. Criteria for protection of freshwater/estuarine and marine organisms are also available. EPA has promulgated water quality criteria for 126 pollutants under the Clean Water Act.

In situations where a numerical water quality standard is not available for a particular hazardous constituent in surface water designated by the State for uses other than drinking, proposed § 264.524(c)(5) provides the Regional

Administrator with the flexibility to consider the State-designated use of the surface water in establishing a concentration as the action level. For example, in some surface waters designated for industrial uses, the Agency believes that an MCL may be too sensitive a trigger for a CMS. In other situations, MCLs may be too insensitive a trigger for a CMS (for example, in trout streams). Federal Water Quality Criteria may provide useful guidance in setting action levels under § 264.524(c)(5).

If Federal Water Quality Criteria are used as action levels, the purposes for which such criteria were developed should be considered in determining which criteria are appropriate to use. For example, for a surface water body used for fishing and drinking, the criteria for protection of human health based on drinking water and eating aquatic organisms would be most appropriate. For Class A and Class B carcinogens, the criteria corresponding to a 10^{-6} risk level should be used, whereas for Class G carcinogens, the Agency suggests that the criteria corresponding to 10^{-5} risk level be used. (See discussion of Agency-established classes of carcinogens and relative risk levels considered appropriate in section VI.E.2.c of this preamble.)

If contaminants attributable to releases from a SWMU exceed an action level anywhere in surface water, a Corrective Measure Study may be required. Proposed § 264.521(c) does not specify where in surface waters concentrations should be measured against action levels. In determining appropriate sampling locations, the Agency will generally attempt to specify locations in the surface water where the highest concentrations of hazardous constituents released from SWMUs are expected to occur—*i.e.*, at or near the point or points where releases enter the surface water. However, in some cases, establishing the precise point(s) where releases enter the surface water may be difficult and time-consuming, such as in the case of a ground-water plume in a complex hydrogeologic setting that flows into a lake. In these cases, the Agency would not wish to delay the initiation of a Corrective Measure Study while the point of release is located, if concentrations greater than action levels could already be detected in the surface water.

EPA specifically requests comment on today's proposal for establishing action levels for surface water.

Proposed § 264.520(b), which allows the Regional Administrator to require a CMS when necessary to protect human health and the environment, even when no action levels have been exceeded, may be particularly important for surface water. For example, the Regional Administrator may determine that a threat from consumption of aquatic organisms exists at levels at or below the MCL, since the MCL does not incorporate exposure through ingestion of contaminated organisms.

A Corrective Measure Study may also be required under § 264.520(b) if the Regional Administrator determines that there is a threat to human health or the environment from contaminated sediments even though action levels for surface water have not been exceeded. The Agency believes it is important to clarify its authority to address sediments contaminated by releases from solid waste management units under sections 3004 (u) and (v) of HSWA, although today's proposal does not establish action levels specifically for sediments. The Agency is currently developing sediment criteria which, when promulgated, may be used as guidance in evaluating contaminated sediments. However, no health-based or environmental levels are currently available which are appropriate as sediment action levels. Thus, until such criteria are developed, the need for Corrective Measure Studies based on sediment contamination will be determined on a case-by-case basis. The Agency requests comment on this approach to addressing sediments.

Finally, the Regional Administrator may require a Corrective Measure Study for surface water under § 264.520(b) when a threat to aquatic health exists at levels at or below action levels. Federal Water Quality Criteria for protection of aquatic health should be used as guidance in making this determination.

f. *Action Levels for Soil.* Proposed § 264.521(d) establishes criteria for establishing action levels for soil, assuming exposure through consumption of the soil contaminated with the hazardous constituent. Action levels would be set on the basis of the exposure assumptions in appendix D, which assume a residential use pattern, with long-term direct contact and soil ingestion by children. Action levels for soil would typically be measured on the surface (generally the upper two feet of earth).

The exception to this approach, is where EPA has already established standards for the cleanup of spilled polychlorinated biphenyls (PCBs), which are regulated under the Toxic Substances Control Act (TSCA). The Agency has determined that the use of these promulgated standards, as action levels and cleanup standards for soil, is relevant to RCRA corrective action. This policy is also consistent with Superfund policy. The PCB Spill Policy under TSCA is discussed more fully in section VII.B of this preamble.

Although action levels for soils are established using direct contact assumptions most appropriate for surficial soils, it is intended that these action levels will often also be used as a presumption that a GMS may be necessary for contaminated deep soils which may pose a threat to ground water in aquifers. The Agency does not believe that generic action levels based on the potential for hazardous constituents in soil to contaminate ground water can be developed at this time, since the type of soil, distance to ground water, and other site-specific factors, as well as the properties of the hazardous constituent, influence this potential. A permittee may attempt to rebut this presumption by demonstrating that there is no threat to human health and the environment from such deep soil contamination, either through direct contact or migration to aquifers or surface water. Alternatively, § 264.520(b) may be used to require a CMS in situations where deep soils are contaminated below action levels, but pose a threat to ground water in aquifers.

Although estimates of soil intake are not as frequently used by the Agency as are estimates of air or water intake, appendix D provides recommended exposure assumptions for non-carcinogenic and carcinogenic soil contaminants given an unrestricted use scenario. A soil ingestion rate of 0.1 g/day is recommended for carcinogens, and a rate of 0.2 g/day, based on an average child's body weight of 16 kg, is recommended for non-carcinogens.

In the case of non-carcinogenic contaminants, the oral RfD would be used to calculate an action level, or threshold concentration below which adverse effects would not occur, assuming 0.2 gram per day of soil is consumed. Sixteen kilograms represents an average body weight for children aged one to six. The Agency believes these exposure assumptions are reflective of a conservative average scenario in which children ages 1–6 years (*i.e.*, the time period during which children exhibit the greatest tendency for hand-to-mouth activity) are assumed to ingest an above-average amount of soil on a daily basis. The exposure levels estimated in this manner are calculated to keep exposures well below the population "threshold" for toxic effects (see earlier preamble discussion). Since the toxic effect of concern is assumed to occur once the threshold

level is exceeded, the amount of soil ingested on a daily basis becomes of major importance in determining non-carcinogenic effects. Therefore, to account properly for the risk from elevated exposure to non-carcinogenic soil contaminants during early childhood years, it is important that the exposure not be estimated over a lifetime; to do so would "smear" out the peak exposure occurring during the above-mentioned time period of five years and result in the failure to detect an unacceptable exposure level (*i.e.*, a level which exceeds the RfD).

In the case of carcinogens, the action level would be derived by assuming consumption of 0.1 g/day averaged out over a lifetime, based on an adult body weight of 70 kilograms. Because the expression of carcinogenic effects is principally a function of cumulative dose (*i.e.*, the time course of exposure is usually secondary), the Agency believes, in general, that elevated exposures during early childhood are relatively unimportant in determining lifetime cancer risk. Therefore, total lifetime (cumulative) soil ingestion can be averaged to derive a per day value. These exposure assumptions do, however, reflect a reasonable worst-case scenario—0.1 g/day is an upper-range estimate of soil ingestion for older children and adults.

The above recommendations are based on the conservative assumptions that 100 percent of the ingested non-carcinogenic and carcinogenic soil contaminants are absorbed across the gastrointestinal tract and that ingestion occurs 365 days/year, regardless of climatic conditions or age. The Agency solicits comment on the above assumptions for soil exposure for establishing action levels.

The Agency considered the use of other generic exposure assumptions for establishing action levels for soil based on direct contact (*e.g.*, exposure through dermal contact, exposure through ingestion under a non-residential scenario), but rejected these alternatives for several reasons. First, establishing action levels based on generic assumptions for dermal exposure or exposure via ingestion of soil under a non-residential scenario would be a far less sensitive trigger, and could in effect cause a "false negative" in situations where the Agency believes corrective action would be necessary. Second, the data base for developing action levels based on dermal exposure or exposure via ingestion of soil under a non-residential exposure scenario is limited.

In addition to considering generic exposure assumptions, the Agency considered the use of site-specific, direct contact exposure factors for deriving soil action levels. However, the Agency believes that assessing site-specific exposure in setting action levels would be a resource-intensive process, and would run counter to the objective of using action levels as a simple screening mechanism. The Agency recognizes that the proposed approach is conservative. Nevertheless, the Agency believes that these levels are appropriate as action levels (as opposed to cleanup targets)—that is, they can reasonably serve as rebuttable presumptions that further study, including analysis of possible remedies, is necessary.

Soil cleanup levels are discussed in more detail in section VI.F.5 of this preamble. However, it should be recognized that facilities with soil contamination above an action level—particularly where the levels would pose no threat under current conditions of exposure—would have a wide range of remedial options open to them, including "conditional" remedies (for which the permit would specify appropriate exposure controls), or the covering of the contaminated soil with a soil cap. In this case, a Corrective Measure Study might simply be a proposal to clean up to protective levels, assuming industrial land use, and to ensure restricted access for the life of the permit. This raises the issue of "conditional" remedies, which is discussed in more detail in section VI.F.8 of this preamble.

g. *Action Levels Where Health- and Environmental-Based Levels Are Not Available.* If, for any medium, Agency-promulgated standards or criteria, or other health-based levels meeting the proposed criteria are not available or cannot be developed for use as action levels, § 264.521(e) allows the Regional Administrator to set an action level for any constituent on the basis of available data and reasonable worst-case assumptions. In most cases, partial data or data on structural analogs will allow the Regional Administrator to estimate whether the detected level of a contaminant is likely to cause a problem. In other cases, other contaminants will be present at high levels (triggering a CMS in any case), and it will be clear that the constituent is not a driving factor in determining the risk at the site, even under worst-case assumptions concerning its toxicity. In such cases it may not be necessary to specify an action level for the constituent. Finally, under proposed § 264.521(e)(2), the Regional Administrator would have the authority to set the action level at background for a hazardous constituent for which data were inadequate to set a health- or environment-based action level. This option, however, is providad primarily as a fall-back position. The Agency believes that it will very rarely be necessary to set action levels at background.

As indicated earlier, appendix A lists possible action levels for a range of hazardous constituents based on the criteria proposed in § 264.521(a)(2). EPA's Office of Solid Waste (OSW) is developing, for the purpose of guidance, health-based numbers on additional constituents. These levels would also satisfy the criteria of proposed § 264.521(a)(2). As these additional health-based levels are developed, they will be entered into tha Integrated Risk Information System (IRIS). For information on these guidance numbers, the OSW Technical Assessment Branch/Health Assessment Section should be consulted at (202) 382–4761.

h. *Authority to Require a Corrective Measure Study Where Action Level Have Not Been Exceeded.* The Agency believes it is important to provide the Regional Administrator authority to require a CMS under § 264.520(b) even when no constituents exceed action levels. For example, a CMS could be required if there are threats to certain sensitive environmental receptors at a particular facility with contamination at or below action levels. Also, a CMS could be required in situations where the risk posed by the presence of multiple contaminants may be high enough to warrant a Corrective Measure Study even if no single constituent exceeds the individual action level for the constituent. Similarly, if individuals living near the site are receiving significant exposures from sources other than SWMUs at the site, the incremental exposure due to SWMUs at the site may result in a cumulative risk large enough to warrant a CMS. In addition, there may be situations where "cross-media" risks could indicate the need for a CMS, even though action levels in a particular medium have not been exceeded. An example might be where at nearby residences releases in both the air and ground water are present at very low levels, but the cumulative risks from both pathways of exposure are sufficiant to be of concern. Although such situations are expected to be relatively rare, the Agency will examine such cross-media risks when site-specific conditions indicate the potential for such exposure factors.

A CMS may also be required if constituents pose a threat through exposure pathways other than that assumed in setting action levels. For example, constituents in surface water that do not exceed MCLs may still pose

a threat to persons who ingest fish caught from that surface water. Constituents in ground water that do not exceed MCLs may still pose a threat through ponding or basement seepage. Nevertheless, the Agency believes that, with few exceptions, proposed action levels will be adequate to identify potential threats to human health and the environment which necessitate a CMS.

3. *Scope of Corrective Measure Study (§ 264.522).* In the RCRA program, corrective action requirements will be implemented at facilities with a wide range of different types of environmental problems. Some RCRA facilities might, if evaluated according to Superfund's Hazard Ranking System (HRS), score high enough to be included on the National Priority List. On the other hand, most RCRA facilities have much less extensive environmental problems, and are maintained by viable owner/operators, who may be expected to operate at the site for an extended period of time. Recognizing the diversity of the RCRA facility universe, today's proposal has been structured to provide the Agency considerable flexibility in defining the scope and analytic approach to developing Corrective Measure Studies, consistent with the extent and nature of the environmental problems at the facility.

EPA anticipates that for most RCRA facilities, the studies needed for developing sound, environmentally protective remedies can be relatively straightforward, and may not require extensive evaluation of a number of remedial alternatives. Such "streamlined" Corrective Measure Studies can be tailored to fit the complexity and scope of the remedial situation presented by the facility. For example, if the environmental problem at a facility were limited to a small area of soils with low-level contamination, the Corrective Measure Study might be limited to a single treatment approach that is known to be effective for such types of contamination. In a different situation, such as with a large municipal-type landfill, it may be obvious that the source control element of the CMS should be focused on containment options. EPA anticipates that a streamlined or highly focused CMS will be appropriate to the following types of situations:

- "Low risk" facilities. Facilities where environmental problems are relatively small, and where releases present minimal exposure concerns.
- High quality remedy proposed by the owner/operator. Owner/operators may propose a remedy which is highly protective (*e.g.*, equivalent to a RCRA "clean closure"), and which is consistent with all other remedial objectives (reliability, *etc.*).
- Facilities with few remedial options. This would include situations where there are few practicable cleanup solutions (*e.g.*, large municipal landfills), or where anticipated future uses of the property dictate a high degree of treatment to achieve very low levels of residual contamination.
- Facilities with straightforward remedial solutions. For some contamination problems, standard engineering solutions can be applied that have proven effective in similar situations. An example might be cleanup of soils contaminated with PCBs.
- Phased remedies. At some facilities the nature of the environmental problem will dictate development of the remedy in phases, (see the discussion of phased approach under § 264.526(d)), which would focus on one aspect (*e.g.*, ground-water remediation) of the remedy, or one area of the facility that deserves immediate measures to control further environmental degradation or exposure problems. In these situations, the Corrective Measure Study would be focused on that specific element of the overall remedy, with follow-on studies as appropriate to deal with the remaining remedial needs at the facility.

EPA recognizes that, in contrast to the above situations, some facilities with very extensive or highly complex environmental problems will require Corrective Measure Studies that assess a number of alternative remedial technologies or approaches. The following are examples of situations which would likely need relatively extensive studies to be done to support sound remedy selection decisions:

- "High risk" facility with complex remedial solutions. Such facilities might have large volumes of both concentrated wastes and contaminated soils, for which several different treatment technologies could be applied to achieve varying degrees of effectiveness (*i.e.*, reduction of toxicity or volume), in conjunction with different types of containment systems for residuals.
- Contaminant problems for which several, very different approaches are practicable. There may be several, quite distinct technical approaches for remediating a problem at a facility, each of which offers varying degrees of long-term reliability, and would be implemented over different time frames, with substantially different associated cost impacts. In such cases, remedy selection decisions will necessarily involve a difficult balancing of competing goals and interests. Such decisions must be supported with adequate information.

In addition to the above examples of situations calling for either a limited, or relatively complex CMS, other studies will fall in the middle of that range. Given this "continuum" of possible approaches to structuring Corrective Measure Studies, it is the Agency's general intention to focus these studies on plausible remedies, tailoring the scope and substance of the study to fit the complexity of the situation.

The general types of analyses and information requirements that may potentially be required of the permittee in conducting a Corrective Measure Study are outlined in today's proposed § 264.522(a). Note that this provision does not prescribe that any specific types of remedies be analyzed, nor does it define a decision process by which remedial alternatives are "screened" or evaluated. It is intended to provide the decisionmaker with a range of options for structuring a study to support the ultimate remedy selection for the facility.

Proposed § 264.522(a)(1) lists items that the Regional Administrator may require in a CMS for any remedy(s) evaluated. In general, sufficient information should be provided for the Agency to determine that the remedy selected can meet the remedy standards of § 264.525(a).

Section 264.522(a)(1) would give the Regional Administrator authority to require the permittee to perform an evaluation of the performance, reliability, ease of implementation, and impacts (including safety, cross-media contaminant transfer, and control of exposures to residual contamination) associated with any potential remedy evaluated. In evaluating the performance of each remedy, the Agency would expect the permittee to evaluate the appropriateness of specific remedial technologies to the contamination problem being addressed and the ability of those technologies to achieve target cleanup concentrations (per following discussion on "target levels").

To evaluate these factors for a specific remedy, the owner/operator may be required to develop specific data. Data may be needed on general site conditions, waste characteristics, site geology, soil characteristics, ground-water characteristics, surface water characteristics, and climate. The Agency anticipates that permittees will collect much of this information during remedial investigations required under § 264.510. In some cases, important relevant information may be included in the part B application. To the extent that potential remedies are identified early in the remedial investigation process, the permittee can streamline his or her data collection efforts to include data needed for the evaluation of specific remedial alternatives.

Analysis of a remedy's performance and reliability should include an assessment of the effectiveness of a remedy in controlling the source of

release and its long-term reliability. Where treatment is planned, an assessment of treatment capability should be provided; where waste will be managed on-site, the details of the management (including a description of the units in which it is treated or disposed of) should be supplied. Potential safety impacts (*e.g.*, associated with excavation, transportation, *etc.*) of the remedy should also be considered in most cases. Further, the Agency may require information on implementability—such as capacity availability or State or local permitting requirements—to determine whether a remedy is feasible.

The Agency is particularly concerned about potential cross-media impacts (intermedia transfer of contaminants) of remedies, and therefore specifically identified them as an area that may require study. In addition, cross-media impacts will be one of the factors considered in remedy selection (see proposed § 264.525). Some remedial technologies may cause secondary impacts that must be considered in selecting remedies. For example, in some circumstances, air stripping of volatile organic compounds (VOCs) from ground water may release these VOCs to the air unless specific emission control devices are installed on the air stripper. The Corrective Measure Study should also determine whether other adverse impacts from a potential remedy will reduce its effectiveness in achieving the cleanup goal. For example, removal of contaminated sediments in large, slow-moving rivers may resuspend sediments and cause more harm than allowing the sediments to remain in place.

Proposed § 264.522(a)(2) would allow the Regional Administrator to require that the Corrective Measure Study assess the extent to which appropriate source controls could be implemented, and contaminant concentrations appropriate to the constituent(s) could be reached by the remedy. In some cases, bench- or pilot-scale studies may be required to determine the given treatment technology's performance on the particular waste at the facility. Such studies can often save both time and money in addressing environmental remediation.

It will often be appropriate for the Regional Administrator to specify, prior to or during the course of the CMS, preliminary "target" cleanup levels for contaminants which the permittee should use in evaluating the items under § 264.522(a) (1) and (2). These target concentrations would thus serve as preliminary estimates of the media cleanup standards to be established in the remedy selection process. Target levels might be specified to cover a cleanup range (*e.g.*, 10^{-4} level and a 10^{-6} level), or a specific level for a constituent that would be EPA's best estimate of the ultimate cleanup standard, based on the information available at the time.

There will be many situations where the levels of cleanup that must be achieved will dictate the kinds of cleanup technologies considered, and thus, the target levels specified in the context of the CMS process will be a critical element in shaping the study. However, there may also be many situations where it would not be necessary to specify preliminary target levels, such as where the remedy involves only removal of a specified number of drums, or construction of a tank for dewatering sludges. Other such situations might be where cleanup concentration levels do not greatly affect the actual design of the remedial technology (*e.g.*, a ground-water extraction system), or where the owner/operator proposes a remedy that will effectively achieve highly protective levels of cleanup. In any case, however, when target levels for a remedy are specified, the Agency would reserve the right to set cleanup standards different from the target levels that were identified, since those standards may often be affected by remedy factors that cannot be fully evaluated until the CMS has been completed.

Today's proposal would also allow the Regional Administrator to require an evaluation of the timing of the potential remedy (§ 264.522(a)(3)), including construction time, start-up, and completion. The timing of a remedy will be particularly important where contamination has migrated beyond the facility boundary or is nearing potential receptors. In these cases, a prompt remedy would be necessary. In other cases, timing will be important in distinguishing among remedies. Some technologies may require considerably less construction and start-up time than others, but would require more time to achieve the cleanup standard. For example, if the permittee has a large volume of waste which must be incinerated to achieve BDAT under the land disposal restriction requirements imposed in HSWA, s/he may need to build an incinerator and successfully complete the requirements for a trial burn. If, on the other hand, the wastes to be removed from a SWMU are not wastes subject to the land disposal restrictions and may be disposed in an operating hazardous waste disposal unit at the site, far less time will be required both to initiate and complete the remedy. The Agency, therefore, may require the permittee to include information on factors affecting both remedy initiation and completion.

The Regional Administrator may also require the permittee to include cost estimates for alternatives considered (§ 264.522(a)(4)). Cost information may become a factor in the remedy selection process when evaluating alternative remedies which will achieve an adequate level of protection. This information will also serve as a first estimate of the cost estimate required to determine the level of financial assurance that the permittee must demonstrate when the final remedy is selected.

Finally, § 264.522(a)(5) would provide the Regional Administrator authority to require the permittee to assess institutional requirements, such as State or local permit requirements, or other environmental or public health requirements, that may be applicable to the remedy and that may substantially affect implementation of the remedy. State and local governments may have specific requirements related to the remedial activities that could affect implementation of the remedies evaluated in the Corrective Measure Study.

In addition to the elements listed in proposed § 264.522(a), the Regional Administrator may include other requirements in the scope of the CMS as needed. Such requirements will be specified in the permit schedule of compliance.

As indicated above, proposed § 264.522(b) would allow the Regional Administrator to specify one or more potential remedies which must be evaluated in the CMS. The Agency is persuaded that this authority is necessary to ensure that delays in initiating cleanup will not result from CMS reports which evaluate only poor or inappropriate remedial solutions.

Requirements for Corrective Measure Studies in two particular circumstances contemplated under today's proposal merit special attention. When either a phased remedy (see § 264.526(d)) or a conditional remedy (see § 264.525(f)) is contemplated for the facility, the scope and timing of Corrective Measure Studies may be adjusted to fit the particular requirements for such remedies.

Proposed § 264.526(d) allows the Regional Administrator to specify (in the permit modification for remedy selection) that a remedy be implemented in phases. Such an approach is

anticipated where separable activities are being addressed at the facility and where, in many cases, imposition of further remedial requirements may be dependent on the experience and/or knowledge gained during preceding phases. In such a case, the CMS may also be divided into phases to match the remedial phases specified in the permit modification.

Conditional remedies are authorized under proposed § 264.525(f). Conditional remedies are not final remedies since they do not necessarily meet all standards for remedies included in § 264.525(a); decisions must be revisited before the permit can be terminated. If the conditional remedy is found to meet all § 264.525(a) standards, it may be declared the final remedy when the decision is revisited. If, however, further corrective action is required to satisfy requirements for a final remedy, a follow-up CMS may be necessary prior to a final remedy decision.

4. *Plans for Corrective Measure Study (§ 264.523).* This section would give the Regional Administrator authority to require the submission of a plan for conducting the Corrective Measure Study at the time s/he determines that a CMS is necessary. Specific requirements for the plan and a schedule for its submission would be included in the permit schedule of compliance.

Typically, a plan would include a description of the general approach to investigating and evaluating potential remedies, a definition of the overall objectives of the study, a schedule for the study, a description of the specific remedies which will be studied, and a description of how each potential remedy will be evaluated. Further, to guarantee an orderly presentation of study results, the Regional Administrator may require the permittee to include as part of the plan the format for presenting the results of the CMS. Discussions between the permittee and the Regional Administrator before the plan is drafted will generally be needed to ensure that appropriate remedial alternatives are considered, that appropriate target concentration levels of contaminants are used, and that the unnecessary expenditures of time or other resources for revisions which otherwise might be required are avoided.

Upon receipt of the corrective measures plan, the Regional Administrator will evaluate its adequacy. If the plan is deficient, proposed § 264.523(a) would allow the Regional Administrator to modify the plan or require the owner/operator to make the appropriate modifications. In some cases the plan will require only slight modification, and by actually making those modifications the Regional Administrator will be able to eliminate the need for further iterations of the submission and approval process. In other cases, where a submitted plan is deficient even after modifications have been made by the owner/operator, modifying the plan will allow the Regional Administrator to cut short the iterative process that has not produced an acceptable document. This provision of § 264.523(a) is analogous to the authority provided to the Regional Administrator for modifying interim status closure plans (see § 265.112). It is also similar to the process involved in obtaining complete permit applications.

Upon approval of the plan by the Regional Administrator, § 264.523(b) would require that the permittee conduct the CMS according to the approved plan, including the schedule. Both the plan and the schedule included in the plan will become an enforceable part of the permit schedule of compliance.

5. *Reports of Corrective Measure Study (§ 264.524).* As proposed, § 264.524 would provide authority for the Regional Administrator to require progress reports on the Corrective Measure Study at intervals appropriate to the site-specific study requirements. Progress reports would serve two functions—they would keep the Regional Administrator informed of the progress of the study, and would provide the basis for a periodic review to determine whether midcourse corrections to the study are needed. For example, if a pilot-scale study is conducted for a specific treatment technology and early results indicate that the technology does not consistently achieve the expected concentration level, it may be appropriate to eliminate further study of that particular remedy and to consider other approaches.

Today's proposal would require, in all cases, submission of a final report of the CMS which summarizes the results of the investigations for any remedy studied, and any pilot tests conducted. The report would evaluate each alternative in terms of its anticipated performance in achieving the standards for remedies, which are provided in today's proposal at § 264.525(a).

Proposed § 264.524(c) would give the Agency the authority, upon review of the CMS report, to require the permittee to evaluate one or more additional remedies or to develop in greater detail specific elements of one or more remedies previously studied. This provision would ensure that appropriate remedies are evaluated by the permittee in sufficient detail to allow the Agency to determine its feasibility and effectiveness. In a case where the permittee does not identify an appropriate remedy during the Corrective Measure Study, the Agency may require him or her to evaluate additional remedies as necessary to ensure that a suitable remedy, meeting the standards established under § 264.525(a), is developed.

F. Selection of Remedy (Section 264.525)

1. *General (§ 264.525).* Proposed § 264.525 outlines the general requirements for selection of remedies for RCRA facilities. As structured, it establishes four basic standards which all remedies must meet and specifies certain decision criteria which will be considered by EPA in selecting the most appropriate remedy which meets those standards for individual facilities. In addition, decision factors for setting schedules for initiating and completing remedies are outlined, and specific requirements for establishing media cleanup standards, including requirements for achieving compliance with them, are also contained in this section. The section also specifies requirements for conditional remedies.

2. *General Standards for Remedies (§ 264.525(a)).* Proposed § 264.525(a) specifies that remedies must:

- Be protective of human health and the environment;
- Attain media cleanup standards as specified pursuant to § 264.525 (d) and (e);
- Control the sources of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment; and
- Comply with standards for management of wastes as specified in §§ 264.550–264.559.

These standards reflect the major technical components of remedies: cleanup of releases, source control, and management of wastes that are generated by remedial activities. The first standard—protection of human health and the environment—is a general mandate derived from the RCRA statute. This overarching standard requires remedies to include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water. Another example would be a requirement for the construction of barriers or for other controls to prevent

harm arising from direct contact with waste management units.

Remedies will be required to attain the media cleanup standards that will be specified by EPA according to the requirements outlined in subsection (d) of this section. The media cleanup standards for a remedy will often play a large role in determining the extent of and technical approaches to the remedy. In some cases, certain technical aspects of the remedy, such as the practical capabilities of remedial technologies, may influence to some degree the media cleanup standards that are established. It is because of this interplay between cleanup standards and other remedy goals and limitations that today's rule establishes media cleanup standards within the overall remedy selection structure of § 264.525.

Section 264.525(a)(3) is the source control standard for remedies. A critical objective of remedies must be to stop further environmental degradation by controlling or eliminating further releases that may pose a threat to human health and the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will involve an essentially perpetual cleanup situation. EPA is persuaded that effective source control actions are an important part of ensuring the long-term effectiveness and protectiveness of corrective actions at RCRA facilities. The proposed source control standard is not intended to mandate a specific remedy or class of remedies. EPA encourages the examination of a wide range of remedies. This standard should not be interpreted to preclude the equal consideration of using other protective remedies to control the source, such as partial waste removal, capping, slurry walls, in-situ treatment/stabilization and consolidation. Overall, EPA expects this policy to be no more stringent than the threshold criteria used for selecting remedies under the National Contingency Plan.

Proposed § 264.525(a)(3) requires that further releases from sources of contamination be controlled to the "extent practicable." This qualifier is intended to account for the technical limitations that may in some cases be encountered in achieving effective source controls. For some very large landfills, or large areas of widespread soil contamination, engineering solutions such as treatment or capping to prevent further leaching may not be technically practicable, or completely effective in eliminating further releases above health-based contamination levels. In such cases, source controls may need to be combined with other measures, such as plume management or exposure controls, to ensure an effective and protective remedy.

The proposed remedy standard of § 264.525(a)(4) requires that remedial activities which involve management of wastes must comply with the requirements for solid waste management, as specified in §§ 264.550–264.559 in today's proposed rule. RCRA remedies will often involve treatment, storage or disposal of wastes, particularly in the context of source control actions and cleanup of releases. This standard will assure that management of wastes during remedial activities will be conducted in a protective manner.

3. *Remedy Selection Decision Factors (§ 264.525(b)).* Proposed § 264.525(b) specifies five general factors which shall be considered as appropriate by EPA in selecting a remedy that meets the four standards for remedies, and that represent an appropriate combination of technical measures and management controls for addressing the environmental problems at the facility. The five general decision factors in proposed § 264.525(b) are:

- Long-term reliability and effectiveness;
- Reduction of toxicity, mobility or volume of wastes;
- Short-term effectiveness;
- Implementability; and
- Cost.

Any remedy proposal developed under a Corrective Measure Study and presented to EPA for final remedy selection must, at a minimum, meet the four standards of § 264.525(a). The Agency will then evaluate potential remedies against the five decision factors listed in proposed § 264.525(b), as appropriate to the specific circumstances of the facility.

The order of the decision factors listed in proposed § 264.525(b) is not intended to establish an implicit ranking, nor does it suggest the relative importance each factor might have at any particular facility or across facilities in general. There are circumstances in which any one of these factors might receive particular weight.

For example, long term effectiveness may rule out alternative remedies that might achieve clean up targets in the short term, but at the expense of creating new or greater future risks that may necessitate a future corrective action. Conversely, remedies that significantly reduce actual or imminent human exposure in the short term may be preferred over alternatives that eliminate long term risks, but at the cost of lengthening the period during which exposure persists. Reductions in toxicity, mobility, or volume are especially valuable in situations where the wastes or constituents may degrade into more hazardous or toxic products, or fail to naturally attenuate. Finally, cost may be determinative when more than one alternative remedy can reach the established cleanup target. In practice, the relative weights assigned to these five factors will vary from facility to facility according the site characteristics. EPA is soliciting comment today on situations in which these tradeoffs may significantly affect the remedy in ways which would suggest that a more prescriptive weighting of the factors might be desirable.

The following is a general explanation of the five decision factors, and how they may generally be used in remedy decisions.

The 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. Thus, 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. Whenever practicable, RCRA corrective action remedies must be able to ensure with a high level of confidence that environmental damage from the sources of contamination at the facility will not occur in the future. EPA believes that long-term reliability of remedies is an essential element in ensuring that actions under section 3004(u) satisfy the fundamental mandate of RCRA to protect human health and the environment.

The second decision factor—reduction of toxicity, mobility or volume—is directly related to the concept of long-term reliability of remedies. 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. Reduction of toxicity, mobility or volume is thus a means of achieving the broader objective of long-term reliability. EPA recognizes, however, that for some situations, achieving substantial reductions in toxicity, mobility or volume may not be practicable or even desirable. Examples might include large, municipal-type landfills, or wastes such as unexploded munitions that would be

extremely dangerous to handle, and for which the short-term risks of treatment outweigh potential long-term benefits.

The third decision factor—short term effectiveness—may be particularly relevant when remedial activities will be conducted in densely populated areas, or where waste characteristics are such that risks to workers are high, and special protective measures are needed. Implementability, the fourth decision factor, will often be a determining variable in shaping remedies. Some technologies will require State or local permits prior to construction, which may increase the time needed to implement the remedy.

One of the decision factors which raises particular issues in the context of RCRA remedies is that of cost. RCRA's overriding mandate is protection of human health and the environment. However, EPA believes that relative cost is a relevant and appropriate consideration when selecting among alternative remedies that achieve the clean up range.

EPA's experience in Superfund has shown that in many cases several different technical alternatives to remediation will offer equivalent protection of human health and the environment, but may vary widely in cost. The Agency believes that it is appropriate in these situations to allow cost to be one of the several factors influencing the decision for selecting among such alternatives.

The exact emphasis placed on these decision factors, and how they will be balanced by EPA in selecting the most appropriate remedy for a facility, will necessarily depend on the types of risks posed by the facility, and the professional judgment of the decisionmakers. Comment is specifically invited on the remedy selection approach outlined in today's proposed rule and preamble.

4. *Schedule for Remedy (§ 264.525(c)).* Proposed § 264.525(c) would require the Regional Administrator to specify a schedule for initiating and completing remedial activities as a part of the selection of remedy process. Some of the factors that will be considered when setting the schedule are enumerated in proposed § 264.525(c) (1)–(5). These factors include:

- Extent and nature of contamination at the facility;
- Practical capabilities of remedial technologies as assessed against cleanup standards and other remedial objectives;
- Availability of treatment or disposal capacity for wastes to be managed as part of the remedy;
- Desirability of utilizing emerging technologies not yet widely available which may offer significant advantages over currently available technologies; and
- Potential risks to human health and the environment from exposure to contamination prior to remedy completion.

Proposed § 264.525(c)(6) would allow the Regional Administrator flexibility to consider other relevant factors in setting a schedule for remedy initiation and completion. Such factors could relate to the remedial technology to be employed or the characteristics of the particular waste or facility being addressed.

The timing of remedy implementation and completion will be determined after these and other factors are considered by the Regional Administrator, and a schedule of compliance will be included in the modified permit. The Agency wishes to emphasize, however, that expeditious initiation of remedies and rapid restoration of contaminated media is a high priority and a major goal of the RCRA corrective action program. The schedule included in the permit will be an enforceable permit condition, and the owner/operator will be obligated to seek any change in the schedule for remedy implementation and completion prior to milestones established. This approach is consistent with the Agency's application of schedules of compliance to other aspects of the corrective action program proposed today.

EPA expects that many different specific factors will influence the timing of remedies. For example, the level of technical expertise required and available to implement a particular remedial technology could be an important factor, or the amount and complexity of construction which must precede actual cleanup, or the amount of time which would routinely be needed to achieve the media cleanup standards set in remedy selection, given a specified technology. All major variables which will affect remedy timing are expected to be assessed routinely in the CMS, and will be considered by EPA in setting aggressive yet realistic schedules for remedial activities.

While the Agency's strong preference is for rapid and active restoration of contaminated media, it is recognized that there may be limited cases where a less aggressive schedule may be appropriate. For example, in situations where ground-water cleanup standards can be achieved through natural attenuation within a reasonable timeframe, and where the likelihood of exposure and potential risks to human health and the environment from exposure to contaminated ground water prior to the attainment of cleanup standards is minimal, a remedy schedule based on natural attenuation could be determined to be the most appropriate solution for a site. Thus, such factors as location, proximity to population, and likelihood for exposure may allow more extended timeframes for remediating ground waters.

Management strategies adopted in the remedy selection decision also may affect the timing of remedies. For example, proposed § 264.526(d) (discussed later in this preamble) would allow the Regional Administrator to require implementation of remedies in discrete phases or incremental segments. Such a phased approach often will affect overall timing of the final cleanup for the facility. As one or more phases of the required remedy are completed, the Regional Administrator may choose to review the results achieved by that phase prior to requiring subsequent stages. For example, if results of an initial treatment process for wastes in a SWMU are successful, the next phase of the remedy might apply that treatment technology to the remainder of the wastes at the facility. Similarly, timing of remedies often may be influenced by the need to address the most important environmental problems first. This might be the case where ground-water contamination has migrated beyond the facility boundary; the initial remedial step would be to require installation of a pump and treat system to stop further migration. (This could also be done as an interim measure prior to final remedy selection; see § 264.540.) Subsequent actions to perform source control, or other remedial action might then be phased in as dictated by their environmental priority, practicability, or other factors.

In addition to these kinds of considerations, adequate time must be allowed in the schedule of the remedy for the owner/operator to decontaminate and remove, close, or dispose of units, equipment, devices, or structures used to implement the remedy. The time needed to perform specific activities associated with this requirement necessarily will be evaluated on a site-specific basis.

5. *Media Cleanup Standards (§ 264.525(d))*— a. *General.* Section 264.525(d)(1)(i)–(iv) outlines the Agency's proposed approach for establishing media cleanup standards (MCS) through the remedy selection process.

Media cleanup standards represent constituent concentrations in ground

water, surface water, soils, and air that remedies must achieve to comply with standards for remedies under § 264.525(a)(2). Media cleanup standards are established at concentrations that ensure protection of human health and the environment, and are set for each medium during the remedy selection process.

The Agency is proposing to set media cleanup standards within the overall context of the remedy selection process. As part of the Corrective Measure Study development process, the Agency will typically provide the owner/operator with target cleanup levels for significant hazardous constituents in each medium of concern when he/she is required to perform a CMS. For carcinogens, these targets will be established within the protective risk range of 1×10^{-4} to 1×10^{-6}, based on site-specific factors, unless another level is deemed necessary to protect environmental receptors. EPA may start the analyses by establishing target cleanup levels at the action level, understanding that action levels are set under conservative assumptions and that the cleanup levels may be modified as appropriate. The remedies analyzed by the owner/operator would generally be designed to meet these targets. After reviewing the permittee's Corrective Measure Study (CMS) using the remedy selection factors given in § 264.525(b), the Agency will select a remedy and set media cleanup standards that must be achieved.

The Regional Administrator will specify media cleanup standards that the remedy must achieve, as necessary to protect human health and the environment. The Regional Administrator may set a media cleanup standard for each constituent for which an action level has been exceeded, as well as other hazardous constituents which the Regional Administrator determines to pose a threat to human health and the environment (*e.g.*, constituents considered under § 264.520(b)). Alternatively, the Regional Administrator may specify media cleanup standards for a subset of hazardous constituents present at the site which are the most toxic, mobile, persistent and difficult to remediate, considering the concentrations at which they are present at the site. This approach may be most appropriate where there are large numbers of hazardous constituents present in a medium. The Regional Administrator may determine in the remedy selection process that some cause exists for not setting a standard for certain constituents, as discussed later in this section of the preamble. Section 264.525(d)(1) describes the specific approach the Agency proposes to follow in setting these levels.

b. *Protectiveness.* A primary goal of corrective action is to achieve cleanup consistent with existing media-specific cleanup standards, or, when such standards do not exist, to achieve protection against risks to human health such that the excess lifetime risk from exposure to a carcinogenic hazardous constituent in soil, air, ground water or surface water does not exceed 10^{-6}. A variety of practical constraints, as described later, can prevent the consistent achievement of that goal. However, the risks to an individual from exposure to a hazardous constituent in contaminated media should not exceed approximately 10^{-4}.

In the corrective action program, remediation decisions must be made at hundreds of diverse sites across the country. Therefore, as a practical matter, the human health goal will typically be established by means of a two-step approach. First, EPA intends to use a lifetime excess cancer risk of 10^{-6} as a point of departure for establishing remediation goals for the risks from hazardous constituents at specific sites. This starting point is generally consistent with historical Agency practice. While it expresses EPA's preference, it is not a strict presumption that the final cleanup will attain that risk level.

The second step involves consideration of a variety of site-specific or remedy specific factors. Such factors will enter into the determination of where within the risk range of 10^{-4} to 10^{-6} the media cleanup standard for a given hazardous constituent will be established.

This means that a risk level of 10^{-6} is used as the starting point for determining the most appropriate risk level that alternatives should be designed to attain. The use of 10^{-6} expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range, but this does not reflect a presumption that the final remedy should attain such a risk level. The ultimate decision of what level of protection will be appropriate depends on the selected remedy, which is, in turn, based on the criteria listed in proposed § 264.525(b). Because of factors related to exposure, uncertainty, and technical limitations, EPA expects that the entire risk range will be available and utilized at various sites.

In the Agency's view, it is important to have an initial value to which adjustments can be made, particularly since the risk range covers two orders of magnitude. By using 10^{-6} as the point of departure, EPA intends that there be a preference for setting remediation goals at the more protective end of the range, other things being equal. EPA does not believe that this preference will be so strong as to preclude appropriate site-specific factors.

Several examples illustrate how under today's proposal EPA might adjust cleanup standards in light of potential uses. First, ground water that is not a potential source of drinking water would not require remediation to a 10^{-4} to 10^{-6} level (although cleanup to address environmental concerns or to allow other beneficial uses might be required). Second, ground water in a broadly contaminated area would typically be remediated to specific background levels as described below, except where the remediation took place as part of an area-wide cleanup. Finally, contaminated soil at an industrial site might be cleaned up to be sufficiently protective for industrial use but not residential use, as long as there is reasonable certainty that the site would remain industrial.

At the same time, in exceptional circumstances, other site-specific exposure factors may indicate the need to establish a risk goal for a particular contaminant that is more protective than the overall goal of 10^{-6}. These site-specific exposure factors may include: The cumulative effect of multiple contaminants (see following discussion); the potential for human exposure from other pathways at the facility; population sensitivities; potential impacts on environmental receptors; and cross-media impacts.

In summary, EPA has proposed an approach that allows a pragmatic and flexible evaluation of potential remedies at a site while still protecting human health and the environment. This approach emphasizes the overall goal of 10^{-6} as the point of departure (in situations where there are not existing standards, such as MCLs), while allowing site or remedy-specific factors, including reasonably foreseeable future uses, to enter into the evaluation of what is appropriate at a given site. As risks increase above 10^{-6}, they become less desirable, and the risks to individuals should not exceed approximately 10^{-4}.

Proposed § 264.525(d)(1)(iii) lists four considerations which may be used in establishing media cleanup standards. These considerations apply to setting standards for both carcinogens and non-carcinogens. The factors listed above which may be used in determining

cleanup standards for carcinogens within the risk range are intended to be included broadly within these four general considerations.

(1) *Multiple Contaminants.* The first consideration under § 264.525(d)(1)(iii)(A) is multiple contaminants in the medium. In order to ensure that individuals exposed to a medium (*e.g.*, via drinking ground water) will be protected it may be necessary to consider the risks posed by other constituents in that medium before a media cleanup standard for a single constituent can be established. In considering the risks posed by multiple contaminants, the Agency will follow the procedures and principles established in its "Guidelines for the Health Risk Assessment of Chemical Mixtures" (51 FR 34014). The cumulative risk posed by multiple contaminants should not exceed a 1×10^{-4} cancer risk. All other factors being the same, the media cleanup standard for a constituent present in a medium that is contaminated with many other constituents posing significant risks may be established at a lower concentration than if that constituent were the sole contaminant in the medium.

(2) *Environmental Receptors.* Remedies must be protective for the environment as well as human health. Section 264.525(d)(1)(iii)(B) allows the Regional Administrator to consider actual or potential exposure threats to sensitive environmental receptors in establishing media cleanup standards. Standards, criteria, and other health-based levels are often based on protection of human health, since more information is usually available on effects of contaminants on humans (or laboratory animals) than on environmental receptors. Levels set for protection of human health will frequently also be protective of the environment. However, there may be instances where adverse environmental effects may occur at or below levels that are protective of human health. Sensitive ecosystems (*e.g.*, wetlands) or threatened or endangered species or habitats that may be affected by releases of hazardous waste or constituents should be considered in establishing media cleanup standards. The Agency plans to develop guidance on evaluating ecological impacts. Until more substantial guidance is developed, the Agency intends to determine on a case-by-case basis when standards must be established at lower concentrations to protect sensitive ecosystems or environmental receptors. For releases to surface water, Federal Water Quality Criteria may be used as guidance in making this determination.

(3) *Other Exposures.* Generally, the Agency will only consider the contamination contributed by the releases subject to corrective action in setting protective cleanup levels. In unusual situations, however, it may be necessary to consider the presence of other exposures or potential exposures at the site (§ 264.525(d)(1)(iii)(C)). For example, if residents living in close proximity to a facility receive unusually high exposures to lead due to the presence of a lead smelter in their town, it may be necessary to set lower cleanup levels for lead in ground water from a SWMU than would otherwise be necessary. Remedies whose cumulative exposures (*i.e.*, mixtures of chemicals, or multiple pathways of exposure) fall within the risk range for carcinogens (1×10^{-4} to 1×10^{-6}), or meet acceptable levels for non-carcinogens, are considered protective of human health.

Chronic exposure to multiple SWMU-contaminated media, although not likely at most sites, may be considered under proposed § 264.525(d)(1)(iii)(C) in establishing media cleanup standards. An example might be where releases from solid waste management units are present in both ground water and soils (from wind blown particulates) at nearby residences. In this case, it might be appropriate to set cleanup standards for either or both releases at more conservative levels, to account for such cumulative risk concerns. The Agency will examine such cross-media effects, when appropriate, on a case-by-case basis.

(4) *Remedy-Specific Factors.* Section 264.525(d)(1)(iii)(D) allows the Regional Administrator to consider the reliability, effectiveness, practicability, and other relevant factors of the remedy in establishing media cleanup standards. These factors are related to the remedy selection decision factors specified in § 264.525(b). An example of how these factors may be considered by the Agency in establishing media cleanup standards under § 264.525(d) is the following. Suppose that one remedial alternative can theoretically treat constituents in soil to concentrations posing a 1×10^{-6} risk level, but relies on a technology that has not been successfully demonstrated under conditions analogous to those at the site in question, or may be unreliable for other reasons. In this situation, consideration of the long-term reliability and effectiveness of the remedy may result in the selection of another technology that can achieve a 1×10^{-5} risk level, but has been demonstrated to be more reliable.

A variety of exposure-related factors may be considered in establishing media cleanup standards. For example, the potential and pathways for exposure to soils may vary greatly across sites. Media cleanup standards will generally be established for soils to protect individuals from health threats resulting from direct contact to soils. In some cases, however, individual health may be threatened due to the absorption of contaminants in soils by plants and in turn by grazing animals used for human consumption. In these cases, cleanup standards might be set on the basis of protecting health from this exposure pathway.

In establishing media cleanup standards for soil based on exposure via direct contact, the Agency may use the exposure assumptions listed in Appendix D. These exposure assumptions are based on a daily intake of soil through ingestion, of particular concern for young children (see preamble section VI.E.2.f for a detailed discussion of soil exposure assumptions). However, the Agency recognizes that these exposure assumptions would be appropriate only where soil ingestion is plausible. The Agency is considering using different exposure assumptions where different exposure scenarios are likely based on current and projected future land use at/near the site. For example, for sites located in industrial areas that are likely to remain industrial in the foreseeable future, exposure assumptions more appropriate to industrial land use might be used. Thus, the exposure assumptions proposed in Appendix D would apply to sites near areas that are now residential or are reasonably projected to become residential. However, the Agency recognizes that considerable uncertainty is involved in forecasting future land use. The Agency requests comment on the general concept of using current and projected land use to develop likely exposure scenarios for different sites in developing media cleanup standards, and on specific exposure assumptions which are reasonable for these different exposure scenarios.

It should be understood that the Agency does not intend typically to establish cleanup standards per se (*i.e.*, according to § 264.525(d)(1)) for "deep" soils that do not pose a direct contact exposure threat. Such contaminated soils can, however, often be a transfer source of contaminants to other media, such as through leaching of wastes into ground water or surface water. In such

cases the contaminated soils would be dealt with as a source, rather than as a release; that is, the remedy would specify containment, removal or treatment measures for the soils in the same manner as for other sources of releases (*e.g.*, landfills). Such measures would be required as necessary to ensure that media cleanup standards for the affected media are not exceeded.

There are several means of investigating the mobility of contaminants in soil, including a descriptive approach (*i.e.*, consideration of constituent and soil properties), and/or the use of mathematical models or leaching tests (for mobility to ground water). The Agency is further evaluating the use of different leach tests, and requests comments on these and other ways of estimating media transfer of soil contaminants.

The Agency recognizes that there are also technical limitations which must be considered, in addition to scientific information about the hazards to human health and the environment, in establishing media cleanup standards. For example, media cleanup standards would not be set lower than detectable levels. Consideration of reliability, effectiveness, practicability, and other factors will generally be considered on a case-by-case basis.

c. *Cleanup Levels and Other Sources of Contamination.* In some cases, solid waste management units will be located in areas contaminated from other sources. For example, a solid waste management unit may lie over an aquifer already contaminated from off-site sources or from other activities at the facility. Similarly, an area of contaminated soil resulting from waste management may lie in a broader area of high naturally occurring contamination. In such cases, section 3004(u) gives EPA authority only to require cleanup of contaminants released from on-site solid waste management units. This authority does not extend to cleanup of releases from production areas (unless the releases are "routine and systematic") or from off-site sources (unless those sources are also at a RCRA facility).

Proposed § 264.525(d)(1)(v) codifies this limitation on section 3004(u) authority by allowing the facility owner/operator to demonstrate that a specific concentration of a constituent in the vicinity of a solid waste management unit does not come from that unit, but rather is attributable to sources other than on-site solid waste management units. If the owner/operator can successfully make this demonstration, EPA would not have the authority under subpart S to require cleanup below that concentration. Proposed § 264.525(d)(1)(v) provides, however, that the Regional Administrator may determine that cleanup to levels below the background concentration is necessary for the protection of human health or the environment in connection with an area-wide cleanup under RCRA or other authorities.

The best example of this limitation on section 3004(u) is found in contaminated ground water. If a specific constituent is found in ground water downgradient of a solid waste management unit at levels exceeding action levels, a CMS would ordinarily be required. However, if the facility owner/operator can demonstrate that the constituent levels did not exceed upgradient "background" levels, and that the upgradient background levels did not come from other solid waste management units on the facility, cleanup would not be required. Similarly, even if the downgradient concentration exceeded upgradient background, cleanup could be required only to the upgradient background levels. This approach to "background" is the same as the one found in subpart F.

In the case of soil, the same principle applies. Section 3004(u) provides EPA the authority only to require owner/operators to clean up contaminated soils to the extent that the contamination derives from releases from a solid waste management unit (or that the area itself is a solid waste management unit). Therefore, cleanup of soils would not be required under subpart S below "background" levels. The best measure of background levels for soils will generally be naturally occurring soils in areas not contaminated by a facility's activities—for example, off-site soils. However, in areas broadly contaminated with nonstituents not subject to section 3004(u) (for example, from manufacturing or off-site air emissions), an owner/operator may be able to argue successfully that constituents found on a facility below a certain level cannot be attributed to releases from a solid waste management unit.

Today's proposal, however, does not allow RCRA facilities located in contaminated areas to ignore facility contributions to the contamination. The permittee will be required to clean up the contamination caused by his/her waste management activities, unless a determination is made under proposed section 264.525(d)(2) that remediation of the release is not required.

In reviewing the demonstration under § 264.525(d)(1)(v) that a hazardous constituent(s) at a specific concentration in a medium is naturally occurring or is from a source other than a solid waste management unit at the facility, the Regional Administrator would evaluate sampling data developed by the permittee. The Regional Administrator would assess the accuracy of these data and evaluate the statistical procedures used by the permittee to characterize these concentrations. The Regional Administrator may use the performance standards proposed on August 24, 1987, at 40 CFR 264.97 to make this assessment (52 FR 31948).

6. *Determination that Remediation of Release to a Media Cleanup Standard Is Not Required.* Proposed § 264.525(d)(2) identifies three situations in which the Regional Administrator may decide not to require cleanup of a release of hazardous waste or hazardous constituents from a SWMU to a media cleanup standard meeting the conditions of § 264.525(d)(1). These situations are limited to cases where there is no threat of exposure to releases from SWMUs; cases where cleanup to a level meeting the standards of § 264.525(d)(1) will not result in any significant reduction in risk to humans or the environment; or is technically impracticable. In situations where the Regional Administrator determines that cleanup to a level meeting the conditions of § 264.525(d)(1) is technically impracticable, the owner/operator may be required to remediate to levels which are technically practicable and which significantly reduce threats to human health and the environment.

The Agency does not believe that continued further degradation of the environment should be allowed, even in those situations where actual cleanup of releases may not be required. As provided by § 264.525(d)(3), the Regional Administrator may require source control measures to control further releases into the environment, or other measures to protect against exposure to contaminated media. If source control or other measures are not necessary (*e.g.*, the source no longer exists), a determination of no further action may be made pursuant to § 264.514.

a. *Areas of Broad Contamination.* In some cases, SWMUs releasing hazardous constituents to the environment will be located in areas that already are significantly contaminated. Where the risks from releases from the SWMUs are trivial compared to the risk already present from overall area-wide contamination, or where remedial measures aimed at the SWMU would not significantly reduce risk, EPA believes that remediation of releases from the SWMU to a cleanup level meeting the standards of § 264.525(d)(1) would not be

necessary or appropriate. In these situations, proposed § 264.525(d)(2)(i) would allow the facility owner/operator to provide the Regional Administrator information demonstrating that such remediation would provide no significant reduction in risk. If the demonstration were successful, the Regional Administrator would determine that remediation to a level meeting the standards of § 264.525(d)(1) was not necessary.

For example, ground water below a leaking SWMU might be heavily contaminated from off-site sources. In this case, removal of the SWMU's contribution to the contamination might have very limited benefit, particularly if that contribution was relatively minor. Similarly, a SWMU such as a surface impoundment might be contributing relatively trivial amounts to area-wide air problems. Control of the SWMU releases might do very little, in such cases, to improve the overall situation in the area, yet (in the case of an operating unit) could be extremely burdensome to the owner/operator.

In such cases, EPA believes that it will make more sense to attack area-wide problems, where they are determined to threaten human health or the environment, on a more comprehensive basis and to focus on the primary sources of release—for example, under RCRA section 7003, CERCLA, or other environmental authorities. The Agency does not believe that it makes sense routinely to require remediation of SWMU releases where they represent only a trivial contribution to an area's problems.

Two points should be stressed here, however. First, the facility owner/operator would be required to take corrective action where it could have a significant effect on reducing risks—for example, as part of an area-wide cleanup strategy. The fact of area-wide contamination would not eliminate EPA's authority to require action in this case. It should be noted that an area-wide cleanup might not be coordinated under a single authority, or within a specific narrow time frame; rather the Regional Administrator may use a variety of authorities to address an area-wide contamination problem over time. Second, EPA in any case would have the authority under proposed § 264.525(d)(3) to require source control to prevent further releases, or to require other measures such as those necessary to protect against exposure to the affected medium.

The Agency has not attempted to define "significant reductions" in risk in this rulemaking, and believes the decision is best made on a case-by-case basis. However, the Agency seeks comment on whether a more specific definition is necessary for the purposes of this rulemaking.

b. *Ground Water.* Under proposed § 264.525(d)(2)(ii), the Regional Administrator may determine that remediation of a hazardous constituent released from a SWMU into ground water to a media cleanup standard meeting the standards of § 264.525(d)(1) is not necessary to protect human health and the environment if: (1) The ground water is not a current or potential source of drinking water; and (2) the ground water is not hydraulically connected with waters to which the hazardous constituents could migrate in concentrations which could increase contamination in the water to concentrations that exceed action levels.

In interpreting whether the aquifer is a current or potential source of drinking water, the Agency will generally use the approach outlined in the Agency's Ground-Water Protection Strategy (August 1984 and as subsequently modified) as guidance. Generally, Class III aquifers will be considered to meet the requirements specified in § 264.525(d)(2)(ii). Class III aquifers are ground waters not considered potential sources of drinking water and are considered to be of limited beneficial use. They are ground waters that are heavily saline, with total dissolved solids (TDS) levels over 10,000 mg/l, or are otherwise contaminated beyond levels that allow cleanup using methods reasonably employed in public water system treatment. These ground waters also must not migrate to Class I or II ground waters or have a discharge to surface water that could cause degradation.

A determination under § 264.525(d)(2)(ii) that remediation to a media cleanup standard is not necessary might be made in situations where a SWMU located in a heavily industrialized area has released to ground water in an aquifer that is surrounded by ground water that has been heavily contaminated from non-SWMU sources. It is not the intention of the Agency to create a ground-water "island of purity" that is unlikely to be used for drinking water or other (non-industrial) beneficial purposes due to its location in an area historically used only for industrial purposes.

Information from the State and/or local government as to the beneficial use of the ground water may also be useful if the ground water has been classified for specific uses. If the ground water is not a potential source of drinking water but has other beneficial uses (*e.g.*, agricultural), then remediation to a media cleanup standard may not be required; however, remediation of the ground water to its beneficial use would be required, as provided under § 264.525(d)(3).

If a determination under § 264.525(d)(2)(ii) is made where the ground water poses a threat to environmental receptors, or poses a threat to human health through an unusual exposure pathway (*e.g.*, ponding or basement seepage from shallow aquifers), remediation to alternative levels could likewise be required pursuant to § 264.525(d)(3). The Agency believes that health-based concerns may be secondary to environmental concerns for releases to Class III ground waters. The need to remediate Class III ground waters will be assessed on a case-by-case basis. In any case, cleanup levels for ground water that is not a potential source of drinking water would be established at other than "drinkable" levels.

In other cases, ground water may not fall into Class III, but, because of its distance from any population or other factors, is unlikely to become a source of drinking water in the foreseeable future. In these cases, remediation might be carried out over an extended period of time, and natural attentuation might play a major role in the remedy. The issue of timing of remedies is discussed in more detail in section VI.F.4 of this preamble.

To demonstrate whether the ground water is hydraulically connected with waters to which the hazardous constituents are migrating, samples of water should be taken within the discharge zone of the ground-water contamination plume. The discharge zone will have to be determined on a site-specific basis, and is dependent on the local hydrogeology. If, upon sampling in the discharge zone, the levels of the constituent of concern are not detectable, a statistical comparison of sampling data does not need to be performed. However, if the discharge levels are detectable, an appropriate statistical procedure should be used to compare the constituent concentration in the discharge zone to the constituent concentration upstream. Guidance on appropriate statistical techniques may be obtained from the proposal on statistical methods for use in the RCRA subpart F program dated August 24, 1987 (proposed as 40 CFR 264.97; see 52 FR 31948). In addition, the Agency expects to develop further guidance on appropriate statistical techniques for making these determinations.

The determination of whether the ground water is hydraulically connected with waters to which the hazardous constituents are likely to migrate in concentrations which exceed action levels will be made on a site-specific basis. The physical and chemical characteristics of the hazardous constituents in ground water, the concentrations of the hazardous constituents in ground water and surface water, and local hydrogeological characteristics should be considered in making this determination.

c. *Technical Impracticability.* Proposed § 264.525(d)(2)(iii) would allow the Regional Administrator to make a determination that remediation of a release to a media cleanup standard meeting the criteria of § 264.525(d)(1) is not required when remediation is technically impracticable. The determination of technical impracticability involves a consideration of both engineering feasibility and reliability. Such a determination may be made, for example, in some cases where the nature of the waste and the hydrogeologic setting would either prevent installation of a ground-water pump and treat system (or other effective cleanup technology), or limit the effectiveness of such a system—*e.g.*, dense, immiscible contaminants in mature Karst formations or in highly fractured bedrock. In other situations a determination under § 264.525(d)(2)(iii) may be made when remediation may be technically possible, but the scale of operations required might be of such a magnitude and complexity that the alternative would be impracticable. The Agency is persuaded that in these and other situations determined to be technically impracticable from a remedial perspective the Regional Administrator should have the authority to not require remediation to media cleanup standards.

Decisions regarding the technical impracticability of achieving media cleanup standards must be made upon careful evaluation of the technical circumstances involved. Facility owner/operators will be required to provide clear and convincing information to support any assertion that such cleanup is technically impracticable.

As suggested in the examples provided above, the Agency believes that the concept of technical impracticability may in some cases also apply to situations in which use of available remedial technologies would create unacceptable risks to workers or surrounding populations, or where cleanup would create unacceptable cross-media impacts. For example, some wastes present a high potential for explosion during excavation. The Agency expects that these types of situations which could lead to a determination of technical impracticability will be quite rare. In the case of cross-media impacts, it is expected that sound techniques and engineering controls—or other remedial alternatives—should be available to effectively minimize such cross-media transfer effects. In the absence of such controls or alternatives, however, remediation of such situations could be determined technically impracticable. The Agency is specifically soliciting comment today on the types of situations which might warrant a determination that remediation of a release to a media cleanup standard meeting the standard of § 264.525(d)(1) is technically impracticable, and would not, therefore, be required.

7. *Demonstration of Compliance With Media Cleanup Standards (§ 264.525(e)).* Section 264.525(e) outlines the Agency's proposed approach to establishing conditions the permittee must fulfill to achieve and demonstrate compliance with the media cleanup standards (or alternative cleanup levels) established during the remedy selection process. Media cleanup standards are contaminant concentration limits set on a constituent-specific basis in each environmental medium in which the permittee is required to remediate a release. (See proposed § 264.525(d).) The site-specific conditions which would be established by the Regional Administrator in the permit under § 264.525(e) include compliance points (where cleanup standards must be achieved) for each medium; sampling, analytical, and statistical methods the owner/operator must use in compliance demonstrations; and the length of time over which the data must show that the media cleanup standard (or alternative cleanup level) has not been exceeded to successfully demonstrate compliance. Each of these requirements is discussed below.

a. *Points of Compliance*—(1) *Ground Water.* Proposed § 264.525(e)(1)(i) would establish that the media cleanup standard would generally be required to be achieved throughout the area of contaminated ground water. This would require that, if the ground water were a drinking water source, the entire plume of contamination would have to be cleaned up to levels acceptable for drinking. EPA is proposing this alternative since exposure to contaminated ground water may potentially occur anywhere within an area of ground-water contamination.

Proposed § 264.525(e)(1)(i) would also provide the Regional Administrator with the discretion to establish a point of compliance for ground water at the boundary of the waste when waste is left in place. Such discretion may be necessary where it is impossible or inappropriate to install monitoring wells at certain locations. For example, in the case of a large landfill, it would usually be unwise to install monitoring wells through the landfill itself. In addition, there will be circumstances where ground water contamination is caused by releases from several distinct units or sources that are in close geographical proximity. In such cases, the most feasible and effective ground-water cleanup strategy may well be to address the problem as a whole, rather than unit by unit, and to draw the plume of contamination back to a point of compliance encompassing the sources of release. Proposed § 264.525(e)(1)(i) therefore explicitly gives the Regional Administrator the authority to set the point of compliance at a line encompassing the original sources of the release.

The Agency stresses that its general goal is to clean up the entire plume of contamination; however, it believes that for very practical reasons it must have the discretion to set an alternative point of compliance for ground water around one or more common sources of release. In determining where to draw the point of compliance in such situations, the Regional Administrator will consider such factors as the proximity of the units, the technical practicabilities of ground-water remediation at that specific site, the vulnerability of the ground water and its possible uses, exposure and likelihood of exposure, and similar considerations.

Further, in situations where there would be little likelihood of exposure due to the remoteness of the site, alternate points of compliance may be considered, provided contamination in the aquifer is controlled from further migration.

Proposed § 264.525(e)(1)(i) provides that the location of ground-water monitoring wells will be specified by the Regional Administrator. The monitoring wells will serve both to monitor the effectiveness of the ground-water remediation program, and to allow the permittee to demonstrate compliance with the media cleanup standards contained in the permit for releases to ground water. Where waste is left in place (either at facility closure or at operating waste management units),

wells will generally be located up to the boundary of the waste (*i.e.*, the unit boundary for operating waste management units).

In establishing the point of compliance for remediation of ground water for today's proposed rule, EPA considered several different alternatives. These include the following:

- Throughout the ground water;
- At the hazardous waste unit boundary;
- At the edge of the existing contamination not to exceed a "buffer" zone inside the facility boundary (*e.g.*, a line describing the point at which it would take at least five years for the contamination to reach the facility boundary if it was left unabated); and
- At the facility boundary.

The alternative considered by the Agency which would have established the point of compliance at the facility boundary would recognize that the likelihood of exposure to ground-water contamination is extremely unlikely on the property of an actively managed facility. Owners and operators of these facilities are required to identify and monitor existing contamination under existing regulations. Where existing contamination would result in exposure (or to any contamination beyond the facility boundary), owner/operators would be required to cleanup this contamination. A point of compliance at the facility boundary would reduce costs in certain cases, while providing protection from adverse exposure. However, the Agency is not proposing this alternative because it may allow the spread of contamination within the facility boundary, and provides a smaller margin of safety than a more stringent point of compliance.

Another alternative would be to set the point of compliance at the edge of the existing contamination, with a "buffer" zone inside the facility boundary. This would prohibit the continued spread of contamination and provide a margin of safety between the facility boundary and any existing contamination. The size of the "buffer" could be determined by the expected mobility of the contamination at that site. For instance, the buffer could be set so that it would take at least five years for contamination to reach the facility boundary. Once identified, contamination entering the buffer zone would be required to undergo corrective action.

EPA requests comments on its proposal and on alternatives to this approach. In any case, if the Agency adopted a point of compliance less stringent than the waste unit boundary, the Regional Administrator would have the discretion to adopt a more stringent point of compliance where warranted by site specific characteristics.

(2) *Air.* Proposed § 264.525(e)(1)(ii) would generally establish the compliance point for hazardous constituents released to air at the location of the most exposed individual. This is intended to be the point(s) where maximum long-term human exposure would occur. It is expected that the point of compliance will typically be outside the facility boundary.

In determining the location of the most exposed individual, the Agency will evaluate the risks where people spend a significant amount of their time on a daily basis rather than address temporary or transient exposures to air emissions (*e.g.*, persons driving by the facility). Thus, cleanup standards 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 if releases continue. This exposure might occur through windblown particles (*e.g.*, from contaminated soil), windblown volatile emissions, or toxic gases migrating from the subsurface into dwellings or other structures. These kinds of potential exposures are evaluated during the facility investigation, and will generally require source controls when they pose an actual or potential threat.

In establishing the location(s) of the most exposed individual(s), EPA will generally not include on-site facility workers, but would include people who live on-site, 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 sites. OSHA has established standards for such exposures in 29 CFR 1910.120. Although EPA has the authority to address occupational exposures, it will generally do so only when the Regional Administrator has cause to believe that inadequate controls are being exercised at the site.

The Agency believes that achieving compliance at the location of actual human exposure will, in most cases, be fully protective. However, the Agency recognizes that some sites may present circumstances in which a different compliance point may be necessary to protect human health and the environment, and has provided the Regional Administrator the flexibility to set a compliance point other than at the most exposed individual. This may particularly apply where exposure of environmental receptors are a concern. For example, the Regional Administrator could specify that a permittee must demonstrate compliance with the cleanup standard at the location of the most exposed environmental receptor if site conditions warranted.

The Agency considered other points of compliance for media cleanup standards for air, including the unit boundary and the facility boundary. The Agency, however, believes that requiring compliance with air cleanup standards at these locations would be unnecessarily stringent, and would provide very little, if any, real additional health or environmental protection. For example, if the point of compliance were set at the unit boundary, releases from the unit would have to be controlled to health-based levels, assuming life-time exposure at that unit. In practical terms, this would require that emissions from units such as surface impoundments would in some cases have to be controlled virtually to zero. The Agency believes that such a standard would be unrealistic. Similarly, the Agency believes that it is unnecessary to set the point of compliance as a routine matter at the facility boundary, since in many, if not most, cases the actual location of exposed populations will be some considerable distance from the site.

As discussed earlier in today's preamble (section VI.E.2.d), action levels for air are determined at the facility boundary in order to ensure that there will be a plan in place to address the contingency of receptors moving close enough to the facility to be adversely affected by air releases from SWMUs. Recognizing that residential patterns may change after a remedy has been selected and implemented, proposed § 264.560(b) would require the facility owner/operator to notify EPA and any individuals who may be exposed to the contaminated air if, at any time, air concentrations exceed the action level beyond the facility boundary. The need for interim measures or additional studies would be assessed at that time.

The approach proposed today for establishing points of compliance for air releases differs somewhat from the proposed approach for other media, such as ground water. This is due to basic differences in the behavior of contaminants in air as compared to ground water. When a release into ground water occurs, typically the resulting ground-water contamination will remain at or near the facility for an

extended period of time. Thus, if the contamination is not remediated, exposure to the contamination (*i.e.*, through drinking water wells) can occur for years thereafter. In contrast, when a release into air occurs, typically it will migrate and disperse relatively rapidly; the time when individuals who are located close to the facility could be exposed to the air toxicants would be a matter of minutes or hours. Thus, an air release that is occurring at any given time does not present a long-term exposure threat to those individuals, as would a ground-water release. Remedies for an air release problem will most often involve stopping or controlling the release itself from continuing to occur; the released chemicals will not actually be "cleaned up" per se.

Although the Agency recognizes that there can be other effects from air releases from solid waste management units (*e.g.*, formation of ozone), the general objective under subpart S is to prevent exposure of nearby individuals to harmful levels of airborne toxicants and carcinogens released from SWMUs (see section VII.C.3 of this preamble for a discussion of the relationship of subpart S to section 3004(n) standards and ozone concerns). Therefore, EPA believes that the proposed approach for setting points of compliance for air releases at the most exposed individual is sensible and realistic. Requiring compliance at the unit boundary (which would follow the approach for ground water) would, in essence, create a standard based on protecting against an implausible exposure scenario.

Proposed § 264.525(e)(1)(ii) also provides that the Regional Administrator will specify locations where air monitoring devices must be installed and what emission modeling or testing, atmospheric dispersion models, or other methods must be used to demonstrate that a permittee has achieved compliance with the media cleanup standards. Methods of demonstrating compliance with air cleanup standards will vary from site to site. At many sites, emission modeling or monitoring air close to the unit may be coupled with air dispersion modeling to estimate concentrations of hazardous constituents at the point of compliance. At other sites, monitoring of air quality at the actual point of compliance may be the most accurate and reliable method of demonstrating compliance with the media cleanup standard. In other cases, corrective measures taken to control the source of the release may eliminate the release to air altogether. In such cases, continued air monitoring or modeling would not generally be required.

(3) *Surface Water.* For surface water, the Agency is proposing the point where releases enter the surface water as the point of compliance. (See § 264.525(e)(1)(iii).) This compliance point will be used for releases to surface water that are ongoing, such as would be the case with contaminated ground water that flows into a surface water body, or non-point runoff which occurs during rainfall events. The Agency believes that achieving compliance with the media cleanup standard for such releases at the point of entry into surface water will be necessary to assure that human health and the environment are protected.

EPA recognizes, however, that in some cases releases from solid waste management units that have occurred in the past have settled and accumulated in surface water sediments. Where actual cleanup of contaminated sediments is determined to be necessary, and cleanup standards have been specified for the sediments in the context of a remedy, proposed § 264.525(e)(1)(iii) would allow the Regional Administrator to designate locations (*i.e.*, areas and depths in the sediments) where compliance with the standards would be required.

The Regional Administrator will specify the locations where surface water must be sampled to monitor the water quality. The Agency recognizes that in some cases (*e.g.*, fast moving streams) there may be some dilution of hazardous constituents before samples can be collected; however, the goal in establishing sampling locations should be to minimize such dilution effects. The Regional Administrator also may specify locations where sediment samples will be collected and analyzed to demonstrate compliance with media cleanup standards. Such considerations will be particularly important where the surface water is an important environment for aquatic life and/or fish or other organisms which are likely to be ingested by a nearby population.

(4) *Soils.* Today's proposal would establish the point of compliance for soils at any point where direct contact exposure to the soils may occur. In most cases this point will be near the surface of soils, because this is where the greatest likelihood exists of human contact.

b. *Methods.* Under § 264.525(e)(2), the Agency proposes that the Regional Administrator specify in the permit the sampling and analytical methods to be used, methods of statistical analyses, if required, and the frequency of sampling or monitoring that may be required to characterize levels of hazardous constituents in all media, and to demonstrate compliance with media cleanup standards (or alternative cleanup levels). In many cases the permittee may have proposed, in the Corrective Measure Study, sampling and other analytic methods that would be appropriate for the remedial alternative as part of an implementability or availability of needed services analysis. In such cases, the Regional Administrator may consider and adopt the proposed methods or other methods that he/she believes to be more appropriate for the environmental problem being addressed or may require the parmittee to use methods he/she believes more reliable.

c. *Timing of Demonstration of Compliance.* The Agency is also proposing under § 264.525(e)(3) that the Regional Administrator specify in the remedy the length of time during which the permittee must demonstrate that concentrations of hazardous constituents have not exceeded specified concentrations in order to achieve compliance with media cleanup standards (or alternative cleanup levels). Under the existing subpart F regulations (§ 264.100), the Agency has required that facility owner/operators remediating ground-water contamination from regulated units continue corrective action until the designated ground-water protection standard has not been exceeded for a period of three years. The Agency has found that, given the variety of hydrogeologic settings of facilities and characteristics of the hazardous constituents, it is difficult to demonstrate reliably that the ground-water protection standard has been achieved by imposing a uniform time for demonstrating compliance.

The Agency is not proposing a specific time period under the subpart S regulations for achieving compliance with cleanup standards before discontinuing corrective action. Instead, the Agency is proposing that the Regional Administrator specify the length of time required to make such a demonstration as appropriate for a given media cleanup standard. As described under proposed § 264.525(e)(3) (i)-(v), the Regional Administrator may consider five factors in setting this timing requirement: (1) The extent and concentration of the release; (2) the behavior characteristics of the hazardous constituents in the affected medium; (3) the accuracy of the monitoring techniques; (4) characteristics of the affected media; and, (5) any seasonal, meteorological, or other environmental variables that may

affect the accuracy of the monitoring results. The Agency believes that consideration of these factors will allow the Regional Administrator to set an appropriate time period for demonstrating compliance with cleanup standards rather than relying on an arbitrary time period for all facilities or all situations at the same facility.

One example of how these considerations might affect a decision on the time a cleanup standard must not be exceeded to demonstrate compliance is given here. The Agency expects that pump and treat systems will be required at many facilities where hazardous wastes or hazardous constituents have migrated to ground water from SWMUs. Experience in the RCRA subpart F program (which addresses releases of hazardous constituents to ground water from regulated units) has shown that continuous operation of a pump and treat system may interfere with the owner/operator's ability to obtain accurate sampling data on constituent concentration levels. Allowing natural restoration of chemical equilibrium in the affected ground water after the pump and treat system is turned off will be necessary to obtain accurate readings of constituent concentrations. If the concentration(s) rise to unacceptable levels after the remedial technology is disconnected, reinitiation of treatment may be required. This process would have to be repeated until acceptable concentration levels are achieved after chemical equilibrium has been reached in the ground water with the treatment system suspended. In such cases it may be necessary to extend the life of the permit until required remedial results have been achieved even when waste management operations have ceased at all active hazardous waste units at the facility.

8. *Conditional Remedies (§ 264.525(f)).* Proposed § 264.525(f) would allow EPA to select a "conditional" remedy. A conditional remedy would allow, at EPA's or the authorized State's discretion, an owner/operator to phase-in a remedy over time, as long as certain conditions are met. EPA recognizes that in some cases completing cleanup will be sufficiently complex and costly to warrant a phased approach to cleanup. Generally, a conditional remedy would allow existing contamination (sometimes at existing levels) to remain within the facility boundary, provided that certain conditions are met. These conditions would include achieving media cleanup standards for any releases that have migrated beyond the facility boundary as soon as practicable, implementing source control measures that will ensure that continued releases are effectively controlled, controlling the further migration of on-site contamination, and providing financial assurance for the ultimate completion of cleanup. The length of time that contamination could be allowed to remain within the facility boundary would be established on a site-specific basis, but could be for as long as the permit remains in effect. Nothing in this provision, of course, would prevent the transfer of property subject to a conditional remedy or other corrective action requirements. For a further discussion of the property transfer issue, see section VI.L.1. of this preamble.

This type of remedial approach may often be appropriate for RCRA facilities, for several reasons. First, permitted RCRA facilities will typically be actively managed properties, with viable owner/operators who can control and restrict access to the property. Typically, exposure at such facilities (which have permits to manage hazardous waste) will be significantly less than at sites where access is unrestricted. For example, actual drinking of ground water under the facility will not generally occur, nor would residences typically be found—as long as the site remained a RCRA permitted facility. Therefore, an appropriate remedy for such a site might be the cleanup of ground water contamination under the site to a level consistent with current exposures. Most RCRA facilities pose significantly lower environmental and human health risks than Superfund sites, and therefore the need to pursue complete cleanup at such facilities will often be less urgent. The use of conditional remedies in appropriate situations complements EPA's overall management goal of addressing the most significant and urgent environmental problems first.

The Agency anticipates that there may be a variety of facility-specific situations under which a conditional remedy would be appropriate, given the nature of the contamination problem at the facility, the capabilities of the owner/operator and other factors such as the level of risk and local public concerns. One example could be a large facility where the contaminant sources and releases are of no current threat, are relatively remote from any potential receptors and can be reliably controlled to prevent further significant degradation, and where the owner/operator can be reasonably expected to maintain an effective, long-term presence at the facility, and thus able to prevent exposure to contaminants during the conditional remedy. EPA recognizes that decisions regarding the appropriateness of conditional remedies could often have important implications for owner/operators, as well as others who may be affected by or who have interest in the long-term environmental conditions of these facilities. Such decisions must be made in careful consideration of relevant, site-specific factors. The Agency specifically requests comment regarding which factors should be considered—and how—in determining the appropriateness of conditional remedies, and whether more formal criteria should be specified in the rule for making such decisions.

Conditional remedies would not be appropriate in situations where EPA or the authorized State lacks reasonable assurance that further environmental degradation will not occur. For example, a conditional remedy would not be appropriate in the case of a fast moving plume or in circumstances where the hydrogeology of the area suggests that additional vertical migration will likely occur despite the implementation of engineered systems or devices to control plume migration. Further, conditional remedies may not be appropriate in situations where a site with ground water contamination is located in close proximity to an environmentally sensitive area. In the case of Federal facilities, conditional remedies may be frequently used because of a combination of factors, including technical limitations on the ability to achieve complete cleanup at facilities which are often extremely large and complex, and the unique financial constraints placed on Federal facilities by the nature of the federal budget process.

The media cleanup standards, source control actions, or other actions required under a conditional remedy may or may not be sufficient for a final remedy. Today's rule recognizes that in some cases, there are technical limitations to achieving complete cleanup of ground water contamination. The proposal recognizes this and allows technical practicability to be factored into the decisionmaking process at a particular site both during the selection of remediation alternatives to be considered and in the final determination of appropriate remedies.

The Agency is particularly interested in comments on this issue from the States, who will ultimately be the implementing agencies for corrective action. Comments are solicited as to whether States support this approach, and whether they believe it reasonably

addresses corrective action problems at facilities operating under State permits.

Section 264.525(f)(2) outlines the seven specific requirements—or conditions—that conditional remedies must comply with. Should any of these conditions not be met during the term of a facility's permit, EPA would either impose new or additional conditions to ensure protection, or require the owner/operator to implement a "final" remedy; *i.e.*, a remedy that fully meets the standards of § 264.525(a). In any event, such a final remedy would ultimately have to be implemented and completed at the facility before termination of the permit.

Under a conditional remedy the owner/operator would be required to achieve media cleanup standards for any releases that have migrated beyond the facility boundary as soon as practicable. In addition, the remedy would have to prevent against any further significant environmental degradation This will typically involve implementing source control measures that will ensure that continued releases (*e.g.*, leachate from a landfill to ground water) are effectively controlled. In order to achieve this standard of protection, substantial treatment of wastes or other containment measures will often be required. In addition to such source control measures, a conditional remedy would also be required to have implemented engineered systems or devices to control the further migration of on-site releases that have already occurred. For example, in the case of a plume of "on-site" contamination (*i.e.*, that had not yet reached the facility boundary), that would continue to migrate and further contaminate the aquifer if left unchecked, the owner/operator would be required to install, at a minimum, some type of ground-water interception system or barrier system that would reliably halt such continued migration.

The source control actions or other actions required under a conditional remedy to prevent further environmental degradation may or may not be sufficient for a final remedy. In some cases, further treatment of wastes or extra engineered features might be required to achieve final remedial goals, consistent with the provisions for remedies under § 264.525 (a) and (b). Likewise, the final remedy would also require compliance with standards for attaining media cleanup standards within the facility boundary, as well as outside the facility.

Under a conditional remedy, any treatment, storage or disposal of wastes required by the remedy would have to be done in accordance with the requirements for management of wastes, as specified in proposed §§ 264.550–264.559.

Today's proposal would require that financial assurance for the remedy be demonstrated. The Agency recognizes that financial assurance may often be very important in ensuring the effectiveness of a conditional remedy, as well as ensuring that final cleanup of the facility will be achieved. Comment is solicited as to the types of financial assurance requirements that should be imposed on conditional remedies.

Since a conditional remedy may allow some contaminated media to remain on the facility during the course of the remedy, a critical feature of the remedy will be ensuring adequate controls to prevent against exposure to such contamination. Controls could be engineered features, such as fences or other physical barriers to restrict access to those areas of the facility. Other non-engineered controls, such as prohibitions against use of on-site ground water for drinking water, could also be required and written into the permit.

EPA solicits comments on the overall concept of conditional remedies, and on the specific conditions and requirements that should be imposed in implementing such remedies.

G. Permit Modification for Selection of Remedy (Section 264.526)

After a preliminary selection of remedy, the Agency will need to revise the permit to incorporate the remedy. This decision (selection of remedy) is a major one in the corrective action process, and the public is entitled to review and comment on the Agency's preliminary decision concerning appropriate remedial activities at the facility. Moreover, this modification provides an opportunity for the public to comment on activities (*e.g.*, the remedial investigations and the CMS) that have led up to the identification and selection of the remedy. As a result, the Agency believes that a major modification of the permit is appropriate. Therefore, the Agency is proposing today in § 264.526(a) to require a major permit modification for the purpose of specifying the selected corrective measures and imposing a schedule of compliance for implementing the remedy.

The regulatory authority for a major permit modification is found in 40 CFR 270.41, as amended by proposed § 270.41(a)(5)(ix) of today's regulation. No changes are being proposed in today's rule for the major modification process, which requires a 45-day notice and comment period, a response to comments, and a public hearing if such a hearing is requested. (Regulations concerning standards for major modifications are located at 40 CFR 270.41; governing procedures are found in 40 CFR part 124.)

Opportunities for public involvement in the corrective action process beyond the modification for selection of remedy are discussed in Section VIII of today's preamble.

Proposed § 264.526(b) specifies seven elements that would be included in the modified permit. The proposed modification and its accompanying statement of basis would provide a framework for the facility owner/operator's and the public's understanding of the remedial activities selected for the facility. First, the proposed modification would have to include a description of the technical features of the remedy necessary to achieve standards for remedies as stated in proposed § 264.525(a). This description must be complete enough to enable a reviewer to determine that it complies with the standards for protectiveness, attainment of media cleanup standards, source control, and waste management practices imposed on all RCRA remedies under § 264.525(a). For instance, if an incinerator is to be constructed to incinerate waste at the facility, the description would generally indicate the type of incinerator proposed, the part 264 performance standards the incinerator would meet, the capacity, *etc.* The remedy description might also need to specify equipment or design features needed to address air releases from the treatment process (*e.g.*, air strippers used to remove volatile organics will generally be required to have a control device such as a carbon adsorption unit). The technical features required should be provided in sufficient detail to allow meaningful comment and to provide the facility owner/operator clear guidance in developing a remedial design. (See discussion of remedy design under section VI.H of today's preamble.) At the same time, EPA believes that many details of the remedy—for example, the operating conditions of the incinerator needed to meet the performance standards or the exact nature of emissions control devices on tanks—might not be available at this stage and would be addressed during approval of the remedy design.

Second, today's proposal would require in § 264.526(b)(2) that media cleanup standards established during remedy selection be included in the modified permit.

Third, proposed § 264.526(b)(3) would require that the modified permit describe conditions the permittee must fulfill to demonstrate compliance with the media cleanup standards established in the remedy selection process under § 264.525(e). For example, the modified permit might require the owner/operator to continue monitoring ground water over a certain period of time after a cleanup standard has been achieved to ensure that the level is not subsequently exceeded. In addition, the permit might specify where ground water would be monitored to measure compliance. Again, specific details on compliance measurements might not be available at remedy selection, but would be addressed through remedy design.

Proposed § 264.526(b)(4) would require the Regional Administrator to specify standards applicable to the management of corrective action wastes in the permit. For example, if the remedy selected specifies use of a temporary tank at the facility for the purpose of waste treatment, any design, operating or performance standard deemed applicable to the operation of the unit would be included in the modified permit by the Regional Administrator.

Fifth, any procedures the permittee must follow to remove, decontaminate, or close units or structures used during remedy implementation would be specified in the permit, as well as any post-closure care required. In the example of the temporary unit used above, the Regional Administrator would specify any closure standards that applied to the temporary unit if the unit was employed to treat hazardous waste.

Proposed § 264.526(b)(6) would require that the modified permit include a schedule for initiating and completing all major technical features and milestones of the remedy.

Finally, the modified permit must include (under § 264.526(b)(7)) any requirements for submission of program reports or other information deemed necessary by the Regional Administrator for the purpose of overseeing remedy implementation and progress. For further discussion of the remedy selection process and components of the decision-making process, see section VI.F of today's preamble.

The Agency believes that these minimum requirements—a description of the remedy's technical features, the cleanup standards that must be achieved, the standards that must be met to demonstrate compliance with the media cleanup standards, standards applicable to the management of corrective action wastes, requirements for removal, decontamination, closure, or post-closure of units or devices employed during remedy implementation, a schedule of compliance, and requirements for reporting—are the most important decisions the modified permit must reflect. Further, they are essential to inform the public fully of the Agency's preliminary decision when the draft permit modification is issued for notice and comment.

In addition to the draft permit modification itself, EPA would also be required to publish, under the permit modification requirements, a statement of basis. This statement, which would be roughly analogous to the Superfund Record of Decision (ROD), would generally describe the basis for EPA's tentative remedy selection or approval and an explanation for the cleanup levels chosen. In addition, EPA would generally make the remedial investigation and the CMS reports available to the public for review. The scope and content of the statements of basis will vary widely, of course, depending on the complexity of the site, the nature of the proposed remedy, the level of public interest, and other relevant factors. In any case, they should be sufficiently detailed for the public and the facility owner/operator to understand and comment on the Agency's tentative decision, and the studies and conclusions leading up to the decision.

The permittee, based on the remedy selected and approved in the final modified permit, will be required under proposed § 264.526(c) to demonstrate financial assurance for completing all required remedial actions specified in the modified permit. The proposed regulations for financial assurance for corrective action (FACA) (51 FR 37854), as discussed in sections IV.D and VII.C.5 of today's preamble, may be used as guidelines by owner/operators for demonstrating the required financial assurance.

Today's proposed § 264.526(c) would require the permittee to demonstrate financial assurance no later than 120 days after the modified permit becomes effective. The Agency believes that this approach is needed since the remedy proposed for the facility in the draft permit modification may be altered in response to comments, and since final detailed remedy design, construction, operation, and maintenance plans which will provide significantly improved cost estimates may not be submitted until after the modified permit is in effect. The Agency chose 120 days to promote consistency with other RCRA financial assurance provisions. Experience in implementing the financial assurance provisions under 40 CFR part 264, subpart H, has shown that 120 days is a reasonable period of time for owners or operators to obtain financial assurance mechanisms. The Agency is specifically soliciting comment on this proposed provision today, and whether 120 days after the final remedy decision is imposed is an appropriate length of time for demonstrating financial assurance.

In addition, proposed § 264.525(c)(2) would allow the Regional Administrator in certain circumstances to release the facility owner/operator's mechanisms establishing financial responsibility for closure and post-closure financial assurance at the time financial assurance for corrective action is established. This amendment is necessary to address situations where corrective action is conducted at regulated units—particularly under the subpart F requirements of § 264.100—and the corrective action schedule of compliance replaces the unit's closure plan. In these cases, it will generally be appropriate for the Regional Administrator to release the facility's financial assurance for closure and post-closure for that unit and allow the facility to apply the mechanisms to financial assurance for corrective action. In addition, at the point where the unit subject to corrective action is effectively closed in accordance with the corrective action schedule of compliance, the Regional Administrator would have the authority under today's proposal to release the owner/operator from third-party liability requirements with respect to that unit. This proposed requirement is consistent with the current provisions of subpart H, which generally provide for the release of third-party liability mechanisms at the time an owner/operator certifies final closure.

Section 264.526(d) provides for phased remedies when considered appropriate by the Regional Administrator. The concept of phased remedies is similar to the designation of "operable units" in CERCLA. Remedial actions at CERCLA sites are often managed in stages called operable units since it is often not feasible, for a variety of reasons, to clean up an entire site in one action. Operable units under CERCLA, or remedial phases under RCRA, may consist of any logically connected set of actions performed sequentially over time, or concurrently at different parts of a site.

One example of a situation where a phased remedial approach would be useful is where treatment of waste is desirable, but where a suitable

treatment technology or adequate treatment capacity is not currently available, although it is expected to be available in the foreseeable future. In such cases, remedial phases might consist initially of limited measures to stabilize the wastes, to be followed by a complete response action when an appropriate treatment technology or capacity becomes available.

Another example of a phased approach would be a requirement to install a ground-water pump and treat system to control further movement of a contaminant plume and begin the cleanup process, prior to specifying the source control measures necessary for the releasing unit(s). Conversely, source controls at a SWMU (or SWMUs) might be required prior to installing the pump and treat system. This kind of approach would be desirable, in many cases, where the disintegration of the engineered structure of the unit(s) is resulting in continued significant releases, but the concentration of the hazardous constituents in the ground water had not reached levels or locations that threaten exposure of humans or sensitive environmental receptors to hazardous constituents at harmful levels in the near term.

Any initial remedy phases should be consistent with, and complementary to, the final remedy that is selected according to § 264.525. The separation of a remedy into phases should in no way impede future cleanups; rather, this approach should often be useful in taking early action to prevent further degradation while other problems are still in a study phase

The Agency has determined that the use of phased remedies for managing corrective action at RCRA facilities is appropriate for many of the same reasons the concept is used at Superfund sites. Using remedial phases at RCRA sites will provide the Agency with more flexibility to require remedies tailored to site-specific considerations. It may be advantageous at a particular RCRA facility to address releases from an individual SWMU or group of SWMUs in stages, focusing first on those releases that pose the greatest risk to human health and the environment, while allowing releases posing less risk to be addressed later.

H. Implementation of Remedy (Sections 264.527–264.531)

1. *Remedy Design (§ 264.527).* After EPA has approved the remedy through the permit modification process, the facility owner/operator will often be required in the modified permit to develop a remedy design. Proposed § 264.527 would require the permittee to prepare detailed construction plans and specifications for implementing the remedy. The schedule for submission of the plans would be included in a schedule of compliance detailed in the permit. This proposed requirement is analogous to the Superfund program's adoption of design standards following the Record of Decision on remedy selection. The Agency would approve or modify the design and incorporate it into the schedule of compliance.

Designs required under § 264.527 must include specifications that demonstrate compliance with the applicable standards for management of hazardous and/or solid wastes during implementation of the remedy, as determined by §§ 264.550 through 264.552 of today's proposal. The information required would be similar to the information typically required about units and processes at facilities in part B applications.

The permittee would also be required under proposed § 264.527 to submit implementation and long-term operation, monitoring, and maintenance plans, a project schedule, and a program to assure quality assurance during the construction phase (if any) of remedy implementation. Such information would include specific dates for major milestones and project completion as well as other significant events.

Proposed § 264.527(b) would require the permittee to implement the remedy according to the plans and schedules approved by the Regional Administrator and in a manner consistent with the objectives specified for the corrective measures during remedy selection. Section 264.527(a) will provide that the approved schedule and specifications become an enforceable part of the permit.

Proposed § 264.527(b)(2) would require the permittee to place a copy of the approved design plans and specifications in the information repository if the facility is required by the Regional Administrator to maintain such a repository under the authority of § 270.36. All permittees would be required, under proposed § 264.527(b)(3), to provide written notice of approval of remedy design to those persons on the facility mailing list. This notice would provide individuals on the facility mailing list a notice of the location of the approved remedy design and specifications and provide information on the availability of those documents for public review.

Additionally, proposed § 264.527(b)(4) would require the permittee to amend the corrective action cost estimate and adjust the amount of financial assurance demonstrated, if necessary, after approval of the remedy construction plans and specifications. These plans will provide improved cost estimates compared to those developed during modification of the permit. Therefore, to ensure that adequate amounts of funds are available to cover corrective action costs, the amount of financial assurance demonstrated must reflect the revised cost estimate derived from the final construction plans and specifications.

2. *Progress Reports (§ 264.528).* Since implementation of remedies will often take place over extended time periods, § 264.528 of today's proposal provides that the Regional Administrator may require periodic progress reports from the permittee. These progress reports may contain information on construction, operation, and maintenance of the selected remedy. The Regional Administrator would specify the frequency and format of such reports in the permit schedule of compliance, when s/he approved the remedy design. Such reports would be designed to summarize the progress of remedy implementation, discuss changes or problems with the remedy, and provide data obtained during remedy implementation.

The timing and content of progress reports will vary from site to site. Factors that may be used by the Regional Administrator in determining what progress reports are necessary for a given site include complexity of the waste mixture, complexity of the remedy, hydrogeologic and climatic conditions, and potential for exposure. These factors are qualitative measures of the risks posed by contamination at a specific site. The Agency intends to monitor closely those sites at which the risk to human health and the environment is greatest. For example, the frequency of progress reports may be greater at sites where there are complex remedies and/or a high potential for exposure to contamination than at sites where remedies are simple and the potential for exposure is low.

Reports required by the Regional Administrator will be tailored to meet site-specific conditions. Where necessary, progress reports may be required to contain detailed information on remedy implementation. In other cases, such as where the remedy is simple, the progress reports may be less detailed.

The Agency considered several alternatives to today's proposal for allowing discretion to the Regional Administrator in requiring progress reports. These included: Not requiring progress reports from any facility; requiring submission of reports on a

routine basis from all facilities implementing remedies; and requiring development of progress reports which would be kept on file at the facility and available for inspection by EPA. The Agency has tentatively rejected these alternatives, because it believes that the variation among sites will require that reporting (including frequency of reporting) be tailored to the specific site.

All raw data and information developed or submitted during remedy implementation (including design, laboratory reports, *etc.*) must be maintained in the operating record of the facility as long as the facility operates under a RCRA permit, including any reissued permit following initiation of corrective action. This requirement is proposed in § 264.528(b) and is necessary to ensure that periodic reviews at the site will have all data available for inspection.

3. *Review of Remedy Implementation (§ 264.529).* Under the regulatory authority proposed in § 264.529, EPA would review remediation activities on a periodic basis. Such reviews will take place throughout the design, construction, operation, and maintenance of the corrective measure(s). The Agency's review of remediation activities will consist both of a review of progress reports submitted by the permittee and, where necessary, on-site inspections and oversight of remedy design, construction, operation, and maintenance. The Agency intends to focus on-site inspections on areas identified for oversight in progress reports or prior Agency reviews.

The Agency believes that the authority to perform close reviews of remediation activities is an essential element of the corrective action program. Experience in the HSWA corrective action program and the CERCLA remedial program has demonstrated that timely and close oversight of cleanup activities is essential in many cases to ensure that remedies are effectively implemented. For example, oversight of the remedy may indicate that the technology originally called for in the design plans is not in fact successfully meeting the media cleanup standards. Proposed § 264.529 provides EPA with the authority to take steps to remedy such implementation problems.

The Agency intends to work closely with permittees by overseeing remedy implementation and addressing problems in a timely manner. Where problems arise during implementation of the selected remedy, the Agency will attempt to settle such problems informally with permittees to ensure prompt completion of the remedy in a manner which adequately protects human health and the environment. In some cases, the Agency may determine that an enforcement action under section 3008(a) is necessary to compel compliance with the permit. In other cases, where no resolution of disagreements appears possible, or where the contemplated change is one that warrants additional public participation, proposed § 264.529 would allow the Regional Administrator to initiate a permit modification using the procedures laid out in 40 CFR 270.41 or those proposed today under § 270.34(c). If the Regional Administrator believes that a disagreement over a proposed provision is suited to alternative dispute resolution, she/he may seek resolution using the procedures described in section VI.L.7 of today's preamble. A more detailed discussion of circumstances which may require permit modifications may be found in section VI.L of today's preamble.

The Agency also considered, but rejected, requiring a specific number of facility inspections during remedy implementation. Because the variety of problems to be addressed under today's proposed regulation is extensive (as is the range of proven reliability of technologies which may be employed to address the problems, complexity of the site, and potential for exposure), the Agency has concluded that frequency of site reviews must be a case-by-case decision.

4. *Completion of Remedies (§ 264.530).* Proposed § 264.530 would establish criteria by which the owner/operator would demonstrate the completion of remedies.

Section 264.530 would specify that corrective measures required in the permit are complete when three conditions have been met. First, under proposed § 264.530(a)(1), the requirements for compliance with all media cleanup standards (or alternative cleanup levels) as specified in the permit would have to be met. For example, if both a ground-water and soil cleanup standard are specified in the permit, the cleanup standard must have been achieved for each medium before the facility meets the criterion of compliance with all media cleanup standards. In addition, after initially achieving the cleanup standard the permittee generally would be required to monitor the medium for an additional period of time to ensure that the remedy was in fact complete and that contaminant levels did not subsequently exceed the cleanup standards under the provisions of proposed § 264.525(e). This requirement is discussed in section VI.F.7.c of this preamble.

Second, under proposed § 264.530(a)(2), all actions required in the permit to address the source or sources of contamination must have been satisfied. This provision is designed to prevent continued contamination in the future. One type of source control which may be required is construction of a structurally sound cap on an inactive SWMU to prevent future contaminant migration to surface water which could potentially result from rainfall runoff from an uncovered SWMU.

Third, under proposed § 264.530(a)(3), the permittee would have to comply with procedures specified in the permit for removal or decontamination of units, equipment, devices, or structures required to implement the remedy. In other words, temporary structures or equipment necessary to conduct the remedy must be removed or decontaminated to complete the remedy. For example, liners or the contents of temporary waste piles would have to be disposed of according to appropriate waste management practices. Units employed during the remedial activities to manage hazardous waste will be required to meet the closure performance standards for the appropriate type of unit. (Closure would not be required, of course, if the owner/operator wished to continue use of the unit to manage waste and continued use was allowed in the permit.)

Proposed § 264.530(b) would establish procedures that permittees must follow to document that corrective measures have been completed in accordance with the requirements of § 264.530(a). Upon completion of the remedy, the permittee would be required to submit a written certification to the Regional Administrator by registered mail stating that the remedy has been completed in accordance with the requirements of the permit. The certification must be signed by the permittee and by an independent professional skilled in the appropriate technical discipline. The Agency believes that a certification by an independent professional is necessary because the permittee may lack the expertise and the incentive to judge adequately the compliance of the remedy with the applicable requirements specified in the permit.

The Agency is not proposing to specify the types of independent professionals who must certify completion of the remedy. The Agency proposes to require certification by an appropriate independent professional in recognition that different certifications

may require different skills (*e.g.*, an engineer may be appropriate in some cases whereas a hydrogeologist might be more appropriate in another).

The Agency considered, but is not proposing, a requirement that all supporting documentation be submitted along with the certificate of completion. Since, in most cases, the Regional Administrator would have required submission of periodic progress reports on remedial activities and since the supporting information must be available at the facility for inspection, the Agency believes that submission of all documentation will not be necessary.

Upon receipt of the certificate of completion, the Regional Administrator would determine whether the remedy has been completed in accordance with the requirements of proposed § 264.530. If the Regional Administrator determines that the applicable requirements for remedy completion established in the permit schedule of compliance have not been met, the Regional Administrator would generally notify the permittee of such a decision and of the steps that must be taken to complete the remedy. After such steps have been taken, the permittee should submit a new certificate of completion in accordance with the requirements of this section.

When the Regional Administrator has determined that the remedy is complete, the permittee will be released from the financial assurance requirements for corrective action under §§ 264.500(c) and 264.526(c).

The Agency is proposing, in § 264.530(c)(1), that the permit will be modified according to the Class III procedures for owner/operator-initiated modifications (§ 270.42), to terminate the permit schedule of compliance when all required corrective action is determined to be complete.

Generally, remedies required under subpart S will be considered complete only when all measures at a facility have been completed. Thus, if separate remedies are implemented for several units at a facility, all remedies must be completed before the Agency considers corrective action at the facility to be complete. For example, if a remedy for releases from two units at a facility is complete, but a different remedy for releases from three other units at the facility is incomplete, the Agency will not consider corrective action for the facility complete.

In some situations, however (*e.g.*, where essentially separate remedial activities addressing releases widely separated in location and affecting different environmental media), it may be possible for the owner/operator to demonstrate that some portion of the remediation required has been successfully completed though other required actions are still underway. This will usually be the case where the remedy chosen for a facility is a phased remedy divided under proposed § 264.526(d). In such cases, the Regional Administrator may allow submission of certifications of partial completion of remedies by the owner/operator. Certifications of partial completion will be handled in a manner analogous to certifications of partial closure and are provided today in proposed § 264.530(d), which includes a provision for partial release of the financial assurance mechanism as well. However, until all corrective action activities required in the permit are complete the owner/operator must continue to comply with all implementation and reporting requirements specified in the permit which have not been specifically satisfied to date.

5. *Determination of Technical Impracticability (§ 264.531).* This proposed section is intended to address situations where a performance requirement set for a selected remedy in the permit cannot technically be achieved after reasonable efforts to do so have been made by the permittee. An example of such a situation might be where hydrogeologic and geochemical factors that were not fully understood at the time of remedy selection prevent the attainment of a media cleanup standard for ground water

EPA will require owner/operators to put forth active efforts to achieve all requirements of the selected remedy. If the selected remedial technology proves not to be capable of attaining a media cleanup standard or other remedy requirement (such as a source control measure), EPA may require the owner/operator to examine alternative technologies that are available and that may be able to achieve the requirement. If such an alternative technology is identified, and is compatible with the overall remedial objectives (*e.g.*, would not create unacceptable cross-media impacts), the permit will be modified to require implementation of the technology. (See discussion of review of remedy implementation under § 264.529.)

EPA will examine, on a case-by-case basis, the owner/operator's efforts to achieve remedy requirements. Comments are solicited as to what objective factors may be examined in making these judgments.

If the Regional Administrator determines that attainment of a remedy requirement is not technically practicable and no practicable alternative technologies are available, it will be necessary to determine what alternative, or additional, requirements, if any, will be needed to ensure that the remedy adequately protects human health and the environment. If, for example, attainment of a cleanup standard for ground water is determined to be technically impracticable, additional measures (*e.g.*, facility access controls) to control long-term exposure to the ground water may be needed if the ground water is not drinkable. Likewise, if treatment of contaminated soils to specified levels were not technically feasible, the soils may need to be covered or disposed of in a unit with upgraded engineering controls for release prevention. In some cases, the Regional Administrator may determine that no alternative or additional requirements are necessary. For example, the total risk from the site may be acceptable, although some carcinogenic constituents may exceed the desired risk level established by the media cleanup standard.

If attainment of a media cleanup standard is determined to be technically impracticable, it is not the intention of EPA to modify the standard to a less stringent level. Media cleanup standards represent levels that are determined to be protective of human health and the environment; a finding that such standards cannot be met does not affect the desirability of achieving those levels. A determination of technical impracticability thus represents a finding that remediation to protective levels cannot be accomplished from a technical standpoint, and that the owner/operator will not be required to continue to expend resources to meet the standard.

A determination of technical impracticability does not relieve the owner/operator of his ultimate responsibility to achieve the specific remedy requirement. If such a determination is made, but subsequent advances in remedial technology or changes in site conditions make achievement of the requirement technically practicable, EPA reserves the authority to modify the permit (if the permit is still in force) or take other appropriate action to require attainment of the standard or other requirement.

I. Interim Measures (Section 264.540)

This section would establish the Agency's regulatory authority to compel permittees to conduct interim measures. As part of its overall strategy for implementing the corrective action program, EPA intends to place strong emphasis on using this interim measure

authority to expeditiously initiate cleanup actions, especially in situations where it is clear that such a measure will be a necessary component of the final remedy. 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 become known.

Under proposed § 264.540(a), the Agency could require the permittee to conduct interim measures at a facility whenever the Agency determines that a release from a SWMU (or, based on site-specific circumstances, a threatened release) poses a threat to human health or the environment. Interim measures will be specified in the schedule of compliance, and will generally serve to mitigate actual threats and prevent imminent threats from being realized while a long-term comprehensive response can be developed.

Interim measures may encompass a broad range of possible actions. In some cases, such measures will involve control of the source of the release, while in other cases, control of the contaminated medium, or other exposure controls, will be necessary. For example, a permittee responsible for contamination of a public drinking water supply may be required to make available an alternate supply of drinking water as an interim measure, until the contaminated surface or ground water can be remediated. A permittee could also be required, as an interim measure, to initiate a ground-water pump and treat system to control the further migration of contamination, if it were determined that further significant degradation of the aquifer would occur while options for the ultimate remedy for the facility are being studied. Other examples of interim measures include fencing off an area of contaminated soils to prevent public access, or overpacking of drums that are in poor condition to prevent possible leakage.

The Regional Administrator will consider the immediacy and magnitude of the threat to human health or the environment as primary factors in determining whether an interim measure(s) is required. Proposed § 264.540(b)(1)–(9) lists factors which the Regional Administrator may consider in determining whether an interim measure is required. These factors include: (1) The time required to develop and implement a final remedy; (2) actual or potential exposures of nearby populations or animals to hazardous constituents; (3) actual or potential contamination of drinking water supplies or sensitive ecosystems; (4) further degradation of the medium which may occur if remedial action is not initiated expeditiously; (5) presence of hazardous wastes or hazardous constituents in drums, barrels, or other bulk storage containers that may pose a threat of release; (6) presence of high levels of hazardous constituents in soils at or near the surface which may migrate; (7) weather conditions which may cause releases of hazardous constituents or migration of existing contamination; (8) risks of fire or explosion or the potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and, finally, (9) any other situations that may pose threats to human health or the environment. For example, consideration of high levels of hazardous constituents in surficial soils at a facility located adjacent to a surface water body (see § 264.540(b)(6)) used as a drinking water source may lead the Regional Administrator to conclude that immediate excavation of the contaminated soil or other containment measures are needed to prevent a threat to the surface water which could result from runoff after a heavy rain.

Proposed § 264.540(c) would require the Regional Administrator to notify the permittee in writing of required interim measures, and would require the permittee to initiate the interim measures as soon as practicable. In some situations, such as an actual emergency situation, the Regional Administrator might require the interim measure to be initiated immediately, with little if any formal procedures. More typically, however, the Regional Administrator will initiate a permit modification under either § 270.34 or § 270.41 as appropriate, to specify the required interim measure. Section 270.41 modification might be used, for example, if installation of an extensive ground-water pump and treat system were required. This would be appropriate since such a requirement would be resource-intensive for the owner/operator, would likely serve as the basis for a final remedial action at the facility during a later decision-making process conducted by the Agency, and would indicate a serious concern for concentrations of contaminants in the ground water about which the public should receive the extensive notice and comment opportunities provided by that procedure. Conversely, if the interim measure were designed to address problems of lesser magnitude, the procedural requirements of the permit modification proposed today in § 270.34 may be sufficient.

The proposed regulations in this subsection are similar to those in the removal section of the NCP under CERCLA (see 40 CFR 300.415). In many cases, the Agency expects that needed interim measures will be undertaken voluntarily by the owner/operator without the need for permit modification. In some cases, however, the use of CERCLA removal authorities or Section 7003 of RCRA may be appropriate; as in a situation where the permittee is unwilling to respond quickly to an exposure problem that merits an immediate response; and where a permit modification to compel the response would cause unacceptable delay. For example, this would be the case if high levels of constituents had migrated from the facility and were affecting nearby drinking water supplies and the owner/operator was unwilling to voluntarily make available an alternate source of drinking water to affected populations. The Agency would first act to protect against potential exposures, then act to compel the permittee to comply with other conditions necessary to protect human health and the environment.

Section 264.540(d) indicates the Agency's intent for interim measures taken at a facility to be consistent with any further remedy that will be implemented at the facility after full characterizations of the contamination under the RFI and selection of the final remedy under proposed § 264.525.

The Agency has developed guidance for imposing interim measures under RCRA. Interim Final RCRA Corrective Action Interim Measures; OSWER Directive 9902.4, May, 1988. Contact: Tracy Back (202) 382–3122.

As the discussion above indicates, interim measures are one type of corrective measure which may be required under the authority of section 3004(u) of RCRA. In considering the statutory requirements for a demonstration of financial assurance by owner/operators for taking corrective action, the Agency evaluated several approaches to financial assurance for interim measures.

In many cases, a requirement to demonstrate financial assurance for interim measures may serve no useful purpose and may actually contribute to delays in facility cleanups. For example, where an interim measure is imposed requiring removal of barrels containing hazardous constituents (similar to a removal action under CERCLA) it would be unnecessary to require a demonstration of financial assurance, since compliance would be relatively inexpensive and could be quickly completed.

In other cases, interim measures could be relatively extensive and could be conducted over a period of several years. This could be the case, for example, where a well system must be installed to stop a plume of contamination from further migration at a highly complex site until a final remedy could be implemented, or where a soil treatment system is installed which would require several years to achieve required contaminant concentration levels. In these kinds of cases, a demonstration of financial assurance for interim measures will not substantially impact the implementation of the interim measures and would promote the Congressional intent of ensuring that adequate funds are available to complete the required actions. In such a case, requiring a demonstration of financial assurance for an interim measure within 120 days of the imposition of the interim measure may be reasonable.

Another option for addressing the question of financial assurance that was considered by the Agency, but was rejected, would have interpreted the requirement for financial assurance to apply only to final remedial actions required by the Agency. Still another possible reading of the statute might lead to the conclusion that imposition of any type of corrective action would require a full demonstration of financial assurance. The Agency has concluded that the objective of the corrective action provisions, which is to remediate environmental problems in an expeditious manner and the financial assurance objective of ensuring adequate funding for remediation, should be balanced on a case-by-case basis for interim measures. The Agency specifically solicits comments on this approach.

J. Management of Wastes (Sections 264.550–264.552)

1. *Overview.* In the course of corrective action, facility owner/operators will manage a wide range of wastes, including both wastes that meet the RCRA definition of hazardous waste and those that do not. Sections 264.550–264.552 of the proposed regulations would establish standards for the management of these wastes during corrective action. Under these sections, wastes that meet the RCRA regulatory definition of hazardous waste must be managed in accordance with the applicable standards of 40 CFR parts 262, 264, 268, and 269, with certain exceptions (see following discussion of temporary units). In addition, statutory land disposal restrictions will be triggered when restricted hazardous wastes are placed into a land disposal unit, and minimum technology requirements will apply to new or replacement units and lateral expansions of existing units. Finally, non-hazardous solid waste must be handled according to applicable subtitle D standards, except where the Regional Administrator determines that additional controls are necessary to protect human health and the environment.

In general, owner/operators will also have to comply with all other applicable Federal, state, and local regulations. The basic responsibility for complying with any applicable permits and requirements will be the owner/operator's; however, the EPA or State permit writer will consider these requirements in selecting a remedy and will take steps to ensure that remedies selected are consistent with other Federal or State standards.

2. *General Performance Standard (§ 264.550).* Section 264.550 proposes a general performance standard for management of all wastes during corrective action. Under this standard, the Regional Administrator may impose any requirements on the management of corrective action waste that s/he deems necessary to protect human health and the environment. This standard applies both to solid and to hazardous waste managed as part of RCRA corrective action requirements. This general standard derives from the statutory mandate of section 3004(u) to require corrective action; as a corollary to this authority, the Agency is authorized to ensure that actions taken to implement corrective actions do not themselves pose unacceptable threats. EPA is therefore obligated to impose controls on management of wastes, pursuant to remedial activities, as necessary to protect human health and the environment.

EPA believes this general performance standard is necessary because current regulations governing treatment, storage, and disposal of solid or hazardous wastes may not be adequate in all situations involving corrective action. In particular, many cleanup activities that do not involve treatment, storage, or disposal of hazardous waste require special care to prevent release of hazardous constituents. For example, dredging of surface impoundments or excavation of soils containing volatile organics can lead to significant releases of hazardous constituents to the air, potentially endangering workers or neighboring populations. When such situations have arisen in Superfund actions, EPA has imposed controls on cleanup activities, such as prohibiting cleanup when the wind was blowing in a certain direction or requiring air monitoring and the cessation of activity when a specific level was exceeded. Requirements to control air emissions from RCRA permitted units, when promulgated, may not be strictly applicable to certain SWMUs. Proposed § 264.550 would give EPA the authority to impose such conditions, or other controls, as part of correction action under section 3004(u).

Section 264.550 proposes general performance standards for management of all wastes during corrective action. Under proposed § 264.550(a), wastes must be managed in a way that is protective of human health and the environment and that complies with applicable Federal, State, and local regulations. Facility owner/operators will be required to comply with all applicable regulations in carrying out corrective action; proposed § 264.550(a)(2) codifies this requirement as a reminder to owner/operators that RCRA corrective action permit conditions do not absolve them of other legal responsibilities.

However, there may be cases where a State or local law stands as an obstacle to the accomplishment of Congress' purpose in enacting section 3004(u), or directly conflicts with regulations developed under section 3004(u). EPA believes that in such rare cases where State or local laws could be said to frustrate the purposes of the statute, a court might find such laws to be preempted by RCRA. See, *e.g. ENSCO, Inc.* vs. *Dumas,* 807 F.2d.745 (8th Cir. 1986). Alternatively, in the case of a State requirement that could jeopardize implementation of a remedy, it may be possible for the State to waive that requirement.

3. *Management of Hazardous Wastes (§ 264.551(a)).* In many cases, waste subject to corrective action will meet the regulatory definition of RCRA hazardous waste. A facility owner/operator would be handling hazardous waste at a SWMU, for example, if it contains listed wastes disposed of before November 19, 1980, or the wastes fail the characteristic test. Also, releases from hazardous waste management units exempted from permitting requirements, such as wastewater treatment units or 90-day accumulation tanks, may be hazardous waste even though the units in which they are managed are exempt from permitting. Similarly, soils and ground water contaminated with releases of listed hazardous waste will generally be subject to subtitle C standards. Under

current rules, a contaminated medium that exhibits any of the characteristics identified in subpart C of part 261 or contains a listed hazardous waste, including (with certain exceptions) any constituent generated by a listed waste (*e.g.*, leachate), must be managed as hazardous waste until it no longer contains any of the waste, is delisted, or for characteristic wastes, until it no longer exhibits any of the characteristics. Where wastes meeting the RCRA regulatory definition of "hazardous" are treated, stored, or disposed of during corrective action, they will be subject (with certain exceptions; see discussion below) to the standards of 40 CFR parts 262, 264, and 268 (or, in the case of air emissions, part 269 or the Clean Air Act). Proposed § 264.551(a) clarifies this point.

Proposed § 264.551(a), however, would also allow the Regional Administrator discretion to waive most procedural requirements associated with closure of hazardous waste management units (subpart G of 40 CFR part 264) for units created for the purpose of managing corrective action wastes. Procedural requirements that may be waived include submission and approval of closure plans, and specific time frames for submission and review of the plan and other activities associated with closure.

EPA believes that the process for developing and reviewing remedies as outlined in today's proposal, coupled with the procedures that will be followed in modifying permits to specify remedies, provides an equivalent and equally effective means of ensuring that the applicable closure and post-closure technical requirements are required of units that are created and operated for the purpose of implementing remedies. Were the subpart G procedural requirements to remain applicable to those units, the result would be to have two parallel, and essentially redundant (and sometimes inconsistent), processes for establishing technical requirements for remedial units. It should be understood, however, that the general performance standard for closure (see § 264 111), and the unit-specific technical closure standards could not be waived, and will be applied to new units created during the remedy.

Waiver of the subpart G procedures is at the discretion of the Regional Administrator. In some situations it would be appropriate to require the owner/operator to follow the subpart G process for closure/post-closure for a unit used in remediation activities. An example could be where a unit (such as a tank) is constructed and operated for the purpose of implementing the remedy for the facility, but the owner/operator subsequently chooses to continue to use the tank after the remedial activity is completed, for other hazardous waste management purposes. Since the tank would no longer be part of the remedy, the owner/operator would have the obligation to follow the normal administrative procedures for closure of the tank.

a. *Temporary Units (§ 264.551(b)).* EPA is concerned that some technical requirements for units prescribed in the current 40 CFR part 264 regulations may be inappropriate for management of hazardous waste during corrective action, and may in fact discourage prompt cleanup. The Superfund program has frequently found it necessary to build temporary units to store wastes for short periods of time before treatment or final disposal. In many cases, the Agency has found that full RCRA 40 CFR part 264 regulatory standards may not be necessary for such short-term storage taking place during the course of remedy implementation, and that full compliance with these standards could in fact delay cleanup. For example, for some remedies it will be necessary to excavate soils contaminated with hazardous wastes and store them in a pile for a short time (*e.g.*, a few days or weeks), prior to treatment. Under current RCRA regulations, the pile would have to comply with the part 264 requirements applicable to waste piles, such as minimum technology liner requirements, ground-water monitoring, and other operating and maintenance requirements. As another example, tanks will often be used for short-term storage of hazardous wastes in the course of a remedy; such tanks would accordingly be required to have full secondary containment. EPA believes that in many cases applying these stringent part 264 standards, which are designed to ensure adequate protection for long-term management of hazardous wastes in such units, would be unnecessary from a technical standpoint, as well as counterproductive in many cases. In the above example of the temporary pile, a single liner might be adequate, with some limited monitoring, depending on the nature of the wastes, the environmental setting, and other factors. Requiring the pile to meet full part 264 standards would result in delays in constructing the pile, and increased expense to the owner/operator which could otherwise be directed to other remedial work, without appreciably increased environmental benefits. Note that adjustments to minimum technology standards applicable to the pile would have to be done in accordance with certain statutory requirements (see following discussion).

Proposed § 264.551(b)(1) provides EPA authority to modify 40 CFR part 264 regulatory design, operating, or closure standards for temporary units, as long as alternative standards that are protective of human health and the environment and comply with statutory requirements are imposed. In the case of temporary tanks, for example, the Regional Administrator would be making a determination generally analogous to risk-based variances from secondary containment requirements for tanks in §§ 264.193(g) and 265.193(g).

The Agency believes that this approach to temporary units; that is, adjusting design and operating standards for such units on a site-specific basis, is sensible and practical within the context of the corrective action process. The process of examining and selecting corrective action remedies will involve a high degree of Agency oversight, and remedial decisions will be made in consideration of a number of site-specific factors. Since remedies can be tailored to site-specific conditions, a degree of protection of human health and the environment equivalent to the generic national standards can be achieved, while facilitating the timeliness and implementability of the remedies.

This provision for temporary units could apply to any unit used during corrective action, except incinerators and non-tank thermal treatment units (*e.g.*, pyrolysis units). EPA believes that modifications of 40 CFR part 264 design standards should not be allowed for incinerators and non-tank thermal treatment units because of the complexity of these devices and the high level of public concern about their operation. Furthermore, the Regional Administrator would be authorized to modify only technical standards for temporary units under this authority, not performance standards. For example, secondary containment for tanks might be modified in specific situations; however, basic performance standards relating to releases to the environment—such as performance standards in the 40 CFR part 269 air emissions regulations—could not be modified.

It should be understood that under this provision for temporary units, only requirements applied solely by regulation, and not directly by statute, may be modified. Statutory requirements may be modified only to the extent authorized by statute.

Two statutory requirements in particular may often be applicable to temporary units, specifically, the land disposal restriction requirements of RCRA section 3004(d)-(g) and 40 CFR part 268, and the minimum technology requirements of section 3004(o). However, the Agency expects that temporary units may often be able to meet the statutory provisions for waivers from these requirements under section 3004(g)(5) (for the land disposal restrictions), and section 3004(o)(2) (for minimum technology requirements). The major permit modification associated with the selection of remedy would provide the public notice and comment usually associated with a petition submitted by the owner/operator (a waiver of land disposal restriction requirements would, however, also be published in the **Federal Register**, as required by RCRA section 3004(i)). In addition, the statement of basis associated with the permit modification will summarize, and the supporting Administrative Record will provide, the documentation of the Agency's finding that the statutory requirements for granting the waiver have been met.

The Agency believes that waivers from these statutory requirements will often be appropriate for temporary units, and in some cases may also be essential to the prompt implementation of corrective action. For example, in many cases it will be necessary to place wastes temporarily on the land beside a hazardous waste unit when that unit is being excavated; this placement would be an interim step before incineration or other treatment. It has been EPA's experience in Superfund that full compliance with minimum technology requirements (*i.e.*, double liners, leachate collection systems, and groundwater monitoring) in such cases may often be unnecessarily restrictive and could delay cleanup. Instead, in cases of short-term storage, something less than minimum technology—for example, a single rather than double liner— could frequently be fully protective of human health and the environment. The Regional Administrator could require design standards less stringent than the full minimum technology requirements, so long as they would ensure (consistent with the waiver provision of section 3004(o)(2)) that the controls will be of an equivalent level of protection for the life of the unit.

Similarly, the application of land disposal restrictions to the temporary placement of waste could impede corrective action in some cases. If the restrictions applied it would be impossible to store wastes on the ground while they awaited treatment, because placement on the ground could not occur before the treatment. The only alternative would be to leave the waste untreated in place, or to store it in tanks or containers, which in some cases might cause a delay and add to the complexity of the remedy without serving public health or the environment. In such cases, it would be necessary to demonstrate that the petition standards for the land disposal ban have been met, so that such temporary placement on the land would be allowed.

In modifying 40 CFR part 264 and part 269 design or operating regulatory standards, and in establishing alternative standards, the Regional Administrator would be required to consider a range of factors, which are listed in proposed § 264.551(b)(2). These include the length of time the unit will be in operation, the type of unit, the potential for releases from the unit, the type of waste, hydrogeological and other conditions at the facility, and the potential for human and environmental exposure to releases if they did occur. The Regional Administrator would specify in the permit design and operating requirements that would apply to the temporary unit and the length of time it could remain in operation, and requirements associated with its closure. These conditions would be subject to public notice and comment as part of the process for approval of remedy selection.

Today's proposal specifies a time limit of 180 days for temporary units. This time period is consistent with the closure period for a hazardous waste unit and the "temporary authorization" period in the new permit modification rule. It is expected that many temporary units will be needed for much shorter periods of time; however, EPA also recognizes that in some cases a temporary unit might have to remain in service beyond the 180-day limit, due to unexpected circumstances. For example, if wastes being stored in a temporary unit were to be taken to an off-site facility, and that facility no longer had the capacity or was unwilling to accept the waste, it might be advisable to continue storing the waste in the temporary unit for a limited amount of time (*e.g.*, 30 days). In such cases, the facility owner/operator could request an extension. Requests for such extensions would typically be processed as a Class I modification, with Regional Administrator approval, under permit modification procedures of § 270.42. Such time extensions for temporary units would only be approved where it is necessary because of unforeseen, temporary, and uncontrolled circumstances, and when the owner/operator is actively seeking alternatives to continued use of the unit(s). If the owner/operator failed to move expeditiously to remove the unit, the Agency would deny further extensions and require the owner/operator to retrofit the unit to meet all applicable Subtitle C design and operating standards, or remove the waste and close the unit.

EPA considered several alternatives in specifying time limits for temporary units. One alternative would have been to not specify a generic time limit for temporary units in the rule, and allow the Regional Administrator to set permit conditions limiting the active life of a temporary unit on a case-specific basis. This approach would allow more flexibility in designating such units, recognizing that the amount of time a temporary unit could safely remain in service may vary significantly, depending on the type of unit, type of waste, unit location and other factors. Another approach could have been to specify a shorter time limit, such as 90 days, which would be consistent with the provision for on-site accumulation of wastes by generators (§ 262.34). Alternatively, a specified time period longer than 180 days (*e.g.*, one year) for temporary units might also be appropriate. EPA specifically requests comments on its approach to temporary units, including suggestions for how "temporary" should be defined.

Today's proposal (§ 264.551(b)(2)(ii)) also clarifies that off-site units (*i.e.*, that are located outside the facility property) will not be treated as "temporary units" for the purpose of managing hazardous wastes generated as part of a remedy or interim measure.

In addition, proposed § 264.551(b)(2)(iii) specifies that temporary units may only be used for treatment or storage of wastes that originate within the facility boundary. This would preclude, for example, wastes from a different facility from being brought to a temporary unit at another facility for storage or treatment. However, wastes that were released from solid waste management units at the facility, and that subsequently migrated beyond the facility property, could be recovered and managed in a temporary unit in the context of implementing a remedy. Comment is solicited on these limitations to the temporary unit concept.

b. *Corrective Action Management Units (§ 264.551(c); § 264.501).* In many cases, corrective action at RCRA

facilities will address broad areas of contamination, which may or may not themselves contain discrete waste management units. For example, soils surrounding one or more leaking surface impoundments, landfills, or tanks may be contaminated. In devising a remedy to address this situation the facility owner/operator, at the direction of EPA, could consider the contaminated area as a whole and select a remedy that best addressed the entire area of contamination. In these situations, EPA believes that the entire area of contamination can properly be considered a waste management "unit" under the RCRA regulatory structure. Consequently, proposed § 264.551(c) gives the Regional Administrator the authority to designate such areas as corrective action management units (CAMUs).

As indicated in proposed §§ 264.551(c)(1) and (2), designation of such an area as a waste management unit will have important implications for the management of hazardous waste within that area. Specifically, movement or consolidation of hazardous wastes within these areas will not automatically trigger the statutory land disposal restrictions (sections 3004(d)–(g)) or minimum technology requirements (section 3004(o)). Land disposal restrictions are triggered by placement of a restricted waste in a waste management unit (section 3004(k)); minimum technology requirements are triggered by the creation of new or replacement surface impoundments or landfills, or lateral expansions of existing surface impoundments or landfills (section 3004(o)(1)). Consequently, if an area of contamination is designated as a unit by EPA during corrective action, hazardous waste moved within the unit would not be subject to land disposal restrictions. Similarly, moving hazardous wastes around inside the unit will not constitute either creation of a new or replacement unit, or a lateral expansion of an existing unit; therefore the minimum technology standards would not apply.

EPA believes that this approach to defining "unit" in the context of corrective action is essential to the implementation of sections 3004(u) and 3008(h) of RCRA, and that it accurately reflects the realities of cleanup activities. In addressing a broad area of contamination, EPA or a facility owner/operator requires the flexibility to move hazardous waste around and consolidate it without automatically triggering minimum technology or treatment requirements at every turn. For example, a typical remedy at a corrective action sight might consist of treatment of the most highly contaminated soil at an off-site incinerator, together with on-site consolidation and capping of remaining soil containing hazardous constituents at low concentrations. Incineration or other treatment of the less contaminated soil might yield few, if any, benefits, and it might in some cases delay cleanup and increase risk; for example, risk resulting from transportation of wastes. However, in moving the soils for consolidation, a narrow application of land disposal restrictions might require incineration (or other treatment) of the soil and prohibit the most straightforward, implementable, and, in some cases, most effective remedy. Similarly, imposition of minimum technology requirements will add to the cost of cleanups and may, in some cases, cause delays in implementation, without providing any significant environmental benefit.

EPA believes that its general approach to the definition of unit makes sense not only within the context of section 3004(u) but also for other remedial action involving waste already in place—such as source control taken in the course of a final cleanup of a unit which will not receive waste in the future. Where remedial action is taking place within an area that has already been contaminated, there should be sufficient flexibility to select effective remedies that can be safely and reliably implemented. In cleaning up existing contamination problems, EPA believes that it will often be unnecessary and counterproductive to strictly apply to cleanup activities standards that were designed to prevent future risks at operating facilities that will continue to receive and manage hazardous waste.

In § 264.501, EPA is today proposing a definition of "corrective action management unit," which is intended to clarify the nature and scope of the areas which may be given this designation. The definition is as follows:

"* * * an area within a facility as designated by the Regional Administrator for the purpose of implementing corrective action requirements of this subpart, which is broadly contaminated by hazardous wastes (including hazardous constituents), and which may contain discrete, engineered land based sub-units."

This definition is intended to place several important restrictions on how CAMUs are designated, and on how hazardous wastes must be managed within CAMUs. It should first be recognized that it will be the Agency's (or State's) role to define the areal configuration of any CAMU at a facility. This decision should be made based upon careful assessment of the extent of the contamination of soils, location of existing solid waste management units, the remedial objectives for the facility, and other relevant factors. Although owner/operators may wish to propose a specific area as a CAMU, the decision as to whether designating a CAMU is necessary and appropriate to implementing a remedy, and if so, the boundaries of the unit, must rest with the Agency or the State.

In designating CAMUs, only areas where contaminated soils or concentrated wastes already exist will be included. Uncontaminated or "virgin" areas of a facility cannot be included within a CAMU. Likewise, two separate areas of contamination could not be combined into one CAMU, since they could not be considered a single unit.

In some cases, remedial solutions may involve creating new "sub-units," or enlarging existing ones within a CAMU. For example, dispersed, low-level contaminated soils might be consolidated into a smaller, discrete landfill which would then be capped. Similarly, in some cases an effective remedial approach could be to remove wastes from several small landfills within a broad area of contamination, stage them in a waste pile prior to treatment, and dispose of the residuals in a newly engineered "sub-unit." Thus, it is intended that CAMUs may include one or more land based sub-units created or expanded as part of the cleanup action, as well as pre-existing solid waste management units.

In specifying that a CAMU may contain land-based sub-units, the proposed definition is meant to clarify that non-land based units, such as a tank or an incinerator, would not be considered part of the CAMU. Thus, while a remedy might involve constructing a tank treatment system for contaminated materials within the area defined as the CAMU, the tanks would be subject to all applicable part 264 standards for tanks, and the residuals from the treatment systems would also be subject to any regulatory or statutory requirements that would apply had the CAMU not been designated.

The Agency believes that allowing the creation of land based sub-units within a CAMU is reasonable and necessary to realizing the basic objective of the CAMU concept; *i.e.*, allowing sensible cleanup solutions for existing contamination problems. In essence, a CAMU can be considered to be a large, land-based unit. Remedial actions such as treating or consolidating wastes, or creating new land-based units within

the CAMU, serve in effect to enhance the environmental performance and integrity of the unit.

In developing the concept of the CAMU as articulated in today's proposal, the Agency considered several alternative approaches. One option would have been to only allow movement of wastes into existing landfill areas within the CAMU; new land-based units would not be considered as part of the CAMU. This option could have caused land disposal ban and minimum technology requirements to be triggered relatively frequently, thus restricting decision makers' flexibility to upgrade these areas of the CAMU, and engineer more effective and protective waste management systems. In addition, the option would likely create substantial difficulties in defining what constituted new units within the area of existing contamination.

EPA also considered options that would have significantly broadened the CAMU concept. Once such option would have allowed wastes to be excavated, treated in a non land-based unit (*e.g.*, a tank) within the CAMU, and the residuals redeposited on the land without triggering the land disposal ban. A variation of this approach would also allow an incineration or other thermal treatment system to be considered as part of the CAMU. Yet another option considered would have allowed CAMUs to include land areas at the facility that were not already contaminated; such areas might thus be used as sites for locating new landfills. Although these options would have offered more flexibility in designing remedies, the Agency has chosen not to propose such broader interpretations of the CAMU concept, for several reasons. Allowing uncontaminated land to be included as part of a CAMU (and thus potentially allowing it to become contaminated) would have contradicted the overall intent of the CAMU; that is achieving reasonable cleanup solutions for existing contamination problems. In addition, allowing non land-based units to be considered part of the CAMU would, in effect, contradict the notion of the CAMU as a type of land-based unit (albeit one that is contaminated and needs to be upgraded to improve its protectiveness), and could have complicated the ability to impose the stringent part 264 standards for treatment units such as incinerators.

It should be understood that, given today's proposed definition or any of the alternative approaches described above, several fundamental requirements will apply to CAMUs. Firstly, land disposal restrictions will apply whenever hazardous waste is placed into a CAMU from outside its defined area. In addition, all waste management activities conducted within the CAMU will be protective of human health and the environment, will conform to the standards for remedies proposed in § 264.525(a), be evaluated in terms of the remedy selection factors of proposed § 264.525(b), and comply with the cleanup standards of proposed § 264.525(d). Finally, all decisions regarding the scope of CAMUs and the nature of remedial activities that will be conducted within them will be subject to public review and comment during the remedy selection and permit modification process.

EPA specifically invites comment on today's proposed approach to defining CAMUs, and any alternative approaches which may be viable in achieving the remedial goals for which it is intended.

Proposed § 264.551(c)(4) lists the factors which the Regional Administrator will consider in specifying closure requirements for CAMUs. As with other units created for the purpose of implementing corrective action remedies. EPA proposes to not apply part 264 subpart G procedural requirements for closure to CAMUs (see previous discussion on closure of remedial units), in favor of using the remedy selection and permit modification process that will serve to establish comprehensively the technical requirements for the remedy. In addition, under today's proposal, the specific technical standards for closure and post-closure (*e.g.*, type of cap, scope of post-closure ground-water monitoring) of CAMUs would be determined through the corrective action process rather than the unit-specific technical closure standards of part 264.

Technical requirements for closure and post-closure of CAMUs, therefore, will be established on a site-specific basis. The specific requirements for CAMU closure/post-closure must be designed to achieve the general performance standard of § 264.551(c)(5). This standard is essentially the same as the performance standard for closure in subpart G (see § 264.111). In addition to this general standard, the Regional Administrator will use the decision factors specified in § 264.551(c)(4) in determining the specific closure and post-closure requirements that are appropriate for the CAMU to ensure that the general performance standard is met. These decision factors will include considerations of waste and unit and environmental characteristics, as well as the potential for exposure to contaminants should future releases occur.

This approach to determining closure/post-closure requirements for CAMUs is intended to provide flexibility for the regulatory Agency in setting appropriate standards specific to the site conditions, while also ensuring that adequate long-term controls are imposed for any wastes remaining within the CAMU. This approach is also consistent with the general process for defining remedies and for management of wastes as established in proposed §§ 264.525 and 264.550–552.

EPA considered other approaches for prescribing closure/post-closure requirements for CAMUs. One approach would have been to adopt a set of more specific requirements that would be applied generically to all CAMUs. This approach would have been similar to the current RCRA regulations for closure/post-closure of conventional hazardous waste units (*e.g.*, tanks or waste piles). This approach was rejected, however, for two reasons. First, the closure requirements for hazardous waste units are designed to apply to discrete, engineered units that must also comply with specific design and operating standards under RCRA. In contrast, CAMUs will typically be broad, contaminated areas that may contain discrete or non-discrete "sub units" of varying types and configurations. It would therefore be impractical to specify generic national standards for a class of units that will be of such diversity, and within which it will make sense to apply different closure techniques to different areas or sub-units of the CAMU.

The second reason for not applying generic national standard to closure of CAMUs relates to the nature of the corrective action process. Under corrective action, the Agency has considerable control over the technical decision-making process, and cleanup problems at facilities are typically subjected to direct Agency review and oversight. In contrast, the closure process under RCRA typically involves review and approval of owner/operator plans against established regulatory standards. EPA believes that the greater control over technical decisions that is provided under corrective action allows a more site-specific tailoring of closure requirements based on a thorough knowledge of site conditions.

4. *Management of Non-Hazardous Solid Wastes (§ 264.552).* In other cases, wastes addressed under corrective action will not meet the specific RCRA definition of hazardous waste. Many

wastes that do not meet the RCRA regulatory definition of hazardous wastes contain varying concentrations of hazardous constituents that, if the waste is improperly disposed of, could be released to ground water, surface water, soil, or air. The goal of corrective action is to protect human health and the environment by removing these contaminants from the environment, and controlling the source of the release—even if the waste from which the release originated does not meet the regulatory definition of hazardous.

Proposed § 264.552 states that non-hazardous wastes handled during corrective action must be handled in accordance with any applicable subtitle D standards. The Agency is in the process of developing more comprehensive regulations under subtitle D, and will continue to examine in that context issues relating to the applicability of those regulations to the management of solid wastes undertaken as part of subtitle C corrective actions.

In addition, the proposal provides the Regional Administrator authority, under certain circumstances, to impose more stringent standards than subtitle D. For example, a specific waste might not be listed as hazardous, but it might have a high concentration of specific hazardous constituents, or it might be similar in composition to a listed waste. In such cases, the Regional Administrator could impose subtitle C standards or standards that were protective given the circumstances at the site and characteristics of the waste where necessary to protect human health and the environment even though the waste did not technically meet the definition of hazardous waste.

K. Required Notices (Section 264.560)

1. *Notification of Ground-Water Contamination.* Proposed § 264.560(a) would require the permittee to notify EPA and any persons who own or reside on land adjacent to the facility in writing within 15 days when s/he discovers that hazardous constituents originating from a SWMU at the facility have migrated beyond the facility boundary in concentrations that exceed action levels.

Action levels are defined in proposed § 264.521 of today's proposal, and are discussed in detail in section VI.E of this preamble; therefore, they are not discussed in detail here. However, the reader should note that action levels are established using conservative assumptions to protect human health and the environment. Concentrations exceeding action levels will not necessarily result in adverse effects. Short term exposures to releases above action levels may often not represent a threat to human health or the environment since action levels are derived using long-term exposure assumptions. In fact, in some cases constituents at or above action levels will not ultimately require active remediation.

This notification requirement is limited to situations in which the adjacent land can reasonably be determined to overlie the contaminated ground water given current knowledge of the direction and rate of the ground-water flow.

EPA believes that it is appropriate to require such notification in order to provide adequate awareness for persons who are, or who could potentially be exposed to the contaminated ground water. It is possible that residents near a facility could be using water from wells that have become contaminated from the facility; in such cases, prompt notice to the individual would be an essential part of the response action.

The Agency may require the permittee to initiate an interim measure to address off-site ground-water releases virtually immediately, including making available an alternative drinking water supply when drinking water supplies have become contaminated. On the other hand, the Agency may ultimately decide, based on further study, that no further action will be necessary. Such might be the case where the ground water is highly saline, and not usable for drinking. As explained earlier in this preamble, the actual response action that may be required when ground-water contamination is identified will be determined by a variety of site-specific factors. In any case, an early notification that an action level has been exceeded will alert the adjacent resident or owner to the potential problem and will allow their informed comment on further permitting actions taken at the facility if they have special concerns. EPA solicits comment as to what alternative mechanisms or approaches could or should be required to alert potential users of ground water that contamination has occurred from a facility.

2. *Notification of Air Contamination.* Proposed § 264.560(b) would require the permittee to notify, in writing, EPA and any residents or other individuals who may be exposed to air emissions from SWMUs above action levels. This proposed notification requirement would apply when there is exposure in a residential setting, or other situation where long-term exposure to the air emissions from the facility can reasonably be assumed. This is consistent with the overall approach to corrective action for air releases (as discussed in section VI.E of this preamble).

This notification requirement for air would also be triggered when residences or activities that could result in long-term exposures become established near the facility after the initial release investigations have been conducted and are within an area where air emissions have been found to exceed action levels. Permittees whose remedial investigations have confirmed substantial air emissions migrating beyond their property limits have a continuing responsibility to identify and provide notice whenever such exposure situations occur. If concentrations of hazardous constituents in air beyond the facility boundary are found to be causing actual exposure problems of concern, the Regional Administrator may require the permittee, in addition to the notice requirement, to institute an interim measure to reduce the threat. For example, s/he could require the installation of a floating cover on a surface impoundment for the purpose of reducing the surface area of the impoundment available to allow the escape of hazardous constituents to air. In many cases the release to air will be reduced or eliminated during the course of remedial activities at the facility. For example, a permittee may be required to excavate and treat wastes contained in the SWMU or to cover the SWMU with a cap.

EPA solicits comments on what alternative mechanisms or approaches could or should be required to alert persons who may be exposed by releases of hazardous constituents into the air from RCRA facilities.

3. *Notification of Residual Contamination.* Under the regulatory authority proposed in § 264.560(c), the Regional Administrator may require the permittee to provide notice whenever hazardous wastes (including hazardous constituents) are left in place in the subsurface at the facility. This requirement would apply whether hazardous wastes or hazardous constituents left in the subsurface are contained in a discrete unit or diffused throughout subsurface soils. The notice would consist of a notation in the deed to the facility property, or a notification via some other instrument used by the State if the instrument is routinely searched during the course of transferring ownership of property. When such a notice is required, the notice must clearly indicate the types, concentrations, and locations of hazardous wastes or hazardous constituents that remain at the property.

EPA believes that the Agency's authority to allow owner/operators to certify completion of their corrective action responsibilities and, in some cases, close or transfer ownership of the property while hazardous wastes remain in place in the subsurface is accompanied by a responsibility to ensure that future owners of the property do not inadvertently act in a way that could result in harmful exposures to the residual contamination. This could occur, for example, when a facility in an area where mixed land uses are common (*e.g.*, residential and light industrial uses) is closed in accordance with applicable regulations and ownership of the property is transferred several times over the course of a few years. If notice is not provided in the property deed, a new owner could be unaware of its previous use for hazardous waste management. Inadvertently, the new owner could then initiate construction or other activities in a manner or at a location where disturbance of the subsurface could result in potentially harmful exposures. For example, by digging a foundation in a certain location, the owner might unearth an old solid waste management unit, and in doing so damage any engineering controls designed to prevent releases from the unit. One of the most likely situations in which residual contamination would remain at the property is where facilities have large areas of contaminated soils deep in the subsurface.

The residual contamination notice requirement proposed today is analogous to the existing requirement contained in 40 CFR 264.119 that facility owner/operators place a notice in the deed (or other instrument normally examined in title searches) within 60 days after the first and the last hazardous waste units at the facility are certified closed in conformance with the approved closure plan, in compliance with subpart G standards. This notice is required in recognition that post-closure care may need to be instituted for some units (or, in the case of corrective action, areas of contamination) where hazardous wastes remain in place. Until the term of the final facility permit expires (*i.e.*, all closure, post-closure, and corrective action responsibilities at the facility have been fulfilled), the permit responsibilities shift to any new owner or operator who assumes control of the property. After the final permit has expired, the Agency believes that prospective purchasers of the property should be made aware of the past use of the property, legal restrictions imposed on its future use, and the location and details of any residual contamination on the property which could influence decisions of the new owner concerning allowable future uses.

In some cases it may be appropriate to require the owner/operator to place the deed notice well before expiration of the permit. For example, a selected remedy may involve capping (thus, leaving in place) units or contaminated soils in an area of the facility. This part of the remedy could be implemented well before all other corrective action requirements at the facility are completed. In this situation, it may be appropriate to require the deed notice as part of the remedy selection permit modification, thus providing notice to prospective purchasers if ownership of that portion of the facility were to be transferred at some point before the permit is terminated.

L. Permit Requirements (Sections 270.1(c)–270.60(c)(3))

1. *Requirement to Maintain a Permit (§ 270.1(c)).* Today's proposal would require an owner/operator to operate under a valid RCRA permit for the entire length of time required to comply with requirements of part 264, subpart S or F corrective action. This requirement would be established by adding to the existing language of 40 CFR 270.1(c), which defines the period during which owner/operators of RCRA treatment, storage, or disposal facilities must maintain a permit. Where corrective action is required under a permit, a permit will be necessary for the duration of the activities regardless of whether other waste management activities are continued at the facility. For example, at a storage or treatment facility not required to have a post-closure permit, the permittee may decide to cease operation prior to or at the end of the term of his/her permit and close the facility according to applicable regulations, rather than reapply for another permit term. If that owner/operator had any remaining corrective action responsibilities at the facility, today's proposal would require that the permit be maintained even after the hazardous waste units are closed, until all subpart S or F requirements have been terminated.

This provision is also likely to have important implications in situations involving transfer of property for which corrective action obligations under subpart S have not been fully discharged. An example would be a facility with a solid waste management unit causing a release to ground water that had been issued a permit with a schedule of compliance requiring the owner/operator to investigate the release and ultimately implement a remedy, where the owner/operator subsequently sold the portion of the facility property upon which the solid waste management unit was located. In this and other situations, EPA believes that transfer of corrective action responsibilities to new property owners is critical to ensuring that RCRA facility owner/operators are not able to evade cleanup requirements by simply selling the contaminated portions of their facilities. If such a transfer of ownership did not also involve a transfer of legal responsibility for complying with corrective action permit conditions, the effect could be a substantial number of new Superfund sites that could no longer be addressed under RCRA. EPA does not believe that Congress intended, in enacting section 3004(u), to create or to allow such an evasion of cleanup responsibilities. The Agency, therefore, intends to require new owners of property at which corrective action responsibilities have been identified in the permit, to obtain a permit and comply with the corrective action requirements specified in the permit. Those corrective action requirements could, alternatively, be specified and enforced through an administrative order (*e.g.*, under section 7003).

EPA specifically solicits comment on cleanup responsibilities following transfer of property. As an alternative to the approach outlined above (under which the new owner/operator becomes responsible for cleanup) EPA considered a provision that would require the former owner/operator to maintain corrective action responsibility. Under such an approach, it is likely that the former owner/operator's responsibilities would be limited to those off-site activities (*i.e.*, activities on the transferred property) that the new owner/operator allowed him to undertake. The former or new owner/operator's responsibility to undertake corrective action on transferred property may also be dependent upon the status of corrective action activities at the time of transfer. For example, a transfer of property before permit issuance would probably not implicate section 3004(u) responsibilities. Transfers occurring after the permit is issued but before remedy implementation or interim measures have begun (*e.g.*, some transfers during the RFI and CMS stages) should perhaps be subject to different rules than transfers occurring after remedial activities have begun.

After consideration of public comment on these questions, the Agency intends to develop a provision governing

corrective action responsibilities upon property transfer for the final rule.

2. *Schedules of Compliance for Corrective Action (§ 270.34).* Section 3004(u) of RCRA specifies that "Permits issued under section 3005 shall contain schedules of compliance (where such corrective action cannot be completed prior to issuance of the permit) * * *." Section 270.34 of today's proposal would codify this requirement and provides a regulatory framework for its implementation.

Schedules of compliance will be a major tool for imposing corrective action requirements because, in most cases, the complex and sequential nature of the corrective action process will not allow its completion prior to permit issuance. The provisions of today's proposed regulation, including plans and reports for remedial investigations and Corrective Measure Study and remedies, will, for the most part, be implemented through a schedule. Consequently, the quality and detail of the permit schedule of compliance are extremely important if the objectives of the corrective action program are to be achieved.

In addition to codifying a statutory requirement, proposed § 270.34(a) states that a corrective action schedule of compliance shall "* * * contain terms and conditions deemed by the Director to be necessary to protect human health and the environment." This provision is derived from the basic statutory objective of RCRA (protection of human health and the environment; see section 1003 of RCRA), and is a logical extension of statutory language found in section 3004(u) which allows cleanup to be implemented through a schedule of compliance specified in the permit where corrective action cannot be completed prior to permit issuance. The Agency believes that inclusion of this language in proposed § 270.34 is desirable to clearly assert the authority of the Region or State to include requirements in the corrective action schedule of compliance to address contingencies that arise during the corrective action process and that are not specifically contemplated by today's proposed regulation, but that must be dealt with in order to protect human health and the environment.

Proposed § 270.34(b) would require the permittee to comply with the schedule imposed in the permit, and provides a time frame for notifying the Agency when s/he finds that such compliance will not be possible. When the permittee will not be able to meet the schedule, s/he must initiate a permit modification under provisions of the recently issued permit modification rule (September 28, 1988, 53 FR 37912, discussed below). Section 270.42(f) of this rule establishes procedures for owner/operators who wish to initiate permit modifications where the desired modification has not been specifically listed as either a Class I, II, or III modification. These procedures are discussed in detail in the permit modification rule and its preamble. In addition, a brief explanation of the provisions of the proposed rule is included later in this discussion.

In § 270.34(c) the Agency proposes a specific procedure for modifying corrective action schedules of compliance for the purpose of implementing subpart S requirements. The proposed § 270.34(c) mechanism is important for two reasons. First, since permits containing corrective action schedules of compliance will often be issued before complete information has been gathered as to the extent and nature of any releases at the facility, and, therefore, the corrective action necessary to address such releases, it will generally not be possible to adequately predict (and thus specifically provide for in the schedule) all requirements and contingencies necessary to develop and implement such corrective action at the facility. Therefore, it may often be necessary for the Agency to modify the schedule of compliance to provide for new actions or to make mid-course changes to provisions specified in the original schedule. Secondly, this modification provides a mechanism to resolve disputes which may arise between the permittee and the Agency concerning the scope or meaning of conditions in the schedule of compliance when those disagreements cannot be resolved through less formal means. (The potential use of this modification procedure for dispute resolution is discussed in more detail later in this section of the preamble.)

It should be understood that the § 270.34(c) procedure will be applied only in modifying corrective action schedules of compliance; it will not be used to modify terms or conditions of the permit that are outside the scope of the schedule. Given this narrower application, a modification made according to § 270.34(c) would not constitute reissuance of the permit.

It is the Agency's objective in creating this modification process for corrective action schedules of compliance to ensure that such actions are implemented expeditiously, while preserving the permittee's due process rights, and ensuring adequate public participation.

The procedures proposed for modifying schedules of compliance using this proposed authority are found in § 270.34(c) (1)–(5); there are fewer procedural requirements for this modification than for a major modification initiated under the current authority of 40 CFR 270.41. Under proposed § 270.34(c)(1), the Director would notify the permittee in writing of the proposed permit modification. This notification would include a description of the exact change(s) to be made to the permit and an explanation of why the change is needed; it would also indicate the date by which the Director would have to receive any comments on the proposed modification. In addition, the notification would indicate whether any supporting documentation is available for review. Further, the notification would include the name of the Agency contact designated to receive comments. At the same time, the Director would publish a notice of the proposed modification in a locally distributed newspaper (§ 270.34(c)(2)), provide notification to individuals on the facility mailing list, and place a notice in the information repository being maintained for the facility, if the permit required that a repository be established. Each of these notifications would contain all of the information included in the notice to the permittee. The comment period provided would extend for no fewer than twenty days after publication of the newspaper notice (or, for the permittee, twenty days after receiving the written notification if the notice were received later than the date of the newspaper notice publication).

If the Director does not receive written comments on the proposed modification, the modification will become effective five days after the close of the comment period. S/he will then notify the permittee and individuals on the facility mailing list that the modified permit is in effect, and will place a copy of the modified permit in the facility's information repository where such a repository is maintained.

If written comments on the proposed modification are received, as provided in § 270.34(c)(4), the Director will make a final determination as to what, if any, changes should be made to the modification. This determination should generally be made within 30 days after the end of the comment period. In some cases, however, it may not be practicable for the Director to make the determination within that time frame; this would not affect the legal validity of the modification. When the determination has been made, the Director will provide notice to the permittee in writing and to the public through a notice in a local newspaper, of

the final decision on the modification. The notice will include an explanation of how comments received were considered in the final decision, an indication of the effective date of the modification (no later than fifteen days following the notification), and a copy of the final modification. EPA believes that the abbreviated § 270.34(c) modification procedures will strike an appropriate balance in most cases between the public and government's interest in ensuring expeditious remediation of harmful situations, and the permittee's due process rights.

It should be understood that the procedure outlined above is a minimum process, and does not preclude providing additional steps or opportunities for review and comment. For example, the Director could conduct a public meeting during the comment period, if it was determined to be appropriate in addressing concerns of the permittee or the public, or both. In other cases, the comment period might be extended for some period to allow for more thorough review or comment. Moreover, as noted later, the burden imposed by some changes may warrant the more extensive process provided for in § 270.41.

Section 270.34(c)(5), as proposed, does not provide for administrative appeals of modifications to corrective action schedules of compliance that are made under the procedures of § 270.34. The administrative appeal process can be quite lengthy; experience with RCRA permit appeals has been that appeal decisions may often take one year or more. If an owner/operator's appeal is denied, s/he then has some recourse through judicial appeal proceedings. Thus, the proposed § 270.34(c) modification process may be advantageous in situations where disputes between the Agency and the owner/operator will be most effectively resolved by reaching a final Agency action expeditiously (see discussion below on dispute resolution). The absence of an administrative appeal procedure will not affect the owner/operator's right to judicial appeal of modification decisions.

When initiating modifications to corrective action schedules of compliance, the Director will decide on a case-by-case basis which modification procedure—§ 270.34(c), or a major modification under § 270.41—is appropriate. A number of factors may influence this decision. Since the § 270.34(c) procedure is less complex administratively and should take substantially less time to make modifications effective, it is anticipated that the process will be used for modifications that are relatively routine and do not include very large additions or changes to the requirements already specified in the schedule. An example might be a requirement to increase the frequency or methods used for groundwater sampling. On the other hand, some Director-initiated modifications, because of the nature, scope, or anticipated resource burden of complying with the new requirement, may be more appropriately handled as a major modification under § 270.41. One example of such a situation is the permit modification for specifying the remedy (see proposed § 264.526); the rule explicitly requires the major modification under § 270.41 in these situations.

In addition to the relative magnitude of the requirement(s) being imposed through a modification, other factors such as timing and public participation considerations may affect decisions as to which type of permit modification should be used. For time-critical actions, such as might be the case for one of several types of interim measures, the § 270.34(c) modification would likely be most appropriate, since the § 270.41 process can take a number of months before the modification requirements are effective. Likewise, for imposing requirements that are especially sensitive or controversial from the community's perspective, major modification procedures, which allow maximum public input into the substance of the permit modification, could be most fitting.

The two types of modifications discussed above also have different legal conclusions, which will also be a factor in the decision as to which one may be more appropriate The proposed modification under § 270.41 is subject to administrative appeal. It is subject to judicial review only after the appeal process has been completed. (Permit appeal procedures are described in 40 CFR part 124.) As discussed earlier, the § 270.34(c) modification would not be subject to administrative appeal. When it is apparent that a disagreement between the permittee and the Agency over corrective action requirements cannot be resolved outside the judicial process (such as might be the case in dealing with a recalcitrant owner/operator), this type of modification would likely be the most direct and timely means of reaching such resolution.

The need for flexibility in procedural requirements for initiation of modifications to corrective action schedules of compliance is supported by an analysis completed for owner/operator initiated permit modifications. EPA issued a rule on September 28, 1988, concerning owner/operator-initiated permit modifications, which was the result of a regulatory negotiation effort involving EPA, industry, States, and public interest groups (see § 270.34 schedules of compliance for corrective action). In this rule, the Agency recognized that situations in which permittees request permit modifications represent a continuum of potential impacts on the permittee, the public, and the environment, which, in turn, warrant a continuum of procedural requirements. The rule does not alter major permit modifications under § 270.41. However, for permittee-requested permit modifications (under a new § 270.42), the rule establishes a permit modification classification system, with each modification defined as either Class I, II, or III. Proposed Class III permit modification procedures are similar to the existing procedural requirements for a major modification initiated by the Director under § 270.41 (additional public meetings are required in the Class III procedures). Class II procedures are somewhat less extensive; and Class I modifications, which are of a limited nature, generally do not require formal Agency approval.

Today's proposal in § 270.34(c) for modifying corrective action schedules of compliance reflects a balance between reasonable public participation and the Agency's need for flexibility in procedural requirements for permit modifications similar to that afforded owner/operators in the recent permit modification rule. The relatively streamlined process associated with proposed § 270.34(c) will not only reduce the administrative requirements imposed on the Agency, but will also minimize delays in implementation of necessary corrective action requirements in appropriate circumstances.

It is important to note that for the purposes of this provision (as well as all other provisions of the regulation proposed today), any plan submitted by the permittee pursuant to a schedule of compliance and approved by the Director becomes an enforceable part of the schedule. Accordingly, modifications to such plans will be required to follow the appropriate procedures of § 270.41, 270.42, or 270.34(c). In addition, such plans are subject to enforcement under RCRA section 3008(a).

As indicated earlier in this discussion, the Agency believes that the proposed § 270.34(c) modification procedure will

be used in the case of disputes which may arise between the permittee and the Agency. In practice, the Agency presumes that the permittee and the Director will be able to resolve most issues that arise during the course of corrective action without resorting to the procedures of § 270.34(c). For example, disputes may arise over the scope of a remedial investigation and how many monitoring wells may need to be installed, or the appropriate soil sampling procedure. The permit modification proposed in § 270.34(c) might be used in this case, although generally such issues can be resolved informally by technical staff from both sides, or through the use of an alternate dispute resolution process (described in section VI.L of this preamble). However, in recognition that cases may arise in which no agreement is possible, the Agency is persuaded that it needs the regulatory authority to modify the permit, as necessary, to specify requirements the permittee must fulfill, and to offer both the public and the permittee an opportunity for formal comment on the proposed changes.

Where situations identified by the Director are determined by him/her to require immediate action to protect human health and the environment, there may be insufficient time to undertake a permit modification even under the relatively streamlined procedures proposed in § 270.34(c). In such cases, the Director may take action under the removal authority provided in CERCLA section 104 or require action under CERCLA section 106 or RCRA section 7003.

3. *Conditions Applicable to All Permits (§ 270.30(l)(12)).* Under §§ 270.30(l) (1)–(11) of 40 CFR part 270, subpart C, the Agency has promulgated regulations that specify reporting requirements applicable to all RCRA permittees. These permit conditions fall into two broad categories. The first category covers those situations in which a permittee must give notice to the Director of changes affecting the permit conditions (*e.g.*, planned physical alterations or additions to a permitted facility). The second includes those reports typically required of all permittees (*e.g.*, manifest discrepancy reports, biennial reports, etc.). Reporting requirements contained in § 270.30 may be incorporated into the permit either expressly or by reference.

Today, EPA is proposing to add a new reporting requirement under § 270.30(l) relevant to the submittal of information pertinent to subpart S corrective action requirements. Specifically, proposed § 270.30(l)(12)(i) would require the permittee to submit information on any additional solid waste management unit(s) (SWMU) discovered at any time during the term of the permit within 30 days of the discovery of this unit. Further, it would require the permittee to submit information on newly discovered releases of hazardous wastes or hazardous constituents from previously identified or newly discovered SWMUs at the facility within 20 days of discovery of the release(s).

Currently, EPA or an authorized State identifies all SWMUs at RCRA facilities during the RCRA Facility Assessment (RFA) prior to permit issuance. In addition, § 270.14(d) requires the owner/operator to identify SWMUs as part of the facility's part B application. The Agency realizes, however, that additional SWMUs and releases may be discovered at any time following permit issuance. Therefore, today's proposal requires the facility owner/operator to provide new data relating to SWMUs and releases from SWMUs during the life of the permit.

Under § 270.30(l)(12)(i)(A), the permittee would be required to submit the following information on each newly identified SWMU within 30 days of identifying the SWMU: (1) Location; (2) type (*e.g.*, landfill, storage tank); (3) general dimensions; (4) operating history; (5) specification of all hazardous and/or solid wastes that have been managed in the unit (if available); and (6) all available data pertaining to any release of hazardous waste (including hazardous constituents) to any media from the unit. The location of the unit may be indicated on the topographic map submitted by the facility on its part B permit application in accordance with § 270.14(b)(19) of 40 CFR, or may be submitted on a topographic map of comparable scale that clearly indicates the location of the unit in relation to other SWMUs at the facility. These data are the same as those now required in the part B application under 40 CFR 270.14(d). (See Second Codification Rule of December 1, 1987, 52 FR 45788.)

Based on the information supplied by the permittee under § 270.30(l)(12)(i)(A), EPA would require, as necessary (under proposed § 270.30(l)(12)(i)(B)) sampling and analysis data for the purpose of determining whether releases warranting further investigations have occurred. Further investigations or corrective measures as necessary would be imposed by amending the existing schedule of compliance or by initiating a permit modification as provided in § 270.34, depending upon the extent of the change needed to cover necessary corrective action.

Proposed § 270.30(l)(12)(i)(C) would require the permittee to identify newly discovered releases from newly discovered SWMUs or from SWMUs where no release had occurred at the time of permit issuance. Information submitted would include the following: (1) The type of unit and its location, clearly identified on a facility map; and (2) available data pertaining to the release, including potential exposure pathways, controls already imposed to address the release, and action planned for further cleanup. The permittee would be required to submit this information within 20 days of discovery.

EPA is persuaded that these requirements are necessary to ensure that both the statutory requirements of section 3004(u) and Congressional intent are satisfied. (See *e.g.*, S. Rep. No. 98–284, 98th Cong. 1st Sess., 32 (1983).) The requirement for corrective action is a continuing one, applying not just to releases that have occurred prior to permit issuance, but also to any releases that occur after permit issuance. Without such requirements, the Agency might have to wait until the time of permit review or reissuance (in some cases as long as ten years) before newly discovered units or releases could be addressed in the permit. Including these requirements in today's proposal will allow the Director to learn of a release requiring remediation in a timely manner.

4. *Information Repository (§ 270.36).* Proposed § 270.36 would provide the Director authority to require in the permit that the permittee establish an information repository. The repository would allow interested parties access to reports, findings and other informative material relevant to ongoing corrective action activities at the facility. A repository would generally be required where the RCRA site is similar to sites listed on the NPL under CERCLA in terms of the magnitude of contamination and potential for exposure to hazardous wastes.

As provided by § 270.36(b), the information repository would contain all public information that the Director determines to be relevant to public understanding of corrective action activities at the facility (*i.e.*, material determined to be confidential business information would not be included). For example, copies of RFI plans and reports and CMS plans and reports would generally be included in the repository. Background material that would also typically be maintained in the repository would include copies of relevant RCRA regulations and press releases.

The repository would be located at a local public library, town hall, public health office, EPA Regional or State office, or another public location within reasonable distance of the facility. In instances where this is not feasible due to the remote location of the facility, for example, the Director would require that the repository be established and maintained at the facility. Regardless of the location, however, interested persons must be allowed reasonable access to the repository. For example, it may be appropriate to require a facility to provide additional hours of access (*e.g.*, beyond normal business hours), depending, among other things, on the degree of public interest in corrective action activities at the facility and the timing of public meetings or hearings. The Agency solicits comment on where and when the information repository should be required.

The Director would specify requirements that the permittee must satisfy in informing the public of the existence of the information repository in the permit schedule of compliance. (See proposed § 270.36(d).) At a minimum, the Director would require the facility owner/operator to notify individuals on the mailing list of the repository's establishment. S/he might also be required to provide public notice in a local newspaper. An EPA contact person to whom comments can be submitted will be identified.

The information repository proposed today is similar to the repository established at CERCLA sites. Experience under CERCLA has shown that the public is frequently concerned about nearby remedial activities and that this interest is effectively served by a repository. Without such a repository, the burden would be on citizens to locate and contact the appropriate officials knowledgeable about the site in Regional EPA or State offices.

There are two major differences between the information repositories in today's proposal and the repositories included in the CERCLA program. First, information repositories are required for all CERCLA sites whereas they will be required for RCRA sites only as determined to be appropriate by the Director. In making such a determination, the Director would consider the extent of contamination, the scope and complexity of the remedial action, and the degree of public interest. Second, designated information repositories under CERCLA generally house the administrative record for CERCLA actions. Under the RCRA permitting program, administrative records, which provide documentation for the basis of EPA's decisions and other parts of the record, are maintained by EPA Regional offices (or authorized States) at the location of the Regional office. Because the RCRA record is kept elsewhere, where it is available for public inspection, the Agency does not believe it is necessary to duplicate the entire administrative record for RCRA sites at information repositories.

5. *Major Permit Modifications (§ 270.41(a)(5)(ix).* Section 270.41(a)(5)(ix) of today's proposal would add a new provision to the major permit modification requirements allowing the Agency to reopen a permit for good cause to modify a permit for reasons arising from corrective action requirements under subpart S of 40 CFR part 264. The Agency would use this authority to modify permits after a remedy has been selected under proposed § 264.525, or to recommence corrective action after a no-action decision had been made under § 264.514. In addition, the Agency might use this authority to begin corrective action after notification of a new SWMU or a new release under § 270.30(1)(12). The Agency believes that it already has the authority to modify permits in this situation under § 270.41(a)(2), which allows it to modify permits when new information justifies the application of different permit conditions. However, the Agency is proposing to amend these regulations to clarify its authority.

Modifications under proposed § 270.41(a)(5)(ix) would undergo the full permit modification procedures of 40 CFR part 124—that is, there would be public notice, a 45-day comment period, and a public hearing, if requested. In addition, the modification could be appealed through EPA's administrative appeal procedures.

The introductory paragraph of § 270.41 has also been amended to make it clear that EPA-initiated modifications may be made pursuant to § 270.34(c), as well as § 270.41. This paragraph has been reprinted in full for purposes of clarity. EPA is seeking to change, and is seeking comments only, on those references to new § 270.34(c) and the balance of the paragraph.

6. *Conforming Changes to Requirements for Permits-by-Rule (§ 270.60(b)(3); § 270.60(c)(3)(viii)).* The subpart S regulations also apply to RCRA "permits-by-rule" for Class I hazardous waste injection wells, and publicly owned treatment works (POTWs) that receive hazardous waste by truck, rail or dedicated pipeline (see 40 CFR 270.60 and conforming changes in today's proposal). Today's proposal provides conforming changes to § 270.60 to reflect the deletion of § 264.101 from the current subpart F requirements. The current "permit-by-rule" requirements for Class I hazardous waste injection wells (§ 270.60(b)(3)) and POTWs that have a National Pollutant Discharge Elimination System (NPDES) permit and that receive hazardous waste by truck, rail or dedicated pipeline (§ 270.60(c)(3)(vii)) stipulate that owners and operators of these facilities must comply with the § 264.101 requirements in order to obtain a RCRA "permit-by-rule". The references to § 264.101 in these two sections have been replaced with references to the requirements of today's proposed subpart S, reflecting that these facilities will be subject to all requirements in this new subpart. Further information on how EPA plans to implement corrective action at these types of permit-by-rule facilities can be found in the preamble to the December 1, 1987, Codification Rule (52 FR 45788) for underground injection control (UIC) wells and in "Guidance for Implementing RCRA Permit-by-Rule Requirements at POTWs." issued on July 21, 1987 (contact Permits Division, Office of Water Enforcement and Permits, at (202) 475–9545).

7. *Alternative Dispute Resolution.* During the process of investigating releases and studying remedies for RCRA facilities, EPA anticipates that some disagreements between the Agency and the owner/operator may arise regarding various technical or procedural issues. For example, in defining the technical scope of a work plan for remedial investigations, the Agency's technical judgment as to the numbers or placement of ground-water monitoring wells may differ from the permittee's.

In most cases, the Agency anticipates that such disagreements can and will be resolved through continuing communications between the owner/operator and the Agency. However, EPA recognizes that there will inevitably be some disagreements which cannot be resolved by such means. In these cases, there are several options the Agency may employ to resolve the dispute and prevent unacceptable delays in implementation of corrective action requirements. Such options include the use of a more formal type of dispute resolution process; enforcement action under RCRA section 3008(a); or a modification of the permit. The choice of options will depend on the specific issues under dispute and the circumstances at the facility. For situations where the requirements at issue are clearly defined in the permit

schedule of compliance, but where the permittee refuses, or otherwise demonstrates an unwillingness to comply with the requirements, EPA would intend to utilize enforcement options (*e.g.*, section 3008(a)) to compel appropriate action by the permittee. Alternatively, a modification to the permit schedule of compliance (such as the process defined in today's proposed § 270.34(c)) may often be chosen as the appropriate mechanism for resolving disputes in situations where the requirement at issue is less specifically defined and when the Agency and the permittee are unable to negotiate an acceptable agreement.

The use of enforcement authorities for corrective action, and the permit modification process proposed today at § 270.34(c) are discussed elsewhere in today's preamble. The remainder of this discussion focuses, therefore, on the potential use of alternative dispute resolution techniques to resolve disagreements.

On August 14, 1987, EPA's "Final Guidance on Use of Alternative Dispute Resolution (ADR) Techniques in Enforcement Actions" discussing multiple ADR techniques was issued. In this guidance document, the Agency articulated its intention of encouraging the use of alternative dispute resolution techniques where there is reason to believe that one or more of the techniques discussed in the guidance may lead to expeditious final compliance agreements. The Agency believes that some of the techniques discussed in this guidance may be useful in resolving disputes which arise in the corrective action process under RCRA permits. A copy of this guidance is included in the docket established for today's rulemaking.

In particular, EPA is examining the use of a neutral, third-party mediator in the context of a time-limited, non-binding negotiation process to resolve corrective action disputes. The Agency is not prescribing the use of such a process as a provision of today's proposed regulation, however, or any other process. Given the Agency's limited experience with ADR to date it is premature to include any specific ADR technique within a RCRA regulatory framework. EPA intends to encourage, when appropriate, the use of ADR in certain situations as the RCRA corrective action program evolves. The Agency is specifically seeking comment today on several issues associated with alternative dispute resolution in the context of corrective action. These issues are: (1) For what types of corrective action issues and disputes would ADR techniques be most useful? (2) What techniques (*e.g.*, mediation, fact-finding, mini-trials) are most suitable for this purpose? and (3) Who should bear the cost (*e.g.*, of third-party mediators) of alternative dispute resolution?

M. Conforming Changes to Closure Regulations (Section 264.113, 265.112 and 265.113)

1. *General.* As discussed further in section VII.C. of today's preamble, corrective actions undertaken at a facility may affect closure of regulated units under applicable standards of 40 CFR parts 264 and 265, subpart G. For example, closure requirements for regulated units contain certain deadlines that may be impractical if corrective action is required at the facility and the closing unit is being used to receive corrective action wastes. EPA today is proposing to amend the closure regulations in §§ 264.113, 265.112, and 265.113 to simplify extension of these deadlines when doing so would assist in implementing corrective action. The Agency is also proposing to expand part 265 closure plan information requirements to include information on SWMUs.

It is important to note that the part 264 and part 265 subpart G closure regulations apply only to hazardous waste management units. Today's proposed changes to closure regulations are designed to address potential effects of subpart S or F corrective action on the closure of such hazardous waste management units. Corrective action at SWMUs that are not used for the management of hazardous waste is not subject to subpart G regulations.

In addition, as discussed earlier in this preamble, § 264.551(a) provides the Regional Administrator with the authority to waive subpart G requirements (except for § 264.111) for units created for the purpose of managing corrective action waste.

The reader should note that the proposed changes are for both permitted hazardous waste units (part 264 standards) and interim status hazardous waste units (part 265 standards). Although today's rule primarily addresses corrective action at permitted facilities, interim status facilities which close without an operating permit are potentially subject to corrective action under orders issued pursuant to Section 3008(h) of RCRA, or they may wish to conduct corrective action voluntarily. Therefore, conforming changes are being proposed for both permitted and interim status units.

2. *Clarifications.* The following discussion clarifies several points relating to corrective action and the closure of hazardous waste management units, and explains how existing regulations and authorities can be used to address potential conflicting interests.

a. *Extension of Closure Deadlines*—(1) *Notification of Closure.* Under current regulations, when a unit ceases to receive hazardous waste, the owner/operator is generally required to notify the Agency and initiate closure of the unit (§ 264.112(d) or § 265.112(d)). In order to perform needed corrective action without posing unnecessary implementation problems, the Regional Administrator may find it necessary to require suspension of the acceptance of wastes at the unit temporarily. For example, it may be necessary to drain liquids from a surface impoundment to allow reinforcement or repair of a berm to prevent migration to a nearby surface water body. However, closure of the unit may not be desirable at that time since available capacity in the unit, once it is repaired, could be beneficially used for the disposal of wastes generated in the course of corrective action. The Agency believes that the current requirements at §§ 264.112(d) and 265.112(d) provide sufficient flexibility to accommodate temporary suspension of waste receipts to facilitate corrective action without triggering the notice and closure initiation requirements. These regulations allow the Regional Administrator to grant an extension to the deadline for beginning partial or final closure if the acceptance of waste is suspended only temporarily and additional hazardous waste capacity remains in the unit. Thus, the Director may allow an extension of time for the initiation of closure activities when capacity in the unit could be beneficial for disposal of corrective action wastes from other SWMUs at the facility.

(2) *Time Allowed for Closure.* For hazardous waste management units that will be required to close, but where corrective action is required prior to or in conjunction with closure, the owner/operator may find it difficult to comply with the timing requirements of § 264.113 or § 265.113. These provisions currently require that within 90 days after receiving the final volume of hazardous waste at a unit, the owner or operator must treat, remove, or dispose of the waste off-site, and that closure of the unit be completed within 180 days after receiving the final volume of hazardous waste. However, extensions to these deadlines may be necessary because corrective action may interfere with the owner or operator's ability to comply with the deadlines for completing closure. Sections 264.113 and

265.113 currently contain provisions for extending closure deadlines under certain circumstances. EPA believes that the need to take corrective action at the unit, or to receive wastes from other SWMUs, is already included within the existing criteria for granting these extensions. However, to clarify this point, EPA is proposing today to amend §§ 264.113 and 265.113 explicitly to include corrective action among the criteria for granting an extension to the deadline for completing closure activities.

b. *Modification of Closure Plans.* Corrective actions may bring about changes in unit and facility design and operation that will require a resulting modification to the closure plan and closure cost estimate for a hazardous waste management unit. For example, a unit may be expanded to accept waste generated during corrective action at other SWMUs as part of the remedy for a facility. Under § 264.112(c) and § 265.112(c), amendments to closure plans are required when changes in operating plans or facility design affect the closure plan. When interim measures or the final remedy selected affect the closure plan for a hazardous waste management unit, both the plan and the associated cost estimate must be amended according to requirements of subparts G and H. For permitted units, the closure plan and cost estimate amendments may be included in the permit modification for remedy selection or in a separate permit modification, but both must be submitted at least 60 days prior to the proposed change in facility design or operation. For interim status facilities, amendments to the closure plan also must be made at least 60 days prior to the proposed change in facility design brought about by the corrective action, or within thirty days if the change occurs during closure.

3. *Closure Plan Information Requirements.* The Agency is also proposing to add § 265.112(b)(8) in this rulemaking to require owners and operators to include information about SWMUs at interim status facilities when they submit an interim status closure plan. This addition is consistent with the second HSWA Codification Rule. This codification rule added § 270.14(d) to require owners and operators to submit information about all SWMUs at a facility as part of the Part B permit application (December 1, 1987, 52 FR 45788). Today's proposed change would address the need to coordinate corrective action and closure activities at closing interim status units and facilities. Since the facility owner/operator is not required to automatically submit a part B application for a unit closing under interim status, the Agency will need a mechanism for obtaining information to assess the need for corrective action at the facility. Today's proposed addition to interim status closure plan information requirements is intended to provide that mechanism.

N. Conforming Change to Section 264.1(g)

As a conforming change, today's proposal includes an amendment to § 264.1(g) that specifies certain explicit exemptions from the requirements of part 264. However, certain units that are exempted under § 264.1(g) are, nevertheless, considered to be solid waste management units according to the definition proposed in § 264.501. Such units would include on-site accumulation tanks and container units, recycling units, totally enclosed treatment units, elementary neutralization units, wastewater treatment units, and transfer units. Thus, today's proposed amendment clarifies that subpart S requirements of part 264 would apply to these units, although the exemption would continue to apply to all other part 264 requirements.

VII. Relationship to Other Programs

A. Superfund

1. *General.* One of the Agency's primary objectives in development of the RCRA corrective action regulations is to achieve substantive consistency with the policies and procedures of the remedial action program under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The fund, which may be used for certain cleanup actions under CERCLA, is called the Hazardous Substances Trust Fund, but is commonly known and referred to as Superfund. Sections 104 and 106 of CERCLA authorize EPA to take response actions, including removal or remedial measures, when a release or threat of a release of a hazardous substance which may threaten human health or the environment is discovered Generally, these authorities are used in situations where contamination has occurred at sites that are not under the active control of a RCRA owner or operator. Where contamination is related to activities at hazardous waste management facilities that are currently operating or have conducted treatment, storage or disposal of hazardous waste at any time since November 19, 1980, both RCRA and CERCLA potentially apply.

Because the most comprehensive set of standards applicable to remediation of hazardous waste sites under the control of private owners and operators will, when promulgated, be the Section 3004(u) regulation, RCRA corrective action standards will be an important potentially applicable or relevant and appropriate requirement for the CERCLA program. As such, a primary goal in development of the RCRA regulations will be to establish a consistent approach between the RCRA and CERCLA programs. Consistency will help to ensure that the regulated industry can gain no advantage by proceeding under one program rather than the other, since the Agency anticipates that similar remedies would be selected under both.

The corrective action process under RCRA will parallel the process established for CERCLA remedial actions. This process includes preliminary assessments and site investigations to evaluate the need for remediation at specific sites, selection of remedies where needed to protect human health and the environment, remedial design and implementation of remedial action, and operation and maintenance to ensure continued effectiveness of the remedy. Procedurally, the activities under the two statutes may differ somewhat, since the permittee implements corrective action under RCRA, whereas the regulatory Agency, for the most part, does so under CERCLA. (In some cases CERCLA cleanups are conducted by responsible parties according to the terms of an order or consent decree and with Agency oversight.) Nonetheless, EPA anticipates that the two programs will arrive at similar solutions to similar environmental problems, and that actions undertaken by one program will be adopted by the other program in cases where the programmatic responsibility for a site shifts from one to the other. Specifically, the Agency anticipates that there may be a number of facilities at which substantial CERCLA remedial studies and/or actual remediation will have been already conducted at the time a RCRA permit is issued (thereby triggering the Subpart S corrective action requirements). This situation is likely to be most common at Federal facilities. In such cases, if the remedial work has been conducted according to the CERCLA NCP, EPA would consider that work to be consistent with the requirements of subpart S, and therefore additional or different studies or cleanup requirements would be unnecessary. If, however, the remedial activities

conducted pursuant to the NCP at a RCRA facility addressed only a portion of the units or releases at the facility requiring remediation, the permit would address any such remaining corrective action requirements pursuant to subpart S.

2. *Listing RCRA Sites on the National Priorities List (NPL).* EPA is emphasizing coordinated implementation of the RCRA and CERCLA programs. Of particular importance is the Agency's policy for listing RCRA facilities on the National Priorities List (NPL). Section 105(a)(8)(B) of CERCLA requires EPA to establish the NPL list to set national priorities among sites with known or threatened releases where action under CERCLA may be warranted. A site must be listed on the NPL before a remedial action can be financed by the Hazardous Substances Trust Fund established under CERCLA.

The Agency's policy regarding the listing of RCRA facilities on the NPL was outlined in a November 23, 1985, Federal Register notice (50 FR 47912). The policy states that sites that can be addressed by RCRA subtitle C corrective action authorities generally will be deferred from placement unless they fall within certain exceptions. For a more detailed discussion of these exceptions, see 54 FR 41004–6 (October 4, 1989).

The proposed RCRA listing policy, however, does not apply to Federal facilities. These are listed on the NPL, as required under CERCA § 120, as amended under SARA (52 FR 17991, May 13, 1987).

3. *Use of CERCLA to Supplement RCRA Authorities.* EPA intends to clean up hazardous waste sites by selecting the most appropriate response and/or enforcement authorities from among all of those available. Accordingly, several CERCLA authorities may be used at RCRA facilities. For example, fund-financed removal actions under CERCLA section 104 can be taken at RCRA sites when necessary to respond promptly to a release. Although removals may be conducted whether or not the site is listed on the NPL, such actions must be undertaken in response to a release or substantial threat of a release and must be consistent with the criteria outlined in the National Contingency Plan and CERCLA. EPA may seek reimbursement of costs of these actions from generators, transporters, or owner/operators of treatment, storage, or disposal facilities pursuant to CERCLA section 107.

Where an "imminent and substantial endangerment" may be posed by a release at a RCRA facility, the Agency may employ either a CERCLA section 106 or RCRA section 7003 order. As noted earlier, these authorities will be particularly useful in addressing contamination from SWMUs that requires prompt action.

The Agency may also use CERCLA or joint efforts with States in conjunction with RCRA to address situations of "area-wide" contamination. Preliminary investigations have shown that at some RCRA facilities substantial portions of on-site contamination is contributed by adjacent facilities not under RCRA jurisdiction. Corrective action at a single RCRA facility alone, therefore, might do little to restore overall environmental quality. In these cases, it may be appropriate to apply both RCRA and CERCLA authorities or other Agency authorities in a comprehensive program to address all sources of the release and provide complete remediation of the area. This would allow a comprehensive cleanup of an area (CERCLA trust funds would be used only where the site scored 28.5 or higher under the HRS) that has become contaminated as a result of activities at multiple facilities, including both operating and abandoned facilities.

In situations where CERCLA section 104 or section 106 remedial activities have been initiated, and where a RCRA permit is to be issued to the facility, the Agency may choose to continue these remedial actions under CERCLA authority. In such cases, the CERCLA cleanup would be referenced in the RCRA permit, and the Agency would take steps to ensure that further cleanup under RCRA section 3004(u) would not be required at the affected portion of the facility. At the same time, RCRA may be used to address other cleanup needs at the facility that are not addressed by the CERCLA action underway. Alternatively, the cleanup may be shifted to RCRA and the selected remedy incorporated into the permit through a permit modification.

B. PCB Spill Policy Under TSCA

EPA regulations under the Toxic Substances Control Act (TSCA) controlling the disposal of PCBs, published in the Federal Register of February 17, 1978 (43 FR 7150) and May 31, 1979 (44 FR 31574), define the term disposal to encompass accidental as well as intentional releases to the environment. When PCBs in concentrations of 50 parts per million (ppm) or greater are improperly disposed (or when material at less than 50 ppm got that way through dilution), EPA has the authority under section 17 of TSCA to compel persons to take actions to rectify damage or clean up contamination resulting from the spill. Before May 4, 1987, standards for the cleanup of spilled PCBs were set by EPA Regions on a case-by-case basis.

However, EPA believed that uniform, predictable, nationwide requirements for the majority of spills would reduce risks to PCB spill sites by encouraging rapid and effective cleanup and restoration of the sites; accordingly, EPA established a nationwide policy for PCB spill cleanup. On April 2, 1987, EPA published the TSCA policy for the cleanup of spills resulting from the release of materials containing PCBs at concentrations of 50 ppm or greater. (See 52 FR 10688.)

The policy requires cleanup of PCBs to different levels depending on spill location, the potential for exposure to residual PCBs remaining after cleanup, the concentration of the PCBs initially spilled, and the 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 exposures, and less stringent requirements where there is little potential for any direct human exposure.

While the policy is expected to apply to the majority of spill situations, the policy does provide for exceptional situations that may require additional cleanup or less cleanup at the direction of the EPA Regional offices. Further, some spills are outside the scope of the policy. Such spills include: Spills directly into surface water, drinking water, sewers, grazing lands, and vegetable gardens. Final cleanup standards for these types of spills are established by the EPA Regional offices on a site-specific basis.

RCRA corrective action authority under section 3004(u) applies to PCBs because PCBs are listed as an Appendix VIII constituent in 40 CFR part 261. PCB releases from solid waste management units at permitted RCRA facilities are addressed in accordance with TSCA PCB spill cleanup policy. These solid waste management units would often technically be considered "old spills" under the spill policy. It is the Agency's belief that the cleanup levels and practices discussed in the policy will be appropriate in many situations, and that when necessary, site-by-site evaluations should still be required.

C. Other Elements of RCRA Subtitle C Program

1. *Relationship to Subpart F Ground-Water Corrective Action.* Existing RCRA regulations for ground-water corrective action (40 CFR Part 264, subpart F) prescribe a specific approach

for detection, characterization, and cleanup of contaminated ground water from regulated land disposal units which received waste after July 26, 1982. Subpart F is a "prospective" program requiring that monitoring be established to detect contamination, and that if detected, contaminated ground water be removed or treated in place if or when a ground-water protection standard has been exceeded. There is additional discussion of current Subpart F corrective action in section IV of today's preamble.

Achieving a coordinated, facility-wide approach to cleanup of releases from both regulated units and other solid waste management units is a basic objective of the Agency. However, the universe of units and contamination being addressed by subpart S corrective action regulation is somewhat broader in scope.

To ensure consistency in implementing corrective action at both regulated units (a subset of SWMUs) and other solid waste management units, and to achieve environmental results as rapidly and effectively as possible, the Agency is developing a proposal that would restructure the current subpart F regulations to make them consistent with the key features of subpart S. These proposed revisions to subpart F are expected to be issued relatively soon. It is expected that these revisions will reference a number of specific sections of today's subpart S proposed regulations; likewise, for the sake of clarity and consistency, the final subpart S rule may also contain cross-references (that do not appear in today's proposal) to certain subpart F provisions.

2. *Land Disposal Restrictions Program.* As enacted on November 8, 1984, the Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) impose restrictions on the land disposal of hazardous wastes. In HSWA, Congress specified dates when particular groups of hazardous wastes not meeting treatment standards are prohibited from land disposal unless it can be demonstrated that "no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous" will occur (RCRA section 3004(d)(1), (e)(1), and (g)(5)). The dates specified by Congress for triggering the land disposal restrictions are listed below:

- Solvents and dioxins by November 8, 1986;
- California list wastes by July 8, 1987; and
- Scheduled wastes by August 8, 1988 (First Third), June 8, 1989 (Second Third), and May 8, 1990 (Third Third).

Note: A separate schedule was established for hazardous wastes disposed of by deep well underground injection.

HSWA required the Agency to set "levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized" (RCRA section 3004(m)(1)). To date, EPA has developed treatment standards based on the performance of best demonstrated available technologies (BDAT) in a series of five rulemakings. After the appropriate effective date, wastes for which treatment standards have been promulgated must meet those standards before the wastes may be land disposed.

Where adequate treatment capacity was not immediately available on the statutory effective date, the Agency granted a national capacity variance. This established an alternative prohibition effective date for the waste of up to two years. During a variance, wastes not treated in compliance with applicable treatment standards may be disposed of in surface impoundments or landfills only if they meet the minimum technological requirements (RCRA section 3004(o)). Furthermore, wastes granted this variance must be in compliance with the California list prohibitions if they are applicable, and are subject to the paperwork requirements of 40 CFR 268.7.

The rules promulgated to date are summarized below:

- *Solvents and Dioxins.* On November 7, 1986, regulations were promulgated establishing the implementation framework of the LDR program (51 FR 40572). In this rulemaking, EPA promulgated treatment standards and effective dates for spent solvents and dioxin-containing hazardous wastes identified as EPA Hazardous Waste numbers F001–F005, F021–F023, and F026–F028 (40 CFR 268.30 and 268.31).
- *California List Wastes.* On July 8, 1987, regulations were promulgated restricting land disposal of the California list hazardous wastes (52 FR 25760). Treatment standards were established for liquid and nonliquid hazardous waste containing halogenated organic compounds (HOCs), and for liquid hazardous wastes containing polychlorinated biphenyls (PCBs). The statutory prohibitions on land disposal of corrosive wastes and liquid wastes containing certain metals were codified and became effective immediately.
- *The Scheduled Wastes.* On August 8, 1988, the Agency promulgated regulations for certain scheduled wastes (40 CFR 268.10), referred to as First Third wastes. Treatment standards were established for most of the wastes identified by EPA Hazardous Waste numbers "F" and "K." Wastes scheduled in the First Third for which treatment standards were not set were subject to the "soft hammer" provisions of § 268.8. On June 8, 1989, the Agency promulgated regulations for the Second Third of the scheduled wastes (40 CFR 268.11). In the Second Third final rule, the Agency also set standards for certain First Third soft hammer wastes, Third Third wastes, and newly listed wastes. This rule also set effective dates for underground injected wastes. On May 8, 1990, the Agency promulgated treatment standards and effective dates for the remaining soft hammer wastes, wastes listed in the Third Third of the scheduled wastes (40 CFR 268.12), wastes that were rescheduled to the Third Third, and five newly listed wastes.

Separate rulemakings for the underground injection control (UIC) program established hazardous waste disposal injection restrictions and requirements and set effective dates for underground injected solvents, dioxins, California list wastes, and First Third scheduled wastes (40 CFR parts 124, 144, 146, and 148).

Corrective action taken under today's rule must comply with the land disposal restriction requirements of 40 CFR part 268. The prohibitions do not apply to hazardous wastes placed into land disposal prior to the effective date of an applicable land disposal restriction, if such wastes do not have to be removed or exhumed for treatment. Furthermore, as explained in the preamble to the NCP revisions (published on March 8, 1990), the Agency has determined that placement, and thus land disposal, of hazardous wastes does not occur when waste is moved or treated in-situ within a unit. This is particularly important for RCRA corrective action since many remedial actions are likely to involve treatment, consolidation, and capping of wastes within existing units. Wastes moved or treated within such units would not be subject to the land disposal restrictions. Placement does occur, and the land disposal restrictions apply, when waste is removed from the unit for treatment or other purposes and the waste or residuals are returned to the unit, or to a different unit.

3. *Relationship to section 3004(n) Standards.* RCRA section 3004(n) requires the Agency to promulgate standards for the control and monitoring of air emissions from hazardous waste management units subject to permitting standards other than subpart S at treatment, storage, and disposal facilities (TSDFs). The goal of these standards is to protect human health and the environment as necessary from air emissions associated with

management of hazardous wastes. Currently, the Agency is developing standards under section 3004(n) that will apply to certain hazardous waste management units covered by today's proposal under section 3004(u). Section 3004(n) standards for air emissions associated with equipment leaks and certain process vents at TSDFs were proposed in February 5, 1987 (52 FR 3748) and are expected to be finalized in June, 1990; standards for volatile organic emissions from certain other TSDF emission sources will be proposed at a later date.

The standards being developed under section 3004(n) will require engineering controls at units that manage hazardous waste. Air emissions will be controlled through, among other things, some combination of covers and add-on control technologies which capture the air emissions for recovery or destruction.

Although standards developed under section 3004(n) will only address air emissions from hazardous waste management units at TSDFs (a subset of all SWMUs), they are expected to provide valuable guidance for addressing air emissions from other SWMUs used for management of non-hazardous solid waste. In addition to the standards being developed under section 3004(n) of RCRA, the Agency is examining technical approaches and policy options for regulating, under the Clean Air Act, air emissions from SWMUs in which non-hazardous solid wastes are managed.

The Agency is today proposing a specific approach to imposing corrective action requirements on certain air releases from SWMUs in today's proposal. The proposed approach is designed to be flexible enough to be used in conjunction with the section 3004(n) standards being developed. When the section 3004(u) standards are developed, EPA will make any adjustments to the subpart S standards necessary to ensure a consistent and complementary approach.

4. *Administrative Orders Under RCRA section 3008(h).* The section 3008(h) authority for interim status corrective action orders provides a sister authority to section 3004(u) for requiring corrective action at non-permitted RCRA facilities.

Corrective action may be required under section 3008(h) whether 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 failed to properly obtain interim status. Corrective action orders under section 3008(h) may be issued unilaterally by the Agency or they may be issued as consent agreements between the owner/operator and the Agency.

In many cases, the entire corrective action process for a facility will be implemented under a section 3008(h) order. However, in some cases a facility that has been issued a section 3008(h) order will be issued a permit prior to completion of the activities specified in the order. In such cases, the Agency may require the owner/operator to continue all or some of the activities under the order, or may incorporate the requirements of the order into the RCRA permit.

In any case, EPA intends that equivalent environmental results will be achieved whether corrective action requirements are imposed in an order under section 3008(h) or a permit. Accordingly, EPA expects that orders issued under section 3008(h) generally should follow the substantive requirements of today's proposal (*e.g.*, remedy selection factors to be considered), as well as procedural elements (*e.g.*, triggers for moving from one phase of corrective action to the next). There will, however, be some procedural differences between orders and permits in implementing corrective action. On April 13, 1988, EPA promulgated rules for administrative procedures for issuing orders under section 3008(h). (See 53 FR 12256.)

The section 3008(h) enforcement authority will not be delegated to States. States which desire enforcement authorities equivalent to section 3008(h) and do not already have such authorities in existing legislation will need to enact parallel statutory enforcement authorities. While procedural aspects of issuance of section 3008(h) orders do not duplicate the procedural aspects of today's proposed rule for corrective action under permits, the procedures for both are designed to ensure equivalent results and to provide adequate participation in the process for all interested parties.

5. *Financial Assurance for Corrective Action.* As discussed in section IV of this preamble, EPA proposed financial assurance requirements for corrective action (FACA) on October 24, 1986 (51 FR 37854). The fourteen commenters on the FACA proposal generally supported the flexibility of the Agency's approach. The procedures presented in FACA and today's regulatory changes to these procedures are summarized below.

a. *Timing.* In today's rule, EPA is proposing specific language that will clarify when financial assurance for corrective action must be demonstrated. Section 264.526(c) requires that, after selection of the remedy, the Director shall modify the facility permit and schedule of compliance to require a demonstration of financial assurance within 120 days of the effective date of the permit modification. This requirement, which is a clarification of the requirement proposed in the 1986 FACA proposal, is discussed further in sections VI.F and VI.G of today's preamble.

In addition to this approach, EPA requested comment in the FACA proposal on a second, more complicated, approach. In this approach, the facility would be required to demonstrate financial assurance once corrective action is determined to be necessary, but before the corrective action measures and cost estimate are specified in the permit. Adjustments to the amount of financial assurance would be required after specification of the corrective measures and cost estimate in the permit.

Most commenters on the FACA proposal supported the proposed approach. However, some commenters argued that financial responsibility demonstrations should be made not at the time the cost estimate is completed, but rather prior to permitting. The Agency disagrees, since unnecessarily early demonstration of financial assurance may increase the number of bankruptcies, increase the amount of unfunded corrective actions, and thus result in less environmental protection.

b. *Cost Estimation.* The 1986 FACA proposal required facility owners or operators to submit a cost estimate for corrective action, consisting of two parts: (1) A year-by-year current cost estimate of required corrective action in undiscounted current dollars; and (2) the sum of these year-by-year estimates of corrective action costs. The Agency proposed that third-party costs, rather than first-party costs, be used to estimate yearly and total corrective action costs (*i.e.*, costs of contractor labor rather than the owner's or operator's own labor). The corrective action cost estimate must be revised if changes in corrective measures alter the cost or expected duration of corrective action. The proposal also would require the owner or operator to adjust the cost estimate annually to account for inflation, using either recalculations in current dollars or an inflation factor derived from the most recent annual Implicit Price Deflator for the Gross National Product published by the Department of Commerce.

In addition to the annual inflation adjustment required under the FACA proposal, EPA is today proposing in

§ 264.527(c) to require that cost estimates be revised, if necessary, upon approval of the remedy design. The financial assurance mechanisms must be adjusted to reflect any changes in the cost estimate. This requirement is discussed further in section VI.H of today's preamble.

c. *Allowable Mechanisms.* Under the October 24, 1986, FACA proposal, owners or operators who are responsible for performing corrective action would be required to demonstrate financial assurance through one or more of the following mechanisms: trust fund, surety bond guaranteeing performance, letter of credit, financial test, or corporate guarantee. A letter of credit and a trust fund may be combined to demonstrate financial responsibility and a single mechanism may be used to demonstrate financial responsibility for multiple facilities. The rationale for authorizing the use of these mechanisms and for the regulatory framework for financial assurance for corrective action is similar to that for the financial assurance requirements for closure and post-closure care under part 264, subpart H (47 FR 15032, April 7, 1982). The key differences between the FACA proposal and Subpart H are that insurance and surety bonds guaranteeing payment into a standby trust fund were not deemed appropriate mechanisms for corrective action situations and are not allowed. Additionally, the proposed fund includes a pay-in period and pay-in formula which accounts for the costs of corrective action (see 51 FR 37854 *et seq.*).

Commenters on the FACA proposal generally supported the range of allowable mechanisms, but offered specific suggestions for altering the requirements of particular mechanisms (*e.g.*, shorten the pay-in period for the trust fund). The Agency will address the commenters suggestions when the final FACA requirements are promulgated. In the interim, EPA intends to rely on the FACA proposal as a guide. The Agency expects that in most cases financial assurance will be demonstrated by use of instruments that are consistent with the proposed regulatory language of FACA. However, other instruments may be permissible if the owner or operator demonstrates, to the satisfaction of the Agency, that such instruments provide an acceptable level of financial assurance.

The fundamental criteria the Agency will use in evaluating the acceptability of other instruments are: (1) the certainty of the availability of funds, and (2) the amount of funds assured. The certainty of the availability of funds from alternate mechanisms should be equivalent to the certainty provided by existing financial assurance mechanisms under 40 CFR part 264, subparts G and H. For example, the alternative mechanisms should provide that the Regional Administrator or State Director has the sole authority to direct the payment or use of funds or must provide for prompt notification of intent to cancel the mechanism. To be deemed equivalent in terms of the amount of funds, the alternative mechanisms should meet several criteria, such as providing that the funds cannot be used for other purposes, and providing that the amount of funds are equal to the current cost estimate.

D. RCRA Subtitle D: Solid Waste Disposal

Today's proposal is for corrective action at facilities subject to RCRA permits issued under the authority of section 3005 of RCRA (*i.e.*, those which treat, store, or dispose of hazardous waste as defined under RCRA). The disposal of non-hazardous solid waste falls under the authority of subtitle D of RCRA. EPA has two major roles under subtitle D. The first is to establish minimum national performance standards (under the authority of section 4004) for the protection of human health and the environment from solid waste disposal facilities. The second is to help the States make appropriate solid waste management decisions by offering up-to-date technical assistance.

Some of the subtitle D standards for protection of human health and the environment from solid waste disposal facilities could apply or be relevant to subtitle C facilities. For example, §§ 257.3–257.8 provides safety limits for the concentration of explosive gases generated by a facility (defined under § 257.2 as any land and appurtenances thereto used for the disposal of solid wastes). It may be appropriate to apply this requirement to subtitle C facilities with solid waste management units that could generate methane (*e.g.*, landfills used for disposal of municipal-type wastes). Thus, the Agency could require compliance with the part 257 requirements for explosive gases if such situations were encountered at a subtitle C facility undergoing corrective action according to subpart S.

Passage of HSWA added section 4010(c) to subtitle D. Section 4010(c) required EPA to revise criteria promulgated under section 4004(a) for facilities that may receive household hazardous wastes or small quantity generator hazardous wastes. The statute indicated that these criteria must include, at a minimum, ground-water monitoring necessary to detect contamination, location standards, and corrective action, as appropriate. The statute also indicated that the criteria should take into account the practicable capability of such facilities.

On August 30, 1988, EPA proposed these revised criteria for municipal solid waste landfills (see 53 FR 33313). The criteria for subtitle D municipal solid waste landfills most relevant to today's proposal are the criteria proposed for ground-water monitoring and corrective action under subpart G of 40 CFR part 258.

The part 258 subpart G proposal would require the owner/operator of a municipal solid waste landfill to establish a two-phase ground-water monitoring program. If parameters established for Phase I monitoring are detected at a statistically significant level above background, the owner/operator must initiate a phase II monitoring program which includes an initial test for all constituents listed in appendix IX of 40 CFR part 264. If the concentration of any appendix IX constituent exceeds the established trigger lever, as discussed below, then the owner/operator must initiate an assessment of the nature and extent of the contamination.

Like the subpart F program under subtitle C, the corrective action program proposed in 40 CFR part 258, subpart G, for municipal solid waste landfills would be limited to releases to ground water. The corrective action program, as described in subpart G, would have to be designed to delineate the areal extent of the plume of contamination and to clean up to maximum allowable constituent concentrations throughout the plume. Ground-water protection standards would be set using the same health and environmental based criteria as those employed in today's proposal for subtitle C corrective action for solid waste management units. The requirements for ground-water cleanup in the corrective action program described in the revised subtitle D criteria are thus very similar to those described in today's subtitle C corrective action proposal. The subtitle D revised criteria will not, however, address procedural requirements; procedures for implementing the criteria will be established by the States.

E. RCRA Subtitle I: Underground Storage Tanks

Section 9003 of subtitle I of the Resource Conservation and Recovery Act (RCRA) directs EPA to promulgate regulations applicable to owners and operators of underground storage tank

(UST) systems to protect human health and the environment. Section 9003(c) specifically requires EPA to promulgate regulations applicable to owner/operators of UST systems which require corrective action in response to releases from USTs and, further, requires the owner/operator to report the actions taken.

Section 9003(h) was added to RCRA by section 205 of the Superfund Amendments and Reauthorization Act (SARA) of 1986, which established a Leaking Underground Storage Tank trust fund that can be used by EPA to clean up releases of petroleum from UST systems. Alternatively, EPA can order UST owners and operators to undertake such cleanup. Under the corrective action requirements of section 9003(c), all petroleum UST cleanups will have to be conducted in accordance with the requirements in the regulations. The approach to UST corrective action adopts the same basic steps as the NCP requirements for CERCLA actions and those contained within today's proposed RCRA section 3004 regulation: control the release source, determine the extent of the contamination, determine the extent of the remediation required, and take the necessary cleanup actions. Specific differences in the programs reflect the different scope and nature of implementation under the different programs.

EPA issued final technical standards governing petroleum and CERCLA hazardous substance UST systems on September 23, 1988 (--- FR ------). Approximately two million USTs will be affected by the regulations, and a wide variety of release situations and hydrogeologic settings are expected. These standards would require owners and operators of leaking UST systems to take certain actions upon confirmation of a release. Owners and operators must report confirmed releases to the appropriate regulatory authority and begin immediate cleanup steps. Immediate measures required under the proposed standards include mitigation of safety and fire hazards; initiation of free product recovery, if applicable; and assembling of information on the nature and quantity of the release and site characteristics. The owner/operator must submit, to the implementing agency, reports describing these immediate steps, as well as the design and implementation of free product recovery systems. A corrective action plan would be required for longer-term cleanups addressing soil and ground-water contamination. Cleanup levels would be established on a site-by-site basis as approved by the implementing agency (typically the State) that would oversee the cleanup by the owner or operator.

The first stage of the UST corrective action process requires immediate steps to abate imminent safety and health hazards whenever a release from a petroleum UST is confirmed The owners and operators must investigate the presence of free product and, if present, begin free product recovery. The owner/operator must also submit information characterizing the site and the nature of the release. If, after reviewing this preliminary information, the implementing agency determines that the product may have reached ground water or that contaminated soil is in contact with ground water, the owner/operator must characterize the extent and location of soil and ground-water contamination. The implementing agency will use this information as the basis for determining, through a site-specific risk assessment, whether the owners and operators will be required to undertake a longer-term correction action.

This second stage of the corrective action process addresses soil and ground-water cleanup. The site-specific analysis is the basis for prescribing the extent and timing of cleanup that would be required for longer-term corrective action. The assessment would be based on analysis of site-specific conditions and problems posed by the release. Factors to be considered include: the quantity of material released; the mobility, persistence, and toxicity of the material; the exposure pathways; its relationship to present and potential ground-water well locations and uses; and any relevant standards. Technology-based cleanup requirements would also be possible under this approach if: (1) The cleanup level set during the UST corrective action process is found to be unattainable with current technology; (2) it is shown that the remaining contamination does not pose a substantial present or potential hazard to human health and the environment; and (3) monitoring procedures are instituted to ensure that the conditions remain stable or improve.

EPA's approach to corrective action at underground storage tanks is largely shaped by the enormous size of the regulated universe. These factors, as well as the absence of permitting requirements for USTs, explain the procedural differences between corrective action for USTs and today's proposal.

EPA estimates that there are approximately two million petroleum USTs at about 700,000 facilities as well as 50,000 hazardous substance USTs at 30,000 facilities potentially subject to subtitle I. Because of the size of this universe, EPA believes that the program is best implemented at the State and local level, and that it should be, to the extent possible, self-implementing. Thus, the UST rule would require that certain automatic actions be taken at the determination of a release: mitigation of fire and safety hazards, recovery of free product, and repair of the leak or removal of the tank. These are all straightforward actions particularly relevant to the UST universe and are amenable to self-implementing standards. At RCRA permitted facilities, contingency plans and tank standards would require comparable action for hazardous waste units. However, the Agency did not adopt comparable self-implementing provisions—beyond the regular facility subtitle C standards—in today's rule because of the much wider variety of units that would be subject to subtitle C corrective action and the close Federal or State oversight afforded by the permit process.

The UST rule would also require long-term remedial action for ground-water and soil contamination, based upon a site-specific assessment, after immediate action had been taken. Because of the large size of the regulated universe, the absence of a national permitting system under which to carry out cleanup, and the necessity of local implementation, EPA believes a procedurally less prescriptive approach to selecting cleanup strategies and cleanup levels is necessary for USTs.

Some USTs are potentially subject to corrective action requirements under both subtitle I and today's rule. Specifically, releases from an UST containing solid wastes at a RCRA permitted facility may be subject to corrective action requirements under both programs. In order to avoid confusion and because USTs located at RCRA facilities will be subject to the oversight provided by a site-specific permitting process, today's regulations, when promulgated, will be the applicable corrective action requirements for USTs subject to section 3004(u). The final UST rules also clarify the applicability of the subtitle I corrective action requirements to USTs located at RCRA permitted facilities by excluding them from coverage under subtitle I.

F. Federal Facilities

Many Federal agencies have facilities which require RCRA permits. Some of these agencies have developed remedial programs which apply at their facilities

in addition to EPA programs under the RCRA and CERCLA statutes. Regardless of any self-imposed remedial programs, federally-owned or operated facilities must comply with all RCRA and CERCLA requirements (with certain limited exceptions) in the same manner and to the same extent as most non-governmental entities. The objective of the RCRA corrective action program at Federal facilities, as at all RCRA facilities, is to ensure protection of human health and the environment.

Section 6001 of RCRA requires any agency of the Federal Government engaged in the management or disposal of hazardous waste to comply with both substantive and procedural requirements under RCRA as well as with any other applicable requirements for the management of hazardous waste, including Federal, State, interstate and local requirements. CERCLA section 120(a) makes Federal facilities subject to CERCLA in the same manner and to the same extent as private facilities. Section 120(i) also makes it clear that the special provisions for Federal facilities in Section 120 do not impair any obligations they have to comply with RCRA requirements, including corrective action. In accordance with section 120 (c) and (d), EPA has established a comprehensive Federal agency hazardous waste compliance docket and will list Federal facilities on the CERCLA National Priorities List (NPL) if they meet the NPL listing criteria.

Many Federal facilities at which hazardous wastes are managed will be subject to both CERCLA remedial action and RCRA corrective action authorities In many such cases, EPA intends to coordinate the application of RCRA and CERCLA authorities through the use of interagency agreements (IAGs), as provided under the authority of section 120(e) of CERCLA. The IAG will provide the vehicle for explicitly defining the procedural and technical requirements for corrective action, in satisfaction of the statutory and regulatory authorities of both RCRA and CERCLA.

While it is the responsibility of Federal facilities to comply with the requirements of both the RCRA and CERCLA programs, the Agency plans to continue its efforts to coordinate the activities required under both programs with those under already-established Federal facility remedial programs. For example, the Department of Defense (DOD) has developed the Installation Restoration Program (IRP) to identify and cleanup contamination resulting from past waste management practices at DOD facilities. IRP conducted activities will often serve to satisfy RCRA and CERCLA requirements. Furthermore, the Agency is aware that in some cases an Environmental Impact Study (EIS) will be conducted at a Federal facility during the same time frame as the RCRA Corrective Action investigations and studies are undertaken. To the extent that the information generated by the EIS is deemed relevant by EPA to the needs of Corrective Action, EPA would not intend to require duplicative information to be generated to satisfy corrective action requirements. In fact, it may be possible in some cases to merge the two studies into one integrated document. EPA intends, however, to oversee and, if necessary, direct the scope and substance of investigations and cleanup activities at DOD and other Federal facilities. In addition, EPA anticipates that many States will exercise oversight authority under State laws to review and participate in corrective action decisions at Federal facilities.

VIII. Public Involvement

Effective public involvement efforts within the corrective action program will enable the interested public to receive accurate and timely information about remedial plans and progress and to comment on proposed actions at significant decision points. The statutory public involvement requirements for permitting contained in RCRA section 7004 are elaborated in regulatory requirements at 40 CFR parts 124 and 270. Today's proposal includes additional requirements intended to promote active and effective communication between the interested public, the regulatory agency responsible for implementation of the corrective action program, and the permittee.

The first required public involvement occurs before a draft RCRA permit is developed. At the time the permit application is submitted, a mailing list must be assembled by EPA or the State for the community in which the facility is located. (See 40 CFR 124.10(c)(1)(viii).) The list serves as an important communications tool to allow the regulatory agency to reach interested members of the public with announcements of meetings, hearings, events, and available reports and documents. Guidance on developing a comprehensive mailing list is available in the January 1986 Guidance on Public Involvement in the RCRA Permitting Program.

After developing a draft permit, the regulatory agency is required to provide public notice that a draft permit has been prepared and is available for public review. (See 40 CFR 124.6.) The notice must be published in a major newspaper and broadcast over local radio stations. A 45-day public comment period on the draft permit must follow the public notice. If a written request is received, EPA or the State is required to hold an informal public hearing. A 30-day advance notice containing the time and place of the hearing is required. In addition, a fact sheet is developed to accompany every draft permit. It includes the significant factual and legal bases used in preparing the draft permit. The comment period for the draft permit will provide the public an opportunity to comment on corrective action conditions contained in the permit. In most cases, requirements for the RCRA Facility Investigation (where necessary) will be included in the schedule of compliance in the draft permit.

When a final decision is reached on whether to issue or deny a permit, EPA regulations require that a notice of the decision be sent to each person who submitted written comments on the draft decision or who requested such a notice. In addition, a response to all significant comments must be issued by the Agency or the State. The response to comments must include a summary of substantive comments received and an explanation of either how they were incorporated or addressed in the final permit condition or why they were rejected.

In addition to the established public involvement activities required during the permitting process, today's regulation proposes in § 270.36 to provide the Director with the authority to require an additional effort to keep the interested public informed of activities at the site. Proposed § 270.36 would allow the Director to require the establishment of an information repository that would house documents pertinent to the corrective action activities near the facility. The details of the proposed repository are discussed in section VI.L of today's preamble. In addition, today's proposal would require the permittee to mail a summary of the final report of the RCRA Facility Investigation to all individuals on the facility's mailing list to keep interested persons informed of findings at the site.

Today's proposal would also require a major permit modification to incorporate remedy selection. The modification would provide an additional opportunity for public involvement. This modification would follow established public participation procedures under part 124 for major modifications. In addition, today's proposal provides that additional permit modifications initiated by the Agency or the permittee will be

classified on the basis of their potential effect on the permittee, the affected public, and the environmental impact of proposed changes. Those that are classified as major modifications will follow the existing procedures for major modifications as described above. Those that have less significant impacts will follow the procedures described under today's proposed § 270.34(c) or those issued on September 28, 1988 (53 FR 37912) for owner/operator initiated modifications. In all cases there will be an opportunity for public review and comment. Section VI.L of today's preamble discusses the classification of permit modifications for corrective action and their related procedural requirements more fully.

There may be some actions taken during the course of a permit that are not reflected in the initial permit and are not the subject of a permit modification. For example, many of the detailed activities taken by the permittee in implementing the RFI or in designing the CMS plan may not be specified in the initial permit. In some cases, EPA and the permittee may reach a mutual agreement about the exact nature of the required activities (within the general scope of the permit), and the specifics of these activities may not be reflected in a permit modification. In such cases, the specific activities agreed to will be documented on the permit record and the public will have an opportunity to comment on them when the permit is modified at the time of remedy selection. This approach would be limited to activities that would not constitute a major change that might otherwise warrant application of the public participation requirements specified in § 7004 of RCRA.

EPA believes that the approach outlined above provides an appropriate balance between the need to involve the public in the remedial process and the need to proceed expeditiously to remedy releases to the environment. The public will have a full opportunity to comment on all remedial activities undertaken during the term of the permit, and not otherwise subject to public scrutiny, at the time of remedy selection. To the extent that public comment takes legitimate issue with such activities, EPA may need to revisit some of these activities or modify its decision regarding the remedy. Accordingly, EPA will be very sensitive to possible public reaction in specifying activities to be undertaken during the course of the permit without public involvement.

Public involvement activities required in the permitting process and proposed today for the corrective action program are similar, though not identical, to those established under the Superfund Community Relations Program. Activities proposed today are in addition to public involvement activities conducted at RCRA facilities targeted by the Agency for expanded public involvement because of the high potential for exposure to the population or because of a high level of interest in the community. Public involvement efforts at RCRA sites listed on the National Priorities List and/or facilities which will accept Superfund wastes should be integrated with concurrent Superfund community relations efforts to the extent possible.

EPA and State offices, as a matter of policy, jointly issue permits. Where States are authorized to implement only some portions of the hazardous waste program, the State and EPA may also conduct public involvement activities jointly.

IX. State Authorization

A. Applicability of Rules in Authorized States

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 the 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 responsibility under section 7002.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final authorization administered its hazardous waste program entirely in lieu of EPA administering the Federal program in that State. The Federal requirements no longer applied in the authorized State, and EPA could not issue permits for any facilities in the State which the State was authorized to permit. When new, more stringent Federal requirements were promulgated or enacted, the State was obliged to enact equivalent authority within specified time frames. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

In contrast, under section 3006(g)(1) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by HSWA take effect in authorized States at the same time that they take effect in nonauthorized States. EPA is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, the HSWA requirements apply in authorized States in the interim.

B. Effect on State Authorizations

1. *Schedule and Requirements for Authorization.* Today's rule is proposed pursuant to section 3004(u), section 3004(v), and section 3005(c)(3) of RCRA, provisions added by HSWA. Therefore, the Agency is proposing to add the requirements to Table 1 in 40 CFR 271.1(j), which identifies the Federal program requirements that are promulgated pursuant to HSWA and take effect in all States, regardless of authorization status. States may apply for either interim or final authorization for the HSWA provisions identified in Table 1, as discussed in this section of the preamble.

EPA will implement today's rule in authorized States until (1) they modify their programs to adopt these rules and received final authorization for the modification or (2) they receive interim authorization as described below. Because this rule is proposed pursuant to HSWA, a State submitting a program modification may apply to receive either interim or final authorization under section 3006(g)(2) or section 3006(b), respectively, on the basis of requirements that are substantially equivalent or equivalent to EPA's. The procedures and schedule for State program modifications for either interim or final authorization are described in 40 CFR 271.21. It should be noted that all HSWA interim authorizations will expire automatically on January 1, 1993 (see 40 CFR 271.24(c)); EPA invites comment on whether this deadline should be extended for cause.

EPA invites comment on an expedited process for granting interim authorization for today's rule, pursuant to RCRA section 3006(g)(2), to States already authorized for HSWA corrective action pursuant to the initial codification of section 3004(u) at 40 CFR 264.101 (50 FR 28747, July 15, 1985). An expedited process is needed if such States are to avoid losing their authority to issue corrective action permits upon the effective date of today's rule. This expedited process would not involve a detailed review of the State regulations. Rather, when determining whether the State's regulations are substantially equivalent to today's rules, EPA would consider the State's statutory authorities to impose similar corrective action requirements. Because today's rules clarify the scope of and are consistent

with, the July 15, 1985, codification rule for which some States are authorized, these authorized States already should have statutory authority to implement today's rules.

To ensure that today's rules are uniformly applied by a State granted interim authorization under this approach, a State applying for interim authorization would be required to commit, in the State-EPA Memorandum of Agreement, to implementing its corrective action authorities according to the subpart S requirements. In particular, permits issued by the State must reflect subpart S requirements even prior to adoption by the State of regulations equivalent to and no less stringent than the subpart S requirements. The State interim authorization application under this approach, then, would consist of the revised Memorandum of Agreement (MOA), and a revised Attorney General's (AG) statement certifying that the State has the authority to enter into the Memorandum of Agreement and that permits issued with the conditions agreed to in the MOA would be enforceable under State law. EPA specifically invites comment on whether State law allows the State to make this MOA commitment.

EPA believes this expedited process will minimize disruptions to the State permit process. A State already authorized for corrective action which applies for interim authorization for today's rule shortly after its publication as a final rule should be able to receive interim authorization prior to the effective date and thus avoid the need for EPA to resume responsibility for issuing permits containing corrective action conditions in that State.

Although requirements imposed pursuant to section 3006(g)(1) of HSWA take effect in authorized States at the same time as in unauthorized States, EPA believes that this requirement applies only to the promulgation of the regulations identified in § 271.1(j) and only to the extent that these requirements put the HSWA program in place. In passing section 3006(g)(1), Congress was concerned that no delay occur before these requirements, once in place in the Federal program, became effective in authorized States. However, Congress clearly did not intend for the authorized State program's authority to return, in part, to EPA every time EPA were to promulgate a subsequent, more stringent modification or addition to these requirements promulgated under HSWA. Thus, once the basic framework for the HSWA provisions has been promulgated and is essentially complete, subsequent regulations promulgated by EPA will be adopted by States according to the timelines for non-HSWA regulations in 40 CFR 271.21(e). In regard to today's rule, EPA is soliciting comment on whether the HSWA corrective action requirements should be considered essentially complete with the adoption of these requirements.

40 CFR 271.21(e)(2) requires that authorized States must modify their programs to reflect Federal program changes, and must subsequently submit the modifications to EPA for approval. The deadlines by which a State must modify its program to adopt this proposed regulation will be determined by the date of promulgation of the final rule, in accordance with 40 CFR 271.21(e). These deadlines can be extended in certain cases (40 CFR 271.21(e)(3)). Once EPA approves the modification, the State requirements become subtitle C RCRA requirements.

A State that submits its official application for final authorization less than 12 months after the effective date of these standards is not required to include standards equivalent to these standards in its application. However, the State must modify its program by the deadlines set forth in 40 CFR 271.21(e). States that submit official applications for final authorization 12 months after the effective date of these standards must include standards equivalent to these standards in their applications. 40 CFR 271.3 sets forth the requirements a State must meet when submitting its final authorization application.

In addition to meeting the requirements in 40 CFR part 271, a State seeking authorization for today's rules must demonstrate the ability to capably implement the base RCRA program as well as the additional HSWA elements. EPA's assessment of a State's capability will reflect an evaluation of the State's entire authorized program. The assessment will examine not only whether a State is effectively implementing the base program, but also how that State may implement additional program areas.

2. *States with Existing Corrective Action Programs.* States that are authorized for RCRA, but not for corrective action may already have requirements under State law similar to those in today's rule. These State regulations have not been assessed against the Federal regulations being proposed today to determine whether they meet the tests for authorization. Thus, a State is not authorized to implement these requirements in lieu of EPA until the State program modification is approved. Of course, States with existing standards may continue to administer and enforce their standards as a matter of State law. In implementing the Federal program, EPA will work with States under cooperative agreements to minimize duplication of efforts. In many cases, EPA will be able to defer to the States in their efforts to implement their programs, rather than take separate actions under Federal authority.

Additionally, some States have received authorization for HSWA corrective action pursuant to the initial codification of section 3004(u) at 40 CFR 264.101 (50 FR 28747, July 15, 1985). The July 15, 1985, Codification Rule explains at 50 FR 28730 that a State's authorization status may change in response to further implementation of HSWA, *i.e.*, when EPA publishes regulations that further define initially codified rules. A State that was authorized for corrective action under the July 15, 1985, Codification Rule will no longer be authorized when today's rules are promulgated unless the State applies for and receives interim or final authorization before the effective date of the final promulgation of today's rules. However, if such States have not obtained interim or final authorization by the effective date, cooperative agreements can be used so as to avoid interruption of ongoing State corrective action activities. See the above discussion of an expedited process for interim authorization of such States.

C. Corrective Action and 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 pursuant to subtitle C of RCRA, States must have authority to regulate the hazardous component of radioactive mixed wastes (51 FR 24504). Radioactive mixed wastes are wastes that contain hazardous wastes subject to RCRA and radioactive wastes subject to the Atomic Energy Act (AEA). Radioactive mixed wastes (except for the component subject to AEA) are considered to be a "solid waste" for purposes of corrective action at solid waste management units. Therefore, in order to obtain authorization for corrective action, States must have previously obtained or must simultaneously obtain authorization for their definition of solid waste, which must not exclude the non-AEA components of radioactive mixed waste. This is because States must be able to apply their corrective action authorities to mixed waste units.

X. Regulatory Impact Analysis

A. Executive Order No. 12291. Regulatory Impact Analysis

1. *Background.* In conjunction with the development of today's proposed rule, EPA performed a regulatory impact analysis (RIA), as mandated by Executive Order 12291. These analyses are required for "major" regulations, defined as those likely to result in annual effects on the economy of § 100 million or more; a major increase in costs or prices for consumers or individual industries; or significant adverse effects on competition, employment, investment, productivity, innovation, or international trade. The results of the RIA prepared for today's rulemaking demonstrate that the rule is a "major" regulation.

Pursuant to the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, the Agency is also required to assess the impact of a proposed or final rule on small entities (*i.e.*, small businesses, small organizations, and small governmental jurisdictions). The results of this assessment, which was conducted as part of the RIA, are presented below in section X.B.

The complete regulatory impact analysis document is available in the docket established for this proposed rule. The following is a summary of the analytical methodology used in conducting the RIA, and the results of the analysis.

2. *Summary and Major Conclusions.* The analysis conducted by the Agency indicates that the corrective action rule may result in a wide range of costs, depending on the nature of the remedies selected in site-specific decisionmaking. Given the large, national scope of this rule, and the flexibility provided by the provisions outlined in this proposal, these uncertainties are expressed in the following discussion.

Overall, the analysis found that about 31 percent of facilities are projected to require corrective action for releases to ground water from solid waste management units (Media other than ground water were not analyzed due to data and modeling limitations.) The average annualized per facility costs for non-Federal facilities under today's proposed rule are estimated to range between $1.8 million to $0.4 million. The total present value national cost of the proposed rule, as an increment over the pre-HSWA corrective action program, is likely to range between $7 billion and $42 billion. The costs of cleaning up Federal facilities, presented separately, are much more uncertain and could range between $3 billion to $18 billion.

The above results reflect two of four regulatory alternatives that were analyzed which the Agency believes reflect the flexibility inherent in the proposed rule. These alternatives provide an upper and lower bound to the costs of the proposed rule and reflect the Agency's uncertainty about several of the data and assumptions used in estimating costs, such as the types of remedial measures that will be ultimately implemented. While both regulatory alternatives would require cleanup to health-based levels, the key distinction between them is in the choice of allowable corrective action remedies. The analysis assumed that the lower bound option would be more flexible than the upper bound (*e.g.*, by allowing use of exposure controls in cases where certain remedies were technically infeasible or prohibitively expensive).

3. *Scope and Analytical Approach.* In developing the RIA for today's proposed rule, the Agency analyzed both qualitatively and quantitatively several basic alternatives which could have been adopted in structuring the corrective action rule The alternatives studied cover a range, from a highly conservative "cleanup to background" approach with very little flexibility in adjusting remedies for site-specific conditions, to alternatives which trigger cleanup of releases in only limited circumstances, and would allow, in many cases, contamination to remain within a facility's property and beyond. The analysis indicates that these alternatives have quite different environmental results, as well as impacts on the regulated community.

In developing the RIA, EPA assembled data to estimate the potential scope of the RCRA corrective action program. The data used in generating these estimates was primarily obtained from the Agency's existing database on RCRA facilities (the "Hazardous Waste Data Management System," or HWDMS), and an analysis conducted for the RIA which examined a sample set of 65 RCRA Facility Assessment (RFA) reports. These reports are typically prepared by EPA or the States prior to issuance of RCRA permits, and provide preliminary findings as to what releases have or may have occurred, and what investigations should be conducted to verify and/or characterize the releases. These preliminary RFA findings were extrapolated to provide estimates of the numbers and types of facilities that may require corrective action. Certain data from the reports were also used to support modeling for the quantitative analysis of the RIA. A summary of the RIA estimates as to the size and distribution of RCRA facilities that may need corrective action are presented in the following section of this discussion.

4. *Potential Scope of the Corrective Action Program.* EPA estimates that there are approximately 5,700 facilities regulated under RCRA subtitle C that are potentially subject to the corrective action authorities of sections 3004(u) and 3008(h). Based on preliminary survey results from RFA reports, it is estimated that roughly 80,000 solid waste management units exist at these facilities; this number includes some 3,000 land-based hazardous waste management units (*e.g.*, hazardous waste landfills and surface impoundments) that were subject to corrective action prior to the 1984 HSWA amendments. The number of solid waste management units at individual facilities varies widely, up to as many as 1,300. Federal facilities, because of their large size, typically contain many more solid waste management units—an average of 55 per facility, according to the RFA survey results. The survey indicated that there are an average of 12 solid waste management units (including hazardous waste management units) at non-Federal facilities.

The types of solid waste management units found at facilities are diverse. More than one-third (36 percent) are tanks used for storage or treatment of wastes. Landfills comprise 16 percent, and surface impoundments 15 percent. The remainder are units such as container storage areas, piles, land treatment units, incinerators and other miscellaneous units. The survey also found a wide diversity within unit categories in terms of size, age, general condition, types of wastes managed, and other factors.

The survey revealed that, on average, 62 percent of all facilities have indications of possible releases, based on RFA findings, sufficient to require follow-up remedial investigations (*i.e.*, RFIs). Typically, facilities that have subtitle C land disposal units and incinerators are more likely to require follow-up investigations than are treatment/storage facilities (74 percent, 70 percent and 56 percent, respectively). The Agency's experience with the corrective action program to date (as confirmed by the RFAsurvey results) indicates that one-half of these facilities (or one-third of the total universe) will require some type of remedial action, based on the confirmation of a release in the RFI.

Potential releases of concern most often noted in RFA findings are releases

to ground water and soil; of all facilities, 30 percent have actual or suspected releases to ground water, 34 percent to soil. Facilities with confirmed or suspected releases to surface water and air are less common—17 percent and 7 percent respectively, based on the RFAs surveyed.

Based on the results of the models used in the quantitative analysis conducted for the RIA, approximately 31 percent (1,700 RCRA facilities) will have ground-water contamination requiring remediation.

5. *Qualitative Analysis.* EPA considered three strategies for implementing corrective action under the HSWA mandate that permits for all treatment, storage, or disposal facilities (TSDFs) address releases from SWMUs to all environmental media. The following is a summary of each alternative strategy.

Strategy 1—Cleanup to background levels as soon as practicable for all facilities. This strategy represented the most stringent and environmentally conservative option of the three. Regulations modeled after this approach would require complete restoration of all contamination back to the unit boundary, as quickly as could be practicably achieved. In order to ensure that solid waste management units would continue to meet what would amount to a "zero release" standard, extensive source controls would be required, perhaps often involving treatment or destruction of all wastes that could cause future contamination.

This strategy would, if implemented, at least theoretically achieve the highest degree of protection to human health and the environment. Realistically, however, current technologies cannot consistently achieve such a cleanup standard. In addition, the economic impacts of such a regulatory approach would obviously be much greater than the other options, and could be expected to cause substantially more owner/operators to become insolvent, thereby placing additional demands on other funding sources, such as State or Federal cleanup funds.

Strategy 2—Cleanup to health-based levels, with flexibility in timing. In broad terms, this strategy would require cleanup of releases to the unit boundary to concentration levels safe for lifetime human exposure. The timing for achieving these levels would vary depending on a number of site-specific factors, such as the extent and nature of the contamination, exposure potential, availability of technologies, and other factors. Source controls would be required in order to prevent further releases above health-based levels.

This strategy would also achieve a conservative level of protection. The economic impacts of this strategy, although substantial, would be considerably smaller than for Strategy 1.

Strategy 3—Cleanup to health-based standards only where actual or imminent exposure exists. Under Strategy 3, corrective actions would be required only if there was evidence of actual or imminent exposure to contaminated media (*e.g.*, contaminated drinking water wells), above health-based standards. The extent of cleanup would be tied to alleviating that exposure; cleanup to the unit boundary would not be required unless exposure were actually of concern at that point. Required source control measures would be less extensive than under Strategy 1 or 2. Protection against future exposure to contamination would rely heavily on institutional controls.

This regulatory approach would achieve a minimum level of protection, as compared to the other two strategies. By allowing contaminated media to remain contaminated based on current exposure patterns, protection against future exposure could not be guaranteed. Thus, Strategy 3 is the least protective strategy. This strategy would, however, be substantially less costly to owner/operators, relative to Strategies 1 and 2.

Today's proposed rule adopts the Strategy 2 approach. The Agency believes that this regulatory strategy provides an optimum balance in ensuring a high degree of protection of human health and the environment, while not placing unnecessary burdens on facility owner/operators.

It should be understood that crafting a comprehensive rulemaking within the broad confines of any of the three alternatives listed above would, of necessity, require addressing a large number of specific policy questions. Thus, a variety of specific regulatory blueprints could be created under any one alternative. In this regard, as noted below, we have developed two alternatives for the purpose of quantitative analysis that we believe reflect the bounds of flexibility of implementation afforded by this rule. This is reflected in the rule proposed today, which is generally patterned after Strategy 2, but also contains certain regulatory requirements that could be considered in line with Strategies 1 and 3.

6. *Description of Options Analyzed Quantitatively.* In developing the quantitative analysis for the RIA, a similar range of regulatory options were assessed as in the qualitative analysis. For comparison purposes, however, the analysis also examined a "baseline" option—in effect, the pre-HSWA corrective action program. In addition, the Agency developed four regulatory options, two of which were generally believed to reflect the flexibility inherent in the proposed rule. It should also be noted that in structuring the modeling logic for this analysis, it was necessary to make certain assumptions and use decision rules that vary slightly from those used in the qualitative analysis; however, the broad regulatory alternatives examined in the qualitative and quantitative analyses are generally the same.

The quantitative analysis examined each of the five regulatory options in terms of the following criteria: cost, protection of human health and the environment, flexibility in implementation, and technical practicability. This analysis evaluates the effects of each alternative only as it would address contamination of ground water.

Detailed information on the data used in this analysis, and how the models were constructed, are presented in the RIA document. The following is a summary of the options modeled, and the general assumptions used in constructing each.

Option 1: Baseline (Pre-HSWA). This option represents requirements under RCRA prior to enactment of the 1984 HSWA corrective action requirements and is used as the basis for comparison of costs and benefits of other options. Only land disposal units that received hazardous waste after July 26, 1982, and thus were regulated under part 264, subpart F, were examined. The corrective action trigger and target concentrations are the same, either the background concentration or a maximum contaminant level. (For modeling purposes, the baseline scenario assumed that cleanup targets would not be established at "alternate concentration limits" under subpart F.) Only onsite cleanup within the facility boundary is addressed. Ground-water removal and treatment, or capping, are the only corrective action remedies considered.

Option 2: Immediate Cleanup to Background. This option is the strictest of those evaluated. All SWMUs, in addition to regulated subtitle C land disposal units, were addressed. Any detectable release to ground water in excess of background levels would trigger corrective action, and both on-site and off-site contamination must be cleaned up to background levels as soon as practical. For purposes of this analysis, we assumed that background

contamination did not exist and, therefore, assumed that cleanup to background was equivalent to cleanup to detection limits. Source controls are required with a bias toward excavation

Option 3: Immediate Cleanup to Health-Based Standards. This option is similar to the previous one in that all SWMUs are addressed, source control remedies such as excavation are required, and off-site contamination must be addressed as soon as detected. However, corrective action would be triggered only if concentrations were detected above a health-based standard, rather than above background concentrations. This option involves a strong preference towards source control remedies and towards cleanup of contamination as quickly as possible. Use of technical infeasibility waivers is very limited, even if remedies cannot reasonably be expected to achieve the target. In addition, unlike the previous option, cleanup of on-site contamination could be deferred until facility closure, at which point cleanup to health-based levels would be required.

Option 4: Flexible Cleanup to Health-Based Standards. This option also addresses SWMUs, and health-based standards are used as both trigger and target levels. As in the previous option, owners and operators may defer cleanup of on-site releases until facility closure. However, in this alternative owners and operators have considerable flexibility in identifying corrective action remedies. Here, remedies less costly than source control can be chosen if they achieve target within a reasonable time frame. As a decision rule to reflect the fact that the problems of scale and other technical difficulties will preclude certain remedies at complex sites, remedies that failed to achieve cleanup in a reasonable period of time (assumed to be about 130 years for this analysis) or that would be extraordinarily expensive (*i.e.*, over $150 million) were rejected as "impracticable." Instead. exposure controls would be relied on to prevent risk in these cases. It is important to note that this approach is not intended to imply that remedies of this scope would never be undertaken, or to define the limits of technical practicability.

Option 5: Flexible Cleanup Based on Actual Exposure. This option is the least stringent of the five. It is similar to Option 4, except that cleanup of off-site exposure could be deferred if there is no actual human exposure to the release. If there is an off-site exposure, corrective action must address the exposure. Again, under this option, there is a flexible approach towards remedy selection.

The Agency believes that options 3 and 4 provide an upper and lower bound on the range of outcomes that may result during implementation of the proposed rule. This range results from the flexible nature of the proposed rule and the uncertainty about the choice of remediation measures in the field and the performance of the remedies that are selected. EPA expects that the real effects of the rule are likely to lie somewhere between these two options.

7. *Results of Quantitative Analysis.* The analysis estimated that approximately 31 percent of all RCRA facilities will trigger corrective action in all the post-HSWA options analyzed, as compared to 14 percent that would trigger under the baseline pre-HSWA scenario. This reflects the requirement that all SWMUs, not just land disposal units, are subject to corrective action under post-HSWA options. Note that even in the post-HSWA options, approximately two-thirds of the facilities will not trigger corrective action for ground water.

It is important to note that differences in trigger levels did not result in significant differences in the number of facilities triggering corrective actions. However, differences in target levels for the various regulatory options made a significant difference in how many corrective actions were "successful" in achieving cleanup levels, as is discussed later in this section. In examining the potential benefits of the proposal (Options 3 and 4) as compared to other options, the Agency developed an "effectiveness" test which measures the degree to which a particular option is successful in achieving its cleanup level The results of the test demonstrate that Options 3 and 4 are the most successful in achieving the cleanup target. This analysis supports the Agency's selection of Options 3 and 4 for the proposed rule. The effectiveness test should not, however, be viewed as a measure of all the potential benefits of remediation of contaminated ground water.

The point when corrective action is triggered was also analyzed. The analysis demonstrates that, for Option 2, in which corrective action must begin immediately, approximately 26 percent of all existing RCRA facilities would initiate corrective action in the first year of the program. In Options 3, 4, and 5, in which on-site corrective action can be deferred, only about 12 percent of all facilities would initiate corrective action in the first year. The ability of a facility to defer on-site corrective actions results in lower economic impacts.

For those facilities that trigger corrective action, the analysis estimated the length of time required for a corrective action to reduce contaminant concentrations below the target levels at all wells within 1,500 meters of the release. Under options requiring cleanup to health-based levels (*i e.*, options 3, 4, and 5), about 51 to 56 percent of the facilities reach cleanup targets at all well distances within 75 years of the initiation of corrective action. In contrast, under the two options requiring cleanup to background, only about 34 percent of facilities triggering corrective action are projected to achieve targets within 75 years: This further confirms the presumption that achieving cleanup to background concentrations may be difficult or impossible to achieve technically.

As part of the quantitative analysis, the Agency developed estimates of the costs of corrective action under different regulatory options on a per-facility basis, as well as on a national basis. Typical facility corrective action costs vary significantly depending upon the specific regulatory option. The cost analysis demonstrates that the most stringent post-HSWA regulatory option, (*i.e.*, Option 2, or "Immediate Cleanup to Background") is by far the most costly option, with a mean present value cost of over $281 million per facility, and an annualized per facility cost of about $19 million (at a 3 percent discount rate).

The upper bound proposed rule option, "Immediate Cleanup to Health-Based Standards" option (*i.e.*, Option 3), was estimated to have a mean present value per facility cost of $26.9 million, and annualized per facility costs of $1.8 million. The lower bound regulatory option (*i.e.*, Option 4, or "Flexible Cleanup to Health-Based Standards") was estimated to have a mean present value cost per facility of $6.3 million, and annualized per facility costs of $0.4 million.

The baseline per-facility cost is the lowest of all the options at a mean present value cost of $3.8 million, and an annualized per-facility cost of $0.3 million. The "Flexible Cleanup Based on Actual Exposure" option (*i.e.*, Option 5) was estimated to have a mean present value cost of $4.8 million and annualized per facility costs of $0.3 million.

The total national cost for EPA's corrective action program is influenced by three parameters: The average cost of each action, the number of facilities required to undertake corrective action, and the cost to facility owners and operators of undertaking required investigations. National costs discussed below are presented in incremental

terms (*i.e.*, after subtracting the costs of the baseline scenario).

The "Immediate Cleanup to Background" option is the most expensive, with an incremental total cost above the baseline pre-HSWA scenario of $490 billion. This option was estimated to have an annualized cost of $32.9 billion.

Among the other regulatory options, the differences in costs are primarily a result of differences in timing of cleanup and in the flexibility afforded in terms of choosing corrective action remedies. Option 3 (*i. e.*, "Immediate Cleanup to Health-Based Standards") was estimated at a total cost of $41.8 billion, with an annualized cost of $2.8 billion. This option is relatively costly, due in part to modeling assumptions as to the types of remedial technologies that would be employed to meet these standards.

Option 4 (*i.e.*, "Flexible Cleanup to Health-Based Standards") was among the least costly, with a total cost of $7.4 billion, and an annualized cost of $0.5 billion. The costs are lower because, in general, less expensive technologies are assumed and, for many facilities, final cleanup of contaminated ground water would be deferred for a number of years, thus reducing the present value costs.

Option 5 (*i.e.*, "Flexible Cleanup Based on Actual Exposure"), where both on-site and off-site cleanup of contamination could be deferred until closure if there was no actual exposure, was somewhat less expensive than the above option. This option had a total cost of $5.0 billion, an annualized cost of $0.3 billion.

Today's proposed regulation is most similar to Option 3 (*i.e.*, "Immediate Cleanup to Health-Based Levels") and Option 4 (*i.e.*, "Flexible Cleanup to Health-Based Standards"). These results illustrate that the total national costs of this rule are likely to range between $7 and $42 billion. The relatively wide range reflects the uncertainty in a number of areas, such as the timing of corrective action, the types of remedial measures that will be considered, and the nature and difficulty of remedial measures that are selected. Overall, the Agency believes that this range represents a reasonable bound of the potential effects of the rule, and that in all likelihood, the actual effects will fall somewhere within this range.

The Agency is committed to trying to refine these costs estimates before promulgation of the final rule. To help in this effort, the Agency requests that commenters provide any data or information relevant to the analysis described in the preamble or in the accompanying Regulatory Impact Analysis.

8. *Economic Impacts.* With the cost information developed from the quantitative analysis, the RIA estimated the financial impacts of the proposed rule on affected firms. The results are expressed in terms of predictions of total costs that facility owners and operators would not be able to cover due to insolvency. The results provide an indication of the magnitude of costs that could ultimately be faced by entities other than the immediate owner or operator of the facility. Alternate funding sources might include the Superfund (provided that the facility would be eligible for Superfund funding), State remedial action funds, corporate parents of facility owners and operators, or, through price increases, the customers of the firm owning or operating the facility. The results of this analysis are presented in "undiscounted" numbers, since Superfund monies are generally described in undiscounted terms. For scenarios other than baseline, costs are presented on an incremental basis relative to the baseline.

Under the baseline scenario, it was estimated that 9 percent of all firms owning RCRA facilities would be adversely affected, creating total unfunded costs of $97 million (undiscounted) over the next 50 years.

The "Immediate Cleanup to Background" scenario generated by far the highest level of unfunded costs, totaling $74 billion over the next 50 years. The "Immediate Cleanup to Health-Based Standards" option results in unfunded costs of over $5.1 billion over the next 50 years. The "Flexible Cleanup to Health-Based Standards" option results in unfunded costs of over $0.5 billion over the next 50 years. The "Flexible Cleanup Based on Actual Exposure" option resulted in a total of $0.2 billion unfunded costs, undiscounted, over the next 50 years.

Based on the RIA analysis, EPA anticipates that the ability to fund corrective action costs will vary between industries. Industries that may have a relatively low ability to pay for corrective actions include sanitary services; coating, engraving, and allied services; and miscellaneous wood products. These industries have relatively low net income levels. Industries that show a particularly high ability to pay include petroleum refining, motor vehicles and motor vehicle equipment, and aircraft and aircraft parts.

9. *Federal Facilities.* The RIA discusses Federal facilities as a separate entity because, although they only constitute 6 percent of the total RCRA facility universe, they contain many more SWMUs per facility (on average, 55 per site) and therefore, may incur higher corrective action costs. These costs must be funded by public money.

Based on the RIA analysis, it is estimated that of the 352 Federal RCRA facilities, between 61 percent and 100 percent are likely to require groundwater corrective action under the proposed rule, compared to between 17 percent and 23 percent under the baseline A rough approximation of the costs for these corrective actions, per facility, ranges from $17 million for the baseline scenario to $1.3 billion for the "Immediate Cleanup to Background" option. For the options most similar to the proposed rule (*i.e.*, "Immediate Cleanup to Health-Based Standards" and "Flexible Cleanup to Health-Based Standards") the mean per facility cost is estimated to range from $123 to $29 million, or in annualized costs, from about $8 to $2 million per facility.

The total Federal facility costs, incremental to the baseline, for the options most similar to the proposal range from $3 to $18 billion; the annualized costs range from $0.2 to $1.1 billion. Again, this range reflects the likely bounds on the ways in which the RCRA corrective action program will ultimately be implemented for Federal facilities. Incremental Federal facility costs for other regulatory approaches could be $208 billion for the "Immediate Cleanup to Background" option, or $2 billion for the "Flexible Cleanup Based on Actual Exposure" option. Baseline costs are estimated to be $1 billion.

This analysis thus concludes that, although Federal facilities only comprise 6 percent of the population affected by the corrective action program, they could incur roughly 30 percent of the total cost of the rule.

10. *Further Regulatory Impact Analyses.* Given the scope and potential impacts of this rulemaking, EPA recognizes the need to continue to refine its estimates of the costs and benefits of the rule. The Agency intends to collect additional data and will conduct substantial new analyses prior to finalizing today's rule. In conducting these studies, the Agency believes that it will be of particular value to examine the experience gained in recent years in remediating Federal facilities. Large volumes of information and extensive technical experience have been accumulated specifically by the Department of Defense and the Department of Energy. EPA intends to form an interagency working group to

develop and conduct these further Regulatory Impact Analyses.

The new analyses will be conducted in accordance with the existing Agency guidance on Regulatory Impact Analysis and the draft Regulatory Impact Analysis Guidance published in the 1988 Regulatory Program of the United States. The analyses will explicitly examine the costs, health and environmental benefits, and technological limitations for the key regulatory requirements contained in the proposal—especially for the several alternative approaches to ground water remediation outlined in the proposed rule. This analysis will also estimate the aggregate impacts, identified above, for sites eligible for remediation under this rule and for those sites which are listed on the NPL, and will, therefore, look to this rule as an ARAR, under the provisions of CERCLA. Upon completion of the revised analyses, EPA will solicit comment on the results of the analyses and the methodology used to derive them. The Agency will then assess these comments, along with comments which will have been received previously on the proposed rule. Through these actions EPA will ensure that the net social benefits (including environmental and health benefits) of the rule proposed today are maximized, taking into account costs, technological limitations, risks, and realistic assessments of both actual and reasonably expected uses of each site. If the revised RIA, together with the comments received, demonstrate that the rule proposed today does not achieve this outcome, the Agency will make appropriate modifications to the final rule, or if necessary, will repropose the rule.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act requires Federal agencies to fully analyze the economic effects of regulations on small entities. The Agency analyzed the economic impacts for the regulatory options that are most similar to today's proposed rule (*i.e.*, "Immediate Cleanup to Health-Based Standards" and "Flexible Cleanup to Health-Based Standards").

The RIA assumes that a small business is significantly impacted if its excess of cash flow over ten percent of its total liabilities is insufficient to meet corrective action costs, or if its net income is insufficient to meet its corrective action costs.

For the alternative analyzed, it was found that small firms encounter more severe impacts from the corrective action requirements than large firms. The options most similar to the proposed rule result in incremental impacts (*i.e.*, relative to the baseline) on approximately 9 to 11 percent of small businesses owning RCRA facilities.

Based on the Agency's guidelines for implementing the Regulatory Feasibility Act, the results of the analysis as summarized above, suggest that the proposed rule does not impose significant impacts on small entities.

C. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* Reporting and recordkeeping burden on the public for this collection is estimated at 42,497 hours for the 674 respondents, with an average of 1.151 hours per response. (Burden estimates should include all aspects of the collection effort and may include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. *etc.*)

If you wish to submit comments regarding any aspect of the collection of information, including suggestions for reducing the burden, or if you would like a copy of the information collection request (please reference ICR #1451), contact Rick Westlund, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460 (202–382–2745); and Tim Hunt, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

List of Subjects in 40 CFR Parts 264, 265, 270, and 271

Administrative practice and procedure, Corrective action, Hazardous waste; Insurance, Reporting and recordkeeping requirements.

Dated: July 5, 1990.

William Reilly,

Administrator.

XI. Supplementary Documents

APPENDIX A.—EXAMPLES OF CONCENTRATIONS MEETING CRITERIA FOR ACTION LEVELS

[Section 264.521(a)(2)(i-iv)]

Constituent name	Class	Air(ug/m^3)	Water (mg/L)	Soils (mg/kg)
Acetone	D		4E−00	8E+03
Acetonitrile	D		2E−01	5E+02
Acetophenone	D	2E−01	4E−00	8E+03
Acrylamide	B2	8E−04	8E−06	2E−01
Acrylonitrile	B1	1E−02	6E−05	1E−00
Aldicarb	D		5E−02	1E+02
Aldrin	B2	2E−04	2E−08	4E−02
Allyl alcohol	D		2E−01	4E+02
Aluminum phosphide	D		1E−02	3E+01
Aniline	B2		6E−03	1E+02
Antimony	D		1E−02	3E+01
Arsenic	A	7E−05	(1)	8E+01
Asbestos (2)	A	2E−02		
Barium cyanide	D		2E−00	6E+03
Barium, ionic	D	4E−01	(1)	4E+03
Benzidine	A	2E−05	2E−07	3E−03
Beryllium	B2	4E−04	8E−08	2E−01
Bis(2-ethylhexyl)phthlate	B2		3E−03	5E+01
Bis(chloroethyl)ether	B2	3E−03	3E−05	6E-01
Bromodichloromethane (3)	B2		3E−05	5E−01
Bromoform (3)	D		7E−01	2E+03
Bromomethane	D	3E+01	5E−02	1E+02
Butyl benzyl phthalate	C		7E−00	2E+04

APPENDIX A.—EXAMPLES OF CONCENTRATIONS MEETING CRITERIA FOR ACTION LEVELS—Continued

[Section 264.521(a)(2)(i-iv)]

Constituent name	Class	Air(ug/m^3)	Water (mg/L)	Soils (mg/kg)
Cadmium	B1	6E−04	(1)	4E+01
Calcium cyanide	D		1E−00	3E+03
Carbon disulfide	D		4E−00	8E+03
Carbon tetrachloride	B2	3E−02	3E−04	5E−00
Chloral	D		7E−02	2E+02
Chlordane	B2	3E−03	3E−05	5E−01
Chlorine cyanide	D		2E−00	4E+03
Chlorobenzene	D	2E+01	7E−01	2E+03
Chloroform (3)	B2	4E−02	6E−03	1E+02
2-Chlorophenol	D		2E−01	4E+02
Chromium (VI)	A	9E−05	(1)	4E+02
Copper cyanide	D		2E−01	4E+02
m-Cresol	D		2E−00	4E+03
o-Cresol	D		2E−00	4E+03
p-Cresol	D		2E−00	40+03
Cyanide	D		7E−01	2E+03
Cyanogen	D		1E−00	3E+03
Cyanogen bromide	D		3E−00	7E+03
DDD	B2		1E−04	3E−00
DDE	B2		1E−04	2E−00
DDT	B2	1E−02	1E−04	2E−00
Dibutyl phthalate	D		4E−00	8E+03
Dibutylnitrosamine	B2	6E−04	6E−06	1E−01
3,3'-Dichlorobenzidine	B2		8E−05	2E−00
Dichlorodifluoromethane	D	2E+02	7E−00	2E+04
1,2-Dichloroethane	B2	4E−02	(1)	6E−00
1,1-Dichloroethylene	C	3E−02	(1)	1E+01
2,4-Dichlorophenol	D		1E−01	2E+02
2,4-Dichlorophenoxyacetic acid	D		4E−01	8E+02
1,3-Dichloropropene	B2		1E−02	2E+01
Dieldrin	B2	2E−04	2E−08	4E−02
Diethyl phthalate	D		3E+01	6E+04
Diethylnitrosamine	B2	2E−05	2E−07	5E−03
Dimethoate	D		7E−01	2E+03
Dimethylnitrosamine	B2	7E−05	7E−07	1E−02
m-Dinitrobenzene	D		4E−03	8E−00
2,4-Dinitrophenol	D		7E−02	2E+02
2,3-Dinitrotoluene (and 2,6-, mixture)	B2		5E−05	1E-00
1,4-Dioxane	B2		3E−03	6E+01
Diphenylamine	D		9E−01	2E+03
1,2-Diphenylhydrazine	B2	4E−03	4E−05	9E−01
Disulfoton	D		1E−03	3E−00
Endosulfan	D		2E−03	4E−00
Endothall	D		7E−01	2E+03
Endrin	D		(1)	2E+01
Epichlorohydrin	B2	8E−01	4E−03	7E+01
Ethylbenzene	D		4E-00	8E+03
Ethylene dibromide	B2	5E−03	4E−07	8E−03
Formaldehyde	B1	8E−02		
Formic acid	D		7E+01	2E+05
Glycidylaldehyde	D		1E−02	3E+01
Heptachlor	B2	8E−04	8E−06	2E−01
Heptachlor epoxide	B2	4E−04	4E−06	8E−02
Hexachlordibenzo-p-dioxin	B2	6E−07	1E−08	1E−04
Hexachlorobutadiene	C	4E−01	4E−03	9E+01
alpha-Hexachlorocyclohexane	B2	6E−04	6E−06	1E−01
beta-Hexachlorocyclohexane	C	2E−02	2E−04	4E−00
Hexachlorocyclopentadiene	D	7E−02	2E−01	6E+02
Hexachloroethane	C	3E−00	3E−02	6E+01
Hexachlorophene	D		1E−02	2E+01
Hydrazine	B2	2E−04	1E−05	2E−01
Hydrogen cyanide	D		7E−01	2E+03
Hydrogen sulfite	D		1E−01	2E+02
Isobutyl alcohol	D		1E+01	2E+04
Isophorone	C		9E−02	2E+03
Lead	B2		(1)	
Lindane (gamma-hexachlorocyclohexane)	B2/C		(1)	5E−01
m-Phenylenediamine	D		2E−01	5E+02
Maleic anhydride	D		4E−00	8E+03
Maleic hydrazide	D		2E+01	4E+04
Mercury (inorganic)	D		(1)	2E+01
Methacrylonitrile	D	7E−01	4E−03	8E-00
Methomyl	D		9E−01	2E+03
Methyl chlorocarbonate	D			
Methyl ethyl ketone	D	3E+02	2E−00	4E+03
Methyl isobutyl ketone	D	7E+01	2E−00	4E+03
Methyl parathion	D		9E−03	2E+01

APPENDIX A.—EXAMPLES OF CONCENTRATIONS MEETING CRITERIA FOR ACTION LEVELS—Continued

[Section 264.521(a)(2)(i-iv)]

Constituent name	Class	Air(ug/m^3)	Water (mg/L)	Soils (mg/kg)
Methylene chloride	B	3E−01	5E−03	9E+01
n-Nitroso-di-n-butylamine	B2	6E−04	6E−06	1E−01
n-Nitroso-n-ethylurea	B			
n-Nitroso-n-methylethylamine	B2		2E−06	3E−02
n-Nitrosodi-n-propylamine	B2		5E−06	1E−01
n-Nitrosodiethanolamine	B2		1E−05	3E−01
n-Nitrosodiphenylamine	B2		7E−03	1E+02
n-Nitrosopyrrolidine	B2	2E−03	2E−05	3E−01
Nickel	D		7E−01	2E+03
Nickel refinery dust	A	4E−03		
Nitric oxide	D		4E−00	8E+03
Nitrobenzene	D	2E−00	2E−02	4E+01
Nitrogen dioxide	D		4E+01	8E+04
Osmium tetroxide	D		4E−04	8E−01
Parathion	C		2E−01	5E+02
Pentachlorobenzene	D		3E−02	6E+01
Pentachloronitrobenzene	C	1E−01	1E−01	2E+02
Pentachlorophenol	D		1E−00	2E+03
Phenol	D		2E+01	5E+04
Phenyl mercuric acetate	D		3E−03	6E−00
Phosphine	D		1E−02	2E+01
Phthalic anhydride	D		7E+01	2E+05
Polychlorinated biphenyls	B2		5E−06	9E−02
Potassium cyanide	D		2E−00	4E+03
Potassium silver cyanide	D		7E−00	2E+04
Pronamide	D		3E−00	6E+03
Pyridine	D		4E−02	8E+01
Selenious acid	D		1E−01	2E+02
Selenourea	D		2E−01	4E+02
Silver	D		(1)	2E+02
Silver cyanide	D		4E−00	6E+03
Sodium cyanide	D		1E−00	3E+03
Strychnine	D		1E−02	2E+01
Styrene	C		7E−00	2E+04
1,1,1,2-Tetrachlorethane	C	1E−00	1E−02	3E+02
1,2,4,5-Tetrachlorobenzene	D		1E−02	2E+01
1,1,1,2-Tetrachloroethane	C	1E−00	1E−02	3E+02
1,1,2,2-Tetrachloroethane	C	2E−01	2E−03	4E+01
Tetrachloroethylene	B2	1E−00	7E−04	1E+01
2,3,4,6-Tetrachlorophenol	D		1E−00	2E+03
Tetraethyl lead	D		4E−06	8E−03
Tetraethyldithiopyrophosphate	D		2E−02	4E+01
Thallic oxide	D		2E−03	6E−00
Thallium acetate	D		3E−03	7E−00
Thallium carbonate	D		3E−03	6E−00
Thallium chloride	D		3E−03	6E−00
Thallium nitrate	D		3E−03	7E−00
Thallium sulfate	D		3E−03	6E−00
Thiosemicarbazide	D		2E−01	5E+02
Thiram	D		2E−01	4E+02
Toluene	D	7E+03	1E+01	2E+04
Toxaphene	B2	3E−03	(1)	6E−01
1,2,4-Trichlorobenzene	D	1E+01	7E−01	2E+03
1,1,1-Trichloroethane	D	1E+03	3E−00	7E+03
1,1,2-Trichloroethane	C	6E−01	6E−03	1E+02
Trichloroethylene	B2		(1)	6E+01
Trichloromonofluoromethane	D	7E+02	1E+01	2E+04
2,4,5-Trichlorophenol	D		4E−00	8E+03
2,4,6-Trichlorophenol	B2	2E−01	2E−03	4E+01
2,4,5-Trichlorophenoxyacetic acid	D		(1)	8E+02
1,2,3-Trichloropropane	D		2E−01	5E+02
Vanadium pentoxide	D		3E−01	7E+02
Xylenes	D	1E+03	7E+01	2E+05
Zinc cyanide	D		2E−00	4E+03
Zinc phosphide	D		1E−02	2E+01

(1) MCL available; see appendix B.

(2) The air action level for asbestos is measured in units of fibers/milliliters.

(3) There is an MCL for total trihalomethanes, which includes four constituents: bromoform, bromodichloromethane, chloroform, and dibromochloromethane. Concentration derived using exposure assumptions in appendix D and reference doses for systemic toxicants and verified risk-specific doses at 10−6 for Class A and B carcinogens and 10−5 for Class C carcinogens (see section VI.F.2.6 for further discussion).

A, B and C represents class A, B and C carcinogens, respectively; D represents a systemic toxicant.

APPENDIX B—MAXIMUM CONTAMINANT LEVELS

Constituent	MCL (ppm)
Arsenic	0.05
Barium	1
Benzene	0.005
Cadmium	0.010
Carbon tetrachloride	0.005
Chromium VI	0.05
p-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007

APPENDIX B—MAXIMUM CONTAMINANT LEVELS—Continued

Constituent	MCL (ppm)
2,4-D	0.1
2,4,5-TP Silvex	0.01
Endrin	0.0002
Fluoride	4.0
Lead	0.05
Lindane	0.004
Mercury	0.002
Methoxychlor	0.1
Nitrate	10

APPENDIX B—MAXIMUM CONTAMINANT LEVELS—Continued

Constituent	MCL (ppm)
Selenium	0.01
Silver	0.05
Toxaphene	0.005
1,1,1-Trichloroethane	0.2
Trichloroethylene	0.005
Trihalomethanes, total [1]	0.10
Vinyl chloride	0.002

[1] Including chloroform, bromoform, bromodichloromethane, and dibromochloromethane

APPENDIX C—RANGE OF CONCENTRATIONS FOR ESTABLISHING MEDIA PROTECTION STANDARDS FOR CARCINOGENS

Constituent name	Class	MaxAir (ug/m 3)	MinAir (ug/m 3)	Max-Water (mg/L)	MinWater (mg/L)	MaxSoil (mg/kg)	MinSoil (mg/kg)
Acetone	D						
Acetonitrile	D						
Acetophenone	D						
Acrylamide	B2	8E-02	8E-04	8E-04	8E-06	2E+01	2E-01
Acrylonitrile	B1	1E-00	1E-02	6E-03	6E-05	1E+02	1E-00
Aldicarb	D						
Aldrin	B2	2E-02	2E-04	2E-04	2E-06	4E-00	4E-02
Allyl alcohol	D						
Aluminum phosphide	D						
Aniline	B2			6E-01	6E-03	1E+04	1E+02
Antimony	D						
Arsenic	A	7E-03	7E-05				
Asbestos (2)	A	2E-00	2E-02				
Barium cyanide	D						
Barium, ionic	D						
Benzidine	A	2E-03	2E-05	2E-05	2E-07	3E-01	3E-03
Beryllium	B2	4E-02	4E-04	8E-04	8E-06	2E+01	2E-01
Bis(2-ethylhexyl)phthlate	B2			3E-01	3E-03	5E+03	5E+01
Bis(chloroethyl)ether	B2	3E-01	3E-03	3E-03	3E-05	6E+01	6E-01
Bromodichloromethane	B2			3E-03	3E-05	5E+01	5E-01
Bromoform	D						
Bromomethane	D						
Butyl benzyl phthalate	C						
Cadmium	B1	6E-02	6E-04				
Calcium cyanide	D						
Carbon disulfide	D						
Carbon tetrachloride	B2	3E-00	3E-02	3E-02	3E-04	5E+02	5E-00
Chloral	D						
Chlordane	B2	3E-01	3E-03	3E-03	3E-05	5E+01	5E-01
Chlorine cyanide	D						
Chlorobenzene	D						
Chloroform	B2	4E-00	4E-02	6E-01	6E-03	1E+04	1E+02
2-Chlorophenol	D						
Chromium (VI)	A	9E-03	9E-05				
Copper cyanide	D						
m-Cresol	D						
o-Cresol	D						
p-Cresol	D						
Cyanide	D						
Cyanogen	D						
Cyanogen bromide	D						
DDD	B2			1E-02	1E-04	3E+02	3E-00
DDE	B2			1E-02	1E-04	2E+02	2E-00
DDT	B2	1E-00	1E-02	1E-02	1E-04	2E+02	2E-00
Dibutyl phthalate	D						
Dibutylnitrosamine	B2	6E-02	6E-04	6E-04	6E-06	1E+01	1E-01
3,3'-Dichlorobenzidine	B2			8E-03	8E-05	2E+02	2E-00
Dichlorodifluormethane	D						
1,2-Dichloroethane	B2	4E-00	4E-02	4E-02	4E-04	8E+02	8E-00
1,1-Dichlorothylene	C	3E-01	3E-03	6E-03	6E-05	1E+02	1E-00
2,4-Dichlorophenol	D						
2,4-Dichlorophenoxyacetic acid	D						
1,3-Dichloropropene	B2						
Dieldrin	B2	2E-02	2E-04	2E-04	2E-08	4E-00	4E-02
Diethyl phthalate	D						

APPENDIX C—RANGE OF CONCENTRATIONS FOR ESTABLISHING MEDIA PROTECTION STANDARDS FOR CARCINOGENS—Continued

Constituent name	Class	MaxAir (ug/m 3)	MinAir (ug/m 3)	Max-Water (mg/L)	MinWater (mg/L)	MaxSoil (mg/kg)	MinSoil (mg/kg)
Diethylnitrosamine	B2	2E-03	2E-05	2E-05	2E-07	5E-01	5E-03
Dimethoate	D						
Dimethylnitrosamine	B2	7E-03	7E-05	7E-05	7E-07	1E-00	1E-02
m-Dinitrobenzene	D						
2,4-Dinitrophenol	D						
2,3-Dinitrotoluene (and 2,6-, mixture)	B2			5E-03	5E-05	1E+02	1E-00
1,4-Dioxane	B2			3E-01	3E-03	6E+03	6E+01
Diphenylamine	D						
1,2-Diphenylhydrazine	B2	4E-01	4E-03	4E-03	4E-05	9E+01	9E-01
Disulfoton	D						
Endosulfan	D						
Endothall	D						
Endrin	D						
Epichlorohydrin	B2	8E+01	8E-01	4E-01	4E-03	7E+03	7E+01
Ethylbenzene	D						
Ethylene dibromide	B2	5E-01	5E-03	4E-05	4E-07	8E-01	8E-03
Formaldehyde	B1	8E-00	8E-02				
Formic acid	D						
Glycidylaldehyde	D						
Heptachlor	B2	8E-02	8E-04	8E-04	8E-06	2E+01	2E-01
Heptachlor epoxide	B2	4E-02	4E-04	4E-04	4E-06	8E-00	8E-02
Hexachlordibenzo-p-dioxin	B2	6E-05	6E-07	6E-07	1E-08	1E-02	1E-04
Hexachlorobutadiene	C	4E-00	4E-02	4E-02	4E-04	9E+02	9E-00
alpha-Hexachlorocyclohexane	B2	6E-02	6E-04	6E-04	6E+06	1E-01	1E-01
beta-Hexachlorocyclohexane	C	2E-01	2E-03	2E-03	2E-05	4E+01	4E-01
Hexachlorocyclopentadiene	D						
Hexachloroethane	C	3E+01	3E-01	3E-01	3E-03	5E+03	5E+01
Hexachlorophene	D						
Hydrazine	B2	2E-02	2E-04	1E-03	1E-05	2E+01	2E-01
Hydrogen cyanide	D						
Hydrogen sulfite	D						
Isobutyl alcohol	D						
Isophorone	C			9E-01	9E-03	2E+04	2E+02
Lead	B2						
Lindane (gamma-hexachlorocyclohexane)	B2/C			3E-03	3E-05	5E+01	5E-01
m-Phenylenediamine	D						
Maleic anhydride	D						
Maleic hydrazide	D						
Mercury (inorganic)	D						
Methacrylonitrile	D						
Methomyl	D						
Methyl chlorocarbonate	D						
Methyl ethyl ketone	D						
Methyl isobutyl ketone	D						
Methyl parathion	D						
Methylene chloride	B	3E+01	3E-01	5E-01	5E-03	9E+03	9E+01
n-Nitroso-di-n-butylamine	B2	6E-02	6E-04	6E-04	6E+06	1E-01	1E-01
n-Nitroso-n-ethylurea	B						
n-Nitroso-n-methylethylamine	B2			2E-04	2E-06	3E-00	3E-02
n-Nitrosodi-n-propylamine	B2			5E-04	5E-06	1E+01	1E-01
n-Nitrosodiethanolamine	B2			1E-03	1E-05	3E+01	3E-01
n-Nitrosodiphenylamine	B2			7E-01	7E-03	1E+04	1E+02
n-Nitrosopyrrolidine	B2	2E-01	2E-03	2E-03	2E-05	3E+01	3E-01
Nickel	D						
Nickel refinery dust	A	4E-01	4E-03				
Nitric oxide	D						
Nitrobenzene	D						
Nitrogen dioxide	D						
Osmium tetroxide	D						
Parathion	C						
Pentachlorobenzene	D						
Pentachloronitrobenzene	C	1E-00	1E-02				
Pentachlorophenol	D						
Phenol	D						
Phenyl mercuric acetate	D						
Phosphine	D						
Phthalic anhydride	D						
Polychlorinated biphenyls	B2			5E-04	5E-06	9E-00	9E-02
Potassium cyanide	D						
Potassium silver cyanide	D						
Pronamide	D						
Pyridine	D						
Selenious acid	D						
Selenourea	D						
Silver	D						
Silver cyanide	D						
Sodium cyanide	D						
Strychnine	D						

APPENDIX C—RANGE OF CONCENTRATIONS FOR ESTABLISHING MEDIA PROTECTION STANDARDS FOR CARCINOGENS—Continued

Constituent name	Class	MaxAir (ug/m 3)	MinAir (ug/m 3)	Max-Water (mg/L)	MinWater (mg/L)	MaxSoil (mg/kg)	MinSoil (mg/kg)
Styrene	C						
1,1,1,2-Tetrachlorethane	C	1E+01	1E-01	1E-01	3E+03	3E+03	3E+01
1,2,4,5-Tetrachlorobenzene	D						
1,1,1,2-Tetrachloroethane	C	1E+01	1E-01	1E-01	1E-03	3E+03	3E+01
1,1,2,2-Tetrachloroethane	C	2E-00	2E-02	2E-02	2E-04	4E+02	4E-00
Tetrachloroethylene	B2	1E+02	1E-00	7E-02	7E-04	1E+03	1E+01
2,3,4,6-Tetrachlorophenol	D						
Tetraethyl lead	D						
Tetraethyldithiopyrophosphate	D						
Thallic oxide	D						
Thallium acetate	D						
Thallium carbonate	D						
Thallium chloride	D						
Thallium nitrate	D						
Thallium sulfate	D						
Thiosemicarbazide	D						
Thiram	D						
Toluene	D						
Toxaphene	B2	3E-01	3E-03	3E-03	3E-05	6E+01	6E-01
1,2,4-Trichlorobenzene	D						
1,1,1,Trichloroethane	D						
1,1,2-Trichloroethane	C	6E-00	6E-02	6E-02	6E-04	1E+03	1E+01
Trichloroethylene	B2			3E-01	3E-03	6E+03	6E+01
Trichloromonofluoromethane	D						
2,4,5-Trichlorophenol	D						
2,4,6-Trichlorophenol	B2	2E+01	2E-01	2E-01	2E-03	4E+03	4E+01
2,4,5-Trichlorophenoxyacetic acid	D						
1,2,3-Trichloropropane	D						
Vanadium pentoxide	D						
Xylenes	D						
Zinc cyanide	D						
Zinc phosphide	D						

Appendix D: Recommended Exposusre Assumptions for Use in Deriving Action Levels

(Sections 264.521 (a)(2); (b); (c)(3); and (d))

1. In deriving action levels for hazardous constituents in ground-water, assume a water intake of 2 liters/day for 70 kg adult/70 year lifetime exposure period.

2. In deriving action levels for hazardous constituents in air, assume air intake of 20 cubic meters/day for 70 kg adult/70 year lifetime exposure period.

3. In deriving action levels for hazardous constituents in soil, which are known or suspected to be carcinogens, assume soil intake of 0.1 gram/day for 70 kg adult/70 year lifetime exposure period.

4. In deriving action levels for hazardous constituents in soil, other than those which are known or suspected to be carcinogens, assume soil intake of 0.2 gram/day for 16 kg child/5 year exposure period (age 1–6).*

5. In deriving action levels for hazardous constituents in surface water designated by the State for use as a drinking water source, assume a water intake of 2 liters/day for 70 kg adult/70 year lifetime exposure period, unless intake of aquatic organisms is also of concern.

*Not to be averaged over a 70-year lifetime.

Appendix E: Examples of Calculations of Action Levels

I. Governing Equations for Calculating Action Levels

A. *Systemic Toxicants*

$C_m = [RfD * W]/[I * A]$

where:

C_m = action level in medium (units are medium-dependent);
RfD = reference dose (mg/kg/day);
W = body weight (kg);
I = intake assumption (units are medium-dependent); and
A = absorption factor [1] (dimensionless).

B. *Carcinogenic Constituents*

$C_m = [R * W * LT]/[CSF * I * A * ED]$

where:

C_m = action level in medium (units are medium-dependent);
R = assumed risk level (dimensionless) (10^{-6} for class A & B; 10^{-5} for class C carcinogens);
W = body weight (kg);
LT = assumed lifetime (years);
CSF = carcinogenic slope factor (mg/kg/day)$^{-1}$;
I = intake assumption (units are medium-dependent);
A = absorption factor (dimensionless); and
ED = exposure duration (years).

[1] Assumed to be 1 for this appendix, based upon the assumption that the human absorption rate will be the same as the rate in the study upon which the RfD or CPF was developed.

II. Example Calculations for Hazardous Constituents in Air

A. *Systemic Toxicants*

Example calculation for 2,4-dinitrophenol:

$C_a = [0.002 \text{ (mg/kg/d)} * 1000 \text{ (}\mu\text{g/mg)} * 70\text{(kg)}]/[20 \text{ (m}^3\text{/d)} * 1] = 7.0 \text{ }\mu\text{g/m}^3$

where:

C_a = action level in air ($\mu g/m^3$)
RfD = 0.002 mg/kg/day
W = 70 kg adult
I = 20 m^3/day
A = 1

B. *Carcinogenic Constituents*

Example calculation for 1,1,2,2-tetrachlorocthane:

$C_a = [10^{-5} * 1000 \text{ (}\mu\text{g/mg)} * 70 \text{ yrs} * 70 \text{ (kg)}]/[0.20 \text{ (mg/kg/day)}^{-1} * 20 \text{ (m}^3\text{/day)} * 1 * 70 \text{ (yrs)}] = .175 \text{ }\mu\text{g/m}$

where:

C_a = action level in air ($\mu g/m^3$)
$R = 10^{-5}$ (1,1,2,2-Tetrachloroethane is a Class C carcinogen)
W = 70 kg adult
LT = 70 year lifetime
CSF = 0.20 (mg/kg/day)$^{-1}$
I = 20 m^3/day
A = 1
ED = 70 year exposure duration

III. Sample Calculation for Hazardous Constituents in Water

A. *Systemic Toxicants*

Sample calculation for toluene:

$C_w = [0.30 \text{ (mg/kg/day)} * 70 \text{ (kg)}]/[2 \text{ (L/day)} * 1] = 10.5 \text{ mg/L}$

where:

C_w = action level in water (mg/L)

RfD=0.30 mg/kg/day for toluene
W=70 kg adult
I=2 L/day
A=1

B. *Carcinogenic Constituents*

Sample calculation for 1,1,2,2,-tetrachloroethane:

$C_w=[10^{-5}*70\ (kg)*70\ (yr)]/[0.20\ (mg/kg/day)^{-1}*2\ (L/day)*1*70\ (yr)]=1.75E-03$ mg/L

where:
C_w=action level in water (mg/L)
$R=10^{-5}$ (1,1,2,2-Tetrachloroethane is a Class C carcinogen)
W=70 kg adult
LT=70 year lifetime
CSF=0.20 $(mg/kg/day)^{-1}$
I=2 L/day
A=1
ED=70 year exposure duration

IV. Sample Calculations for Hazardous Constituents in Soils

A. *Systemic Toxicants*

Example calculations for toluene:

$C_s=[0.30\ (mg/kg/day)*16\ (kg)]/[0.2\ (g/day)*1*0.001\ (kg/g)=24{,}000$ mg/kg

where:
C_s=action level in soil (mg/kg)
RfD=0.30 mg/kg/day for toluene
W=16 kg (5 year old child)
I=0.2 g/day
A=1

B. *Carcinogenic Constituents*

Sample calculation for 1,1,2,2,-tetrachloroethane:

$C_s=[10^{-5}*70\ (kg)*70\ (yrs)]/[0.20\ (mg/kg/day)^{-1}*0.1\ (g/day)*0.001\ (kg/g)*1*70\ (yrs)]=35.0$ mg/kg

where:
C_s=action level in soil (mg/kg)
$R=10^{-5}$ (1,1,2,2-tetrachloroethane is a Class C carcinogen)
W=70 kg adult
LT=70 year lifetime
CSF=0.20 $(mg/kg/day)^{-1}$
I=0.1 g/day
A=1
ED=70 year exposure duration

Appendix F—List of Constituents Showing Action Level Source Data

Constituent name	Class	Noncarcinogenic effects		Carcinogenic effects	
		Oral RFD (mg/kg/d)	Inhalation RFD (mg/kg/d)	Oral slope factor (mg/kg/d)-1	Inhalation slope factor (mg/kg/d) ^{1}
Acetone	D	1.0E−01			
Acetonitrile	D	6.0E−03			
Acetophenone	D	1.0E−01	5.0E−05		
Acrylamide	B2	2.0E−04		4.5E−00	4.5E−00
Acrylonitrile	B1			5.4E−01	2.4E−01
Aldicarb	D	1.3E−03			
Aldrin	B2	3.0E−05		1.7E+01	1.7E+01
Allyl alcohol	D	5.0E−03			
Aluminum phosphide	D	4.0E−04			
Aniline	B2			5.7E−03	
Antimony	D	4.0E−04			
Arsenic	A	1.0E−03			5.0E+01
Asbestos (2)	A				2.3E−01
Barium cyanide	D	7.0E−02			
Barium, ionic	D	5.0E−02	1.0E−04		
Benzidine	A	3.0E−03		2.3E+02	2.3E+02
Beryllium	B2	5.0E−03		4.3E−00	8.4E−00
Bis(2-ethylhexyl)phthlate	B2	2.0E−02		1.4E−02	
Bis(chloroethyl)ether	B2			1.1E−00	1.1E−00
Bromodichloromethane	B2	2.0E−02		1.3E−00	
Bromoform	D	2.0E−02			
Bromomethane	D	1.4E−03	8.0E−03		
Butyl benzyl phthalate	C	2.0E−01			
Cadmium	B1	5.0E−04			6.1E−00
Calcium cyanide	D	4.0E−02			
Carbon disulfide	D	1.0E−01			
Carbon tetrachloride	B2	7.0E−04		1.3E−01	1.3E−01
Chloral	D	2.0E−03			
Chlordane	B2	6.0E−05		1.3E−00	1.3E−00
Chlorine cyanide	D	5.0E−02			
Chlorobenzene	D	2.0E−02	5.0E−03		
Chloroform	B2	1.0E−02		6.1E−03	8.1E−02
2-Chlorophenol	D	5.0E−03			
Chromium (VI)	A	5.0E−03			4.1E+01
Copper cyanide	D	5.0E−03			
m-Cresol	D	5.0E−02			
o-Cresol	D	5.0E−02			
p-Cresol	D	5.0E−02			
Cyanide	D	2.0E−02			
Cyanogen	D	4.0E−02			
Cyanogen bromide	D	9.0E−02			
DDD	B2			2.4E−01	
DDE	B2			3.4E−01	
DDT	B2	5.0E−04		3.4E−01	3.4E−01
Dibutyl phthalate	D	1.0E−01			
Dibutylnitrosamine	B2			5.4E−00	5.4E−00
3,3'-Dichlorobenzidine	B2			4.5E−01	
Dichlorodifluoromethane	D	2.0E−01	5.0E−02		
1,2-Dichloroethane	B2			9.1E−02	9.1E−02
1,1-Dichloroethylene	C	9.0E−03		6.0E−01	1.2E−00
2,4-Dichlorophenol	D	3.0E−03			
2,4-Dichlorophenoxyacetic acid	D	1.0E−02			
1,3-Dichloropropene	B2	3.0E−04			
Dieldrin	B2	5.0E−05		1.6E+01	1.6E+01
Diethyl phthalate	D	8.0E−01			
Diethylnitrosamine	B2			1.5E+02	1.5E+02

APPENDIX F—LIST OF CONSTITUENTS SHOWING ACTION LEVEL SOURCE DATA—Continued

Constituent name	Class	Noncarcinogenic effects		Carcinogenic effects	
		Oral RFD (mg/kg/d)	Inhalation RFD (mg/kg/d)	Oral slope factor (mg/kg/d)-1	Inhalation slope factor (mg/kg/d) [1]
Dimethoate	D	2.0E−02			
Dimethylnitrosamine	B2			5.1E+01	5.1E+01
m-Dinitrobenzene	D	1.0E−04			
2,4-Dinitrophenol	D	2.0E−03			
2,3-Dinitrotoluene (and 2,6-, mixture)	B2			6.8E−01	
1,4-Dioxane	B2			1.1E−02	
Diphenylamine	D	2.5E−02			
1,2-Diphenylhydrazine	B2			6.0E−01	6.0E−01
Disulfoton	D	4.0E−05			
Endosulfan	D	5.0E−05			
Endothall	D	2.0E−02			
Endrin	D	3.0E−04			
Epichlorohydrin	B2	2.0E−03		9.9E−03	4.2E−03
Ethylbenzene	D	1.0E−01			
Ethylene dibromide	B2			8.5E+01	7.6E−01
Formaldehyde	B1				4.5E−02
Formic acid	D	2.0E−00			
Glycidyaldehyde	D	4.0E−04			
Heptachlor	B2	5.0E−04		4.5E−00	4.5E−00
Heptachlor epoxide	B2	1.3E−05		9.1E−00	9.1E−00
Hexachlordibenzo-p-dioxin	B2			6.2E+03	6.2E+03
Hexachlorobutadiene	C	2.0E−03		7.8E−02	7.8E−02
alpha-Hexachlorocyclohexane	B2			6.3E−00	6.3E−00
beta-Hexachlorocyclohexane	C			1.8E−00	1.8E−00
Hexachlorocyclopentadiene	D	7.0E−03	2.0E−05		
Hexachloroethane	C	1.0E−03		1.4E−02	1.4E−02
Hexachlorophene	D	3.0E−04			
Hydrazine	B2			3.0E−00	1.7E+01
Hydrogen cyanide	D	2.0E−02			
Hydrogen sulfite	D	3.0E−03			
Isobutyl alcohol	D	3.0E−01			
Isophorone	C	2.0E−01		4.1E−03	
Lead	B2				
Lindane (gamma-hexachlorocyclohexane)	B2/C	3.0E−04		1.3E−00	
m-Phenylenediamine	D	6.0E−03			
Maleic anhydride	D	1.0E−01			
Maleic hydrazide	D	5.0E−01			
Mercury (inorganic)	D	3.0E−04			
Methacrylonitrile	D	1.0E−04	2.0E−04		
Methomyl	D	2.5E−02			
Methyl chlorocarbonate	D				
Methyl ethyl ketone	D	5.0E−02	9.0E−02		
Methyl isobutyl ketone	D	5.0E−02	2.0E−02		
Methyl parathion	D	2.5E−04			
Methylene chloride	B	6.0E−02		7.5E−03	1.4E−02
n-Nitroso-di-n-butylamine	B2			5.4E−00	5.4E−00
n-Nitroso-n-ethylurea	B				
n-Nitroso-n-methylethylamine	B2			2.2E+01	
n-Nitrosodi-n-propylamine	B2			7.0E−00	
n-Nitrosodiethanolamine	B2			2.8E−00	
n-Nitrosodienylamine	B2			4.9E−03	
n-Nitrosopyrrolidine	B2			2.1E−00	2.1E−00
Nickel	D	2.0E−02			
Nickel refinery dust	A				8.4E−01
Nitric oxide	D	1.0E−01			
Nitrobenzene	D	5.0E−04	60E−04		
Nitrogen dioxide	D	1.0E−00			
Osmium tetroxide	D	1.0E−05			
Parathion	C	6.0E−03			
Pentachlorobenzene	D	8.0E−04			
Pentachloronitrobenzene	C	3.0E−03			2.5E−01
Pentachlorophenol	D	3.0E−02			
Phenol	D	6.0E−01			
Phenyl mercuric acetate	D	8.0E−05			
Phosphine	D	3.0E−04			
Phthalic anhydride	D	2.0E−00			
Polychlorinated biphenyls	B2			7.7E−00	
Potassium cyanide	D	5.0E−02			
Potassium silver cyanide	D	2.0E−01			
Pronamide	D	7.5E−02			
Pyridine	D	1.0E−03			
Selenious acid	D	3.0E−03			
Selenourea	D	5.0E−03			
Silver	D	3.0E−03			
Silver cyanide	D	1.0E−01			
Sodium cyanide	D	4.0E−02			

APPENDIX F—LIST OF CONSTITUENTS SHOWING ACTION LEVEL SOURCE DATA—Continued

Constituent name	Class	Noncarcinogenic effects		Carcinogenic effects	
		Oral RFD (mg/kg/d)	Inhalation RFD (mg/kg/d)	Oral slope factor (mg/kg/d)-1	Inhalation slope factor (mg/kg/d) [1]
Strychnine	D	3.0E−04			
Styrene	C	2.0E−01			
1,1,1,2-Tetrachlorethane	C	3.0E−02		2.6E−02	2.6E−02
1,2,4,5-Tetrachlorobenzene	D	3.0E−04			
1,1,1,2-Tetrachloroethane	C	3.0E−02		2.6E−02	2.6E−02
1,1,2,2-Tetrachloroethane	C			2.0E−01	2.0E−01
Tetrachloroethylene	B2	1.0E−02		5.1E−02	3.3E−03
2,3,4,6-Tetrachlorophenol	D	3.0E−02			
Tetraethyl lead	D	1.0E−07			
Tetraethyldithiopyrophosphate	D	5.0E−04			
Thallic oxide	D	7.0E−05			
Thallium acetate	D	9.0E−05			
Thallium carbonate	D	8.0E−05			
Thallium chloride	D	8.0E−05			
Thallium nitrate	D	9.0E−05			
Thallium sulfate	D	8.0E−05			
Thiosemicarbazide	D	6.0E−03			
Thiram	D	5.0E−03			
Toluene	D	3.0E−01	2.0E−00		
Toxaphene	B2			1.1E−00	1.1E−00
1,2,4-Trichlorobenzene	D	2.0E−02	3.0E−03		
1,1,1-Trichloroethane	D	9.0E−02	3.0E−01		
1,1,2-Trichloroethane	C	4.0E−03		5.7E−02	5.7E−02
Trichloroethylene	B2			1.1E−02	
Trichloromonofluoromethane	D	3.0E−01	2.0E−01		
2,4,5-Trichlorophenol	D	1.0E−01			
2,4,6-Trichlorophenol	B2			2.0E−02	2.0E−02
2,4,5-Trichlorophenoxyacetic acid	D	1.0E−02			
1,2,3-Trichloropropane	D	6.0E−03			
Vanadium pentoxide	D	9.0E−03			
Xylenes	D	2.0E−00	3.0E−01		
Zinc cyanide	D	5.0E−02			
Zinc phosphide	D	3.0E−04			

For the reasons set out in the preamble, 40 CFR parts 264, 265, 270. and 271 are proposed to be amended as follows:

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

1. The authority citation for part 264 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a). 6924, and 6925.

2. Section 264.1 is amended by revising paragraphs (d) and (g) introductory text to read as follows:

§ 264.1 Purpose, scope and applicability.

* * * * *

(d) The requirements of this part apply to a person disposing of hazardous waste by means of underground injection subject to a permit issued under an Underground Injection control (UIC) program approved or promulgated under the Safe Drinking Water Act only to the extent they are required by § 144.14 of this chapter and to the extent they are included in a RCRA permit by rule granted to such a person under part 270 of this chapter.

* * * * *

(g) Except as required under subpart S of this part governing releases from solid waste management units, the requirements of this part do not apply to:

* * * * *

§ 264.101 [Removed]

3. In 40 CFR part 264, subpart F, it is proposed to remove § 264.101.

4. In 40 CFR part 264, subpart G, it is proposed to amend § 264.113 by redesignating paragraphs (a)(1)(ii) as (a)(1)(iii) and (b)(1)(ii) as (b)(1)(iii), and by adding new paragraphs (a)(1)(ii) and (b)(1)(ii) to read as follows:

§ 264.113 Closure time allowed for closure.

* * * * *

(a) * * *

(1) * * *

(ii) Corrective action required at the unit or the facility under subpart S will delay the completion of partial or final closure; or

* * * * *

(b) * * *

(1) * * *

(ii) Corrective action required at the unit or the facility under subpart S will delay the completion of partial or final closure; or

* * * * *

5. 40 CFR part 264 is amended by adding subpart S to read as follows:

Subpart S—Corrective Action for Solid Waste Management Units

Subpart S—Corrective Action for Solid Waste Management Units

§ 264.500 Purpose and applicability.

(a) The provisions of this subpart establish requirements for investigation and corrective action for releases of hazardous waste, including hazardous constituents, from solid waste management units.

(b) The owner or operator of a facility seeking a permit under subtitle C of RCRA must institute investigations and/or corrective action, as necessary to protect human health and the environment, for all releases of hazardous waste, including hazardous constituents, from any solid waste management unit at the facility, regardless of the time at which waste was placed in such unit.

(c) Requirements for investigations and/or corrective action will be specified in the permit. The permit will contain schedules of compliance for such investigations and/or corrective action (where such cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.

(d) The owner or operator must implement corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the Regional Administrator that, despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such actions. The owner or operator is not relieved of responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for completing such corrective action must be provided.

(e) For protection of ground water from landfills, surface impoundments, land treatment units, and waste piles that received listed or identified hazardous waste after July 26, 1982, the provisions of this subpart apply only as specifically provided herein.

(f) The provisions of this subpart do not apply to:

(1) Permits for land treatment demonstrations using field test or laboratory analyses (see § 270.63).

(2) Emergency permits (see § 270.61).

(3) Permits by rule for ocean disposal barges or vessels (see § 270.60(a)).

(4) Research, development, and demonstration permits (see § 270.65).

§ 264.501 Definitions.

For the purpose of complying with the requirements of this subpart, the following definitions apply:

Corrective Action Management Unit means a contiguous area within a facility as designated by the Regional Administrator 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.

Facility means all contiguous property under the control of the owner or operator seeking a permit under subtitle C of RCRA.

Hazardous Constituent means any constituent identified in appendix VIII of 40 CFR part 261, or any constituent identified in appendix IX of 40 CFR part 264.

Hazardous Waste means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined above.

Release means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

Solid Waste Management Unit means 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.

§§ 264.502–264.509 [Reserved]

§ 264.510 Requirement to perform remedial investigations.

If the Regional Administrator determines that hazardous waste (including hazardous constituents) have been, are likely to have been, or, based on site-specific circumstances, are likely to be released into the environment from a solid waste management unit at the facility, the Regional Administrator may specify in the permit schedule of compliance that the permittee investigate and characterize solid waste management units and releases from solid waste management units at the facility.

§ 264.511 Scope of remedial investigations.

(a) Investigations required under § 264.510 shall characterize the nature, extent, direction, rate, movement and concentration of releases, as required by the Regional Administrator. In addition, such investigations may include, but are not limited to, the following:

(1) Characterizations of the environmental setting at the facility, including:

(i) Hydrogeological conditions;

(ii) Climatological conditions;

(iii) Soil characteristics;

(iv) Surface water and sediment quality and other characteristics; or

(v) Air quality and meteorological conditions.

(2) Characterization of solid waste management units from which releases have been or may be occurring, including unit and waste characteristics.

(3) Descriptions of humans and environmental systems which are, may have been, or, based on site-specific circumstances, may be exposed to release(s).

(4) Information that will assist the Regional Administrator in assessing risks to human health and the environment from releases from solid waste management units.

(5) Extrapolations of future movement, degradation and fate of contaminants.

(6) Laboratory, bench-scale or pilot-scale tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the facility.

(7) Statistical analyses to aid in the interpretation of data required under § 264.510, in accordance with statistical methods approved by the Regional Administrator.

(b) Samples of ground water, surface water, soils, or air which are collected as part of remedial investigations

required under § 264.510 shall be analyzed for those constituents and parameters determined to be necessary by the Regional Administrator to accurately and adequately characterize the presence of hazardous wastes (including hazardous constituents) in the samples.

§ 264.512 Plans for remedial investigations.

(a) The Regional Administrator may require the permittee to develop and submit a plan(s) for conducting any remedial investigations required under § 264.510 of this subpart. Such plans shall be subject to review and approval or modification by the Regional Administrator, and shall be developed and submitted according to a schedule specified in the schedule of compliance. Such plans may include, but are not limited to, the following:

(1) Overall approach, including objectives, schedules, and qualifications of personnel conducting investigations.

(2) Technical and analytical approach and methods for investigations.

(3) Quality assurance procedures, including:

(i) Data collection strategy;

(ii) Sampling, chain of custody procedures; and

(iii) Methods of sample analysis.

(4) Data management procedures, including formats for documenting analytical results and tracking sample custody, and other results of investigations.

(b) Upon approval or modification of the plan by the Regional Administrator, the plan shall be incorporated expressly or by reference as a part of the permit schedule of compliance. The permittee shall conduct the studies and investigations in accordance with the plan and any other requirements specified in the permit schedule of compliance.

§ 264.513 Reports of remedial investigations.

(a) The Regional Administrator may require periodic reports to be submitted by the permittee during remedial investigations required under § 264.510, and may, based on information from the investigations, or other information, require new or modified investigations. Such modifications will, if necessary, be specified by modifying the permit schedule of compliance.

(b) Upon conclusion of the remedial investigations, the permittee shall submit to the Regional Administrator for approval:

(1) A final report describing the procedures, methods, and results of the remedial investigations, in such format and containing such information as specified by the Regional Administrator; and

(2) A summary of the report.

(c) If, upon receipt of the final report and summary, the Regional Administrator determines that the final report and summary do not fully satisfy the requirements for the report and summary specified in the permit schedule of compliance, or otherwise do not provide a full and accurate summary and description of the remedial investigations, the Regional Administrator may require the permittee to submit a revised report.

(d) Upon approval of the summary, the permittee shall mail it to all individuals on the facility mailing list (required under § 124.10(c)(1)(viii)).

(e) All raw data, such as laboratory reports, drilling logs and other supporting information generated from investigations required under § 264.510 shall be maintained at the facility (or other location approved by the Regional Administrator) during the term of the permit, including any reissued permit.

§ 264.514 Determination of no further action.

(a)(1) Based on the results of investigations required under § 264.510 or other relevant information the permittee may submit an application to the Regional Administrator for a permit modification to terminate the schedule of compliance for corrective action, according to the procedures for Class III permit modifications under § 270.42.

(2) The permit modification application must contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units at the facility that may pose a threat to human health or the environment.

(b) If the Regional Administrator, upon review of the request for a permit modification, reports submitted under § 264.513, or other information, determines that there is no such threat to human health and the environment from releases from solid waste management units at the facility. The Regional Administrator shall grant the permit modification according to the procedures of § 270.42.

(c) Any determination made pursuant to § 264.514(b) will not affect the authority or responsibility of the Regional Administrator to:

(1) Modify the permit at a later date to require the permittee to perform such investigations and studies as may be necessary to comply with the requirements of this Subpart, if new information or subsequent analysis indicates that there are, or are likely to be, releases from solid waste management units at the facility that may pose a threat to human health or the environment; or

(2) Require continued or periodic monitoring under the terms of the permit if the Regional Administrator determines, based on site-specific circumstances, that releases are likely to occur.

§§ 264.515–264.519 [Reserved]

§ 264.520 Requirement to perform corrective measure study.

(a) If at any time the Regional Administrator determines that concentrations of hazardous constituents in ground water in an aquifer, surface water, soils, or air exceed an action level (as defined under § 264.521), and there is reason to believe that such hazardous constituents have been released from a solid waste management unit at the facility, the Regional Administrator shall require as part of the permit schedule of compliance that the permittee perform a corrective measure study, according to the requirements of §§ 264.522–264.524, except as otherwise provided under § 264.520(c).

(b) If the Regional Administrator determines that a constituent(s) present in a concentration below an action level (as defined under § 264.521) may pose a threat to human health or the environment, given site-specific exposure conditions, and there is reason to believe that the constituent(s) has been released from a solid waste management unit at the facility, the Regional Administrator may require a corrective measure study according to the requirements of §§ 264.522–264.524.

(c) If an action level has been exceeded (as provided under § 264.520(a), but the Regional Administrator determines that the release(s) may nevertheless not pose a threat to human health and the environment, the Regional Administrator may allow the permittee to apply for a determination of no further action, according to § 264.514.

(d) The Regional Administrator shall notify the permittee in writing of the requirement to conduct a corrective measure study. This notice shall identify the hazardous constituent(s) which exceed action levels defined under § 264.521, as well as any hazardous constituent(s) identified pursuant to § 264.520(b).

(e) For purposes of §§ 264.520, 264.521, 264.525 (d) and (e), the term "constituent" refers to hazardous

constituents, as defined in § 264.501, as well as other hazardous wastes (as defined in § 264.501) that are single chemical constituents.

§ 264.521 Action levels.

Action levels are defined as follows:

(a) Action levels for constituents in ground water in an aquifer which the Regional Administrator has reason to believe may have been released from a solid waste management unit at the facility shall be concentration levels specified as:

(1) Maximum contaminant levels (MCLs) promulgated under § 141.2 of the Safe Drinking Water Act (40 CFR part 141 subpart B); or

(2) For constituents for which MCLs have not been promulgated, a concentration which satisfies the following criteria, assuming exposure through consumption of the water contaminated with the constituent:

(i) Is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants (51 FR 33992, 34006, 34014, 34028); and

(ii) Is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act (TSCA) Good Laboratory Practice Standards (40 CFR part 792), or equivalent; and

(iii) For carcinogens, represents a concentration associated with an excess upper bound lifetime cancer risk of $1x10^{-6}$ due to continuous constant lifetime exposure, and considers the overall weight of evidence for carcinogenicity; and

(iv) For systemic toxicants, represents a concentration to which the human population (including sensitive subgroups) could be exposed on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime.

(b) Action levels for constituents in air which the Regional Administrator has reason to believe may have been released from a solid waste management unit at the facility shall be defined as concentrations which meet the criteria specified in § 264.521(a)(2)(i)–(iv), assuming exposure through inhalation of the air contaminated with the constituent, as measured or estimated at the facility boundary, or another location closer to the unit if necessary to protect human health and the environment.

(c) Action levels for constituents in surface water which the Regional Administrator has reason to believe may have been released from a solid waste management unit at the facility shall be specified as:

(1) Water Quality Standards established pursuant to section 303(c) of the Clean Water Act (40 CFR part 131) by the State in which the facility is located, where such standards are expressed as numeric values; or

(2) Numeric interpretations of State narrative water quality standards, if appropriate, where water quality standards expressed as numeric values have not been established by the State; or

(3) MCLs promulgated under the Safe Drinking Water Act for constituents in surface waters designated by the State for drinking water supply, where numeric values or numeric interpretations, described in paragraphs (1) and (2), are not available; or

(4) For constituents in surface waters designated by the State for drinking water supply for which numeric values, numeric interpretations, or MCLs (as described in paragraphs 1–3 above) are not available, a concentration which meets the criteria specified in § 264.521(a)(2)(i)–(iv), assuming exposure through consumption of the water contaminated with the constituent; or

(5) For constituents in surface waters designated for a use or uses other than drinking water supply and for which numeric values or numeric interpretations (as described in paragraphs (1) and (2) above) have not been established, a concentration established by the Regional Administrator which meets the criteria specified in § 264.521(a)(2)(i)–(iv), considering the use or uses of the receiving waters.

(d) Action levels for constituents in soils that the Regional Administrator has reason to believe may have been released from a solid waste management unit at the facility shall be defined as concentrations which meet the criteria specified in § 264.521(a)(2)(i)–(iv), assuming exposure through consumption of the soil contaminated with the constituent.

(e) If, for a constituent(s) detected in ground water in an aquifer, air, surface water or soils, a concentration level that meets the criteria of § 264.521(a)–(d) is not available, the Regional Administrator may establish an action level for the constituent as:

(1) A level that is an indicator for protection of human health and the environment, using the exposure assumptions for the medium specified under § 264.521(a)–(d); or

(2) The background concentration of the constituent.

§ 264.522 Scope of corrective measure studies.

(a) As determined by the Regional Administrator, corrective measure studies required under § 264.520 may include, but are not limited to, the following:

(1) Evaluation of performance, reliability, ease of implementation, and potential impacts of the remedy, including safety impacts, cross media impacts, and control of exposure to any residual contamination.

(2) Assessment of the effectiveness of potential remedies in achieving adequate control of sources and cleanup of the hazardous waste (including hazardous constituents) released from solid waste management units.

(3) Assessment of the time required to begin and complete the remedy.

(4) Estimation of the costs of remedy implementation.

(5) Assessment of institutional requirements, such as State or local permit requirements, or other environmental or public health requirements which may substantially affect implementation of the remedy(s).

(b) The Regional Administrator may require the permittee to evaluate as part of the corrective measure study one or more specific potential remedies. These remedies may include a specific technology or combination of technologies that, in the Regional Administrator's judgment, achieves or may achieve the standards for remedies specified in § 264.525(a) given appropriate consideration of the factors specified in § 264.525(b).

§ 264.523 Plans for corrective measure studies.

(a) The Regional Administrator may require the permittee to develop and submit a plan(s) for conducting a corrective measure study required under § 264.520. The plan shall be subject to review and approval or modification by the Regional Administrator, and shall be developed and submitted according to a schedule specified in the permit schedule of compliance. Such plans may include, but are not limited to, the following:

(1) Description of the general approach to investigating and evaluating potential remedies;

(2) Definition of the overall objectives of the study;

(3) Description of the specific remedy(s) which will be studied;

(4) Plans for evaluating remedies to ensure compliance with the standards for remedies specified in § 264.525(a);

(5) Schedules for conducting the study; and

(6) Proposed format for information presentation.

(b) Upon approval or modification of the corrective measure study plan by the Regional Administrator, the plan shall be incorporated expressly or by reference as part of the permit schedule of compliance. The permittee shall conduct the studies and investigations in accordance with the plan and any other requirements as specified in the permit schedule of compliance.

§ 264.524 Reports of corrective measure studies.

(a) The Regional Administrator may require periodic reports during the conduct of the corrective measure study, and may, based on information from these reports or other information, require the permittee to modify the corrective measure study. Such modifications will, if necessary, be specified by modifying the permit schedule of compliance.

(b) Upon completion of the corrective measure study, the permittee shall submit a report summarizing the results of the study. This report must include a detailed description of the remedies assessed pursuant to § 264.522 or § 264.524(a). The report shall describe how any proposed remedy(s) meets the standards for remedies as specified in § 264.525(a).

(c) Upon review of the corrective measure study report, the Regional Administrator may require the permittee to evaluate further, and report upon, one or more additional remedies, or develop particular elements of one or more proposed remedies. Such further requirements will, if necessary, be specified by modifying the permit schedule of compliance.

§ 264.525 Selection of remedy.

Based on the results of the corrective measure study, and any further evaluations conducted under § 264.524(c), the Regional Administrator shall, except as otherwise provided under paragraph (f) of this section, select a remedy that, at a minimum, meets the standards listed in paragraph (a) of this section.

(a) *Standards for remedies.* Remedies must:

(1) Be protective of human health and the environment;

(2) Attain media cleanup standards as specified pursuant to paragraphs (d) and (e) of this section;

(3) Control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous wastes (including hazardous constituents) that may pose a threat to human health and the environment; and

(4) Comply with standards for management of wastes as specified in §§ 264.550–264.559 of this subpart.

(b) *Remedy selection factors.* In selecting a remedy which meets the standards of § 264.525(a), the Regional Administrator shall consider the following evaluation factors as appropriate:

(1) *Long-term reliability and effectiveness.* Any potential remedy(s) may be assessed for the long-term reliability and effectiveness it affords, along with the degree of certainty that the remedy will prove successful. Factors that shall be considered in this evaluation include:

(i) Magnitude of residual risks in terms of amounts and concentrations of waste remaining following implementation of a remedy, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes (including hazardous constituents);

(ii) The type and degree of long-term management required, including monitoring and operation and maintenance;

(iii) Potential for exposure of humans and environmental receptors to remaining wastes;

(iv) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated wastes and residuals; and

(v) Potential need for replacement of the remedy.

(2) *Reduction of toxicity, mobility or volume.* A potential remedy(s) may be assessed as to the degree to which it employs treatment that reduces toxicity, mobility or volume of hazardous wastes (including hazardous constituents). Factors that shall be considered in such assessments include:

(i) The treatment processes the remedy(s) employs and materials it would treat;

(ii) The amount of hazardous wastes (including hazardous constituents) that would be destroyed or treated;

(iii) The degree to which the treatment is irreversible;

(iv) The residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes (including hazardous constituents).

(3) The short-term effectiveness of a potential remedy(s) may be assessed considering the following:

(i) Magnitude of reduction of existing risks;

(ii) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment;

(iii) Time until full protection is achieved.

(4) *Implementability.* The ease or difficulty of implementing a potential remedy(s) may be assessed by considering the following types of factors:

(i) Degree of difficulty associated with constructing the technology;

(ii) Expected operational reliability of the technologies;

(iii) Need to coordinate with and obtain necessary approvals and permits from other agencies;

(iv) Availability of necessary equipment and specialists;

(v) Available capacity and location of needed treatment, storage and disposal services.

(5) *Cost.* The types of costs that may be assessed include the following:

(i) Capital costs;

(ii) Operation and maintenance costs;

(iii) Net present value of capital and operation and maintenance costs;

(iv) Potential future remedial action costs.

(c) *Schedule for remedy.* The Regional Administrator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. The Regional Administrator will consider the following factors in determining the schedule of remedial activities:

(1) Extent and nature of contamination.

(2) Practical capabilities of remedial technologies in achieving compliance with media cleanup standards, and other objectives of the remedy.

(3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy.

(4) Desirability of utilizing technologies which are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives.

(5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy.

(6) Other relevant factors.

(d) *Media Cleanup Standards.* Except as otherwise provided by § 264.525(d)(2), the Regional Administrator shall specify in the selected remedy requirements for remediation of contaminated media as follows:

(1) Regional Administrator shall specify concentration levels of hazardous constituents in ground water, surface water, air or soils that the remedy must achieve, as necessary to protect human health and the environment. Such media cleanup standards will be established by the Regional Administrator as follows:

(i) The cleanup standard(s) shall be concentration levels in the affected media which protect human health and the environment.

(ii) Unless a lower concentration level is deemed necessary to protect environmental receptors, cleanup standards shall be established as follows:

(A) For known or suspected carcinogens, cleanup standards shall be established at concentration levels which represent an excess upperbound lifetime risk to an individual of between 1×10^{-4} and 1×10^{-6}. The Regional Administrator shall use the 1×10^{-6} risk level as the point of departure in establishing such concentration levels.

(B) For systemic toxicants, cleanup standards shall represent concentration levels to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime.

(iii) In establishing media cleanup standards which meet the requirements of § 264.525(d)(1) (i) and (ii), above, the Regional Administrator may consider the following:

(A) Multiple contaminants in the medium;

(B) Exposure threats to sensitive environmental receptors;

(C) Other site-specific exposure or potential exposure to contaminated media;

(D) The reliability, effectiveness, practicability, or other relevant features of the remedy.

(iv) For ground water and surface water that is a current or potential source of drinking water, the Regional Administrator shall consider maximum contaminant levels promulgated under section 141.2 of the Safe Drinking Water Act (40 CFR part 141 subpart B) in establishing media cleanup standards.

(v) If the permittee can demonstrate to the satisfaction of the Regional Administrator that a specific concentration of a constituent in a medium at the facility is naturally occurring or from a source other than a solid waste management unit at the facility, the cleanup level established under this Subpart for the constituent in the medium shall not be below that specific concentration, unless the Regional Administrator establishes that:

(A) Remediation to levels below that specified concentration is necessary to protect human health and the environment; and

(B) Such remediation is in connection with an areawide cleanup under RCRA or other authorities.

(2) The Regional Administrator may determine that remediation of a release of a constituent from a solid waste management unit to a media cleanup standard established pursuant to § 264.525(d)(1) is not necessary if the permittee demonstrates to the Regional Administrator's satisfaction that:

(i) The affected medium is also contaminated by substances that are naturally occurring or have originated from a source other than a solid waste managment unit at the facility, and those substances are present in concentrations such that remediation of the release from the solid waste management unit would provide no significant reduction in risks to actual or potential receptors; or

(ii) The constituent(s) is present in ground water that:

(A) Is not a current or potential source of drinking water, and

(B) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) greater than an action level(s) specified according to § 264.522; or

(iii) Remediation of the release(s) to media cleanup standards is technically impracticable.

(3) If a determination is made pursuant to paragraph (d)(2) of this section the Regional Administrator may require any alternative measure(s) or standards he or she determines are necessary to protect human health and the environment, including the control of further releases.

(e) *Compliance with media cleanup standards.* The Regional Administrator shall specify in the remedy requirements for achieving compliance with the media cleanup standards established under § 264 525(d) (or alternative levels under § 264.525(d)(1)(v) or (d)(3)), as follows:

(1) The Regional Administrator shall specify where compliance with such standards or levels must be achieved, as follows:

(i) For ground water, the cleanup standard(s) or levels shall be achieved throughout the contaminated ground water, or, at the Regional Administrator's discretion, when waste is left in place, up to the boundary of a waste management area encompassing the original source(s) of release.

The Regional Administrator shall specify the locations at which ground-water monitoring wells must be located for purposes of:

(A) Monitoring the effectiveness of the ground-water remediation program; and

(B) Demonstrating compliance with the ground-water cleanup standard(s) or level(s).

(ii) For air, the cleanup standard(s) or level(s) shall be achieved at the location of the most exposed individual, or other specified point(s) of exposure closer to the source of the release, if determined by the Regional Administrator to be necessary to protect human health and the environment. The Regional Administrator shall specify locations where air monitoring devices must be installed, or what emission modeling or testing, atmospheric dispersion models, or other methods must be used to demonstrate that compliance with any air cleanup standard(s) or level(s) has been achieved at the point(s) of exposure.

(iii) For surface water, the cleanup standard(s) or level(s) shall be achieved at the point where the release(s) enters the surface water. For releases that have accumulated in surface water sediments, the Regional Administrator may, as necessary to protect human health and the environment, require that a cleanup standard(s) or level(s) be achieved at designated locations in the sediments. The Regional Administrator will specify the locations where surface water or sediment samples must be taken to monitor surface water quality, and demonstrate that compliance with any surface water cleanup standard(s) or level(s) has been achieved.

(iv) For soils, the cleanup standard(s) shall be achieved at any point where direct contact exposure to the soils may occur. The Regional Administrator will specify the locations, or methods for determining appropriate locations, where soil samples must be taken to demonstrate compliance with the soil cleanup standard(s) or level(s).

(v) If the owner/operator is unable to obtain the necessary permission to undertake corrective action beyond the facility boundary, and can demonstrate to the satisfaction of the Regional Administration that despite the owner/operator's best efforts. she is as a result unable to achieve media cleanup standards or levels beyond the facility boundary, then media cleanup standards or levels must be achieved to the extent practicable, as specified by the Regional Administrator.

(2) The Regional Administrator will specify in the remedy the sampling and analytical methods, any statistical analyses that may be required. and the frequency(s) of sampling or monitoring

that may be required to characterize levels of hazardous constituents in ground water, surface water, air or soils.

(3) The Regional Administrator will specify in the remedy the length of time during which the permittee must, in order to achieve compliance with a media cleanup standard or level, demonstrate that concentrations of hazardous constituents have not exceeded the standard(s). Factors that may be considered by the Regional Administrator in determining these timing requirements include:

(i) Extent and concentration of the release(s);

(ii) Behavior characteristics of the hazardous constituents in the affected medium;

(iii) Accuracy of monitoring or modeling techniques;

(iv) Characteristics of the affected media; and

(v) Seasonal, meteorological, or other environmental variabilities which may affect the accuracy of monitoring or modeling results

(f) Conditional remedies. (1) If the criteria of § 264.525(f)(2) are met, the Regional Administrator may select a conditional remedy that protects human health and the environment under plausible exposure conditions during the term of the permit.

(2) A conditional remedy must:

(i) Protect human health and the environment; and

(ii) Achieve all media cleanup standards or levels as specified pursuant to paragraphs (d) and (e) of this section beyond the facility boundary as soon as practicable; and

(iii) Prevent further significant environmental degration by implementing, as soon as practicable:

(A) treatment or other necessary engineering controls to control any source(s) of releases; and

(B) engineered measures as necessary to prevent further significant migration of releases within the facility boundary.

(iv) Institute effective institutional or other controls to prevent any significant exposure to hazardous wastes at the facility; and

(v) Continue the monitoring of releases so as to determine whether further significant environmental degradation occurs; and

(vi) Include assurances of financial responsibility for the remedy; and

(vii) Comply with standards for management of wastes as specified in §§ 264.550–264.559 of this subpart.

(3) If at any time during the term of the permit, any condition of paragraph (f)(2) of this section is violated, the Regional Administrator shall modify the permit to:

(i) Require the permittee to perform additional studies or actions, or implement additional controls to achieve compliance with the requirements of paragraph (f)(2) of this section; or

(ii) Require additional studies, actions, or controls as necessary to implement a remedy which meets the standards of § 264.525(a).

(4) The permit shall not be terminated until a remedy which meets the standards of § 264.525(a) has been implemented and certified complete according to § 264.530.

§ 264.526 Permit modification for remedy.

(a) The Regional Administrator shall modify the permit to specify the remedy selected according to § 264.525, according to the procedures for major permit modifications under § 270.41.

(b) The permit modification shall include, at a minimum, the following:

(1) Description of the technical features of the remedy that are necessary for achieving the standards for remedies specified in § 264.525(a) and/or (f).

(2) All media cleanup standards established pursuant to § 264.525(d).

(3) Requirements for achieving compliance with media cleanup standards, pursuant to § 264.525(e).

(4) Requirements for complying with the standards for management of wastes, pursuant to §§ 264.550–264.559.

(5) Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the remedy.

(6) A schedule for initiating and completing the major technical features and milestones of the remedy.

(7) Requirements for submission of reports and other information.

(c)(1) The schedule of compliance specified in the permit modification shall include a schedule for the permittee to demonstrate financial assurance for completing the remedy specified according to § 264.526(b). The schedule shall require the demonstration no later than 120 days after the effective date of the permit modification.

(2) If the remedy requires closure of a hazardous waste management unit, and the schedule of compliance for the remedy supplants or modifies the unit's closure or post-closure plan, the Regional Administrator may partially or fully release existing financial assurance for closure, post-closure, and third party liability required under §§ 264.143, 264.145, and 264.147. Such releases shall not be effective until the financial assurance requirements at § 264.526(c)(1) are satisfied.

(d) A remedy specified in a permit modification may be separated into phases. A remedy phase may consist of any set of actions performed over time, or any actions that are concurrent but located at different areas, provided that the actions are consistent with the final remedy.

§ 264.527 Remedy design.

(a) The Regional Administrator may require the permittee, upon modification of the permit according to § 264.526, to prepare detailed construction plans and specifications to implement the approved remedy at the facility, unless such plans and specifications have already been specified in the permit modification. Such plans shall be subject to review and approval or modification by the Regional Administrator, and shall be developed and submitted in accordance with the permit schedule of compliance. Upon approval by the Regional Administrator, the plan shall be incorporated expressly or by reference into part of the permit schedule of compliance. The plans and specifications must include, but are not limited to, the following:

(1) Designs and specifications for units in which hazardous wastes and non-hazardous solid wastes will be managed, as specified in the approved remedy.

(2) Implementation and long-term maintenance plans.

(3) Project schedule.

(4) Construction quality assurance program.

(b) Upon approval of the plans and specifications for the remedy, the permittee shall—

(1) Implement the remedy in accordance with the plans and specifications, and consistent with the objectives of the remedy specified in the permit;

(2) Place the plans and specifications in the information repository, if required under § 270.36;

(3) Provide written notice of the availability for inspection of the approved plans and specifications for the remedy to all individuals on the facility mailing list. If an information repository has not been required pursuant to § 270.36, the notice shall specify where the plans and specifications are available for inspection; and

(4) Revise the cost estimate used to demonstrate financial assurance under § 264.526(c), if necessary.

§ 264.528 Progress reports.

(a) The permittee may be required by the Regional Administrator to provide

progress reports during the design, construction, operation and maintenance of any remedy. Frequency and format of reports shall be determined by the Regional Administrator and specified in the permit schedule of compliance. Such reports may include, but are not limited to:

(1) Summaries of progress of remedy implementation, including results of monitoring and sampling activities, progress in meeting media cleanup standards, and description of other remediation activities.

(2) Problems encountered during the reporting period. and actions taken or proposed to resolve the problems

(3) Changes in personnel conducting or managing the remedial effort.

(4) Project work for next reporting period.

(5) Copies of laboratory reports and field sampling reports.

(b) All raw data, such as laboratory reports, drilling logs and other supporting information generated from the remedial activities shall be maintained at the facility (or other location approved by the Regional Administrator) during the life of the permit, including the term of any reissued permits.

§ 264.529 Review of remedy implementation.

The Regional Administrator shall periodically review the progress of the remedy. Based on such review, the Regional Administrator may modify the permit schedule of compliance to require additional remedial measures to ensure prompt completion, safety, effectiveness, protectiveness, or reliability of the remedy.

§ 264.530 Completion of remedies.

(a) Remedies specified pursuant to § 264.526 shall be considered complete when the Regional Administrator determines that:

(1) Compliance with all media cleanup standards (or alternate levels) as specified in the permit have been achieved, according to the requirements of § 264.525(e); and

(2) All actions required to control the source(s) of contamination have been satisfied; and

(3) Procedures specified for removal, decontamination, closure, or post-closure care of units, equipment, devices or structures required to implement the remedy have been complied with.

(b) Upon completion of the remedy, the permittee shall submit to the Regional Administrator, by registered mail, a request for termination of the corrective action schedule of compliance according to the procedures for Class III modifications in § 270.42. The request shall include a certification that the remedy has been completed in accordance with the requirements of § 264.530(a), and that all other terms and conditions specified in the permit pursuant to Subpart S have been satisfied. The certification must be signed by the permittee and by an independent professional(s) skilled in the appropriate technical discipline(s).

(c) When, upon receipt of the certification, and in consideration of public comments and any other relevant information, the Regional Administrator determines that the corrective measure remedy has bean completed in accordance with the terms and conditions of the permit and the requirements for remedy completion under § 264.530(a), the Regional Administrator shall:

(1) Modify the permit to terminate the corrective action schedule of compliance, according to the Class III procedures of § 270.42.

(2) Upon modification of the permit, release the permittee from the requirements for financial assurance for corrective action under § 264.500(c) and § 264.90.

(d) If a remedy includes one or more identified phases, the Regional Administrator may:

(1) Require separate certification that the remedy phase has been completed as specified in the permit, to be signed by the permittee and an independent professional(s) skilled in the appropriate technical discipline(s); and

(2) Release the permittee from the requirements for financial assurance for that remedy phase, if the Regional Administrator determines that the remedy phase has been successfully completed.

§ 264.531 Determination of technical impractiability.

(a) The Regional Administrator may determine, based on information developed by the permittee or other information, that compliance with a requirement(s) for the remedy is not technically practicable. In making such determinations, the Regional Administrator shall consider:

(1) The permittee's efforts to achieve compliance with the requirement(s); and

(2) Whether other currently available or new and innovative methods or technologies could practicably achieve compliance with the requirements.

(b) If the Regional Administrator determines that compliance with a remedy requirement is not technically practicable, the Regional Administrator shall modify the permit schedule of compliance to specify as necessary and appropriate:

(1) Further measures that may be required of the permittee to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(2) Alternate levels or measures for cleaning up contaminated media, controlling the source(s) of contamination, or for removal or decontamination of equipment, units, devices, or structures required to implement the remedy which:

(i) Are technically practicable; and

(ii) Are consistent with the overall objectives of the remedy

§§ 264.532-264.539 [Reserved]

§ 264.540 Interim measures.

(a) If, at any time the Regional Administrator determines, based on consideration of the factors specified in § 264.540(b), that a release or, based on site-specific circumstances, a threatened release from a solid waste management unit(s) at the facility poses a threat to human health or the environment, the Regional Administrator may specify in the permit interim measures required of the permittee to abate, minimize, stabilize, mitigate, or eliminate the release(s) or threat of release(s).

(b) The following factors may be considered by the Regional Administrator in determining whether an interim measure(s) is required:

(1) Time required to develop and implement a final remedy;

(2) Actual or potential exposure of nearby populations or environmental receptors to hazardous wastes (including hazardous constituents);

(3) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

(4) Further degradation of the medium which may occur if remedial action is not initiated expeditiously;

(5) Presence of hazardous wastes (including hazardous constituents) in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

(6) Presence of high levels of hazardous wastes (including hazardous constituents) in soils largely at or near the surface, that may migrate;

(7) Weather conditions that may cause hazardous wastes (including hazardous constituents) to migrate or be released;

(8) Risks of fire or explosion, or potential for exposure to hazardous wastes (including hazardous constituents) as a result of an accident

or failure of a container or handling system;

(9) Other situations that may pose threats to human health and the environment.

(c) If the Regional Administrator determines that an interim measure is necessary pursuant to § 264.540(a), the Regional Administrator shall notify the permittee of the necessary actions required. Such actions shall be implemented as soon as practicable, in accordance with a schedule as specified by the Regional Administrator. The Regional Administrator shall modify the permit schedule of compliance, if necessary, to require implementation of an interim measure, in accordance with the procedures of § 270.34 or § 270.41, as appropriate.

(d) Interim measures should, to the extent practicable, be consistent with the objectives of, and contribute to the performance of any remedy which may be required pursuant to § 264.525.

§§ 264.541-549 [Reserved]

§ 264.550 Management of wastes.

(a) All solid wastes which are managed pursuant to a remedy required under § 264.525, or an interim measure required under § 264.540, shall be managed in a manner:

(1) That is protective of human health and the environment; and

(2) That complies with applicable Federal, State and local requirements.

(b) The Regional Administrator shall specify in the permit requirements for units in which wastes will be managed, and other waste managament activities, as determined by the Regional Administrator to be necessary for protection of human health and the environment.

§ 264.551 Management of hazardous wastes.

(a) Except as Provided herein and in paragraphs (b) and (c) of this section any treatment, storage or disposal of listed or identified hazardous waste necessary to implement a remedy or an interim measure shall be in accordance with the applicable standards of 40 CFR parts 262, 264, 268 and 269. Requirements for closure contained in subpart G of 40 CFR part 264, except for § 264.111, may be waived by the Regional Administrator for units created for the purpose of managing corrective action wastes.

(b)(1) For temporary units (except for incinerators and other non-tank thermal treatment units) in which hazardous wastes will be stored or treated, the Regional Administrator may determine that a design, operating, or closure standard(s) applicable to such unit(s) solely by regulation may be replaced by alternative requirements which are protective of human health and the environment.

(2) Any temporary unit to which alernative requirements are applied according to paragraph (b)(1) of this section shall:

(i) Be operated for a period not exceeding 180 calendar days, unless the period is extended under § 264.551(b)(3) below; and

(ii) Be located at the facility; and

(iii) Be used only for treatment or storage of hazardous wastes (including hazardous constituents), or other solid wastes that have originated within the boundary of the facility.

(3) The Regional Administrator may grant an extension to the 180-day period of a temporary unit if hazardous wastes must remain in the unit due to unforeseen, temporary, and uncontrollable circumstances. The owner/operator must request this extension as a Class I modification, with Director approval, under the procedures of § 270.42.

(4) In establishing standards to be applied to temporary units, the Regional Administrator shall consider the following factors:

(i) The length of time such unit(s) will be in operation.

(ii) Type of unit, and volumes of wastes to be managed.

(iii) Potential for releases from the unit(s).

(iv) Physical and chemical characteristics of the wastes to be managed in the unit(s).

(v) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential releases.

(vi) Potential for exposure of humans and environmental receptors if releases were to occur from the unit(s).

(5) The Regional Administrator shall specify in the permit the length of time that such units will be allowed to operate, and specific design, operating, and closure requirements for the unit(s).

(c) For the purposes of implementing remedies under this subpart, the Regional Administrator may designate an area of contamination as a corrective action management unit.

(1) Movement or consolidation of wastes within a corrective action management unit will not constitute placement of hazardous wastes in a hazardous waste management unit.

(2) Consolidation of wastes within the corrective action management unit will not constitute creation of a new, replacement, or lateral expansion of a hazardous waste management unit.

(3) In making determinations as to whether a corrective action management unit is appropriate for implementing a remedy at a facility, and/or the nature and configuration of a corrective action management unit at a facility, the Regional Administrator may consider the following:

(i) The nature, extent and location of surficial contamination at the facility;

(ii) The potential benefits of a corrective action management unit in achieving remedial objectives for the facility, including (but not limited to):

(A) Expediting the timing of remedy implementation; and

(B) Enhancing the effectiveness, cost-effectiveness, reliability or protectiveness of a remedy;

(iii) The practicability of alternative remedial approaches; or

(iv) Other relevant factors.

(4) The requirements of subpart G of 40 CFR part 264 will not apply to corrective action management units. The Regional Administrator will specify in the permit closure requirements for any corrective action management unit, in consideration of the following factors:

(i) Unit characteristics;

(ii) Volume of wastes which will remain after closure;

(iii) Potential for releases from the unit;

(iv) Physical and chemical characteristics of the wastes;

(v) Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential releases; and

(vi) Potential for exposure of humans and environmental receptors if releases were to occur from the unit.

(5) Closure requirements specified for corrective action management units under paragraph (c)(3) of this section shall:

(i) Minimize the need for further maintenance; and

(ii) Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

(6) The Regional Administrator will specify in the permit post-closure requirements for any corrective action management unit, as necessary to protect human health and the environment, including monitoring and maintenance activities and the frequency with which they will be performed to ensure the integrity of the

cap, final cover, or other containment system.

§ 264.552 Management of non-hazardous solid wastes.

(a) Treatment, storage and disposal of non-hazardous solid wastes pursuant to a remedy or interim measure required under this subpart shall be in accordance with applicable technical standards for solid waste management as specified in regulations promulgated pursuant to RCRA subtitle D.

(b) For any unit in which non-hazardous solid wastes will be managed pursuant to a remedy or interim measure, the Regional Administrator may specify additional design and operating standards for the unit(s), as necessary to protect human health and the environment. In determining appropriate design and operating requirements for such units, the Regional Administrator shall consider the factors specified under § 264.551(b)(2).

§§ 264.553-264.559 [Reserved]

§ 264.560 Required notices.

(a) *Notification of ground-water contamination.* If at any time the permitted discovers that hazardous constituents in ground water that may have been released from a solid waste management unit at the facility have migrated beyond the facility boundary in concentrations that exceed action levels (as defined under § 264.521), the permittee shall, within fifteen days of discovery, provide written notice to the Regional Administrator and any person who owns or resides on the land which overlies the contaminated ground water.

(b) *Notification of air contamination.* If at any time the permittee discovers that hazardous constituents in air that may have been released from a solid waste management unit at the facility have or are migrating to areas beyond the facility boundary in concentrations that exceed action levels (as defined under § 264.521), and that residences or other places at which continuous, long-term exposure to such constituents might occur are located within such areas, the permittee shall, within fifteen days of such discovery:

(1) Provide written notification to the Regional Administrator; and

(2) Initiate any actions that may be necessary to provide notice to all individuals who have or may have been subject to such exposure.

(c) Notification of residual contamination. If hazardous wastes or hazardous constituents in solid waste management units, or which have been released from solid waste management units, will remain in or on the land after the term of the permit has expired, the Regional Administrator may require the permittee to record, in accordance with State law, a notation in the deed to the facility property or in some other instrument which is normally examined during title search that will, in perpetuity, notify any potential purchaser of the property of the types, concentrations and locations of such hazardous wastes or hazardous constituents.

PART 265—INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

6. The authority citation for part 265 continues to read as follows:

Authority: 42 U.S.C. 6905, 6924, and 6925.

7. In 40 CFR part 265, subpart G, it is proposed to amend § 265.112(b) by adding new paragraph (b)(8). and to amend § 265.113 by redesignating paragraphs (a)(1)(ii) as (a)(1)(iii) and (b)(1)(ii) as (b)(1)(iii), and by adding new paragraphs (a)(1)(ii) and (b)(1)(ii) to read as follows:

§ 265.112 Closure plan, amendment of plan.

* * * * *

(b) * * *

(8) Information which complies with the requirements of 40 CFR 270.14(d) for all solid waste management units at the facility.

* * * * *

§ 265.113 Closure, time allowed for closure.

* * * * *

(a) * * *

(1) * * *

(ii) Corrective action required at the unit or the facility under subpart S will delay the completion of partial or final closure; or

* * * * *

(b) * * *

(1) * * *

(ii) Corrective action required at the unit or the facility under subpart S will delay the completion of partial or final closure: or

* * * * *

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

8. The authority citation for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6925, 6927, and 6974

9. It is proposed to amend paragraph (c) of § 270.1 by adding the following introductory text immediately before the sentence which begins "The denial of a permit for the active life * * *," as follows:

§ 270.1 Purpose and scope of these regulations.

* * * * *

(c) * * * Owners and operators must also have permits covering any period necessary to comply with the requirements of subpart S of part 264.* * *

* * * * *

10. It is proposed to amend § 270.30(l) by adding new paragraph (l)(12) to read as follows:

§ 270.30 Conditions applicable to all permits.

* * * * *

(l) * * *

(12) *Information pertinent to corrective action requirements.* (i) If the permittee discovers additional solid waste management units or learns of releases of hazardous wastes (including hazardous constituents) from previously identified or newly discovered solid waste management units at the facility, the permittee shall submit the following information to the Director:

(A) *Identification of additional solid waste management unit(s).* Within thirty days of the receipt of information about a previously unknown and unreported solid waste management unit at the facility (as defined in 40 CFR 264.501), the permittee shall submit the following information to the Director:

(*1*) The location of the unit on the topographic map submitted as part of the part B application in accordance with 40 CFR 270.14(b)(19) or a topographic map of comparable scale which clearly indicates the location of the unit in relation to other solid waste management units at the facility.

(*2*) Designation of type of unit.

(*3*) General dimensions of the unit.

(*4*) When the unit was operated.

(*5*) Specification of all wastes that have been managed in the unit, if available.

(*6*) All available information pertaining to any release of hazardous wastes (including hazardous constituents) from the unit.

(B) Sampling and analysis data. The Director may require the permittee to perform sampling and analysis of ground water (which may involve the installation of wells), soils, surface water, or air, as necessary to determine whether a release(s) from such unit(s)

has occurred, is likely to have occurred, or will likely occur.

(C) *Releases of hazardous waste.* If the permittee discovers a release of hazardous wastes (including hazardous constituents) from a solid waste management unit at the facility that may pose a threat to human health and the environment, the permittee shall, within twenty days of the discovery, submit the following information to the Director:

(*1*) Identification of the solid waste management unit(s) from which the release has occurred, to include the type of unit, and location of the unit clearly indicated on a facility map; and

(*2*) Any other information currently available concerning the release, including potential exposure pathways, controls already imposed to address the release, and any action planned for further cleanup.

(ii) Based upon information supplied under (A), (B), or (C) above the Director may, as necessary, require further investigations or corrective measures in accordance with the standards for corrective action specified in 40 CFR subpart S. Such additional activities shall, if necessary, be specified by modifying an existing schedule of compliance according to § 270.34(c), or by initiating a permit modification according to § 270.41.

* * * * *

11. Section 270.33 is amended by adding the following sentence at the end of paragraph (a) to read as follows:

§ 270.33 Schedules of Compliance

(a) * * * Schedules of compliance for corrective action are governed solely by § 270.34.

* * * * *

12.* * * It is proposed to amend 40 CFR part 270, subpart C, by adding new § 270.34 to read as follows:

§ 270.34 Schedules of compliances for corrective action.

Schedules of compliance for corrective action are governed by this section and not § 270.33.

(a) The Director may include a schedule of compliance in the permit for purposes of specifying the terms and conditions necessary for the permittee to comply with the requirements of subpart S of part 264. Permit schedules of compliance issued under this section shall contain terms and conditions deemed by the Director to be necessary to protect human health and the environment.

(b) The permittee shall adhere to the schedules specified in the permit. If at any time the permittee determines that schedules cannot be met, the permittee shall, within 15 days of such determination, notify the Director and submit a request for a permit modification under § 270.42, with an explanation of why the current schedule cannot be met.

(c) The Director may modify the permit to include conditions in the schedule of compliance as necessary to comply with the requirements of subpart S of part 264. The following procedures will be followed unless the Director determines instead that it is appropriate to modify the permit pursuant to § 270.41(a)(5)(ix):

(1) The Director will notify the permittee in writing of the proposed modification. Such notice will:

(i) Describe the exact change(s) to be made to the permit conditions;

(ii) Provide an explanation of why the modification is needed; and

(iii) Provide notification of the date by which comments on the proposed modification must be received. Such date will not be less than twenty days from the date the notice of proposed modification is received by the permittee, or after the public notice is published under § 270.34(c)(2);

(iv) Provide notification that supporting documentation or data may be available for inspection at the Regional or State office; and

(v) Include the name and address of an Agency contact to whom comments may be sent.

(2) The Director shall:

(i) Publish a notice of the proposed modification in a newspaper distributed in the locality of the facility, which includes notice of items (1)(i)–(v);

(ii) Mail a notice of the proposed modification to all persons on the facility mailing list maintained according to 40 CFR 124.10(c)(1)(viii). Such notice will include items (1)(i)–(v), and shall be mailed concurrently with notice to the permittee;

(iii) For facilities which have established an information repository pursuant to § 270.36, the Director shall place a notification of the proposed modification, including items (1)(i)–(v), in the information repository concurrently with actions taken under (i)–(ii).

(3) If the Director receives no written comment on the proposed modification, the modification will become effective five days after the close of the comment period; the Director will promptly notify the permittee and individuals on the facility mailing list in writing that the modification has become effective, and will place a copy of the modified permit in the information repository if a repository is maintained for the facility.

(4) If the Director receives written comment on the proposed modification, the Director shall make a final determination concerning the modification within thirty days after the end of the comment period if practicable. The Director shall then:

(i) Notify the permittee in writing of the final decision. Such notification shall:

(A) Indicate the effective date of the modification, which shall be no later than fifteen days after the date of notification of the final modification decision,

(B) Include an explanation of how comments were considered in developing the final modification, and

(C) Provide a copy of the final modification;

(ii) Provide notice of the final modification decision, including paragraphs (c)(4)(i)(A) and (i)(B) of this section, in a newspaper of local distribution in the vicinity of the facility; and

(iii) Place a copy of items (i)(A)–(i)(C) in the information repository for the facility if such a repository is maintained.

(5) Modifications initiated and finalized by the Director using procedures in § 270.34(c) are not subject to administrative appeal.

* * * * *

B. It is proposed to amend 40 CFR part 270, subpart C, by adding new

§ 270.36 Information repository.

(a) At any time during conduct of investigations or other activities required under part 264, subpart S, the Director may require the permittee to establish and maintain an information repository for the purpose of making accessible to interested parties documents, reports and other public information developed pursuant to investigations and activities required under part 264, subpart S.

(b) The information repository shall contain all documents, reports, data and other information which the Director deems relevant to public understanding of the activities, findings and plans for such corrective action initiatives.

(c) The information repository shall, when feasible, be located within reasonable distance of the facility, or if not feasible, at the facility. The repository shall be accessible to the public during reasonable hours, as required by the Director.

(d) In the permit schedule of compliance, the Director shall specify requirements for informing the public about the information repository. At a minimum, written notice about the information repository shall be given to

all individuals on the facility mailing list.

(e) Information regarding procedures for submission of comments shall be made available at the repository.

* * * * *

14. It is proposed to amend § 270.41 by revising the introductory text and by adding new paragraph (a)(5)(ix) to read as follows:

§ 270.41 Modification or revocation and reissuance of permits.

When the Director receives any information (for example, inspects the facility, receives information submitted by the permittee as required in the permit (see § 270.30), receives a request for modification or revocation and reissuance under § 124.5, or conducts a review of the permit file) he or she may determine whether one or more of the causes listed in paragraphs (a) and (b) of this section for modification, or revocation and reissuance or both exist. If cause exists, the Director may modify or revoke and reissue the permit accordingly, subject to the limitations of paragraph (c) of this section, and may request an updated application if necessary. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term. (See 40 CFR 124.5(c)(2).) If cause does not exist under this section, the Director shall not modify or revoke and reissue the permit, except on request of the permittee or in accordance with § 270.34(c). If a permit modification is requested by the permittee, the Director shall approve or deny the request according to the procedures of 40 CFR 270.42. The Director may also modify the permit schedule of compliance for corrective action under the procedures of § 270.34(c). Otherwise, a draft permit must be prepared and other procedures in part 124 (or procedures of an approved State program) followed.

(a) * * *

(5) * * *

(ix) The Director determines good cause exists for modification of the permit for the purposes of compliance with subpart S of part 264.

* * * * *

15. It is proposed to revise paragraphs (b)(3)(i) and (c)(3)(vii) of § 270.60 as follows:

§ 270.60 Permits by rule.

* * * * *

(b) * * *

(3) * * *

(i) Complies with 40 CFR subpart S; and

* * * * *

(c) * * *

(3) * * *

(vii) for NPDES permits issued after November 8, 1984, 40 CFR subpart S.

* * * * *

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

16. The authority citation for part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), and 6926.

17. It is proposed to amend § 271.1(j) by adding the following entry in Table 1 in chronological order by date of publication:

§ 271.1 [Amended]

TABLE 1—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Date	Title of Regulation
* * * * *	
July 27, 1990	Corrective Action for Solid Waste Management Units.
* * * * *	

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