

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Ch. I

[FRL-5460-2]

RIN 2050-AB80

Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Advance notice of proposed rulemaking.

SUMMARY: Today's action has three purposes. First, it introduces EPA's strategy for promulgating regulations governing corrective action for releases from solid waste management units at hazardous waste management facilities under the Resource Conservation and Recovery Act (RCRA) and requests information to assist in identification and development of potential improvements to the protectiveness, responsiveness, speed or efficiency of corrective actions. The Agency originally proposed corrective action regulations on July 27, 1990. Second, to provide context for potential revisions to the corrective action program, today's Notice includes a general status report on the corrective action program and how it has evolved since the 1990 proposal, and provides guidance on a number of topics not fully addressed in 1990. Third, it emphasizes areas of flexibility within the current program and describes program improvements currently underway or under consideration.

DATES: To ensure consideration, information and data must be received on or before July 30, 1996.

EPA will hold a public hearing on this Notice on June 3, 1996.

ADDRESSES: Written comments responding to today's Notice should be addressed to: Docket Clerk, U.S. Environmental Protection Agency, RCRA Docket (OS-305), 401 M Street SW, Washington, D.C. 20460. Comments sent by special delivery, such as overnight express services, should be addressed to: RCRA Docket Information Center (RIC), Crystal Gateway One, 1235 Jefferson Davis Highway, First Floor, Arlington, VA 22202. Electronic comments should be addressed to: RCRA-Docket@epamail.epa.gov.

The June 3, 1996 public hearing will be held at the Key Bridge Marriott, located at 1401 Lee Highway, Arlington, VA 22209. Advance requests to speak at the hearing should be submitted, in

writing, to: Hugh Davis (5303W) U. S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.

For important additional instructions on submitting comments or making a request to speak at the public hearing, see Supplementary Information.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at (800) 424-9346 (toll-free) or (800) 553-7672 (hearing impaired), or (703) 412-9810 (locally), Monday-Friday, 8:00-5:00 eastern standard time. For technical information, contact Hugh Davis, Office of Solid Waste (5303W), U.S. Environmental Protection Agency, 401 M Street SW, Washington, D.C. 20460. Phone, (703) 308-8633. E-mail address, davis.hugh@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

Instructions for Submitting Comments and Requests To Speak at the Public Hearing

Commenters should place the docket number (F-96-CA2P-FFFFF) on all comments and submit an original and two copies. Comments also may be submitted electronically, through the Internet. Comments submitted electronically should be in ASCII to avoid the use of special characters and encryptions.

The official record for this action will be kept in paper form. EPA will transfer all comments received electronically into paper form and place them, with comments submitted directly in writing, in the official record. EPA responses to comments will be recorded in a notice in the Federal Register or in an official record for this action. EPA will not immediately reply to electronic comments other than to seek clarification of comments that may be garbled in transmission or during conversion to paper form.

Confidential business information (CBI) may be included in comments, however, to ensure continued confidentiality, it must be submitted under separate cover. If including CBI, commenters should submit an original and two copies to: U.S. Environmental Protection Agency, RCRA CBI Document Control Officer, OSW (5303W), 401 M Street SW, Washington, D.C. 20460. Place the docket number (F-96-CA2P-FFFFF) on the CBI and include a reference to any non-CBI comments submitted. Do not submit CBI electronically.

Docket materials may be reviewed by appointment by calling (703) 603-9230. The docket is located on the first floor of the Crystal Gateway building at 1235 Jefferson Davis Highway in Arlington, Virginia and is open from 9:00 a.m. to

4:00 p.m., Monday through Friday, excluding Federal holidays. A maximum of 100 pages of material may be copied at no cost from any one regulatory docket. Additional copies are \$0.15 per page. The main switchboard number for the hotel is (703) 524-6400.

Individuals interested in directions to the June 3, 1996 public hearing at the Key Bridge Marriott or room reservations should contact the hotel directly at (703) 524-6400. Registration for the hearing will begin at the hotel at 8:30 a.m. The hearing will begin at 9:00 a.m. and end at 5:00 pm unless concluded earlier. Oral and written statements may be submitted at the public hearing. Time for the public hearing is limited; oral presentations will be made in the order that requests are received and will be limited to 15 minutes, unless additional time is available. Advance requests to speak at the public hearing should be clearly marked as a request to speak at the public hearing and include the scheduled date of the hearing (June 3, 1996) and the docket number for this action (F-96-CA2P-FFFFF). Requests to speak at the public hearing may also be made on the day of the hearing, by registering at the door; request to speak by individuals who choose to register at the door on the day of the hearing will be granted in the order received, as time permits. All individuals who choose to speak at the public hearing are requested to provide a paper copy of their testimony for the record.

Internet Access

This notice is available on the Internet. To access today's Notice electronically:

Gopher: gopher.epa.gov
WWW: <http://www.epa.gov>
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From the main EPA Gopher menu, select: EPA Offices and Regions/Office of Solid Waste and Emergency Response (OSWER)/Office of Solid Waste (RCRA)/Hazardous Waste/Corrective Action.

FTP: [ftp.epa.gov](ftp://ftp.epa.gov)
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Glossary of Commonly Used Acronyms

ASTM—American Society for Testing and Materials
ASTSWMO—Association of State and Territorial Solid Waste Management Officials
CAMU—Corrective Action Management Unit
CAP—Corrective Action Plan
CERCLA—Comprehensive Environmental Response, Compensation and Liability Act
CMI—Corrective Measures Implementation

- CMS—Corrective Measures Study
 CSGWPP—Comprehensive State Groundwater Protection Program
 DQO—Data Quality Objective
 EAB—Environmental Appeals Board
 FACA—Financial Assurance for Corrective Action
 HSWA—Hazardous and Solid Waste Amendments
 LDR—RCRA Land Disposal Restrictions
 MCL—Maximum Contaminant Limit
 MTR—RCRA Minimum Technology Requirements
 NCAPS—National Corrective Action Prioritization System
 NPL—National Priorities List
 NCP—National Oil and Hazardous Substances Pollution Contingency Plan
 OSW—EPA Office of Solid Waste
 OSWER—EPA Office of Solid Waste and Emergency Response
 POC—Point of Compliance
 RBCA—Risk Based Corrective Action (refers to ASTM standard E1739-95)
 RCRA—Resource Conservation and Recovery Act
 RFA—RCRA Facility Assessment
 RFI—RCRA Facility Investigation
 RU—Regulated Unit
 SWMU—Solid Waste Management Unit
 SSG—EPA Soil Screening Guidance
 TI—Technical Impracticability
 TSDF—Treatment, Storage, or Disposal Facility
 UST—Underground Storage Tank
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- I. Background
- A. *Statutory and Regulatory Requirements*
- In the 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA), Congress directed EPA to require corrective action for all releases of hazardous waste and hazardous constituents from solid waste management units at facilities seeking RCRA permits (i.e., hazardous waste Treatment, Storage or Disposal Facilities or TSDFs) regardless of the time at which waste was placed in the units. When corrective action cannot be completed prior to permit issuance, the statute directs EPA to specify corrective action schedules of compliance and financial assurance in all permits issued under RCRA section 3005. In addition, EPA is directed to require that corrective action be taken beyond facility boundaries unless facility owners/operators demonstrate to the Agency's satisfaction that, despite their best efforts, they were unable to obtain the necessary permission to undertake off-site corrective action. (See, RCRA section 3004 (u) and (v), 42 U.S.C. 6924 (u) and (v).) At the same time, Congress enacted the RCRA permit omnibus provision directing that, "each permit issued under [RCRA Section 3005] contain such terms and conditions as the Administrator determines necessary to protect human health and the environment." (See, RCRA sections 3005(C)(3), 42 U.S.C. 6925(c)(3).) EPA is authorized to require corrective action

at interim status facilities under RCRA section 3008(h), 42 U.S.C. 6928(h).

At the time the new corrective action provisions were enacted, corrective action for releases to groundwater from RCRA regulated units was already required under 40 CFR part 264, subpart F. RCRA regulated units are defined in 40 CFR 264.90 as surface impoundments, waste piles, land treatment units, and landfills that received hazardous waste after July 26, 1982; they are a subset of the universe of solid waste management units. The 1984 HSWA amendments extended corrective action authority at TSDFs to all waste management at units that received solid or hazardous waste at any time. In the legislative history of RCRA section 3004(u), Congress noted that one purpose of the new corrective action requirements was to ensure that RCRA facilities did not become Superfund cleanup sites. The legislative history records that, "Unless all hazardous constituents released from solid waste management units at permitted facilities are addressed and cleaned up the Committee is deeply concerned that many more sites will be added to the future burdens of the Superfund program with little prospect for control or cleanup. The responsibility to control such releases lies with the facility owner and operator and should not be shifted to the Superfund program, particularly when a final permit has been requested by the facility." (See, H.R. Rep. No. 198, 98th Cong., 1st Sess., part 1, 61 (1983).)

In July 1985, EPA codified corrective action requirements at 40 CFR 264.90(a)(2); 264.101; 270.60(b) and 270.60(c). (See, 50 FR 28702, July 15, 1985.) These regulations reiterate the statutory language of RCRA section 3004(u) by requiring facility owners/operators seeking RCRA permits to institute corrective action, as necessary to protect human health and the environment, for all releases of hazardous waste and constituents from solid waste management units at the facility. When corrective action cannot be completed prior to permitting, EPA requires that all permits contain corrective action requirements, schedules of compliance, and financial assurance. In 40 CFR 270.60(b) and 270.60(c), EPA clarified that corrective action is also required for some facilities with RCRA permits-by-rule, including hazardous waste management facilities with permits issued under the Underground Injection Control program and the National Pollution Discharge Elimination System (NPDES) permitting program.

In December 1987 (52 FR 45788, December 1, 1987), EPA promulgated additional corrective action regulations to codify the statutory language of RCRA § 3004(v), requiring corrective action for releases beyond the facility boundary. EPA also established permit application requirements necessary to support corrective action implementation, and modified the corrective action requirements for underground injection wells with RCRA permits-by-rule.

On July 27, 1990 (55 FR 30798), EPA proposed detailed regulations to govern the RCRA corrective action program. The 1990 proposal was designed to be the analogue to the CERCLA program's National Oil and Hazardous Substances Pollution Contingency Plan (NCP). As such, it addressed both technical (e.g., cleanup levels, remedy selection, points of compliance) and procedural (e.g., definitions, permitting, reporting) elements of the corrective action program. In the 1990 proposal, EPA emphasized the need for site-specific flexibility in cleanup programs. The Agency stated, "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." (See, 55 FR 30802.)

The 1990 proposal was the subject of significant public comment. Although EPA has finalized only a few sections of the 1990 proposal,¹ the bulk of the proposal is routinely used as guidance during corrective actions.

B. Summary of Today's Notice

Today's Notice introduces EPA's strategy for promulgation of corrective action regulations and requests public input on a variety of issues and concepts associated with corrective action. To provide context for potential revisions to the corrective action program and because the Agency's philosophy and strategies have evolved in many respects since 1990, today's Notice also includes a general status report on the corrective action program and how it has grown since the 1990 proposal, and provides guidance on a number of topics not fully addressed in 1990. Finally, today's Notice

¹ See 58 FR 8658, February 16, 1993, "Corrective Action Management Units" where EPA finalized regulations addressing the creation, management, and closure of units created specifically for purposes of managing remediation wastes.

emphasizes the flexibility inherent in the existing corrective action program, discusses steps EPA is already taking to improve corrective actions and requests comments on new approaches to expedite and simplify facility cleanups.

In Section I of today's Notice, EPA identifies the statutory and regulatory basis of the corrective action program.

Section II of today's Notice introduces EPA's Subpart S Initiative. Through the Subpart S Initiative the Agency intends to identify and implement improvements to the protectiveness, responsiveness, speed and efficiency of the corrective action program. Section II includes discussions of the Subpart S Initiative objectives, outreach, and schedule. It also includes discussions of major corrective action program guidance and policy milestones that have occurred since 1990, and the relationship of the Subpart S Initiative to other agency rulemakings and initiatives.

In Section III, EPA discusses corrective action implementation, describes how certain program elements have evolved since 1990, and provides guidance on a number of topics that were not fully addressed in the 1990 proposal. This section emphasizes areas of flexibility in the current corrective action program and highlights innovative approaches some program implementors and facility owners/operators have used to expedite cleanups. Readers are urged to pay particular attention to Section III in order to gain an overall understanding of the Agency's latest thinking on corrective action implementation.

Section IV of today's Notice builds on the detailed discussions in Section III by providing concise statements of EPA's corrective action implementation goals and strategies.

In Section V of today's Notice, EPA requests comments and data on a variety of issues to assist it in identifying and developing improvements to the corrective action program. In some cases, the Agency raises new concepts that would likely warrant re-proposing regulations or developing new guidance documents; in other cases, concepts were addressed in the 1990 proposal but are included in Section V because the Agency is requesting additional comment and data at this time.

II. Subpart S Initiative

EPA and the states have made considerable progress in implementing the corrective action requirements; however, despite this progress, the overall implementation of the corrective action program has been subject to considerable criticism. States,

environmental groups and the regulated community have raised many concerns, including: slow progress in achieving cleanup or other environmental results; an emphasis on process and reports over actual work in the field; unrealistic, impractical or overly conservative cleanup goals; excessive and detailed oversight; reluctance to authorize or recognize the work of state cleanup programs; and, lack of meaningful public participation. EPA believes that many of these concerns have been overstated; however, at the same time, it recognizes that improvements to the corrective action program are necessary. EPA and the states now have more than ten years experience in implementing the corrective action requirements. EPA believes the time has come to reevaluate the RCRA corrective action program to identify and implement improvements to the program's speed, efficiency, protectiveness and responsiveness, and to focus the program more clearly on environmental results. The reevaluation effort is known as the Subpart S Initiative.

As part of the Subpart S Initiative, EPA has been working with states and other stakeholders to develop a comprehensive strategy to identify and develop improvements to the corrective action program and promulgate final corrective action regulations. The Subpart S Initiative involves assessment of the current corrective action program, outreach to stakeholders, finalization of some elements of the 1990 proposal, development of new proposals and guidance documents, and today's Notice.

EPA is committed to substantive consistency among its cleanup programs. For that reason, the Subpart S Initiative is being coordinated closely with the Superfund program, including the Superfund administrative improvements efforts and Superfund reauthorization activities.

A. Objectives

Taking into consideration corrective action implementation experience, recent feedback from stakeholders, and the comments received on the 1990 proposal, EPA has developed five objectives for the Subpart S Initiative:

- (1) Create a consistent, holistic approach to cleanups at RCRA facilities;
- (2) Establish protective, practical cleanup expectations;
- (3) Shift more of the responsibilities for achieving cleanup goals to the regulated community;
- (4) Focus on opportunities to streamline and reduce costs; and,
- (5) Enhance opportunities for timely, meaningful public participation.

Implementation of these five objectives will involve new approaches to corrective action and may necessitate significant revisions to the existing corrective action program. In adopting any new approach, EPA will not sacrifice protection of human health and the environment or the meaningful involvement of the public and affected communities.

B. Outreach

EPA believes the experiences of states, the regulated community, other Federal agencies, and environmental and public interest groups will be tremendously valuable as it works to identify and develop improvements to the corrective action program. Today's Notice reflects the involvement of interested stakeholder groups, as discussed below. EPA is committed to a continuing and meaningful dialogue with these groups as the Subpart S Initiative develops. As the Subpart S Initiative progress, EPA will continue to identify interested stakeholder groups and invite their input and involvement.

1. States

In December and January 1995, EPA met twice with interested state representatives to solicit their early input in the Subpart S Initiative. In general, these state representatives advised that the corrective action program: Retain considerable flexibility; emphasize results over process; be generally consistent with the CERCLA program; address consistency issues within the RCRA program (e.g., between cleanups at SWMUs and regulated units); address risk assessment and risk management, including ecological risk; empower states and expedite state authorization; and, encourage stabilization without discouraging final cleanups. State representatives also strongly advised against finalizing corrective action regulations in pieces, favoring the comprehensive approach reflected in today's Notice. The ongoing role of the states in the Subpart S Initiative is discussed below.

2. Environmental and Public Interest Community

EPA wrote nine environmental and public interest groups requesting their early involvement in the Subpart S Initiative. To date, EPA has met with one environmental group, the Environmental Defense Fund (EDF). The Environmental Defense Fund expressed support for changes in the corrective action program to improve the speed and efficiency of cleanups and increase opportunities for meaningful public participation. Their suggestions include:

tailoring the level of public participation to the level of community interest; including opportunities for public participation throughout the cleanup process; using risk goals and clearly defined cleanup standards to make cleanups more efficient; maintaining a throughout-the-plume/unit boundary cleanup point of compliance; and, using deed restrictions at non-residential cleanups. While EDF expressed general support for consistency in technical matters between RCRA and CERCLA, they also expressed the opinion that operating hazardous waste management facilities, such as those typically addressed by RCRA corrective action, have an ongoing responsibility to their communities and should, perhaps, be held to higher cleanup standards than abandoned (i.e., Superfund) sites. EPA welcomes the continued involvement of EDF in the Subpart S Initiative and will continue to look for opportunities to involve other environmental and public interest groups.

3. Regulated Community

EPA met with and received written materials from a variety of industry groups which offered their suggestions for improvements to the corrective action program. In general, industry groups expressed frustration with the pace and cost of corrective actions and what they perceive as overly stringent cleanup criteria. Their suggestions include increased reliance on performance standards, more emphasis on non-residential future land use scenarios, and improved coordination with other applicable cleanup authorities (e.g., the Superfund program and state cleanup programs). EPA welcomes the continued involvement of the regulated community in development of the Subpart S Initiative.

4. Other Federal Agencies

During Spring and Summer 1995, EPA held a series of meetings with other Federal agencies, including, the Department of Defense (DOD), the Department of Energy (DOE), the Department of Agriculture, the Council on Environmental Quality (CEQ), and the Office of Management and Budget (OMB). Many of these agencies own or operate facilities which are subject to RCRA corrective action. During these meetings, EPA and the other Federal agencies discussed potential improvements to the RCRA corrective action and Superfund programs. EPA will continue these discussions during development of the Subpart S Initiative.

The Department of Defense and the Department of Energy reviewed and

provided comments on a draft version of today's Notice and EPA met with DOD and DOE representatives to discuss their comments and suggested changes.

C. On-Going Role of the States

The states are the primary implementors of the corrective action program. Because of this, EPA has actively solicited state input and participation in the Subpart S Initiative and is developing the Initiative in full partnership with the states. As of today's Notice, thirteen states² have agreed to participate in the Subpart S Initiative as co-regulators. During the co-regulation process, state representatives participate actively in development of policy and regulatory options and analyses. As discussed above, EPA has held two meetings with state representatives to discuss development of the Subpart S Initiative; three additional meetings and a fifty-state review of any regulatory proposals are planned. In addition, representatives of interested states participated actively in development of today's Notice and reviewed and provided comment on numerous drafts.

D. Strategy and Schedule

The Subpart S Initiative will include development of guidance and policy documents and rulemaking. EPA intends to publish rule language in fall 1997. In order to present the Agency's visions for the corrective action program and regulations in totality, the 1997 publication will promulgate elements of the 1990 proposal that the Agency believes do not need additional public review and will re-propose other program elements. Based in part on comments received in response to Section V.B of today's Notice, EPA will determine which elements of the 1990 proposal will be finalized without further comment and which elements will be re-proposed.

Guidance and policy development will play an important role in the Subpart S Initiative. The balance between guidance and policy development and rulemaking will be determined, in part, by comments received on today's Notice. Section V.A of this Notice requests specific recommendations for additional policy or guidance development.

E. Major Corrective Action Program Developments Since 1990

The Subpart S Initiative builds on several recent and important

developments in the corrective action program. Many of these program developments are addressed in the EPA guidance documents discussed below; other program developments were associated with promulgation of the Corrective Action Management Unit (CAMU) regulations, also discussed below. A complete list of corrective action guidance documents is available in the "RCRA Corrective Action Plan," EPA/520-R-94-004, OSWER Directive 9902.3-2A, May 1994, included in the docket for today's Notice.

1. Stabilization Initiative

EPA's early implementation of the corrective action program focused on final, comprehensive cleanups at a limited number of facilities. As EPA and states gained more experience, it became clear that, at many sites, final cleanups were difficult and time-consuming to achieve and that an emphasis on final remedies at a few sites could divert limited resources from addressing ongoing releases and environmental threats at many other sites. As a result, in 1991, the Agency established the Stabilization Initiative as one of the primary implementation objectives for the corrective action program. The goal of the Stabilization Initiative is to increase the rate of corrective actions by focusing on near-term activities to control or abate threats to human health and the environment and prevent or minimize the further spread of contamination. Through the Stabilization Initiative, the Agency is seeking to achieve an increased overall level of environmental protection by implementing a greater number of actions across many facilities rather than following the more traditional process of pursuing final, comprehensive remedies at a few facilities.

Controlling exposures or the migration of a release may stabilize a facility, but does not necessarily mean that a facility is completely cleaned up. At some stabilized facilities, contamination is still present and additional investigations or remediation may eventually be required; however, as long as the stabilization measures are maintained, stabilized facilities should not present unacceptable near-term risks to human health or the environment and program implementors and facility owners/operators have the opportunity to shift their resources (either at the stabilized facility or among facilities) to additional health or environmental concerns. Stabilization actions should be a component of, or at least consistent with, final remedies. More information on the Stabilization Initiative is

available in the 1991 guidance memorandum "Managing the Corrective Action Program for Environmental Results: The RCRA Facility Stabilization Effort" and in Section III.C.3 of today's Notice.

2. Environmental Indicators for Corrective Action

Critics of the corrective action program have often charged that EPA focuses too much on administrative processes rather than actual cleanups. As an example of this problem, critics cite Agency management systems which often track the number of paperwork deliverables (e.g., work plans approved) rather than achievement of environmental results. In response to these concerns and the Government Performance and Results Act of 1993, EPA is moving the corrective action program away from more traditional management systems and, consistent with a broader Agency-wide effort, now focuses management of the corrective action program on environmental indicators. Two specific environmental indicators have been developed for the corrective action program. These indicators are: Human Exposures Controlled Determination and Groundwater Releases Controlled Determination. The environmental indicators are facility-wide measures. Human Exposures Controlled is attained when there are no unacceptable risks to humans due to releases of contaminants at or from the facility subject to RCRA corrective action. Groundwater Releases Controlled is attained when the migration of groundwater contamination at or from the facility across designated boundaries (these boundaries may be facility boundaries or specified boundaries within a facility) is controlled.

The environmental indicators are not tied to specific program activities or paperwork deliverables. In the course of implementing final remedies, the environmental indicators will be achieved; however, the implementation of stabilization measures can also result in achieving the environmental indicators. EPA is striving to make the corrective action program more performance based. Because the environmental indicators focus on results, they can serve well as performance measures for remedial activities. Further guidance on the environmental indicators is available in the July 29, 1994 memorandum "RCRIS Corrective Action Environmental Indicator Event Codes CA725 and CA750," which has been placed in the docket for today's Notice.

² These states are: Wisconsin, Texas, Georgia, Idaho, Florida, Colorado, New York, California, Utah, Oklahoma, North Carolina, Delaware, and Missouri.

EPA is committed to using the corrective action environmental indicators to increase the efficiency of the corrective action program by focusing on results. Although EPA has developed only two environmental indicators for corrective action to date, additional indicators may be developed to address factors such as ecological risk or source control. EPA requests comments on the development of additional environmental indicators in Section V.C.1 of today's Notice.

3. Corrective Action Plan

Another concern in the corrective action program has been consistency. While no two cleanups will follow the exact same course, EPA recognizes that some level of consistency in cleanup processes can help to ensure that all cleanups will achieve the same overall level of protection. The RCRA Corrective Action Plan or CAP (OSWER Directive 9902.3-2A, May 1994), provides guidance which program implementors and facility owners/operators can use to develop and direct the specific corrective action activities which might be necessary at any given facility. The CAP provides an overall program implementation framework and model scopes of work for site characterizations, interim actions, evaluation of remedial alternatives and remedy implementation. Program implementors and facility owners/operators can use these model scopes of work when developing site-specific strategies, work plans, and schedules of compliance.

The CAP is not meant to be a cleanup prescription. The model scopes of work in the CAP present a range of activities which might be necessary at a corrective action facility. Program implementors and facility owners/operators should choose carefully from this range when developing facility specific work plans.

4. CAMU Rule

Program implementors and facility owners/operators have long recognized that certain RCRA Subtitle C hazardous waste requirements can significantly complicate or delay cleanups when applied to remediation wastes. To address this problem, EPA promulgated regulations for corrective action management units (58 FR 8658, February 16, 1993). The CAMU rule provides relief from specific RCRA standards that can preclude desirable remediation options or unnecessarily add to the cost of remedies (e.g., the RCRA land disposal restrictions when applied to remediation waste) by creating a new type of RCRA unit. EPA and authorized states may choose to

designate a CAMU for management of remediation waste during RCRA corrective actions and other cleanups. When designating CAMUs, EPA and authorized states have the flexibility to establish site-specific design, operating, closure and post-closure requirements instead of using the existing RCRA requirements for land-based units. Remediation wastes (i.e., media and debris which contain hazardous waste or exhibit a hazardous waste characteristic) may be consolidated into a CAMU before or after treatment. In addition, remediation wastes may be treated in a CAMU or moved (again, before or after treatment) between CAMUs at the same facility without automatically triggering otherwise applicable RCRA land disposal restrictions or minimum technology requirements.

The CAMU rule was challenged in 1993; however, the challenge has been stayed pending publication of the final Hazardous Waste Identification Rule for Contaminated Media (HWIR-Media). EPA expects that the HWIR-Media rule will largely obviate the need for the CAMU rule, and is planning to propose withdrawal of the CAMU regulations as part of the HWIR-Media proposal (for a discussion of the HWIR-Media proposal, see Section II.F.1 of today's Notice). In the meantime, CAMUs may be used to support efficient and protective cleanups.

5. Other Developments

In addition to the examples discussed above, program implementors and facility owners/operators are using the existing flexibility in the corrective action program to explore a range of new approaches in an effort to improve the corrective action process and expedite cleanups at a facility-specific level. These include: using performance standards to set goals for site investigations and cleanups; encouraging innovative technical approaches; facilitating voluntary or accelerated cleanups, when a facility owner/operator wants to move ahead of a regulatory agency; the use of third-party oversight; expanded public participation, including use of citizen advisory boards; innovative coordination with or deferral to other programs, including state cleanup programs; and, many other efforts. In accordance with EPA's emphasis on consistency of results between the RCRA and CERCLA programs, many of these approaches are being developed in cooperation with the Superfund program or state remedial programs.

EPA encourages program implementors and facility owners/

operators to continue to explore new approaches to corrective action and to share their successes and failures. Some of the innovative approaches which have proved most successful at individual facilities are discussed later in today's Notice; EPA is looking forward to receiving information on other new approaches in response to today's Notice. One of the purposes of today's Notice is to gather information on successful facility-specific approaches to corrective action so EPA can build on implementation experience as it identifies and develops improvements to the national program during the Subpart S Initiative.

F. Relationship to Other Agency Initiatives and Rulemakings

EPA is involved in several rulemakings and other activities which will have particular impact on the Subpart S Initiative. Coordination with these other rulemakings and activities is ongoing.

1. HWIR Media

The Hazardous Waste Identification Rule for Contaminated Media (HWIR-Media) is a regulatory reform proposal that reexamines the application of many of the RCRA hazardous waste treatment and management standards to contaminated environmental media (e.g., soil and groundwater) managed during Agency or authorized state overseen cleanups. Under current regulations, environmental media that contain (or are contaminated by) hazardous wastes must be managed as hazardous waste (this is known as the "contained-in policy"). In developing the HWIR-Media proposal, EPA, in partnership with the states, is examining a number of reforms designed to allow program implementors to tailor treatment and management requirements for contaminated media to site- and media-specific conditions. EPA is proposing several types of reforms and seeking comment on a number of alternatives. The Agency may finalize any one or combinations of these reforms or alternatives.

The first major area of reform that EPA is considering would revise the Land Disposal Restrictions (LDRs) Minimum Technological Requirements (MTRs) and permitting requirements that apply to contaminated media currently subject to hazardous waste management requirements, to make them more appropriate for the types of contaminated media and concerns typically addressed at cleanup sites. Currently, large volumes of contaminated media are subject to

hazardous waste requirements, notably LDR, MTR and permitting, that were originally designed for newly generated or process wastes, where the concerns are different from those at cleanup sites.

More broadly, EPA is also proposing to exempt some contaminated media from RCRA Subtitle C hazardous waste management requirements. This reform would allow authorized states or EPA to determine contaminated media management standards for those exempted media on a site-specific basis. EPA is considering two exemption options. First, EPA is considering exempting media by determining, often based on management conditions, that the media do not contain hazardous wastes (this is commonly known as the "contained-out" approach); second, EPA is considering exempting media only if certain conditions were met (this is commonly known as the "conditional exclusion" approach). Under the options that would exempt only some contaminated media from hazardous waste management requirements, EPA is proposing to use a set of constituent concentrations known as a "Bright Line" to divide the media that would and would not be eligible for exemption. Media with concentrations of constituents below Bright Line concentrations would be eligible for exemption; media with constituent concentrations above the Bright Line would not be eligible. Finally, in the HWIR-Media proposal, EPA is requesting comment on exempting all cleanup wastes, including contaminated media, sludges, debris, and other wastes managed during the course of a cleanup, based on a conditional exclusion. Under this option, authorized states or EPA would set all management and treatment requirements for cleanup wastes on a site-specific basis.

The HWIR-Media proposal in particular will complement the Subpart S Initiative by potentially providing program implementors with the flexibility to tailor requirements for management of contaminated media to the risks posed by any given medium and the circumstances at any given corrective action facility.

2. Post-Closure Rule

EPA has long recognized the need to more effectively integrate corrective action and closure activities. Toward this end, the Agency proposed a rule entitled "Standards Applicable to Owners and Operators of Closed and Closing Hazardous Waste Management Facilities; Post-Closure Permit Requirement; Closure Process; State Corrective Action Enforcement Authority" (59 FR 55778, November 8,

1994). In this notice, the Agency proposed revisions to the current requirements applicable to facilities with closed and closing land disposal units, and revisions to the requirements for state authorization for corrective action. These provisions, described in more detail below, were proposed as part of the Agency's efforts to create a consistent approach to cleanups at RCRA facilities.

a. The Post-Closure Permit Requirement. The current regulations at 40 CFR Part 270.1(c) require owners and operators of surface impoundments, landfills, land treatment units, and waste pile units that received wastes after July 26, 1982, or that certified closure after January 26, 1983 to obtain a post-closure permit for the facility, unless they demonstrate closure by removal at those units. For facilities that did not receive an operating permit, and closed under interim status standards, this post-closure permit serves to impose several critical statutory and regulatory requirements, including the requirements for corrective action.

The November 8, 1994 proposal would allow a regulatory agency (e.g., EPA or an authorized state) to address these facilities using the best available regulatory or enforcement authority, instead of requiring that agencies issue post-closure permits in all cases. While the proposal would not otherwise modify the applicable cleanup requirements at these facilities, it would remove the requirement that they be imposed through the post-closure permitting process. Under the proposal, a regulatory agency could require post-closure care (including corrective action) at the facility under an enforcement mechanism, a state cleanup authority, or Federal Superfund authority. This flexibility contributes to the Agency's efforts in the Subpart S Initiative.

b. Applicability of 40 CFR Parts 264 and 265 to Regulated Units Requiring Corrective Action. Under the current regulations, the requirements that apply to closed and closing land disposal units depend on their legal status. Regulated units, defined in 40 CFR 264.90 as surface impoundments, waste piles, land treatment units, or landfills that received waste after July 26, 1982, are subject to the fairly specific closure, post-closure, financial assurance, groundwater monitoring and corrective action requirements of 40 CFR Parts 264 and 265. Non-regulated solid waste management units are not subject to 40 CFR Parts 264 and 265; consequently, environmental risks at those units are determined and addressed on a site-

specific basis through the corrective action process.

Despite this regulatory distinction, these units are often indistinguishable in terms of environmental risk. EPA is concerned that this dual regulatory scheme can, in some cases, limit its authority to determine the best remedy at regulated units. In the November 8, 1994 proposal, the Agency expressed this concern, and solicited comment on whether the regulations should be modified to give overseeing agencies the discretion to remove or modify all or part of the Part 264 and 265 requirements described above at a facility that is undergoing cleanup using the RCRA corrective action process.

c. State Corrective Action Enforcement Authority. Under the current Federal authorization process, states are required to obtain authorization for implementing provisions of HSWA, such as Section 3004(u), to address corrective action at permitted facilities. However, states have never been required to obtain authority to address corrective action at interim status facilities. On November 8, 1994, EPA proposed that states be required to upgrade their judicial or administrative enforcement authority to respond to releases of hazardous waste or hazardous constituents at interim status facilities as provided by Section 3008(h). This provision was designed to provide consistent and complete delegation of the corrective action program to states.

EPA is completing its review of comments on the proposed provisions and plans to proceed with promulgation of the final rule in the near future.

3. RCRA Statutory Reform

On March 16, 1995 the President committed to identify high cost, low benefit provisions of the Resource Conservation and Recovery Act (RCRA) for legislative reform. After an extensive stakeholder outreach process, the Administration selected two issues. The first issue for legislative reform, an exemption for certain low risk wastes from costly regulation under RCRA's land disposal restrictions program, was signed into law—the Land Disposal Flexibility Act—by the President on March 26, 1996.

The second topic identified for legislative reform was the application of RCRA hazardous waste management requirements to cleanup wastes. The Administration currently is discussing with stakeholders and Congress the possible development of bipartisan legislation to expedite the safe and cost-effective management of cleanup wastes that are currently subject to RCRA

hazardous waste management requirements. In addition to RCRA cleanup sites, the type of reform being discussed would benefit site cleanups under Superfund, Brownfield and State voluntary programs.

4. Improvements to the Procedures for Authorization of State Hazardous Waste Program Revisions

Under RCRA Section 3007, EPA is charged with authorizing equivalent state hazardous waste programs including corrective action programs. Authorized states administer and enforce the RCRA program within the state in lieu of the Federal program (see 40 CFR Part 271); authorized states have primary enforcement responsibility, although EPA retains enforcement authority under RCRA sections 3008, 7003, and 3013.

Following their initial authorization, states are required to periodically revise their hazardous waste programs to remain equivalent to the Federal program. Since EPA is continually revising the RCRA program in response to statutory changes, court ordered deadlines and evolving priorities, states are continually updating their authorized programs. Preparation, review and approval of changes to authorized state hazardous waste programs represents a significant workload for states and EPA. In addition, states have often expressed the concern that EPA review of changes to authorized hazardous waste programs is too detailed, resource intensive, and time consuming. To increase the pace and efficiency of authorization of state program revisions and respond to state concerns, EPA proposed changes to the regulations for processing state program revision applications in the Land Disposal Restrictions Phase IV rule (60 FR 43654, August 22, 1995). Additional provisions to streamline authorization of state program revisions are under consideration for inclusion in the HWIR-Media rule, currently under development. Improvements proposed in the LDR Phase IV rule and under consideration for the HWIR-Media rule include: creating a tiered approach to tailor authorization to the complexity and impact of the program revisions at issue; increasing reliance on state certifications; and placing more emphasis on time-frames for processing of authorization applications. Improvements to the procedures for state program revisions would apply to all state program revisions, including revisions made necessary by promulgation of corrective action regulations.

5. Superfund Reauthorization

As a general philosophy, EPA believes that the RCRA and CERCLA remedial programs should operate consistently and result in similar environmental solutions when faced with similar circumstances. Currently, Congress is considering legislation to reauthorize CERCLA. If CERCLA is amended, EPA believes that parallel changes in the corrective action program should generally be adopted. Changes to the CERCLA program which might impact the RCRA corrective action program include new approaches to setting cleanup standards and factoring risk into remedial decision making.

6. Superfund Administrative Improvements and Reforms

Independent of reauthorization of the CERCLA statute, EPA's Superfund program has undertaken a number of administrative initiatives to streamline the Superfund program and increase the fairness, effectiveness, and efficiency of CERCLA cleanups. Several of the proposals developed as part of the administrative reform and improvement efforts also apply to RCRA cleanups, as discussed below.

a. Guidance on Land Use. On May 25, 1995, EPA issued a Directive titled, "Land Use in the CERCLA Remedy Selection Process." The directive has two primary objectives. First, to promote early discussions between EPA and local land use planning authorities, local officials, and the public regarding reasonably anticipated future land uses. Second, to promote the use of the information from those discussions to formulate realistic assumptions regarding future land use, and to clarify how land use assumptions influence risk assessment, development of remedial alternatives, and remedy selection.

The directive was developed primarily to address land use considerations under the CERCLA program; however, the principle of early and complete involvement of stakeholder groups to develop realistic land use assumptions is equally applicable to the RCRA corrective action program. EPA recognizes that RCRA facilities are often industrial properties that are actively managed, rather than the abandoned sites typically addressed under CERCLA. Because of this consideration, the directive stated that non-residential use considerations might be especially appropriate at many RCRA corrective action facilities. Consideration of non-residential land use in RCRA corrective actions was addressed in the 1990 proposal and is

discussed further in Sections III.C.5.j and V.E.1 of today's Notice.

b. Soil Screening Guidance. In December 1994, EPA issued a draft "Superfund Soil Screening Guidance," (SSG) for public review and comment. The SSG was developed to accelerate decision making at CERCLA and other cleanup sites by focusing investigations on exposure pathways and contaminated areas of concern and eliminating certain pathways, areas, and contaminants not of concern from more detailed assessments. The SSG provides a framework for developing site-specific screening levels for residential-based exposure scenarios.

Specific soil screening levels (SSLs), derived in accordance with the SSG, are defined as contaminant concentrations in soil below which no further action or study would generally be warranted under CERCLA. They are not intended to be cleanup levels. According to the SSG, where soil contaminant concentrations equal or exceed SSLs, further assessment, but not necessarily a cleanup, would likely be warranted.

EPA is evaluating comments on the draft guidance and intends to issue final soil screening guidance in the near future. The Agency anticipates that the SSG may also be used to develop action levels for certain RCRA corrective action facilities. For more information on the role of action levels during corrective actions, see Section III.C.2.e of today's Notice.

c. Presumptive Remedies. The Superfund program began developing presumptive remedy guidance in 1991, to use past experience to streamline cleanups. Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. The Agency expects that presumptive remedies will be used at all appropriate sites, including RCRA facilities, to help ensure consistency in remedy selection and implementation and to reduce the cost and time required to investigate and remediate similar types of sites. Several presumptive remedy guidance documents are available and have been placed in the docket for today's Notice, including: Presumptive Remedies: Policies and Procedures; Presumptive Remedy for CERCLA Municipal Landfill Sites; Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils; and, Presumptive Remedies for Soils, Sediments and Sludges at Wood Treating Sites. Future presumptive

remedy guidance documents may address sites with groundwater contamination, sites contaminated with polychlorinated biphenyl compounds (PCBs), and manufactured gas sites.

d. Community Based Remedy Selection. In an effort to increase community involvement, EPA plans to pilot a new community-based Superfund remedy selection process. Under this process, EPA will assist community groups, local governments and other stakeholders in developing consensus and becoming more directly involved in remedy selection at select Superfund sites.

During the first half of fiscal year 1996, EPA will develop guidelines and options for community-based remedy selection pilot programs at specific sites. These pilot programs will empower affected parties to play a direct role in finding a protective, cost-effective remedy for a Superfund site in their community, inform affected parties of the applicable statutory and regulatory requirements, and improve community understanding and acceptance of Superfund remedies. EPA will use the results of the Superfund community-based remedy selection pilot programs as it works to improve public participation at RCRA corrective action facilities.

7. Brownfields Initiative

EPA developed the Brownfields Economic Redevelopment Initiative to help communities revitalize abandoned, idled, or under-used industrial and commercial sites where expansion or redevelopment is complicated by environmental contamination. Through the Brownfields Action Agenda, the Agency committed to fund up to 50 Brownfield Pilot Programs to explore brownfield characterization and redevelopment strategies at the local level. The brownfields pilots will test redevelopment models, direct special efforts toward removing regulatory barriers without sacrificing protectiveness, and facilitate coordinated environmental cleanup efforts at the Federal, state and local levels. The Pilots are intended to provide EPA, states, tribes, municipalities, and communities with useful information and strategies as they continue to seek new methods to promote a unified approach to site assessment, environmental cleanup, and redevelopment. To date, EPA has awarded 40 pilots.

EPA anticipates that many approaches to cleanup and site redevelopment evolving from the Brownfields Initiative will have direct application to the

corrective action program and the Subpart S Initiative.

8. Environmental Justice

Executive Order 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations," directs each Federal Agency to ". . . make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies and activities on minority populations and low income populations." In response to the Executive Order and to concerns voiced by many groups outside the Agency, EPA issued a Directive on September 21, 1994 which required that environmental justice issues be considered at all stages of policy, guidance and regulation development.

EPA has identified four main areas of environmental justice concerns within the Subpart S Initiative: (1) outreach to stakeholders, including members of affected communities, during the rulemaking process; (2) public participation on a site-specific level during the corrective action process; (3) public participation in future land-use and associated remedial decisions; and (4) ensuring the continued effectiveness of any institutional controls. The Agency recognizes that discussions of streamlining, such as those in today's Notice, often raise concerns in environmental justice communities. The Agency remains committed to identifying and addressing environmental justice concerns and to expanding public participation in the corrective action process, and would welcome the involvement of the environment justice community in development of the Subpart S Initiative.

9. Permits Improvement Team

In July 1994, EPA organized a group of state, tribal and local government officials to examine and propose improvements to EPA's permit programs. This group is known as the Permits Improvement Team. The Permits Improvement Team is examining ways to streamline the permitting process, exploring alternatives to individual permits, and evaluating ways to enhance public participation in permitting. For RCRA corrective action, the emphasis is on addressing RCRA and non-RCRA facilities in order of environmental priority, rather than having a state's priorities skewed by the RCRA permit process. For example, the RCRA permit could include a general provision to

require compliance with the state's existing environmental cleanup program. Any changes to the RCRA permitting program that result from the Permits Improvement Team's efforts will be considered as EPA implements the Subpart S Initiative.

III. Corrective Action Implementation

As discussed in Section II of today's Notice, EPA generally uses the 1990 corrective action proposal, supplemented by later guidance, as a guideline for corrective action implementation. The 1990 proposal was intended to support a flexible approach to corrective action. Unfortunately, EPA believes the proposal has at times been interpreted too narrowly, and much of the intended flexibility has been under used. In addition, the nature of the corrective action program and some of EPA's positions have evolved since 1990.

For the benefit of those involved with the corrective action program, and to provide context for the requests for comment in Section V of today's Notice, this section provides a general status report on the corrective action program, and how it has evolved since the 1990 proposal and includes guidance on a number of topics not fully addressed in 1990. It also emphasizes the flexibility inherent in the current corrective action program and encourages program implementors and facility owners/operators to take advantage of this flexibility to improve the corrective action process and expedite cleanups.

A. Program Management Philosophy

More than 5,000 facilities are subject to RCRA corrective action, over three times the number of sites on CERCLA's National Priorities List (NPL). The degree of investigation and subsequent corrective action necessary to protect human health and the environment varies significantly across these facilities. Some facilities may require no cleanup at all or only minor corrective action, while others are as complex and highly contaminated as any Superfund site. To account for the variety of corrective action facilities and site-specific circumstances, EPA has emphasized a flexible, facility-specific approach to corrective action. Few cleanups will follow exactly the same course; therefore, program implementors and facility owners/operators must be allowed significant latitude to structure the corrective action process, develop cleanup objectives, and select remedies appropriate to facility-specific circumstances. At the same time, a number of basic operating principles

guide corrective action program implementation and development.

(1) Corrective Action Decisions Should Be Based on Risk

As in most EPA programs, the Agency's fundamental goal in the corrective action program is to control or eliminate risks to human health and the environment. Risk-based decision making is especially important in the corrective action program, where it should be used to ensure that corrective action activities are fully protective given reasonable exposure assumptions and consistent with the degree of threat to human health and the environment at a given facility.

(2) Program Implementation Should Focus on Results

The purpose of the corrective action program is to stabilize releases and clean up RCRA facilities in a timely manner, not to ensure compliance with or fulfillment of a standardized process. Program implementors and facility owners/operators should focus on environmental results rather than process steps and ensure that each corrective action related activity at any given facility directly supports cleanup goals at that site. In focusing on results, program implementors are encouraged to use innovative approaches to management and oversight.

(3) Interim Actions and Stabilization Should Be Used To Reduce Risks and Prevent Exposures

A primary implementation strategy of the corrective action program is to focus resources first on stabilizing continuing releases and controlling exposure at facilities undergoing corrective action. Once a facility is stabilized, Agency oversight at that facility can be reduced and resources shifted to other facilities of concern. By focusing on stabilizing many facilities, rather than pursuing a final cleanup at a few facilities, EPA can achieve a greater overall level of human health and environmental protection in the near-term.

(4) Activities at Corrective Action Facilities Should Be Phased

Significant efficiencies can be gained by phasing corrective action at individual facilities to focus on areas of the facility that represent the greatest risk to human health and/or the environment. Phasing allows information obtained from previous phases to be used for planning and refining subsequent investigations or responses. Using a phased approach, response actions can be taken at some high-priority areas of the facility while

other lower-priority areas are addressed at a later time.

(5) Program Implementation Should Provide for Meaningful Inclusion of All Stakeholders

EPA is committed to including all stakeholders in the corrective action process. Stakeholders are included in both facility-specific decision making through public participation activities and in the development of the national corrective action program. The Agency believes stakeholder involvement is essential in all corrective action cleanups, regardless of the oversight mechanism used (e.g., order, permit, state authority, voluntary action).

(6) Corrective Action Obligations Should Be Addressed Using the Most Appropriate Tool for Any Given Facility

EPA recognizes that there are many mechanisms or tools which can be used to ensure appropriate corrective action at any given facility, including RCRA orders or permits, state cleanup orders, and voluntary cleanup programs. Each mechanism has advantages and disadvantages when applied to individual facilities. Program implementors and facility owners/operators should carefully consider these advantages and disadvantages when choosing a corrective action mechanism.

(7) States Will Be the Primary Implementors of the Corrective Action Program

Since corrective action requirements will be, predominantly, implemented by states, EPA is committed to full and meaningful state involvement in development of corrective action implementation strategies, policy, guidance and regulations.

B. Scope and Definitions

Corrective action requirements apply at hazardous waste treatment, storage and disposal facilities (TSDFs). These include permitted facilities and facilities that have, have had, or should have had RCRA interim status. This collection of facilities is typically referred to as the "corrective action universe." Corrective action may be required for releases of hazardous waste or hazardous constituents from these facilities, as necessary to protect human health and the environment. EPA does not generally require corrective action at facilities which are issued land treatment demonstration permits, emergency permits, permits-by-rule for ocean disposal, or research, development and demonstrations permits unless these facilities otherwise

become subject to RCRA operating or post-closure permitting requirements.

The 1990 proposal established EPA's views on the scope and applicability of RCRA corrective action authorities. Although EPA's views have largely remained unchanged in this area, there have been several important refinements or developments, as discussed below.

1. Concept of Parity

Most facilities in the RCRA corrective action universe are potentially subject to cleanup under numerous cleanup authorities, including state or Federal Superfund authorities. The potential for overlapping application of these authorities can cause confusion and concern in the regulated community and among state and Federal regulators. In the 1990 proposal, EPA stated that one of the Agency's primary objectives was "to achieve substantial consistency with the policies and procedures" of the Superfund remedial program. The logic behind this concept is that, since both programs address cleanup of potential and actual releases, both programs should arrive at similar remedial solutions. EPA's position is that any procedural differences between RCRA and CERCLA should not substantively affect the outcome of remediation.

Generally, cleanup of any given site or area at a facility under RCRA corrective action or CERCLA will substantively satisfy the requirements of both programs. We believe that, as a general matter, RCRA and CERCLA program implementors can defer cleanup activities from part or all of a site to one program with the expectation that no further cleanup will be required under the other program. For example, when investigations or studies have been completed under one program, there should be no need to review or repeat those investigations or studies under another program. Similarly, a remedy that is acceptable to one program can be presumed to meet the standards of the other.³ The same principle should apply to authorized state corrective action programs and state CERCLA analogous programs. Over half the states have Superfund-like authorities. In some cases, these authorities may be substantively equivalent in scope and effect to the Federal CERCLA program, and therefore are likely to be substantially equivalent to the RCRA corrective action program.

³In some cases specific releases or constituents are not "solid wastes" under RCRA. For example, RCRA excludes from the definition of solid waste certain source, special nuclear, or byproduct material as defined by the Atomic Energy Act 42 U.S.C. §2011.

EPA emphasized the concept of parity in a recently issued policy for deleting RCRA facilities from the NPL and deferring their cleanup to the RCRA corrective action program (60 *FR* 14641), available in the docket for today's Notice.⁴ EPA is planning to issue additional guidance on RCRA and CERCLA parity in an upcoming policy memo, "Coordination of RCRA/CERCLA Activities" and through the inter-agency and state "Lead Regulator Workgroup."

2. Voluntary Cleanup

EPA strongly encourages voluntary corrective actions. As discussed in the 1990 proposal, voluntary cleanups have a number of advantages, including timeliness, flexibility, and efficient use of facility owner/operator and Agency resources. Unfortunately, representatives of the regulated community have, on occasion, complained that procedural barriers have delayed cleanups they were willing to undertake voluntarily. Over the last few years, EPA and the states have taken significant steps to address this concern and to further encourage and facilitate voluntary actions. For example, EPA is planning to issue guidance on the use of state voluntary cleanup programs to address contamination at sites that may be subject to cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act including hazardous waste generators, unregulated by RCRA corrective action requirements. The Guidance for Development of Memoranda of Agreement (MOA) Language Concerning State Voluntary Cleanup Programs is being developed in partnership with interested states and will outline general principles which EPA will use when deciding whether to endorse a state voluntary cleanup program and to assure private parties that subsequent Federal action under CERCLA will not be taken except under limited circumstances.

The same general principles established in the CERCLA MOA guidance may apply to the use of state voluntary cleanup programs at facilities subject to RCRA corrective action; however, because of distinctions in statutory requirements, consideration of additional factors may be required of those programs. Issues associated with voluntary cleanups at facilities subject

to RCRA corrective action, including the use of state voluntary cleanup programs, are discussed in Section V.D.3 of today's Notice.

3. Definitions

The 1990 proposal included definitions for a number of terms which help to further define the applicability of RCRA corrective action. Pending final action on the proposal, EPA has generally continued to interpret these terms consistently with the proposal; however, as EPA has gained experience with applications in particular cases, it has refined its interpretations in some respects. The following discussion highlights the way in which these issues have been addressed in some specific situations (e.g., cases decided by the EPA Environmental Appeals Board (EAB)).

a. Facility. Under RCRA § 3004(u), corrective action is required for releases from solid waste management units at facilities seeking RCRA permits. The 1990 proposal defined "facility" as "all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA." This definition was finalized when the rule on corrective action management units (CAMUs) was promulgated (58 *FR* 8658, February 16, 1993) and is now codified at 40 CFR 260.10. For reasons discussed in the 1990 proposal, the term "facility" for corrective action purposes is separate and substantively different from the facility definition for other RCRA purposes.

A number of issues continue to arise regarding the application of the facility definition. A common issue is whether or not a certain parcel is considered "contiguous" for purposes of the corrective action facility definition. One such situation is the case of two parcels under common ownership but separated by a road or public right of way. In the 1990 proposal, EPA indicated it would interpret such parcels to constitute a single facility for purposes of corrective action. This approach was recently accepted by the EAB, which held that two parcels were a single facility where they were separated by a privately owned railroad line (*In re Exxon Co., USA*, RCRA Appeal No. 94-8 (EAB May 17, 1995)).

Another common scenario involves two geographically separated parcels under common ownership that are connected by ditches, bridges, or other links under the control of the facility owner/operator. In the *Exxon* permit appeal, the EAB noted the fact that the two parcels (which it found to be "contiguous" in any case) were also connected by a sewer system collecting

waste water from different parts of the facility. It pointed out that in an earlier case, evaporation ponds three miles from a refinery were treated as part of the same facility because they were linked to the refinery by a drainage ditch controlled (although not owned) by the same party. (See, *In re Navajo Refining Co.*, RCRA Appeal No. 88-3 (Adm'r June 27, 1989)). In a separate final RCRA section 3008(h) order, EPA has determined that two parcels on opposite sides of a river, but connected by a trestle, constitute a single facility for corrective action purposes. (See, *In re Sharon Steel Corp.*, Docket No. RCRA III-062-CA (Region III).)

The 1990 proposal requested comment on how the definition of facility should apply where a large parcel is owned by one party who leases a small portion to another party for a RCRA-permitted facility. In the proposal, EPA indicated that it would consider corrective action requirements to extend to SWMUs throughout the larger parcel. At the same time, EPA recognizes that there are differing views as to the policy merits of this interpretation and invites further comment in section V.C.2 of today's Notice.

b. Release. The definition of release for corrective action was first discussed in the 1985 HSWA codification rule (50 *FR* 28702, July 15, 1985). In the 1985 rule, EPA wrote that the definition of release for corrective action should, at a minimum, be as broad as the definition of release under CERCLA. Accordingly, EPA has interpreted the term release to mean "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment." (See, 50 *FR* 28713, July 15, 1985.) In the 1990 proposal, EPA clarified that the definition of release also includes abandoned or discarded barrels, containers, and other closed receptacles containing hazardous wastes or constituents and that it could include releases that are permitted under other authorities, such as the Clean Water Act. EPA continues to adhere to these interpretations of the term "release."

c. Solid Waste Management Unit. In 1990, EPA proposed to define the term "solid waste management unit" or "SWMU" to mean, "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." Pending resolution of the 1990 proposal, EPA has used this definition in

⁴The RCRA deletion policy does not pertain to Federal Facilities, even if such facilities are also subject to RCRA Corrective Action; however, program implementors and facility owners/operators are encouraged to use interagency agreements to eliminate duplication of effort, including oversight, at Federal facilities.

corrective action implementation. The inclusion of units not specifically intended for the management of solid or hazardous waste is supported by the legislative history of RCRA sections 3004 (u) and (v), and this point has been applied in decisions by the EAB. (See, e.g., *In re General Motors Corp.*, RCRA Appeal No. 90–24 (EAB Nov. 6, 1992).)

As discussed in the 1990 proposal, not all areas where releases have occurred are considered SWMUs. In the 1990 proposal, EPA indicated a one-time spill which had been adequately cleaned up would not constitute a SWMU; on the other hand, a location at which wastes or other materials were released in a routine and systematic manner (such as a loading area where minor spills or leaks occurred routinely over time) would be a SWMU. The 1990 proposal indicated that industrial sewers used for collecting wastes would constitute SWMUs. This interpretation, which was based in part on earlier decisions in permit appeals, has been affirmed by the EAB in *In re Amoco Oil Co.*, RCRA Appeal No. 92–21 (EAB Nov. 23, 1993).

The definition of a SWMU is often a point of disagreement when corrective action permits or orders are issued. Facility owners/operators and representatives of the regulated community often argue that Congress intended the RCRA corrective action program to be focused on waste management units (i.e., SWMU) and that non-waste-management related releases (e.g., spills) should be addressed by other cleanup programs or authorities. EPA notes that authority exists for requiring corrective action for releases that are not attributable to SWMUs. Given the legislative history of RCRA section 3004(u), which emphasizes that RCRA facilities should be adequately cleaned up, in part, to prevent creation of new Superfund sites, EPA believes that corrective action authorities can be used to address all unacceptable risks to human health or the environment from RCRA facilities. In the permitting context, remediation of non-SWMU related releases may be required under the “omnibus” authority (see 40 CFR 270.32(b)(2)) which allows EPA to impose such permit conditions as are necessary to protect human health and the environment. In other contexts, orders under RCRA sections 3008(h) or 7003 may require remedial action to address releases regardless of whether a SWMU is present. Therefore, extended debate or litigation over a particular SWMU designation will in many cases be unproductive for all parties and, as a general principle, EPA discourages debate on these issues, believing that

discussions should more properly focus on whether there has been a release that requires remediation.

To reflect a more holistic approach, permits and orders often use the term “area of concern” to refer to releases which warrant investigation or remediation under the authorities discussed above, regardless of whether they are associated with a specific SWMU as the term is currently used. For example, when an overseeing agency believes one-time spills of hazardous waste or hazardous constituents have not been adequately cleaned up, these releases are often addressed as areas of concern.

d. Hazardous Waste and Hazardous Constituent. RCRA section 3004(u) requires corrective action for releases of “hazardous wastes or constituents.” As discussed in the 1990 proposal, EPA interprets the term “hazardous waste,” as used in RCRA section 3004(u) to include all wastes that are hazardous within the statutory definition in RCRA section 1004(5), not just those that are either listed or identified by EPA pursuant to RCRA section 3001.

EPA also used the 1990 proposal to discuss use of the phrase “or constituents” in RCRA section 3004(u). EPA views this phrase as significant in two ways. First, it indicates that Congress was particularly concerned that, within the broad category of wastes that might be “hazardous” within the statutory definition, the corrective action authority should be used to address the specific subset of “hazardous constituents.” Second, it indicates that the corrective action authority was not intended to be limited to hazardous waste, and extends to hazardous constituents regardless of whether they also fall within the term “hazardous waste,” or whether they were derived from hazardous waste. Under this interpretation, constituents that were contained within nonhazardous solid wastes may be addressed through corrective action.

C. Corrective Action Process

The corrective action process discussed in the 1990 proposal was structured around five elements common to most cleanup activities: initial site assessment, site characterization, interim actions, evaluation of remedial alternatives, and implementation of the selected remedy. These elements typically occur, to one degree or another, during most cleanups. As discussed in the 1990 proposal, EPA emphasizes that no one approach to implementing these cleanup elements is likely to be appropriate for all corrective action

facilities; therefore, a successful corrective action program must be procedurally flexible. In addition, these cleanup elements should not become ends in themselves; EPA continues to encourage program implementors and facility owners/operators to focus on the desired result of a cleanup rather than a mechanistic cleanup process. These five elements should be viewed as evaluations necessary to make good cleanup decisions, not prescribed steps along a path.

1. Initial Site Assessment

The first element in most cleanup programs is an initial site assessment. During the initial site assessment information is gathered on site conditions, releases, potential releases, and exposure pathways to determine whether a cleanup may be needed and to identify areas of potential concern. Overseeing agencies may also use initial site assessments to set relative priorities between sites and allocate oversight and other resources.

In the CERCLA program, the initial site assessment is called a Preliminary Assessment/Site Investigation, or PA/SI; in the corrective action program, it is referred to as a RCRA Facility Assessment or RFA. During an RFA, an overseeing agency typically compiles existing information on environmental conditions at a given facility and, as necessary, gathers additional facility-specific information on solid waste management units and other areas of concern, releases, potential releases, release pathways, and receptors. Information gathered during an RFA usually forms the basis for initiating full scale site characterization

a. Facility Owners/Operators May Gather RFA Information. At the time to today’s Notice, EPA and the states have completed 3,534 RFAs at RCRA facilities. In the past, EPA has been reluctant to allow facility owners/operators to conduct RFAs because of concern over the adequacy of the facility submissions; however, by now the RFA is a well developed process and EPA believes it may be more reasonable to accept the work of facility owners/operators. Where RFAs have not yet been completed, facility owners/operators may choose to conduct their own site assessment and submit the report to EPA for review. If EPA believes the site assessment is adequate, the site assessment may be approved and adopted as the RFA for the facility. In the same way, when an RFA was completed some years ago, a facility owner/operator might conduct a site assessment to update the RFA and submit it to EPA for review, approval

and adoption as an RFA update. Facility owners/operators who choose to conduct or update their own RFAs should ensure that they address all solid waste management units and other areas of concern at the facility. Guidance on the scope of RFAs is available in "RCRA Facility Assessment (RFA) Guidance" EPA/530/SW-86/053, PB87-107769, October 1986, which has been placed in the docket for today's Notice. Facility owners/operators who want to obtain a copy of the RFA conducted for their facility should contact the appropriate EPA Regional Office or their authorized state.

b. Release Assessment. Release assessments (sometimes referred to as Phase 1 assessments) are used to confirm or reduce uncertainty about solid waste management units, areas of concern, and potential releases identified during the initial site assessments. Under the corrective action process as originally conceived, program implementors and facility owners/operators would typically move directly from the initial site assessment to full scale site characterization. As program implementors and facility owners/operators have gained experience in corrective action implementation, they have often found it advantageous to conduct a limited release assessment after the RFA but before full scale site characterization, to focus subsequent investigations or eliminate certain units or areas from further consideration. Release assessments can be especially helpful in cases where the RFA is old or where the overseeing agency and the facility owner/operator disagree about inclusion of one or more units, areas, or releases in the site characterization.

Information collected during a release assessment can be used to focus site characterizations on the areas and releases and exposure pathways which constitute the greatest risks or potential risks to human health and the environment and to eliminate areas from consideration during site characterization. For example, an initial site assessment could identify an old waste pile as a solid waste management unit. The facility owner/operator might present information showing that the waste in the pile had been removed; however, there may be little or no information to confirm that releases from the unit (if any) were adequately addressed during waste removal. The facility owner/operator could, during a release assessment, conduct highly focused sampling at the unit to confirm that releases either had not occurred or were adequately remediated.

c. National Corrective Action Prioritization System. Implementing agencies often use initial site assessments to set priorities for limited oversight resources. In the corrective action program, EPA sets priorities using the National Corrective Action Prioritization System (NCAPS). NCAPS priorities are generally based on information gathered during the RFA. Because of the number of facilities subject to corrective action, the variety of facility-specific conditions, and the limitations on Agency oversight resources, careful prioritization is essential. The Agency's policy is to focus its corrective action resources first on facilities and areas at facilities which present the greatest relative risk to human health and the environment. Accordingly, NCAPS considers the environmental setting of a facility and potential receptors, actual and potential releases of hazardous wastes or constituents from the facility, and the toxicity of constituents of concern to group facilities into high, medium and low priority groups.

NCAPS rankings are based on risk, but NCAPS does not involve a traditional site-specific risk assessment. NCAPS is a resource management tool that EPA and authorized states use to set relative priorities among corrective action sites to focus limited agency resources. Currently 40% of facilities subject to corrective action are considered high priority, 30% medium, and 30% low.

2. Site Characterization

Before cleanup decisions can be made, some level of characterization is necessary to ascertain the nature and extent of contamination at a site and to gather information necessary to support selection and implementation of appropriate remedies. In the CERCLA program, this step is referred to as the Remedial Investigation or RI; in the RCRA program, the RCRA Facility Investigation or RFI.

Carefully designed and implemented RFIs are critical to accurately characterize the nature, extent, direction, rate, movement, and concentration of releases at a given facility; this information is needed to determine potential risks to human health and the environment and support development and to implementation of corrective measures should they prove necessary. It can also be used to eliminate facilities which are shown not to present unacceptable risks from further consideration. A successful RFI will identify the presence, movement, fate, and risks associated with environmental contamination at a site

and will elucidate the chemical and physical properties of the site likely to influence contamination migration and cleanup.

The 1990 proposal outlines the types of information which may be required during a remedial investigation. As discussed in the 1990 proposal, program implementors and facility owners/operators should gather the information necessary to support cleanup decisions; collection of all the information discussed in the 1990 proposal will not be necessary at most facilities.

Experience in corrective action implementation has demonstrated that poorly focused investigations can become a drain on time and resources and, in some cases, unnecessarily delay remedial actions. EPA emphasizes that remedial investigations should be tailored to the specific conditions and circumstances at the facility and focused on the units, releases, and exposure pathways of concern. For example, in delineating the extent of contamination it may not be necessary to delineate to background concentrations in all cases. In some cases, information adequate to support cleanup decisions can be obtained through delineation to risk-based concentrations or other investigation endpoints. For example, an investigation endpoint might be based on the presence or absence of a competent confining layer rather than constituent concentrations.

EPA has found a number of approaches to be particularly helpful in developing focused site investigations, as discussed below.

a. Conceptual Site Models. Site investigations and remedy implementation are often most successful when based on a "conceptual site model." A conceptual site model is a three-dimensional picture of site conditions that conveys what is known or suspected about the sources, releases and release mechanisms, contaminant fate and transport, exposure pathways and potential receptors, and risks. The conceptual site model is based on the information available at any given time and will evolve as more information becomes available. The conceptual site model may be used to present hypotheses that additional investigations could confirm or refute, to support risk-based decision-making, and to aid in identification and design of potential remedial alternatives.

The conceptual site model is not a mathematical or computer model, although these tools often prove helpful in visualizing current information and predicting future conditions. The conceptual site model can be

documented by written descriptions of site conditions and supported by maps, cross sections, analytic data, diagrams of the site that illustrate actual or potential receptors, and other descriptive tools.

The conceptual site model is dynamic and should be tested and refined from the very first stages of corrective action to the point at which the site has been remediated and no longer presents a threat to human health or the environment. The RCRA Facility Assessment often forms the basis for the first conceptual model of the site. At this stage, the model should be used as a tool to compile available and relevant information and to identify the urgency and scope of subsequent investigations as well as interim actions. One use of the conceptual site model could be to ensure that site conditions are consistent with the underlying assumptions that were used to develop standardized action levels (see Section III.C.2.e). The model can also be used to support phasing of site investigations to ensure data collection efforts address the most important information needs. In addition, a conceptual site model can be a critical tool for evaluating remedy performance.

More detailed guidance on the development and use of the conceptual site model is available in "Guidance for Evaluating the Technical Impracticability of Ground Water Restoration" (EPA/540-R-93-080). Additional guidance on using conceptual models will be included in the upcoming Soil Screening Guidance (see, Section II.F.6.b).

b. Innovative Site Characterization Technologies. In the 1990 proposal, EPA recommended a focused approach to site characterization activities. EPA continues to support data collection approaches that focus on information needed to support decisions. The Agency has seen tremendous improvements in site characterization efficiency when innovative approaches are used, especially those that rely on rapid sample collection (e.g., direct-push technologies) and on-site analytical techniques (e.g., sensor technologies, assay kits, field gas chromatography/mass spectrometry (GC/MS), X-ray fluorescence). Depending on the data quality objectives for a particular site, confirmatory laboratory analyses may also be necessary. Data quality objectives are discussed in Section III.C.2.c, below.

The benefits of using innovative site characterization technologies are magnified when a work plan is used only to convey strategies, methods, data quality objectives, and general areas

subject to investigation, and exact sample locations are left to be determined based on iterative on-site data collection and analysis. Some of the benefits of using innovative characterization techniques along with iterative decision-making include: Rapid sample collection and analysis allowing for on-site decision making and optimization of the investigation effort; enhanced three-dimensional understanding of the site because of the greater number of data points available for a given commitment of resources; better identification of actual or potential risks to human health and environmental receptors; and, more rapid assessment of the need for interim actions.

Program implementors and facility owners/operators should take advantage of innovative characterization technologies. Likewise, EPA encourages implementing officials to be receptive to innovative approaches which can significantly improve the quality as well as the cost- and time-effectiveness of site characterization.

c. Tailored Data Quality Objectives. Program implementors and facility owners/operators should tailor data gathering strategies to the purpose for which the data will be used. The overall degree of data quality or uncertainty that a decision maker is willing to accept is referred to as the Data Quality Objective (DQO) for a decision. The DQO is used to specify the quality of the data, usually in terms of precision, bias, representativeness, comparability and completeness. The DQO approach applies to the entire measurement system (e.g., sampling locations, methods of collection and handling, field analysis, etc.), not just to laboratory analytical operations. In general, EPA has found that DQOs can and should be used to ensure that environmental data are scientifically valid, defensible, and of an appropriate level of quality given the intended use for the data.

Program implementors and facility owners/operators using innovative site characterization and assessment approaches should pay particular attention to DQOs. For example, an objective of the early stages of an investigation could be to identify the presence of gross contamination. In this context, a DQO could include a higher method detection limit (e.g., part per million) that could be obtained with cost-effective field screening technologies. In contrast, a very low method detection limit (part per billion or even trillion) could be an appropriate DQO to determine if groundwater is fit for human consumption.

EPA encourages program implementors and facility owners/operators to use the DQO approach to define adequate data collection for corrective action decisions. EPA has found that site investigations can be expedited considerably when DQOs are carefully established. For additional information on incorporating DQOs in the decision-making process at RCRA facilities, see Chapter One of SW-846 (Chapter One of SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition as amended by Update I, July 1992); "Final Guidance for the Data Quality Objective Process" EPA QA/G-4, September 1994; and, "Quality Assurance Project Plans for RCRA Ground-Water Monitoring and Corrective Action Activities" EPA, Sylvia Lowrance and H. Matthew Bills, July 1993, available in the docket for today's Notice.

d. Use of Existing Information to Streamline the Remedial Investigation. Many RCRA facility owners/operators have collected information on physical characteristics or on the nature and extent of contamination at the facility outside of the RCRA corrective action process. Information on site conditions may have also been obtained by entities other than the facility owner/operator. As a general principle, information that is not time dependent should not be collected again; EPA encourages the incorporation of pertinent existing information into the corrective action process. For example, many states have required facilities to conduct groundwater investigations under state laws for units that are not regulated units under RCRA; this information can often be easily incorporated into a corrective action investigation. Similarly, information collected through a state Superfund process is also generally of appropriate quality to be directly useable to support corrective action decisions.

Information that is relevant to corrective action may exist in reports or formats that are not traditionally used for RCRA corrective action. For example, engineering boring logs may have been generated on the facility by local utility companies, or by the facility itself during building construction. Provided data and information are submitted in a usable format, state or Federal agencies overseeing RCRA corrective actions should not require adequate information to be recollected or reformatted.

Facility owners/operators who are developing site characterization or other information independently are urged to document the quality of their information carefully. Thorough

documentation of data quality will increase its usefulness in the corrective action process. Use of existing information can reduce costs of conducting investigations and increase the speed of corrective action cleanups.

To determine whether existing data is appropriate for corrective action decisions, the nature and quality of the information should be assessed in view of the goals of the corrective action investigation. Where DQOs have been established, existing data can be assessed against DQOs to determine their adequacy. For example, the DQO for a specific corrective action decision could be a minimum analytical detection limit that is considerably lower than that used in an existing study. In this case, non-detects in the existing data could not be used to justify no action; however, the existing data could be used to determine "hot-spots" and to plan a second phase study using a more sensitive analytical method. On the other hand, if the detection limits were below an acceptable risk level and no constituents were detected, re-sampling would not typically be required—even if more sensitive methods were available.

EPA regions and states are currently incorporating existing information into ongoing corrective actions. If the regulatory agencies are aware of pertinent existing information at the time of issuance of a permit or order, they have the option of explicitly referencing the relevant information in the facility investigation requirements of the permit or order or, if the data are of sufficient quality and quantity, stating that the data fulfill site investigation needs. In some cases, the facility owner/operator will inform the overseeing agency of existing information; EPA or the states have the option of redirecting any investigations based upon the relevance of this information.

e. Role of Action Levels. At certain facilities subject to corrective action, contamination will be present at concentrations that may not justify further action. For this reason, EPA has, in some cases, used the concept of "action levels" as a trigger mechanism for conducting additional corrective action activities (e.g., additional investigations, evaluation of remedial alternatives, site-specific risk assessments). Under this approach, contamination found in a particular medium below an appropriate action level would not generally be subject to remediation or further study.

Action levels are health- or environmental-based concentrations derived using chemical-specific toxicity information and standardized exposure

assumptions. Action levels are often established at the more protective end of the risk range (e.g., 10⁻⁶) using conservative exposure and land use assumptions; however, action levels based on less conservative assumptions could be appropriate based on site-specific conditions. For example, if the current and reasonably anticipated future uses of a site are industrial, an action level based on industrial exposure scenarios could be appropriate.

Action levels can be developed on a facility-specific basis or can be taken from standardized lists. Currently, some states and EPA Regions have developed standardized lists of action levels or cleanup levels (standardized cleanup levels can serve as action levels) for RCRA corrective action facilities and other cleanup sites. One of the earlier and more widely distributed lists of action levels was developed by EPA and included in Appendix A of the preamble to the 1990 proposal. Since 1990, toxicity research has progressed; accordingly, some of the action levels included in the 1990 proposal may no longer be appropriate. In addition, the action levels in the 1990 proposal were based on residential land-use assumptions which may not be appropriate at all corrective action facilities. Program implementors and facility owners/operators should ensure that action levels used at RCRA corrective action facilities reflect up-to-date toxicity information and that action level assumptions are consistent with the physical conditions and current or reasonably anticipated exposure assumptions at any given facility. For example, risk to ecologic receptors is not accounted for in the action levels included in the 1990 proposal. If ecologic risks are a concern at a given corrective action facility, program implementors and facility owners/operators should consider developing facility-specific action levels to account for ecologic risk issues.

EPA has found that action levels are most beneficial when they are available during the planning stages of site investigations. In the 1990 proposal, the Agency indicated that it would be advantageous to include action levels in corrective action permits to give facility owners/operators and the public an indication of contaminant concentrations that would likely trigger additional study or corrective measures. At the same time, the Agency recognized that, in some cases, including action levels in corrective action permits would not be necessary (e.g., when available information establishes the need for an analysis of

remedial alternatives). Program implementors and facility owners/operators have the flexibility to determine whether or not to include action levels in corrective action permits and orders.

In Section V of today's Notice, EPA requests comments on the use of action levels and the role of the Federal government in promoting national consistency by developing, maintaining, and distributing action levels (as well as media cleanup levels) or standardized protocols for developing site-specific levels.

f. Integration With the Evaluation of Remedial Alternatives. At most sites, likely remedial strategies will become clear during the initial site assessment and subsequent site characterization. To expedite the corrective action process, EPA encourages program implementors and facility owners/operators to focus data gathering during site characterization on information needed to support plausible remedies. This strategy is discussed more fully in Section III.C.4.a of today's Notice.

3. Interim Actions

Since the 1990 proposal, EPA has increasingly emphasized the importance of interim actions and site stabilization in the corrective action program. Many cleanup programs, including RCRA and CERCLA, recognize the need for interim actions while site characterization is underway or before a final remedy is selected. Typically, interim actions are used to control or abate ongoing risks to human health or the environment in advance of final remedy selection. For example, actual or potential contamination of drinking water supplies might necessitate an interim action to provide alternative drinking water sources. Similarly, hazardous waste or constituents stored in poorly maintained or damaged drums or tanks might require an interim action to stabilize (e.g., by overpacking) or remove the damaged containers. The concept of interim actions is especially appropriate to facilities subject to RCRA corrective action, since many facilities in the corrective action universe are operating industrial facilities, where a final facility cleanup might not be completed for many years.

One of EPA's overriding goals in managing the corrective action program is to expedite risk reduction by emphasizing early implementation of interim actions to control or minimize ongoing threats to human health or the environment. The importance of interim actions at RCRA corrective action facilities is further emphasized in the Agency's Stabilization Initiative

discussed in Section II.E.1 of today's Notice.

Interim actions at RCRA facilities can include a wide range of activities such as source removal, installation of a pump and treat system, and institutional controls. In accordance with the Stabilization Initiative, interim actions should be employed as early in the corrective action process as possible, consistent with the environmental objective and priorities for the site; as further information is collected, program implementors and facility owners/operators should continue to look for opportunities to conduct additional interim actions. Generally, interim actions should be compatible with, or a component of, the final remedy.

4. Evaluation of Remedial Alternatives

Contamination at most cleanup sites can be addressed using a number of remedial alternatives, each of which would present advantages and disadvantages. Before choosing a cleanup approach, program implementors and facility owners/operators will typically analyze a range of alternatives and evaluate their advantages and disadvantages relative to site-specific conditions. In the CERCLA program the identification and evaluation of remedial alternatives is referred to as the Feasibility Study or FS; in the RCRA corrective action program, the Corrective Measures Study or CMS.

The purpose of a Corrective Measures Study is to identify and evaluate potential remedial alternatives for facilities undergoing corrective action. During the CMS, program implementors and facility owners/operators typically evaluate one or more remedial alternatives based on site-specific conditions and select a preferred remedial alternative as the remedy. The CMS does not necessarily have to address all potential remedies for every corrective action facility. EPA advises program implementors and facility owners/operators to focus corrective measures studies on realistic remedies and to tailor the scope and substance of studies to the extent, nature and complexity of releases and contamination at any given facility. For example, some potential remedies should not be considered because they are simply implausible. In cases where EPA has identified a presumptive remedy (presumptive remedies are discussed in Section II.F.6.c of today's Notice), the purpose of the CMS will be to confirm that the presumptive remedy is appropriate to facility-specific conditions. In cases where EPA or a

state is using performance standards or a similar approach, the Agency might not require submission or approval of a formal CMS at all. EPA continues to emphasize that it does not want studies to be undertaken simply for the purpose of completing a perceived step in a perceived process. While, for a complex site, review of a full range of remedial alternatives may be required, at many sites, the preferred remedial approach will be apparent early in the cleanup process and the analysis of remedial alternatives should be highly focused.

In implementing the corrective action program, EPA has found a number of opportunities to significantly increase the efficiency of corrective measures studies, as discussed below.

a. Integration With Site Characterization. EPA continues to emphasize that the components of corrective action (e.g., release assessment, RFI, CMS) should not be viewed as isolated steps in a linear process. In the Agency's experience, it is generally more efficient to focus data collection on information needed to support an appropriate, implementable remedy than to attempt to complete separate evaluations at each step. As remedial alternatives are considered during a CMS, the facility owner/operator might find additional site characterization necessary. Similarly, the earlier in the corrective action process potential remedies can be identified, the more effectively information gathering can be focused. For example, in a situation where the contamination being addressed involves a large mixed fill landfill, the remedial alternatives will likely involve physical and institutional controls. These alternatives should be identified early in the RFI enabling the facility owner/operator to tailor the RFI toward collection of information necessary to support development of appropriate physical controls. In other cases, a facility may have relatively limited soil contamination or old solid waste management units which the facility owner/operator desires to remove all contaminated material for treatment and disposal off-site. In these cases, the RFI might be focused on removal options and analysis of other alternatives would not be necessary. Other benefits associated with combination of the RFI and CMS can include cost savings associated with consolidation of reports and other documents, and time savings associated with concurrent rather than sequential analysis. The 1990 proposal and the 1990 RCRA Corrective Action Plan discuss other situations where the CMS could be combined with site characterization, including:

(1) "Low risk" facilities. These are facilities where environmental problems are relatively small and where releases present minimal exposure concerns. Such facilities might have limited on-site soil contamination;

(2) Facilities where removal remedies have been proposed by the owner/operator. For example, at a facility where there is contaminated soil and the owner/operator proposes to excavate all the contaminated soil for subsequent off-site recycling, treatment or disposal;

(3) Facilities with straightforward remedial solutions or where presumptive remedies, as discussed in Section II.F.6.c of today's Notice, can be applied. These are facilities where standard engineering solutions, which have proven effective in similar situations, may be appropriately applied;

(4) Facilities where few remedial options are available. This includes situations where there are few practicable remedial solutions; and,

(5) Facilities where the remedy is phased.

b. Formal Evaluation Not Always Necessary. At some facilities the CMS does not have to be submitted to an overseeing agency for review and approval in favor of a performance-based approach. In these scenarios, the overseeing agency (e.g., EPA or a state) might oversee the facility investigation to ensure that all releases and potential releases from the facility are adequately identified and characterized and that adequate remedial goals are developed for the facility. After the remedial goals undergo public review and comment and are approved by the overseeing agency, the facility owner/operator would design and implement a remedy sufficient to meet the remedial goals without direct agency oversight.

For example, the remedial investigation at a facility may reveal widespread groundwater contamination caused by a release from an old surface impoundment. The remedial goals for the facility might be to control the source contaminating the groundwater, contain the groundwater plume, and restore groundwater quality to specified cleanup levels. Media cleanup levels would be included in the remedial goal and the facility owner/operator would be required to conduct remedial activities in a manner which involves the affected public in a meaningful and timely way. The facility owner/operator would then design and implement a remedy (and a public participation plan). In this example, while the facility owner/operator might analyze a number of alternatives, the overseeing agency would not ordinarily second-guess the

remedial choice (since the agency had been involved in developing the performance standards). Instead, the overseeing agency would monitor compliance with the remedial goals. If the remedial goals or milestones were not met in the required performance period, additional remediation measures would likely be required. EPA favors performance-based approaches provided that the remedial goals for the facility are clear, the oversight during remedy implementation is appropriate to the complexity of the facility-specific circumstances, and the public is substantively involved. Many states, in particular the State of Georgia, attribute the success of their corrective action programs, in part, to eliminating Agency review and approval of the CMS as a step in the corrective action process in favor of a performance-based approach.

c. Facility Owner/Operator Should Recommend a Preferred Remedy. EPA emphasizes that it expects facility owners/operators to develop and recommend remedies or remedy performance standards (if a performance-based model is being used), including proposed media cleanup levels, points of compliance and compliance time frames, that address the proposed threshold criteria and present an advantageous combination of the proposed balancing criteria. During remedy selection, EPA will consider the facility owner/operator's preferred remedial alternative, other remedial alternatives and public comment. Although it is the responsibility of the facility owner/operator to develop and recommend a preferred remedial alternative or remedy performance standard, the Agency can reject any alternative and require further analysis or prescribe a different remedial alternative or remedy performance standard.

5. Remedy Selection

Remedies should be protective of human health and the environment, and maintain protection over time. In meeting this remedial goal, EPA has learned that certain combinations of facility-specific circumstances are often addressed by similar approaches. Based on this experience, the Agency has developed certain expectations for remedies. Remedy expectations are not binding requirements; rather, they reflect collective experience and guide development of remedial alternatives. For example, the fact that remedies for highly mobile contaminants often involve some form of treatment does not preclude a non-treatment option; however, expectations developed from past experience can focus program

implementors and facility owners/operators on the more generally acceptable remedial options. In effect, the remedial expectations allow program implementors and facility owners/operators to profit from prior EPA experience and focus resources on the most plausible remedial alternatives. Many of these expectations were first articulated in the discussion of remedy selection at CERCLA sites in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 430(a)(1)). The remedial expectations discussed below express EPA's experiences to date given our current remedial goals and remedy selection strategies; however, the Agency recognizes that issues associated with remedial goals and strategies are currently the subject of considerable public debate, i.e., in Congressional discussions of Superfund reauthorization. Since EPA is committed to consistency of results between the RCRA corrective action and Superfund remedial programs, any revisions to the CERCLA remedial expectations or the CERCLA remedy selection process will likely be incorporated into RCRA corrective action. Currently, EPA has the following remedial expectations:

(a) EPA expects to use treatment to address the principal threats posed by a site whenever practicable and cost-effective.⁵ Contamination that represents principal threats for which treatment is most likely to be appropriate includes contamination that is highly toxic, highly mobile, or cannot be reliably contained, and that would present a significant risk to human health and the environment should exposure occur.

(b) EPA expects to use engineering controls, such as containment, for wastes and contaminated media which can be reliably contained, pose relatively low long-term threats, or for which treatment is impracticable.

(c) EPA expects to use a combination of methods (e.g., treatment, engineering and institutional controls), as appropriate, to achieve protection of human health and the environment.

(d) EPA expects to use institutional controls such as water and land use restrictions primarily to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous wastes and constituents. EPA does not expect that institutional controls will often be the sole remedial action.

⁵ The term "cost-effective" does not necessarily imply least costly.

(e) EPA expects to consider using innovative technology when such technology offers the potential for comparable or superior treatment performance or implementability, less adverse impact, or lower costs for acceptable levels of performance when compared to more conventional technologies.

(f) EPA expects to return usable groundwaters to their maximum beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. When restoration of groundwater is not practicable, EPA expects to prevent or minimize further migration of the plume, prevent exposure to the contaminated groundwater and evaluate further risk reduction. EPA also expects to control or eliminate surface and subsurface sources of groundwater contamination.

(g) EPA expects to remediate contaminated soils as necessary to prevent or limit direct exposure of human and environmental receptors and prevent the transfer of unacceptable concentrations of contaminants (e.g., via leaching, runoff or air borne emissions) from soils, including subsurface soils, to other media.

In addition to experiences recorded in the remedial expectations, EPA routinely encounters a number of issues associated with remedy selection, as discussed below.

a. Balancing Treatment and Exposure Control. Risk is a function of toxicity and exposure; therefore, risk reduction can be accomplished by reducing toxicity (e.g., through treatment to reduce toxicity, mobility or volume) and/or preventing exposure (e.g., through engineering and institutional controls). Program implementors and facility owners/operators often struggle to find an appropriate balance between these approaches.

While preventing exposure may appear to be the most direct near-term means of reducing risk, permanent reduction of the toxicity, mobility and/or volume of contaminated material might be the most cost-effective means of reducing risk over time. For example, at a facility where the remedy relies, in part, on engineering controls to prevent exposure there could be: associated operation and maintenance costs; the need to maintain the RCRA facility permit for the life of the remedy; increased Agency involvement to monitor the continued effectiveness of the remedy; and, need for institutional controls. When treatment to reduce toxicity, mobility or volume is chosen, EPA does not necessarily expect the remedy to involve treatment alone. For

example, highly toxic contaminated material could be treated so that the concentrations of hazardous constituents, while still above media cleanup levels, would support a reliable containment remedy.

The exact balance between reduction in toxicity, mobility or volume and exposure control will best be established on a case-by-case basis in consideration of site-specific conditions; however, all things being equal, permanent reductions in toxicity, mobility or volume are preferred to exposure control because it is protective of human health and the environment in the long-term and removes the risks associated with the potential failure of engineering or institutional controls. Program implementors and facility owners/operators are cautioned against too great a reliance on exposure control remedies when alternatives which include permanent reduction in toxicity, mobility or volume are available, affordable and practical. Additional information on the balance between toxicity reduction and exposure control is available in "A Guide to Principal Threat and Low Level Threat Wastes," Superfund Publication 9380.3-06FS, November 1991, which is available in the docket for today's Notice.

b. Remedy Selection Criteria. The 1990 proposal, like the Superfund NCP, established a two-phased evaluation for remedy selection. During the first phase, potential remedies are screened to see if they meet "threshold criteria"; remedies which meet the threshold criteria are then evaluated using various "balancing criteria" to identify the remedy that provides the best relative combination of attributes. While the CERCLA remedy selection criteria are not identical to the RCRA corrective action criteria proposed in 1990, they address the same types of considerations and should generally result in similar remedies when applied to similar site-specific conditions.

The 1990 proposal identified four remedy threshold criteria and five balancing criteria. The four threshold criteria proposed in 1990 were that all remedies must: (1) be protective of human health and the environment; (2) attain media cleanup standards; (3) control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous waste (including hazardous constituents) that might pose threats to human health and the environment; and (4) comply with applicable standards for waste management. EPA believes these threshold criteria remain appropriate as

general goals for cleanup and screening tools for potential remedies.

There has been some confusion regarding the proposed threshold criterion that remedies attain media cleanup standards. Attaining media cleanup standards does not necessarily entail removal or treatment of all contaminated material above specific constituent concentrations. Depending on the site-specific circumstances, remedies may attain media cleanup standards through various combinations of removal, treatment, engineering and institutional controls. For example, in situations where waste is left in place in an engineered landfill or under a cap, media cleanup standards would be attained, in part, through long-term engineering and institutional controls.

The 1990 proposal identified five balancing criteria for choosing among remedies that meet the threshold criteria. The five balancing criteria proposed in 1990 were: (1) Long-term reliability and effectiveness; (2) reduction of toxicity, mobility or volume of wastes; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing criteria were not ranked in terms of relative importance. As discussed in the 1990 proposal, any one of the balancing criteria might prove to be the most important at a particular site. For example, a remedy at a certain site might be protective in the short term but not necessarily reliable in the long term (e.g., capping of a highly contaminated area). In this case, the need for long term reliability and the potential for long-term operation and maintenance costs would tend to point toward a remedy which presented a more advantageous combination of the balancing criteria (e.g., removal or treatment of hot spots, capping residual contamination, and implementing an institutional control).

The proposed balancing criterion of cost has caused some confusion. Cost can and should be considered when choosing among remedies which meet the threshold criteria. As discussed in the 1990 proposal, EPA believes that many potential remedies will meet all the threshold criteria. In that situation, cost becomes an important consideration in choosing the remedy which most appropriately addresses the circumstances at the facility and provides the most efficient use of Agency and facility owner/operator resources. For cost comparisons between alternatives to be accurate, they should include capital and operation and maintenance costs for the anticipated life of the remedy.

Pending resolution of the 1990 proposal, program implementors and

facility owners/operators should use the threshold and balancing criteria proposed in 1990 as guidance when selecting facility-specific remedies; however, as discussed in Section V of today's Notice, EPA is also considering and requesting comment on a number of alternatives for corrective action remedy selection, including focusing on remedy performance standards. These alternatives are based, in part, on innovative approaches already used in some states and EPA Regions.

c. Media Cleanup Standards. The term "media cleanup standards" typically refers to broad cleanup objectives; it often includes the more specific concepts of "media cleanup levels," "points of compliance," and "compliance time frames." The more specific term, "media cleanup levels" typically refers to site- and media-specific concentrations of hazardous constituents, developed as part of the overall cleanup standards for a facility. Media cleanup standards (and levels) should reflect the potential risks of the facility and media in question by considering the toxicity of the constituents of concern, exposure pathways, and fate and transport characteristics.

Consistent with the CERCLA program, in the RCRA corrective action program EPA intends to clean up sites in a manner consistent with available, protective, risk-based media cleanup standards (e.g., MCLs and state cleanup standards) or, when such standards do not exist, to clean up to protective media cleanup standards developed for the site in question (e.g., through a site-specific risk assessment). Both approaches require a site-specific risk-based decision. When available media cleanup standards are used (e.g., MCLs, state cleanup standards), the assumptions used to develop the standardized cleanup values should be consistent with the site-specific conditions at the facility in question.

As discussed in the NCP and the 1990 proposal, EPA's risk reduction goal is to reduce the threat from carcinogenic contaminants such that, for any medium, the excess risk of cancer to an individual exposed over a lifetime generally falls within a range from 10^{-6} , in other words, an exposed individual will have an estimated upperbound excess probability of developing cancer of one in one-million, to 10^{-4} , or an exposed individual will have an estimated upperbound excess probability of developing cancer of one in ten-thousand. For non-carcinogens, the hazard index should generally not

exceed one (1).⁶ Available risk-based media cleanup standards are considered protective if they achieve a level of risk which falls within the 10^{-6} to 10^{-4} risk range.

EPA's preference, all things being equal, is to select remedies that are at the more protective end of the risk range. Therefore, program implementors and facility owners/operators should generally use 10^{-6} as a point of departure when developing site-specific media cleanup standards. Use of 10^{-6} as a point of departure does not establish a strict presumption that all final cleanups will necessarily attain that level of risk reduction. Given the diversity of the corrective action universe and the emphasis on consideration of site-specific conditions such as exposure, uncertainty, or technical limitations, the Agency expects that other risk reduction goals may be appropriate at many corrective action facilities. As discussed in the 1990 proposal, EPA endorses " * * * an approach [to remedy selection] that allows a pragmatic and flexible evaluation of potential remedies at a facility while still protecting human health and the environment. This approach emphasizes the overall goal of 10^{-6} as the point of departure, while allowing site or remedy-specific factors, including reasonable foreseeable future uses, to enter into the evaluation of what is appropriate at a given site." (See, 55 FR 30826.)

d. Points of Compliance. As proposed in 1990, the point of compliance (POC) is the location or locations at which media cleanup levels are achieved. In the absence of final corrective action regulations specifically addressing points of compliance, program implementors and facility owners/operators develop POCs on a site-specific basis. For air releases, program implementors and facility owners/operators have generally used the location of the person most exposed, or other specified point(s) of exposure closer to the source of the release. For surface water, program implementors and facility owners/operators have routinely established the POC at the point at which releases could enter the surface water body; if sediments are affected by releases to surface water, a sediment POC is also established. Points of compliance for soils are generally

selected to ensure protection of human and environmental receptors against direct exposure and to take into account protection of other media from cross-media transfer (e.g., via leaching, runoff or airborne emissions) of contaminants. For groundwater, program implementors and facility owners/operators generally set the POC throughout the area of contaminated groundwater or, when waste is left in place, at and beyond the boundary of the waste management area encompassing the original source(s) of groundwater contamination. This approach to the groundwater POC is generally referred to as the "throughout the plume/unit boundary POC." This approach is consistent with the groundwater POC described in the preamble to the Superfund program's National Oil and Hazardous Waste Contingency Plan (NCP, pages 8713 and 8753, Federal Register March 8, 1990). EPA recommends consideration of the following factors when developing a site-specific groundwater POC: proximity of sources of contamination; technical practicability of groundwater remediation; vulnerability of the groundwater and its possible uses; and, exposure and likelihood of exposure and similar considerations.

In 1990, EPA proposed specific POCs for groundwater, air, surface water, and soil. These proposals, especially the proposed POC for groundwater, generated a substantial number of comments. Developing site-specific points of compliance generally continues to be an area of discussion and debate. In Section V.E.2 of today's Notice, EPA requests additional comment regarding POCs for corrective action.

e. Compliance Time Frame. The compliance time frame is the time period and schedule according to which corrective actions are implemented. In the 1990 proposal, EPA expressed a preference for the expeditious stabilization of releases, followed by timely completion of corrective actions and full restoration of contaminated media; however, a number of factors may influence the time frame within which media cleanup standards are attained, including: the extent and nature of contamination at the facility; risks to human health and the environment before and during remedy implementation; practical capabilities of remedial technologies; the availability of treatment or disposal options; and, the desirability of utilizing emerging technologies.

Remedy implementation schedules developed at the time of remedy selection should, to the extent possible,

specify the compliance time frame; however EPA recognizes that uncertainties associated with remediation may make it impossible to specify when a remedy must be completed. For example, due to complexities associated with contaminant occurrence in the subsurface and with groundwater remediation in general, the time needed to remediate groundwater at some sites cannot be accurately predicted. In these circumstances, the Agency recommends the use of performance measures or milestones monitored over time to track progress toward attaining remedial goals. These performance measures should be specified in the remedy implementation plans or performance standards. In cases where it is not practical to determine a precise compliance time frame, estimated compliance time frames may be used to help evaluate remedial alternatives and the technical practicability of site-specific remedial goals.

EPA emphasizes that, at many sites, the primary focus should be on near-term stabilization of releases. At these sites, it may be appropriate to focus the compliance time frame and corrective measures implementation schedule on the stabilization action; the remaining compliance time frame and corrective measures implementation schedule (if any are necessary) could then be developed during selection of the facility-wide remedy.

f. Site-Specific Risk Assessments. EPA's strategy for corrective action implementation incorporates risk-based decision-making throughout the corrective action process. At some sites, risk-based decisions can be made using standardized risk considerations, such as standardized exposure assumptions. At other sites, a site-specific risk assessment will be desirable. When a site-specific risk assessment is needed, EPA, in some cases, has directed the facility owner/operator to perform the risk assessment; in other cases EPA has chosen to do the risk assessment itself based on data submitted by the owner/operator. Site-specific risk assessments conducted at RCRA facilities may be based on CERCLA's extensive guidance in this area (e.g., "Risk Assessment Guidance for Superfund," Volumes I and II, Interim final EPA/540/1-89/001 and 002, December 1989 and March 1989). Additional information on the Agency's approach to risk-based decision-making is available in the Agency's recent memorandum on risk characterization. (See, 3/21/95 memorandum from Carol Browner, "EPA Risk Characterization Program" in the docket for today's Notice.) The

⁶The hazard index is a measurement of non-carcinogenic risks. It is calculated by summing two or more hazard quotients for multiple substances and/or multiple exposure pathways. A hazard quotient is the ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a similar exposure period.

Administrator stated, “* * * we must improve the way in which we characterize and communicate environmental (human health and ecologic) risk.” The key values conveyed in the 1995 Risk Characterization guidance are: (1) “transparency” in the decision making process (i.e., full and open discussion of supporting analyses, uncertainties, assumptions, etc.); (2) “clarity” in communication within the Agency and the public regarding environmental risk and the uncertainties associated with our assessments; (3) consistency; and (4) reasonableness in our use of scientifically defensible risk assessments. It is EPA’s policy to incorporate these values in all risk-based considerations, including site-specific risk assessments at corrective action facilities.

g. Ecological Risk. Corrective action remedies must protect both human health and the environment. Some form or ecological assessment will generally be necessary at all corrective action facilities; at some corrective action facilities, a formal ecological risk assessment will be necessary. When an ecological risk assessment is needed, EPA, in some cases, has directed the facility owner/operator to perform the risk assessment; in other cases EPA has chosen to do the risk assessment itself based on data submitted by the owner/operator. The use of ecological risk assessment is an important component of the corrective action program. Often, environmental receptors are sensitive to contamination at lower concentrations than humans are, and the exposure is usually longer and more intense. In order to fulfill EPA’s mandate, the program must be implemented in a manner that is protective of both human health and the environment. This includes the selection of media cleanup standards and the implementation of remedial activities that are protective or ecologic receptors. In the process of selecting stabilization measures or implementing final remedies, program implementors and facility owner/operators should be aware of how different remedial activities may affect ecological systems, especially sensitive populations, either on or adjacent to the facility.

Ecological risk assessment may be even more important when non-residential land use assumptions are used. Action or cleanup levels based on human health exposure scenarios or land use assumptions might not be protective of ecological receptors; therefore, consideration of the ecological exposure pathway may, in

certain settings, be the driving factor in selection of action or cleanup levels.

CERCLA’s National Contingency Plan (55 FR 8666, March 8, 1990) designates certain key Federal agencies, state agencies and Indian tribes as natural resource trustees. Section 300.600 of the NCP indicates that trustees act on behalf of the public in regards to protection of natural resources. Under CERCLA, trustees should be notified when contamination threatens natural resources. As a matter of policy, EPA recommends that trustees also be notified when RCRA corrective action identifies a release that threatens natural resources. In addition, trustee agencies have a great deal of experience in their respective areas and can be used as a valuable resource when conducting ecological assessments.

h. Determinations of Technical Impracticability. Remediation of contaminated media to a desired media cleanup standard can, in certain situations, be technically impracticable. Congress formally recognized technical impracticability (TI) in the CERCLA statute and EPA incorporated the concept in the National Contingency Plan and the 1990 Subpart S proposal (proposed 40 CFR 264.525(d) and 264.531).

Technical impracticability decisions may be made for any medium; however, contaminated groundwater has received in the most TI-related attention. The single greatest cause for technical impracticability determinations during groundwater restoration has been the presence of dense non-aqueous phase liquids (DNAPLs).⁷ The Superfund program estimates that DNAPLs are likely present at approximately 60 percent of NPL sites. While EPA has not conducted an overall assessment of the presence of DNAPLs at RCRA facilities, it believes the percentage of DNAPLs at high priority corrective action facilities is likely comparable to the Superfund estimate for NPL sites. To provide a framework for addressing technical impracticability, the Agency issued “Guidance for Evaluating the Technical Impracticability for Ground-Water Restoration” (EPA/540-R-93-080). EPA encourages program implementors and facility owner/operators to refer to this guidance for a more detailed description of technical impracticability and a

⁷Liquid contaminants that do not readily dissolve in water are known as non-aqueous phase liquids (NAPLs). NAPLs are divided into two classes: light NAPLs (LNAPLs), such as gasoline, are less dense than water; dense NAPLs (DNAPLs), such as the common solvent trichloroethylene, are more dense than water. NAPLs in the subsurface can cause long-term groundwater contamination, can be difficult to locate and, in many circumstances, technically impracticable to remove.

discussion of related issues, including: a description of DNAPLs and why they are difficult to remediate; factors to consider when making a technical impracticability determination; and, appropriate and practicable remedial options in situations where complete restoration is technically impracticable.

The possibility that certain remedies may be technically impracticable should be considered throughout the remediation process—from the early stages of developing a conceptual site model through all stages remedy implementation. When possible, determinations of technical impracticability should be made early in the remediation process and included in RCRA corrective action remedial decision documents (permits and orders). In some cases, program implementors and facility owner/operators might not have enough information to justify a determination of technical impracticability at the time of the site characterization or, even, when the remedy is selected. At the same time, there may be strong indications that restoration of a particular medium will be difficult and may prove technically impracticable (e.g., complicated groundwater remedies). In such situations, program implementors and facility owner/operators may choose not to establish a fixed media cleanup level, point of compliance or compliance time-frame, since achieving full restoration may prove technically impracticable. Instead, the remedy might proceed using interim goals and performance measures which could be revisited as more information became available. To avoid creating unrealistically high remedial expectations in these situations, the corrective action permit or order should discuss the possibility that full restoration of a particular medium may prove technically impracticable.

By recognizing technical impracticability, EPA is not in any way scaling back the general goal of returning contaminated groundwater to beneficial uses. Where technical impracticability is determined, the Agency would expect to require an alternative remedial strategy that is: (1) technically practicable; (2) consistent with the overall objectives of the remedy; and (3) controls the source(s) of contamination, and human and environmental exposures. A determination of TI does not release a facility owner/operator from corrective action obligations.

i. Natural Attenuation. EPA’s three major remedial programs (i.e., Superfund, RCRA Corrective Action Program, and the Underground Storage

Tank Program) recognize that natural attenuation, in certain circumstances, can be an acceptable component of remedial actions for contaminated groundwater. As discussed in the NCP, a natural attenuation remedy uses natural processes such as biodegradation, dispersion, dilution, and/or adsorption to achieve remedial goals. (See, 55 *FR* 8734, March 8, 1990.)

Natural attenuation remedies are not "no action" remedies. Natural attenuation should be evaluated, where it might be applicable, along with and in a manner similar to other potential remedial approaches. In some cases, natural attenuation might be only one aspect of an overall approach to achieving remedial goals. As in any other remedial approach, a proposed remedy involving natural attenuation will have to be protective of human health and the environment and satisfy remedy selection criteria. Program implementors and facility owner/operators should provide a complete description of natural attenuation remedies and emphasize that, by approving a natural attenuation remedy, an overseeing agency is not allowing a responsible party to avoid its remedial obligations. Remedies involving natural attenuation should include: a thorough site characterization; source control or removal where appropriate; documentation or evidence of attenuation processes and the ability of these processes to achieve remedial objectives; an appropriate long-term monitoring plan; and, in certain circumstances, a contingency plan for a more active remedial measure (e.g., pumping).

j. Land Use. As discussed in the 1990 proposal, EPA's policy is that current and reasonable expected future land use and corresponding exposure scenarios should be considered in both the selection and timing of remedial actions. In the 1990 proposal, the Agency stated, "* * * 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." (See, 55 *FR* 30803.) Recently, EPA issued additional guidance on incorporating reasonable future land use assumptions in remedial decision making in the guidance document "Land Use in the CERCLA Remedy Selection Process" (OSWER Directive No. 9355.7-04, May 25, 1995; see Section II.F.6.a of today's Notice).

Reasonable future land use assumptions should be assessed when developing remedial goals for any given facility and used to focus all aspects of

the corrective action process; however, EPA cautions against automatically restricting assumptions of future land use to extrapolation of the current use or relying only on designated zoning or industrial use codes to establish land use assumptions. A large industrial facility could include office areas, parking areas, a child care area or on-site residences. Highly industrial sites are sometimes located adjacent to residential properties. All of these factors should be considered when making land use assumptions.

EPA recognizes the complexities associated with developing reasonably anticipated land use assumptions and the need for caution when basing remedial decisions on assumptions of future use; however, the Agency believes that non-residential land use assumptions are appropriate for many corrective action facilities. When remedies based on non-residential exposure scenarios involve a combination of treatment and engineering or institutional controls, program implementors and facility owner/operators should use currently available tools to ensure that the remedy continues to achieve its objectives over time and the land use assumptions remain valid. For example, many implementing agencies allow facility owner/operators to use institutional controls to ensure that exposure scenarios at the facility remain consistent with those used at the time of remedy selection.

EPA requests comments on these and other land use issues in Section V.E.1 of today's Notice.

6. Remedy Implementation

Remedy implementation typically involves detailed remedy design, remedy construction, remedy operation and maintenance, and remedy completion. In the CERCLA program, remedy implementation is known as "remedial design/remedial action, operation and maintenance"; in the corrective action program, it is known as "corrective measures implementation" or CMI. As proposed in 1990, corrective measures implementation is generally conducted in accordance with an approved CMI plan. Components of corrective measures implementation might include: conceptual design, operation and maintenance, intermediate design plans and specifications, final design plans and specifications, construction work plan, construction completion report, corrective measure completion report, health and safety plan, public participation plan and progress reports; however, in many cases, only a subset

of these documents will be required for individual corrective measures implementations.

EPA has found a number of useful strategies for improving the efficiency of corrective measures implementation, as discussed below.

a. Performance Based Corrective Measures Implementation. Similar to the performance-based approach discussed for evaluation of remedial alternatives in Section III.C.4.b of today's Notice, some states and EPA regions have developed a performance-based approach to corrective measures implementation. When using a performance-based approach to corrective measures implementation, the overseeing agency generally works with the facility owner/operator during remedy selection to develop remedial goals for the facility. Following public review and comment and approval of a remedy and remedial goals, the facility owner/operator is tasked with designing and implementing the chosen remedy in a manner which would meet the remedial goals. For example, if the remedy chosen for a particular facility included some form of groundwater treatment, an accompanying remedial goal might be to achieve hydrologic containment of the groundwater plume and continuous reduction of the concentrations of hazardous constituents. While the overseeing agency would review and approve the remedy and remedial goals and be involved in developing monitoring systems or other means of measuring compliance with the remedial goals, it would not necessarily be involved with the details of remedy design, construction and implementation. Rather, the overseeing agency would monitor compliance with the remedy implementation milestones and remedial goals and become involved in the details of remedy design and implementation only if a facility owner/operator was having trouble meeting the remedial goals. A performance-based approach to remedy implementation emphasizes that the facility owner/operator, not the overseeing agency, is responsible for designing and implementing a successful remedy.

b. Performance Monitoring. Evaluation of the performance of a chosen remedy is necessary to measure progress toward remedial goals and ensure that remedial objectives are achieved. Program implementors and facility owner/operators have recognized that appropriately designed performance monitoring programs can maximize efficiency and cost-effectiveness and ensure protection of potential human or ecologic receptors.

Properly designed performance monitoring programs are especially important for groundwater remediation because the concentration and distribution of contamination in the subsurface often change with time. Likewise, the ability of remediation systems to prevent migration of contaminated groundwater can be influenced by natural and human factors (e.g., seasonal precipitation or nearby agricultural groundwater usage). For groundwater remediation systems, performance monitoring can assess changes in subsurface conditions so that the remedy can be modified to ensure maximum efficiency in terms of both the location and pumping rate at individual extraction wells.

Performance monitoring is also a critical aspect of a remedial alternative that relies on engineering controls (e.g., liners, barrier walls). Poorly designed monitoring programs for engineered remedies can potentially fail to detect releases from the "contained" areas.

While EPA recognizes the importance of performance monitoring, it also acknowledges that long-term routines of sample collection and analysis carry significant financial burdens. The Agency encourages program implementors and facility owner/operators to design monitoring programs with effectiveness and efficiency as fundamental considerations. For example, due to subsurface heterogeneities, it may be more effective and efficient to monitor a greater number of discrete locations for a subset of mobile contaminants, than to monitor fewer locations for an exhaustive list of analytical parameters and contaminants.

Properly designed performance monitoring programs are integral to remedy success and should be considered throughout the corrective action process, including in remedy selection and design. Detailed guidance regarding performance monitoring and designing monitoring programs in general is available in "RCRA Ground-Water Monitoring: Draft Technical Guidance" (EPA/530/R-93/001) and "Methods for Monitoring Pump-and-Treat Performance" (EPA/600/R-94/123).

c. Completion of Corrective Measures. Documents specifying corrective measures implementation should include methods to determine when remedial goals have been achieved. For example, statistical procedures are often appropriate for determining that concentrations of hazardous constituents measured in groundwater samples meet a remedial goal. Other remedies might require that certain tests be undertaken to determine that

engineering standards have been achieved. Decisions regarding completion of corrective measures may be made for the entire facility, for a portion of the facility, or for a specified unit or release. The public and affected community should be given an opportunity to review and comment on all proposals to complete corrective measures.

In 1990, EPA proposed that corrective measures be considered complete based on a three-part evaluation: the corrective measure had to have complied with all media cleanup standards; all required source control actions would have to be completed; and all specified procedures for removal and decontamination of units, equipment, devices and structures would have to be complete. In addition to certifying compliance with the three criteria, the Agency proposed that the owner/operator's certification be signed by an independent registered professional "skilled in the appropriate technical discipline(s)." The Agency chose not to propose that all certifications be signed by an independent qualified registered professional engineer because it believed that engineering certifications would not be appropriate in all cases (e.g., for a remedy largely addressing groundwater, the Agency believed that certification by a hydrogeologist might be more appropriate). In the absence of final regulations addressing completion of corrective measures, program implementors and facility owner/operators should use the requirements for completion of corrective measures proposed in 1990 as guidance when developing site-specific procedures for completion of corrective measures. At a minimum, the public and affected community should be given notice and an opportunity to comment before corrective action implementation is terminated and a facility is released from its RCRA obligations.

D. Incorporation of Corrective Action in RCRA Permits

RCRA Section 3004(u) mandates that corrective action and schedules of compliance be required for facilities seeking a permit, when corrective action cannot be completed prior to permit issuance. Approximately half the states are authorized to implement state RCRA corrective action programs in lieu of the Federal program. In authorized states, the state issues the RCRA permit including the corrective action component (using any of the options discussed above). In states not authorized for the corrective action program, the state typically issues most of the RCRA permit and EPA issues the

corrective action portion. Although any given facility may be issued a portion of its RCRA permit by an authorized state and a portion by EPA, this should not lead to the perception that any given facility has more than one RCRA permit. Program implementors and facility owner/operators should remember that any given facility has only one RCRA permit; when joint permitting is necessary, EPA will coordinate permitting schedules and priorities with authorized states.

Corrective action requirements and schedules can be included in RCRA permits in a number of ways. In some cases, the RCRA permit will contain detailed corrective action provisions, work plan requirements, and schedules. In other cases, the RCRA permit may incorporate corrective action requirements by referencing another document (e.g., a state or Federal corrective action order). Finally, in certain cases, RCRA permits may defer to corrective action activities being conducted under another authority or by another program. In many cases, incorporation of corrective action requirements into any given permit will use a combination of these strategies. For example, at a corrective action facility where the facility owner/operator has chosen to address a subset of the releases voluntarily, a corrective action permit could defer action at the areas being addressed by the voluntary cleanup while incorporating detailed corrective action conditions for the remaining releases or areas of concern.

E. Corrective Action Orders

Although the 1990 proposal focused primarily on corrective action under RCRA permits, EPA and the states frequently use orders to initiate or oversee corrective actions. EPA intends for equivalent environmental results to be achieved whether corrective action requirements are dictated in an order or a permit. As a matter of EPA policy, the substantive corrective action requirements and public participation requirements imposed under either mechanism are generally the same.

RCRA, as amended by HSWA, includes several enforcement authorities which can be used to issue corrective action orders. The most commonly used authority is RCRA section 3008(h). EPA's longstanding interpretation is that corrective action may be required under RCRA section 3008(h) at facilities which have or should have had interim status, as well as some facilities that had interim status at one time but no longer do (e.g., facilities that have lost interim status under RCRA interim status section 3005(e)(2) and facilities which

have clean closed under interim status), or have failed to properly obtain interim status. In addition, the 1990 proposal explained that issuance of a permit does not automatically terminate the effectiveness of a previously issued 3008(h) order.

Other enforcement authorities which can be used to issue corrective action orders include RCRA sections 3013 and 7003. RCRA section 7003 provides EPA the authority to take enforcement actions to compel corrective action where solid or hazardous waste may present an imminent and substantial endangerment to human health or the environment. RCRA section 3013 provides EPA the authority to require investigations and studies where the presence or release of hazardous waste may present a substantial hazard to human health or the environment. All corrective action orders may be issued unilaterally by the Agency or as consent agreements between the respondent and the Agency.

F. Public Participation and Environmental Justice

EPA is committed to providing meaningful public participation in all aspects of the RCRA program, including RCRA corrective action. In 1993, the Agency released a detailed guidance manual on public participation (RCRA Public Involvement Manual, EPA 530-R-93-006). EPA followed this guidance in December 1995 with the RCRA Expanded Public Participation rule (60 FR 63417, December 11, 1995). EPA is also committed to the principles of environmental justice and equitable public participation. One of the Agency's central goals in the RCRA program is to provide equal access to information and an equal opportunity to participate. EPA continues to regard public participation as an important activity that empowers all communities, including minority and low-income communities, to become actively involved in local waste management activities. EPA strives to provide adequate public participation opportunities to all communities, putting forth additional effort, where appropriate, to reach communities that have not been involved in the past.

When corrective action is part of the RCRA permitting process, it follows the procedural requirements set forth in 40 CFR Parts 124 and 270. Under these requirements, the corrective action provisions in any permit application are available for public review throughout the permitting process and the public can comment on them at the draft permit stage.

The RCRA Expanded Public Participation rule creates more opportunities for public participation in the RCRA permit process.⁸ Additional opportunities of public participation include: (1) A prospective applicant must advertise and hold an informal public meeting before submitting an application for a RCRA permit; (2) the permitting Agency must mail a notice to the facility mailing list when the facility submits its permit application, telling members of the public where they can examine the application during Agency review; and (3) giving the permitting Agency the authority to require a facility owner/operator to set up an information repository at any time during the permitting process or the permit life. EPA anticipates that these provisions, combined with existing public participation requirements, will provide community members with significant opportunities for early input and access to information.

In addition to the new requirements in the RCRA public participation rule, EPA is using guidance to help facility owner/operators meet the Agency's public participation goals. In the preamble to the RCRA Expanded Public Participation rule, EPA encourages agencies and facilities to use all reasonable means to ensure equal opportunities for participation and equal access to information. These means may include, but are not limited to, multilingual notices and fact sheets, as well as translators, in areas where the affected community contains significant numbers of people who do not speak English as a first language. The Agency expects all those involved in implementing corrective action to make good faith efforts to meet these objectives in all permitting processes, including corrective action. In the near future, EPA will issue further guidance to assist facilities and permitting agencies in providing full and equitable public participation in corrective action activities.

EPA's policy is for corrective actions imposed or overseen using a non-permit mechanism to have the same level of public participation as that associated with permits. Although EPA typically has less control over public

participation during voluntary corrective actions, it strongly encourages the use of public participation and will take into account the level of public participation conducted by the facility owner/operator when evaluating the acceptability of voluntary actions. In the absence of final regulations specifically addressing public participation during corrective action, program implementors and facility owner/operators should develop public participation strategies on a site-specific basis, consistent with existing public participation requirements and the program goal of full, fair, and equitable public participation. At a minimum, information regarding corrective action activities (e.g., RFI and CMS reports) should be available to the public and the public should be given an opportunity to review and comment on proposed corrective action remedies.

G. Financial Assurance

RCRA section 3004(u) requires that, when corrective action cannot be completed prior to permitting, RCRA permits contain corrective action schedules of compliance and financial assurance. Financial assurance is also typically included in corrective action orders. On October 24, 1986, EPA proposed detailed regulations to govern financial assurance for corrective action (FACA). The October 1986 proposal would require owners or operators seeking an RCRA permit to demonstrate financial assurance for completion of remedies. Proposed acceptable mechanisms included trust funds, surety bonds guaranteeing performance, letters of credit, the financial test, and the corporate guarantee. These are similar to the mechanisms used to assure closure and post-closure costs. In a subsequent memorandum, EPA clarified that insurance would also be an acceptable mechanism. In addition to permissible mechanisms, the October 1986 proposal provided that financial assurance demonstrations would ordinarily be required at the time of remedy selection (e.g., rather than at the time an RFI is required). The proposal also discussed cost-estimating procedures, including the periodic adjustment of cost estimates, for determining the amounts of required financial assurance.

In the absence of final rules, program implementors and facility owner/operators have the flexibility to tailor financial responsibility requirements to facility-specific circumstances. In some instances, however, industry has expressed concern with EPA's implementation of the financial

⁸The RCRA public participation rule is generally effective only in states which have amended their authorized hazardous waste programs to adopt the public participation rule requirements. At a minimum, all authorized states are scheduled to make such amendments by July 1, 1997. The exceptions are the following states and territories where EPA implements the entire RCRA hazardous waste program, including the public participation rule: Alaska, Hawaii, Iowa, Puerto Rico, the Northern Mariana Islands, the Virgin Islands and American Samoa.

assurance requirements. Representatives of the regulated community have also expressed concern that the costs of providing financial assurance divert resources from actual cleanup activities, and that it may be difficult for facility owners/operators to provide assurance for future work while simultaneously performing current work.

In Section V of today's Notice, EPA requests comments on these concerns and on corrective action financial assurance in general. In the interim, EPA emphasizes that program implementors should apply financial assurance requirements flexibly and that their main goal should be to ensure that remedies proceed expeditiously.

IV. Corrective Action Program Priorities

In the absence of detailed regulations, EPA and authorized states have implemented the corrective action program based on guidance and policies developed over the past ten years. EPA stresses that implementation of the corrective action requirements must continue even as the Agency considers improvements to the corrective action program. EPA's key goals and implementation strategies for the corrective action program are outlined below.

1. Prioritize the corrective action universe:

a. Meet the goal of assessing and prioritizing all hazardous waste treatment, storage or disposal facilities by end of FY96.

b. Focus resources on high priority areas at high priority facilities.

2. Increase the amount of corrective action:

a. Continue to authorize states for corrective action.

b. Do not duplicate work already performed by another Federal or state program.

c. Encourage alternate state authorities to conduct analogous work at RCRA facilities.

d. Utilize the expertise of other Federal/state agencies where appropriate (e.g., the U.S. Fish and Wildlife Service for ecological, wetlands issues).

e. Increase the number of voluntary actions, including actions at facilities without a permit or an order, actions outside of an existing permit or order, and actions required under permit or order but with no Agency oversight.

f. Disinvest or substantially reduce oversight at lower priority facilities and high priority facilities where the owner/operator has proven his or her capability.

3. Continue to implement the stabilization initiative:

a. Implement stabilization actions as early in the process as possible.

b. Phase and focus RFIs to collect any information needed to implement stabilization actions.

c. Use existing corrective action program environmental indicators as stabilization performance measures.

d. Include meaningful opportunities for public participation throughout the process including during extensive or long-term stabilization actions.

4. Streamline the corrective action process where possible:

a. Implement stabilization actions where possible, then disinvest and move on to other facilities.

b. Focus RFI data collection and tailor investigations to specific site conditions.

c. Use existing pertinent data.

d. Communicate remediation expectations to facility owners/operators early in the process.

e. Use innovative technical tools, including new site characterization techniques and treatment technologies when appropriate and beneficial.

f. Avoid unnecessary procedural steps whenever feasible (e.g., eliminate the CMS if a desirable remedy can be identified without one).

g. Use presumptive remedies when appropriate.

h. Focus on plausible remedies, if a CMS is necessary.

i. Conduct CMS concurrent with RFI when possible.

j. Utilize site-specific performance standards instead of detailed review of work plans and remedy designs when possible.

k. Consider non-residential land use scenarios when appropriate, while recognizing that ecological risks may end up driving media cleanup standards and remedy designs when using industrial land use assumptions.

5. Continue to involve the public in all stages of the corrective action process.

V. Request for Comment and Data

EPA has the benefit of more than ten years experience in corrective action implementation as it begins the Subpart S Initiative. The Agency is committed to using this experience to identify, develop, and implement improvements to the speed, efficiency, protectiveness and responsiveness of the corrective action program as part of the Subpart S Initiative. Today, EPA requests information, comments and data to assist in this process. Some of the topics discussed in this section raise new concepts that would likely warrant re-

proposing regulations or developing new guidance documents; others were addressed in the 1990 proposal but are included in this section of today's Notice because the Agency is requesting additional comment and data at this time. EPA requests that commenters be as specific as possible in their responses to today's requests. The Agency is particularly interested in comments which rely on actual experience in corrective action implementation and include specific suggestions for improvement to the corrective action program. The Agency also requests that commenters keep in mind the objectives of the Subpart S Initiative: create a consistent, holistic approach to cleanups at RCRA facilities; establish protective, practical cleanup expectations; shift more of the responsibilities for achieving cleanup goals to the regulated community; focus on opportunities to streamline and reduce costs; and, enhance opportunities for timely, meaningful public participation.

EPA emphasizes that its purpose in requesting comments at this time is to take advantage of information and experience gained through program implementation to aid in identification and development of new proposals and to determine which portions of the 1990 proposal should be promulgated immediately. EPA will consider all comments submitted in response to today's Notice in development of the Subpart S Initiative. Comments submitted during the 1990 comment period will be considered before the Agency takes final action on any part of the 1990 proposal. If EPA later proposes new corrective action regulations, full public notice and opportunity for comment will be provided at that time.

A. General

EPA requests general comment on its implementation of the corrective action program to date and on the strategy, goals and schedule of the Subpart S Initiative as discussed in Sections II and IV of today's Notice. The Agency is especially interested in comments which include suggestions for specific improvements to the corrective action program based on actual implementation experiences. The Agency is also interested in examples of situations where the existing flexibility in the corrective action program has been used to expedite facility cleanups and in examples of the corrective action program providing too much or too little flexibility. Since the Subpart S initiative includes policy, guidance and rule development, commenters should include specific recommendations for

additional policy or guidance development and address the balance between guidance/policy documents and regulations (e.g., in 1990 EPA proposed detailed regulations to address most aspects of the corrective action program perhaps some of that information could be presented more effectively in policy or guidance documents).

B. Resolution of the 1990 Proposal

EPA believes there may be elements of the 1990 proposal which have been largely non-controversial or for which the issues have been fully aired; accordingly, going through additional notice and comment on all the issues raised by the 1990 proposal would not be necessary or, from an efficiency standpoint, desirable. On the other hand, many issues raised by the 1990 proposal have evolved during the past six years of corrective action implementation, necessitating additional opportunities for public notice and comment. In the discussions to follow, EPA identifies the issues on which it believes further public input is most needed. EPA also requests that commenters identify any other issues, or elements of the 1990 proposal, on which they believe it would be inappropriate for the Agency to take final action without re-proposal. At the same time, EPA requests that commenters identify specific elements of the 1990 proposal which could be promulgated without additional public review and the advantages or disadvantages of immediately promulgating such provisions. Comments submitted in response to this request will be considered part of the administrative record for the 1990 proposal; however, commenters should keep in mind that EPA's intent is not to request new comment on the specifics of the 1990 proposal. Comments submitted during the 1990 comment period will be considered before the Agency takes final action on any part of the 1990 proposal.

C. Focusing the Corrective Action Program on Results

As discussed earlier in today's Notice, the goal of the corrective action program is to appropriately stabilize and clean up RCRA facilities in a timely way. EPA believes that too often program implementors and facility owners/operators may lose sight of this goal and become distracted by processes. On the other hand, the purpose of a standardized cleanup process is to ensure that the program is implemented consistently and that all facilities appropriately meet cleanup goals. The Agency is interested in improving the

corrective action program's focus on cleanup goals and requests general comment on the balance between focusing on results and ensuring an appropriate level cleanup at all facilities. In addition, EPA is specifically interested in comments which address:

1. Performance Standards

EPA believes that focusing the corrective action program on compliance with clear measurable performance standards rather than a prescriptive corrective action process could significantly increase the pace and quality of corrective action cleanups. Corrective action performance standards could be part of a larger Agency effort to develop results-based measures. The Government Performance and Results Act of 1993 (GPRA) requires EPA to develop and implement results-based measures across its programs by 1998. For example, the corrective action environmental indicators (discussed below), were developed, in part, in response to the GPRA. The Agency will consider any performance-based approaches developed as part of the Subpart S Initiative as it develops its implementation plan for the GPRA.

Reliance on performance standards, however, can raise a number of implementation issues. For example, some stakeholders have suggested that using performance standards in lieu of detailed review and approval of work plans may increase the risk that individual facility owners/operators will attempt to obscure or avoid legitimate corrective action obligations. Stakeholders have also expressed concern about potential reductions in public participation when corrective action activities occur with reduced Agency oversight. In addition, some elements of corrective action may be difficult to specify as performance standards, and measuring, documenting compliance with, and enforcing performance standards can be difficult for facility owners/operators and overseeing agencies. EPA requests general comment of the use of performance standards in the corrective action program. The Agency is particularly interested in comments which address the details of documenting and measuring compliance with performance standards and in approaches to ensure adequate public involvement in performance-based corrective action activities. In addition, as discussed in Section II.E.2 of today's Notice, the corrective action program currently has two environmental indicators covering human exposures controlled and

groundwater releases controlled. The Agency requests comments on the development of additional environmental indicators; the Agency is specifically interested in indicators targeted at ecological risks.

2. Less Focus on Solid Waste Management Units

Use of the solid waste management unit (SWMU) concept as discussed in the 1990 proposal has led to numerous unsuccessful permit appeals. These permit appeals slow corrective action implementation and increase the transaction costs. In certain cases, the SWMU concept may also deter program implementors and facility owners/operators from addressing contamination on a site-wide basis by focusing corrective action resources unit-by-unit instead of more holistically.

In general, EPA believes that a holistic approach to corrective action, as opposed to a unit-by-unit approach, could increase cleanup efficiency and reduce transaction costs. EPA requests general comment on focusing the corrective action program less on individual solid waste management units and more on holistic approaches. The Agency requests that commenters who support a less unit oriented corrective action program also address whether there is any need for clarifications to the corrective action jurisdiction language and/or the SWMU definition in order to use such an approach.

D. Using Non-RCRA Authorities for Corrective Action

EPA recognizes that there are many authorities which could be used to impose or oversee corrective action at any given facility. Typically, these authorities include RCRA orders and permits, state cleanup orders, and voluntary and independent actions. In some cases, CERCLA authorities are also available. The Agency is concerned that, to date, it has not taken full advantage of the work of other programs in the RCRA corrective action program. In principle, EPA believes that when a facility is being adequately addressed it should not matter what authority is used or what Agency is overseeing the cleanups. In support of this principle, the Agency requests general comment on the use of non-RCRA authorities to satisfy corrective action requirements. Commenters should address the scope and stringency of non-RCRA authorities as compared to corrective action requirements and the ability of non-RCRA authorities to adequately involve the public and affected communities.

The Agency is also specifically interested in comments which address:

1. State Cleanup Programs

Over half the states have independent Superfund-like authorities and cleanup programs; typically, these authorities and cleanup programs are modeled after the Federal Superfund program. In many cases, EPA believes these independent state authorities are substantively equivalent in scope and effect to the RCRA corrective action program.

The use of state cleanup programs can offer a number of advantages to state and regional personnel as well as to the regulated, environmental and public interest communities. EPA believes these advantages include: providing states the ability to recover the costs of their program oversight; expanded opportunities for public participation; the ability to recover damages associated with contamination caused by previous owners or operators who would likely not be considered liable under RCRA sections 3004(u) and 3004(v); and, opportunities for voluntary or independent cleanups.

Many states are already using their independent Superfund-like authorities to address releases of hazardous waste and hazardous constituents at facilities subject to corrective action, especially at facilities operating under interim status. The Agency is interested in exploring the relationship between independent state Superfund-like authorities and the corrective action program and, if appropriate, providing some level of assurance that facility owners/operators who complete cleanups under independent state authorities have satisfied RCRA corrective action obligations.

EPA requests general comment on the use of state Superfund-like cleanup programs to compel or conduct cleanups at facilities subject to RCRA corrective action. EPA is especially interested in comments which address:

(a) *Scope.* Whether the scope and effect of state Superfund-like cleanup programs are substantively equivalent to the scope and effect of the RCRA corrective action program.

(b) *Advantages/Disadvantages.* Advantages and disadvantages which might be associated with using a state Superfund-like cleanup authority, rather than, or in addition to, an RCRA corrective action authority, at an operating hazardous waste management facility.

(c) *Compliance with Federal Standards.* The degree to which compliance with state Superfund-like authorities should be assumed to meet

corrective action requirements, including procedural requirements such as public participation and permitting.

(d) *Coordination with RCRA Permits.* Issues which might be associated with coordination of state Superfund-like cleanup orders with RCRA permits and Federal RCRA corrective action orders.

2. Enhanced Flexibility for States With EPA-Endorsed CSGWPPs

Current EPA policy is to provide states greater flexibility for the management and protection of their groundwater resources. This policy was stated formally in a report titled, "Protecting the Nation's Ground Water: EPA's Ground Water Strategy for the 1990s" (Publication 21Z-1020, July 1991). The 1991 report indicated that, to the extent authorized by EPA statute and consistent with Agency program implementation objectives, EPA will defer to state policies, priorities, and standards once a state has developed an adequate groundwater protection program. EPA provided a definition of an adequate state groundwater protection program in a December 1992 guidance titled, "Final Comprehensive State Ground Water Protection Program Guidance" (EPA 100-R-93-001). The focal point of the 1992 guidance was the creation of Comprehensive State Ground Water Protection Programs (CSGWPPs). As discussed in the 1992 guidance, CSGWPPs are intended to provide a more efficient, coherent, and comprehensive approach to protecting the nation's groundwater resources.

Developing a CSGWPP is a three-stage process. First, a state develops a "core CSGWPP" and submits it to EPA for review and endorsement. The core CSGWPP is only required to include one groundwater protection or remediation program to demonstrate whether the state's CSGWPP approach inconsistent with EPA guidance. Second, after the core CSGWPP is endorsed by EPA, joint state-EPA discussions are held to develop a "multi-year planning agreement." The multi-year planning agreement will establish methods and a schedule for incorporating other state groundwater programs into the CSGWPP. Third, at the completion of the multi-year planning process, all groundwater protection and remediation programs conducted in the state, including Federal remediation programs, are included in a "fully integrating CSGWPP."

At the time of today's Notice, EPA has endorsed five state core CSGWPPs; endorsement of thirteen more is anticipated by June 1996. EPA is committed to taking actions within its own programs to provide states with

endorsed CSGWPPs greater flexibility in protecting their groundwater resources. The Agency has recently affirmed this commitment in, "EPA's Commitments to Support Comprehensive State Ground Water Protection Programs" EPA, 100/R-94/002, date. In the RCRA corrective action program, EPA committed to considering state groundwater classification when making groundwater use assumptions, selecting groundwater cleanup levels, and setting cleanup priorities.

EPA is interested in evaluating additional opportunities to provide states with endorsed CSGWPPs enhanced flexibility in implementation of the RCRA corrective action program. EPA requests comments and suggestions on specific areas of flexibility that should be available in states with endorsed CSGWPPs. The Agency is also interested in suggestions and comments addressing areas where a distinction in the amount of flexibility afforded to states with an EPA-endorsed CSGWPPs would not be appropriate. For example, should states with EPA-endorsed CSGWPPs be provided greater flexibility than states without endorsed CSGWPPs in specifying groundwater cleanup levels, points of compliance or compliance time-frames based on state determination of current and future groundwater uses as recorded in an EPA-endorsed CSGWPP? Similarly, should states with EPA-endorsed CSGWPPs be given additional flexibility to prioritize oversight resources or facility-specific corrective action schedules?

3. Voluntary Corrective Action

EPA requests comments on the use of state voluntary cleanup programs to accelerate cleanups at facilities subject to RCRA corrective action and the roles of EPA and states in such situations. EPA is specifically interested in comments which address:

(a) *Use of state voluntary cleanup programs at RCRA corrective action facilities.* Over half the states have developed voluntary cleanup programs; these state voluntary cleanup programs vary significantly in program design, the degree to which the state offers guidance and oversight during the cleanup process and the review, if any, of the final cleanup. EPA is interested in comments which address the use of state voluntary cleanup programs to accelerate corrective action at RCRA facilities including the level of Federal review or endorsement, if any, necessary for such programs. Commenters who support Federal review or endorsement should address program criteria (e.g., protectiveness,

public participation) that EPA should use to evaluate state voluntary cleanup programs used to satisfy corrective action obligations.

(b) *Incentives for private parties to accelerate corrective actions.* EPA recognizes that many facility owners/operators who might be inclined to accelerate corrective action voluntarily at their facilities may choose not to because of concerns that the Agency might "second-guess" the cleanup conducted and impose additional requirements. EPA requests comments on incentives which can be offered to encourage facility owners/operators to voluntarily accelerate corrective action at their facilities including approaches which could be used to provide comfort or assurance to facility owners/operators who complete corrective action under a state voluntary program. In addition, the Agency requests comments on the degree to which accelerated corrective action should be based on compliance with general performance standards or, alternatively, more detailed guidance documents or regulations. Commenters who support the use of guidance should specify whether guidance should be developed at the state or Federal level, and list the existing documents that they believe would be applicable.

(c) *Specific site eligibility for accelerated corrective action.* In some state voluntary cleanup programs, site eligibility for voluntary cleanup is limited to sites which are considered low risk (e.g., sites where the contamination is not highly concentrated or highly toxic). EPA requests comments on site eligibility for accelerated corrective action and whether eligibility should in any way be limited based on the degree of health or environmental threat present at any given facility. The Agency is specifically interested in comments which address whether, or to what extent, facilities already under real-time Agency oversight should be allowed to switch to an accelerated action pursuant to a state voluntary cleanup program.

(d) *Public participation.* EPA believes that meaningful opportunities for public participation are essential to a successful corrective action program; it requests comments on the specific opportunities and procedures for public participation which should be included in any voluntary corrective action program.

(e) *Review of accelerated actions.* EPA anticipates that some level of review by the implementing state agency will be necessary to ensure that accelerated corrective actions are of sufficient quality to fulfill corrective action requirements. The Agency requests

comments on the level of review by the implementing state agency, if any, necessary to ensure the quality of accelerated corrective actions. Commenters who believe some level of review is necessary should address the timing and substance of the review (e.g., audits of facility actions and records, review of milestone documents), and the role, if any, of EPA in the review process.

(f) *Third-party oversight.* Several states have established cleanup programs which rely on a licensed third-party overseer, rather than implementing agency staff, to ensure compliance with cleanup requirements at certain facilities. One state requires an independent third-party overseer to monitor compliance with all phases of the cleanup process at facilities and certify to the implementing agency when cleanup at a facility is complete. EPA believes such approaches may reduce the risks associated with voluntarily accelerated cleanups and provide necessary relief to state regulators. While development of a third-party oversight system is not currently under consideration at the Federal level, EPA requests comments on the use of state third-party oversight programs for oversight of cleanups at facilities subject to RCRA corrective action.

4. Corrective Action at Interim Status Facilities

In 1990, EPA proposed that corrective action regulations be included in 40 CFR Part 264 (the permitting standards). The only changes proposed to 40 CFR Part 265 (the interim status standards) were to address the need to coordinate corrective action and closure activities at closing interim status units and facilities. EPA's longstanding view has been that the requirements to address facility-wide corrective action at interim status facilities are consistent with those for permitted facilities. For this reason, the Agency requests comments on whether the corrective action regulations should be developed under 40 CFR Part 265 as well as under Part 264. The Agency is especially interested in comments which address the trigger for initiation of corrective action activities at interim status facilities, the degree to which any corrective action requirements included in 40 CFR Part 265 would be independent or self-implementing (see, discussion of independent or self-implementing corrective action, below), and the incorporation of corrective action activities conducted while facilities are under interim status into final facility permits. In addition, EPA requests

comments on further modifying the interim status requirements to include provisions for the cleanup of releases to groundwater from regulated units equivalent to those at 40 CFR 264.100.

5. Independent or Self-Implementing Corrective Action

EPA believes that the 1990 corrective action proposal appropriately emphasized the need for flexibility and site-specific decisions; however, the administrative framework proposed in 1990 relies on intensive oversight by a regulatory agency. In general, corrective action facility owners/operators initiate a cleanup only after being compelled to do so by a regulatory agency (e.g., in an order or permit). The regulatory agency then reviews and approves intermediate steps, such as work plans and reports, ultimately selects the remedy, and ensures that the remedy is implemented and achieves cleanup objectives. This command and control approach reduces risks associated with all phases of cleanup at a facility; however, it is resource intensive and may discourage facility owners/operators from undertaking voluntary or accelerated cleanup actions.

Due to limited oversight resources, many of the lower risk facilities which are believed to require some form of corrective action have remained unaddressed. This issue has raised concerns about the pace and quantity of corrective action cleanups. In order to address these concerns and shift more of the responsibility for conducting corrective action activities to the regulated community, EPA is examining approaches to independent or self-implementing corrective action. By "independent" or "self-implementing" the Agency is referring to activities required by regulation to meet certain standards of performance within specified time periods without direct, real-time, oversight by a regulatory agency. For example, the RCRA regulations for hazardous waste characterization require generators of solid waste to determine if such wastes are considered hazardous wastes and, if hazardous, to manage them appropriately. Generators notify overseeing agencies of their waste determinations and management (through the biannual reporting and manifesting systems) and overseeing agencies periodically audit or inspect generator compliance. Similarly, EPA believes some corrective action activities could be sufficiently prescribed by regulation and carried out independently by facility owners/operators subject to auditing by an overseeing agency, rather than being

specified in facility specific order or permit conditions. For example, facility owners/operators could be required, upon identification of a release of hazardous waste or hazardous constituents at or from the facility, to conduct an initial screening investigation and take appropriate steps to control the release. In another example, facility owners/operators could be required to take whatever steps are necessary to certify compliance with EPA's two environmental indicators for corrective action. (As discussed in Section II.E.2 of today's Notice, the two environmental indicators for corrective action are human exposures controlled and groundwater releases controlled.)

EPA believes that applying the concept of self-implementation to a cleanup scenario raises many issues. For example, the complexity and site-specific nature of corrective action, coupled with the fact that it requires the exercise of professional judgement (e.g., hydrogeologic, engineering) throughout the process, may make self-implementation problematic. These same factors may make compliance monitoring and enforcement difficult. The Agency's experience with the self-implementing groundwater monitoring requirements in the interim status standards (i.e., Part 265, Subpart F) is indicative of the difficulties that may be associated with ensuring full compliance with self-implementing standards. The Agency is interested in general comment on the concept of independent or self-implementing corrective action; it is specifically interested in comments which address:

(a) *Scope.* EPA requests that commenters specifically identify the elements of the corrective action process which they believe are amenable to self-implementation.

(b) *Public participation.* Meaningful public participation is essential to the corrective action process. EPA requests that commenters address incorporation of public participation opportunities and activities in self-implemented corrective action.

(c) *Detailed guidance.* An argument can be made that, without detailed guidance for self-implemented activities, quality will vary across actions. EPA requests that commenters address the degree to which self-implementation should rely on detailed guidance and whether the Agency should issue new guidance for self-implemented corrective action or if EPA can rely on guidance already available at the state and Federal level. Commenters suggesting that EPA rely on existing guidance should indicate the guidance documents they believe would

be applicable. The Agency is also interested in comments which address approaches to ensure that facility owners/operators have access to and use current and appropriate guidance documents.

(d) *Record keeping and reporting.* Facility owners/operators might be required to submit information certifying and documenting their compliance with self-implementing requirements. Information and documentation which EPA could use to assess the quality of self-implemented actions might also be necessary. EPA requests that commenters address whether or not Record keeping and reporting requirements should be part of self-implementing corrective action. Commenters who support Record keeping and reporting requirements should address the specific requirements they believe are necessary.

(e) *Compliance Monitoring and Enforcement.* Compliance with self-implementing requirements might be monitored through regular inspections or periodic auditing. EPA requests comments on the ability of state or Federal overseeing agencies to adequately monitor and enforce self-implementing requirements. EPA requests that commenters specifically address its ability to accurately assess the quality of self-implemented corrective actions without ongoing Agency oversight.

(f) *Risks.* Any reduction in real-time agency oversight increases the risks that individual facility owners/operators might attempt to avoid or obscure legitimate corrective action obligations. EPA requests comments on the potential risks associated with self-implementation of certain corrective action provisions and suggestions of actions that the Agency could take to eliminate or mitigate such risks.

6. Consistency with the CERCLA Program

As discussed in Section III.B.1 of today's Notice many facilities subject to corrective action are also subject to cleanup under the Federal CERCLA program. At some of these facilities, RCRA corrective actions are proceeding concurrently with CERCLA cleanups (e.g., the RCRA corrective action is addressing SWMUs while the CERCLA cleanup is focusing on other releases). At other facilities, cleanup is being addressed by one authority but final action under the other authority is being deferred (e.g., a site undergoing RCRA corrective action but still on the NPL). In general, EPA believes coordination of cleanup activities at facilities with overlapping RCRA and CERCLA

liability is appropriate; however, the Agency continues to hear concerns over duplication of procedural and substantive cleanup requirements, including oversight. Recently, EPA established a multi-agency and state workgroup to examine issues associated with overlapping cleanup obligations. Through the "Lead Regulator Workgroup" the Agency hopes to identify specific strategies for expediting cleanups though reducing or eliminating the transaction costs that may be associated with overlapping cleanup obligations. The Agency requests comments on the issue of coordination of overlapping RCRA and CERCLA cleanup requirements and suggestions for improvement to the Agency's current policy and regulatory approaches to coordination. For example, would using of the same terms for remedial activities, such as investigations or remedy selection, improve coordination at sites with overlapping RCRA corrective action and CERCLA cleanup obligations? Similarly, should the remedy selection criteria between the two programs be explicitly conformed?

While EPA's focus is on coordination between the RCRA and CERCLA programs, it also requests comments on coordination of overlapping state and Federal cleanup obligations.

7. ASTM RBCA Standard

EPA expects the number of identified releases from underground storage tanks (USTs) to increase to more than 400,000 as the 1998 deadline for upgrading, replacing, or closing UST systems approaches. To meet the challenge of addressing these releases in a timely manner, EPA is working with states to streamline their administrative processes and to encourage the use of expedited site assessment and alternative cleanup technologies. The Agency is also encouraging state and local agencies to incorporate risk-based decision-making into their corrective action programs.

Risk based decision-making is a process UST implementing agencies can use to: focus site assessment data gathering; conduct initial response actions; categorize or classify sites; determine what, if any, further action is necessary to remediate a site; help establish cleanup goals; and decide on the level of oversight provided to cleanups conducted by UST owners and operators. To provide support for the use of risk-based decision-making, EPA's Office of Underground Storage Tanks, within the Office of Solid Waste and Emergency Response (OSWER), issued Directive 9610.17: Use of Risk-

Based Decision-Making in UST Corrective Action Programs. The American Society for Testing and Materials (ASTM) has also developed guidance addressing risk-based decision-making in its recently issued standard ASTM E1739-95, Risk Based Corrective Action Applied at Petroleum Release Sites (referred to as RBCA). The ASTM standard is one example of how risk-based decision-making can be incorporated into state UST corrective action programs. EPA believes the ASTM standard may be a good starting point for the development of a risk-based process tailored to applicable state and local laws and regulatory practices. In addition, state UST RBCA processes may often be applicable to petroleum releases from sources other than leaking USTs.

EPA requests general comment on the use of the ASTM RBCA approach in the corrective action program; it is especially interested in comments which address: the appropriateness of using RBCA-like programs to address releases from sources other than leaking underground storage tanks (e.g., petroleum spills and contamination at refineries); whether the ASTM RBCA approach is acceptable for releases of chemicals other than petroleum products; and, whether there have been, or could be, conflicts between the result of a cleanup conducted using the ASTM RBCA approach and cleanups conducted using the RCRA corrective action or CERCLA approaches.

8. Definition of Facility for Corrective Action

As discussed in Section III.B.3.a of today's Notice, EPA's definition of facility for purposes of corrective action has been problematic in some situations. In certain circumstances, the concept of contiguity can bring large tracts of land not involved with hazardous waste management under corrective action authorities. In many cases, these large tracts of land are being (or could be) addressed using another cleanup authority (e.g., CERCLA or state cleanup programs); in other cases, they may not be a high priority for cleanup. For example, EPA indicated in the 1990 proposal that, if five acres of a one hundred-acre parcel of land were leased to a company that engaged in hazardous waste management, the facility for purposes of corrective action could be the entire 100-acre parcel. EPA also stated that if (in the same example) the lessee/operator also owned 20 acres of land adjacent to the 100-acre parcel (but not necessarily adjacent to the five acres used for hazardous waste management), the facility might include that 20 acres

as well. (See, 55 FR 30808, July 27, 1990.) In practice, EPA has found that imposing this interpretation of contiguity on situations such industrial parks, port districts, and large areas of Federally owned land (e.g., national forests) can, in some cases, force the Agency to address sites which are not engaged in hazardous waste management and which may not be a high priority for cleanup using limited corrective action resources. Another concern has been that it may be seen as inequitable to require the operator of a small facility to be responsible for the cleanup of a much larger parcel that he or she does not own. Accordingly, EPA is requesting comment on whether corrective action requirements should apply more narrowly (e.g., only to the portion of the facility under the control of the operator engaged in hazardous waste management). EPA requests that commenters endorsing a narrow definition of facility address the concern that it would encourage facility owners/operators to narrowly define their facilities in an effort to avoid legitimate corrective action obligations and also address other potential consequences and concerns, if any, of a facility definition which is too narrow.

E. Balance Between Site-specific Flexibility and National Consistency

To account for the variety of circumstances at corrective action facilities, EPA has emphasized a flexible, facility-specific approach to cleanup; however, using a facility-specific approach can raise issues associated with national consistency and minimum national standards. The Agency requests general comment on the appropriate balance between national consistency and site-specific decision-making in the corrective action program. The Agency is specifically interested in comments which address:

1. Land Use

EPA has been criticized for too often assuming that the future uses of facilities undergoing cleanups will be residential. Residential use is considered unrestricted land use and carries the greatest potential for exposures and the most conservative exposure assessments. As discussed in Section III.C.5.j of today's Notice, the Agency believes that the 1990 proposal adequately provides for reasonable consideration of future land use during development of remedial goals at corrective action facilities; however, it recognizes that the uncertainties surrounding land use assumptions may cause many program implementors and facility owners/operators to choose a

conservative approach to future land use issues. Today the Agency invites comment on the general issues associated with consideration of future land use in the corrective action context. EPA is specifically interested in comments which address:

(a) *Effect.* EPA is interested in comments on the effect of a non-residential land use determination on a facility owner/operator's corrective action obligations and the need (if any) for additional regulations to address incorporation of land use determination in the corrective action process. For example, how, if at all, should non-residential land use determinations affect the scope of facility investigations? Should land use determinations be explicitly required as part of remedy selection?

(b) *Institutional controls.* When final remedies rely on non-residential exposure assumptions, steps must be taken to ensure the non-residential exposure assumptions remain valid and to trigger additional cleanups should exposures change. EPA is interested in comments which address the role of the government, if any, in ensuring the continued application of exposure assumptions and in imposing additional cleanups as necessary. In addition to the role of government, commenters should list other factors, incentives or institutions they believe will play a role in this process. The Agency is particularly interested in comment on the adequacy of institutional controls (e.g., deed notices, easements, or local land use controls) to ensure that changes in land use trigger additional cleanups as appropriate, the advantages or disadvantages associated with such controls as opposed to direct governmental oversight.

(c) *Additional cleanup necessitated by changing land use.* EPA requests that commenters specifically address completion of any additional increment of cleanup necessitated by changing land use. The Agency is also interested in comments which address the continuing obligation, if any, of the facility owner/operator to ensure that (should land use change) additional cleanups will be effected, the obligation (if any) on the person who changes the land use at the facility, the legal mechanisms that might be used to impose these obligations, the role of the Agency and/or facility owner/operator in monitoring land use changes and the necessity, if any, for the facility owner/operator or others to provide financial assurance in case an additional cleanup should become necessary.

(d) *Periodic review of remedies.* The Superfund program periodically reviews

remedies to ensure their continued effectiveness. EPA requests commenters address the need for and potential benefits or problems associated with periodic review of RCRA corrective action remedies. Commenters who believe periodic review of remedies is desirable should address the frequency and content of such reviews.

2. Points of Compliance

The location at which media cleanup levels must be attained (point of compliance or POC) has significant implications for the scope, magnitude and cost of corrective actions. Comments regarding the POC for corrective actions were received in response to the 1990 proposal; this issue has remained controversial and EPA believes it is appropriate to provide another opportunity for public review and comment at this time. The Agency requests general comment on its implementation of the point of compliance concept in the corrective action program and other POC issues. EPA is especially interested in comments which address:

(a) *Alternatives to the throughout-the-plume/unit boundary POC.* EPA requests suggestions on alternative POCs, especially groundwater POCs. Commenters should address the factors, scenarios, and decision-making criteria that should be considered in justifying alternatives to a throughout-the-plume/unit boundary POC (e.g., a facility boundary POC). In supplying input on alternative POCs for groundwater, commenters should consider the Agency's expectations for groundwater cleanups, (1) returning groundwater to its maximum beneficial uses wherever practicable; (2) preventing or minimizing further migration, preventing exposure to the contaminated groundwater and evaluating further risk-reduction; and, (3) controlling or eliminating surface and subsurface sources of groundwater contamination. Commenters who believe that changes to EPA's expectations for groundwater are necessary to support appropriate POCs are also invited to comment on EPA's groundwater expectations in general.

(b) *Points of compliance for stabilization.* EPA requests comments on whether it should develop a stabilization point of compliance or to support the Stabilization Initiative. As discussed in Section II.E.1 of today's Notice, the Stabilization Initiative is EPA's primary corrective action implementation strategy. Stabilization actions for groundwater often involve source control and hydraulic containment. A stabilization point of

compliance could be used to help define the location at which a performance measure of groundwater plume containment would be measured.

(c) *Point of compliance for surface water.* Typically, the point of compliance for releases to surface water is at the point where the release enters the surface water. EPA requests comments regarding factors that should be considered in selecting the appropriate standards that must be achieved at the point where the release enters surface water. For example, is it appropriate to consider the mixing that occurs within the receiving surface water when establishing points of compliance for surface water discharges? Mixing zones are often considered when evaluating the acceptability of waste water discharges regulated by the National Pollution Discharge Elimination System (NPDES).

EPA also requests comments on the differences between evaluating the actual and potential impact from point source "pipeline" NPDES discharge and a more widespread discharge of groundwater entering as base-flow into the surface water body. Of particular interest associated with groundwater discharge to surface water is the potential for, and impacts from accumulation of contaminants in sediments. Also, the Agency is interested in feedback regarding the degree to which monitoring would be capable of assessing impacts of both the short- and long-term discharge of groundwater to surface and the associated standard of protection being afforded. The Agency is interested in examples where a discharge to surface water of certain loadings of contaminated groundwater was determined to be harmful or not harmful to human or ecologic receptors.

3. Standardized Lists of Action Levels and Media Cleanup Levels

The attempt to balance flexibility with the need for national consistency can be particularly contentious in the area of media-specific action and cleanup levels. Some stakeholders argue that lists of clearly defined action and cleanup levels will reduce transaction costs, increase the pace of cleanups and encourage voluntary actions; many program implementors and facility owners/operators currently use lists of standardized action or cleanup levels when implementing corrective action requirements (e.g., some states have lists of standardized media-specific cleanup levels). Other stakeholders argue that standardized lists of action or cleanup levels are too often developed based on conservative residential exposure

scenarios, can be too easily misapplied, and often result in overly stringent cleanup actions. As an alternative to lists of standardized action and cleanup levels, some Agencies have developed standardized approaches (i.e., formulas) that allow for consideration of site-specific conditions. EPA has recently taken this approach in developing the Superfund Soil Screening Guidance (see, Section II.F.6.b of today's Notice).

EPA invites general comments and suggestions pertaining to the development, distribution and use of media-specific action and cleanup levels. The Agency is specifically interested in comments which address the advantages, disadvantages and preferences regarding standardized approaches versus publishing lists of standardized levels (note, lists of standardized levels would be developed using standardized approaches, the difference is in consideration of site-specific factors, such as depth to groundwater). Since many states have already developed standardized approaches or lists of action and cleanup levels, EPA requests commenters also address the role of EPA in developing, distributing, and periodically updating national approaches or lists and the relationship of any standardized approaches or lists developed at the national level to existing state programs.

4. Area Wide Contamination Issues

In some cases corrective action facilities are located in areas of widely dispersed contamination. For example, some corrective action facilities may be located in tidal areas which were reclaimed by placement of fill materials now considered contaminated. In other cases, an RCRA corrective action facility may be impacted by releases from off-site source areas not subject to RCRA corrective action (e.g., sources at an adjacent facility not seeking an RCRA permit). In some of these circumstances, cleanup of the corrective action facility to risk based media cleanup levels, while desirable in the long term, might not make sense in the short term because contamination from off-site or otherwise unrelated sources would quickly re-contaminate the facility. EPA requests comments on application of corrective action requirements in areas of widely dispersed contamination and when the RCRA facility is otherwise impacted by releases from off-site sources. EPA requests that commenters specifically address the obligation, if any, a facility owner/operator should have to address the area-wide contamination to the extent it is present at his or her facility. If commenters

believe facility owners/operators should not be required to address area-wide contamination, the Agency requests comments on the continuing obligation under RCRA, if any, such facility owners/operators should have for an eventual cleanup to risk based levels.

5. Ecological Risk

As described in Section III.C.5.g of today's Notice, EPA's mandate is to protect both human health and the environment; therefore, assessing risks to ecologic receptors may be warranted in the context of implementing RCRA corrective action at many sites. The Agency recognizes, however, that assessing impact to ecologic receptors from environmental contamination is a rapidly evolving field of study. Therefore, the Agency is interested in receiving comments and data pertaining to: state-of-the-art approaches and tools for conducting ecologic-risk assessment, including initial screening as well as detailed assessments; availability of identification of useful guidance; availability of standardized eco-based action levels and cleanup levels, or standardized approaches for developing site-specific levels; site-specific examples of impacts to ecologic receptors from RCRA corrective action sites, and examples of successful remedial actions implemented to address these impacts; limitations associated with assessing ecologic risks, and taking remedial actions to protect ecologic receptors in general; specific needs for additional guidance and research; and suggestions regarding the scope of specific corrective action regulations dealing with assessment and protection of ecologic receptors.

6. Risk Assessment Methods

EPA has been criticized for relying on uniform, "one size fits all" risk assessment methods, particularly in the context of its remedial action programs. According to critics, often, the default assumptions or models incorporated into Agency risk assessment guidance documents do not adequately reflect site-specific conditions. The use of empirical data collected from a site, or methods developed expressly for application at specific sites or types of sites, could result in more valid and reliable characterizations of risks to human health and the environment. On the other hand, not every site would benefit from a comprehensive site-specific evaluation. EPA thus needs to strike a balance between the ease of uniform risk assessment methods and the improved targeting and effectiveness associated with accounting for site-specific conditions.

EPA is interested in the effect of provisions which would encourage the expanded consideration of site-specific conditions and other innovative risk assessment methods where such provisions would enhance program effectiveness or efficiency. For example, how could the Agency provide for the use of site-specific or innovative approaches to risk assessment while still enabling EPA or state agencies to maintain adequate oversight? Are there mechanisms available for risk assessment to be independently validated as reasonable characterizations of site risk, thereby reducing the demands for technical oversight and the time required to approve site-specific decisions. What incentives (if any) should EPA provide to encourage these efforts? What provisions or procedures, either in the 1990 proposal or in existing regulations, inhibit the effective use of site-specific risk assessments?

Significant improvements in risk assessment methodology have occurred since the 1990 proposal. EPA is interested in capturing these benefits in the corrective action program. The Agency thus seeks comments concerning how RCRA corrective action regulations might be constructed so as to maximize the extent to which these improvements are reflected in site evaluations, as well as the development and selection of remedial alternatives. Further, EPA is interested in comments addressing actions the Agency could take to act as a positive force for change in the evolutionary improvement of risk assessment methods.

F. Public Participation and Environmental Justice

EPA intends for the final corrective action regulations to be consistent with the Agency's efforts to improve permitting and public participation while providing sufficient flexibility to meet site-specific goals. The Agency believes that facility owners/operators, state environmental agencies, tribes, and private citizens are often in the best positions to determine what modes of communication and participation will work best in their communities. EPA believes the final rule should provide the flexibility necessary to find the best local solutions.

EPA requests general comment on the role of public participation in the corrective action program and on opportunities to improve public participation, especially the participation of any communities which have not been effectively involved in the corrective action process to date.

The Agency is particularly interested in comments which address:

(a) *Public participation tools.* Currently, most public participation opportunities center around use of public notices (usually in a local newspaper) and public meetings. EPA requests that commenters address the use of additional public participation tools (such as public participation plans, community advisory panels, fact sheets, workshops, on-line communications, and informal meetings) which might be more effective in reaching communities.

(b) *Public participation responsibility.* EPA believes there may be situations where the corrective action process would benefit if the facility initiated the permit modifications under 40 CFR 270.42, rather than the Agency initiating permit modifications under 40 CFR 270.41. For instance, if a facility owner/operator must undertake an interim action, it may be more appropriate for the facility to request a permit modification. EPA anticipates that allowing this flexibility would improve interaction between the public and the facility and allow owners/operators to streamline the process by combining modifications, where appropriate. We request comment on this approach and the use of owner/operator initiated permit modifications to provide public participation opportunities.

(c) *Tailoring public participation to the level of interest.* EPA encourages facility owners/operators and regulatory agencies to choose a level of public participation that is commensurate with the level of public interest. The Agency is aware of innovative approaches to public participation where the level of public participation opportunities increase dramatically if a certain number of citizens from the affected community request increase public participation. The Agency realizes that every corrective action process is different and may involve overlapping and varied activities. EPA requests comments on public participation tools which could be used to tailor public participation opportunities to the level of interest in the affected community and to the significance of any given corrective action activity. The Agency requests that commenters who support tailoring public participation requirements to the level of interest at any given facility also address the degree to which the Agency or the facility owner/operator should take steps to inform the public of the onset of corrective actions to initiate public interest.

G. When Permits Can Be Terminated

The 1990 proposal contained a provision requiring owners and operators to obtain RCRA permits for the entire "period necessary to comply with the requirements of Subpart S" (proposed 40 CFR 270.1(c)). As discussed in the preamble to the 1990 proposal (see, 55 *FR* at 30846) this was intended to apply even where the hazardous waste management activities that originally triggered the need to obtain a permit were no longer continuing. The aim of this provision was to ensure that corrective action was carried to its conclusion. Furthermore, EPA believed that if corrective action obligations ceased when the need for the permit otherwise ended, an artificial incentive would be created to terminate viable facilities (e.g., facility owners/operators would choose to curtail management of hazardous waste—and the need for an RCRA permit—in to avoid completing corrective actions).

When the CAMU rule was promulgated, EPA reiterated its view that facilities undergoing corrective action must continue to renew their permits, even if the original regulated hazardous waste activity has ceased, until the corrective action has been completed. See 58 *FR* at 8676–77. EPA clarified that this obligation arises under existing statutes and regulations, even pending final promulgation of the additional language proposed in 1990. EPA indicated at that time that it would determine whether further regulatory clarification of this issue was necessary.

At this time, EPA is inviting comment on whether, as a policy matter, extended permitting is the best approach to ensuring that corrective action is carried out over the long term, or whether other alternatives should be considered. For example, one approach might be to terminate the permit when active hazard waste management ceased, but to continue the cleanup obligation through some other vehicle, possibly an enforcement order. Any alternatives proposed should address such matters as the reliability of the approach over the very long term, the level of administrative oversight required, the legal basis in RCRA for imposing the requirement if a permit is not issued and whether the RCRA statute would allow terminating a permit before the corrective action was complete. Commenters proposing alternatives are particularly encouraged to address options for the situation where engineering or institutional controls must be managed indefinitely into the future and whether permits can or should be terminated when the final

remedy involves some form of engineering or institutional controls.

Commenters who support permit termination when final remedies involve engineering or institutional controls are encouraged to address what other mechanisms, if any, should be used to ensure continued reliability of the engineering or institutional control and the role of EPA, if any, in imposing, maintaining and enforcing such mechanisms.

H. Effect of Property Transfer on Corrective Action Requirements

The transfer of part of a facility subject to corrective action creates questions regarding which corrective action obligations continue at the transferred parcel and which party has the corrective action responsibility. The 1990 proposal discussed this issue, and EPA is still interested in general comments in this area. The 1990 proposal identified two options: requiring the permittee to complete corrective action even on parcels sold to others, and requiring the purchaser of the parcel to complete the corrective action. EPA continues to be interested in comments on these two options.

A related issue is the point in time at which the extent of the facility is defined. For example, if a parcel were transferred after a permit application had been submitted, but before a permit or corrective action order was issued, the implications might be different from if the transfer occurred after the permit was issued. The 1990 proposal also suggested that it might make a difference whether the transfer occurred before implementation of the remedy. Since RCRA corrective action requirements apply to the current owner and operator of an RCRA facility and do not routinely extend to past facility owners/operators, EPA believes there may be some incentive for facility owners/operators to sell portions of their facilities before corrective action requirements can be imposed. EPA is aware of situations where a facility owner/operator has sold entire facilities, excluding only the closed RCRA regulated units, in what seems to be an effort to avoid application of RCRA corrective action requirements. While EPA has numerous authorities that could be used to address cleanup requirements even after portions of the facility had been sold, EPA believes application of these other authorities, rather than RCRA corrective action authorities, could increase transaction costs and delay cleanups.

I. Financial Assurance for Corrective Action

Currently, Financial Assurance for Corrective Action or FACA is required under 40 CFR 264.101. More detailed requirements for financial assurance for corrective action were proposed on October 24, 1986 (51 *FR* 37854) and in the 1990 proposal. EPA requests general comment on the need for detailed corrective action financial assurance regulations and the utility of the 1986 and 1990 proposals as guidance in this area. Commenters should address whether regulations or guidance would better promote the goals of the corrective action program and financial assurance for corrective action, and whether the flexibility inherent in the FACA proposals has been useful or detrimental. In addition, EPA is interested in comments which address:

(a) *Timing of financial assurance.* EPA requests commenters address both the stages in the corrective action process where FACA requirements have proven most useful (e.g., should financial assurance be required before a remedy is selected, perhaps to ensure completion of facility investigations) and the stages, if any, where FACA requirements have been of limited utility. In its previous notices, EPA has said that financial assurance should be required at the time of remedy selection. Is this still an appropriate policy? EPA is especially interested in comments that address whether financial assurance has been an impediment to corrective actions due to the investment entailed. In addition, the Agency requests comments on how the amount of financial assurance required should be determined. For example, should financial assurance be required for operation and maintenance costs in perpetuity or should it be required for a standardized length of time (e.g., five, ten or twenty years)? Should the financial assurance timing be adjusted to address interim measures and support the stabilization initiative? Because cost estimations at certain stages in the process can be inaccurate, should financial assurance requirements cover shorter time frames, such as two years? Should EPA be concerned with financial assurance for short term investigation and construction costs, or should we focus on assuring long term operations and maintenance expenses?

(b) *Design of a FACA rule.* Commenters who believe that EPA should promulgate detailed regulations on financial assurance for corrective action should address the design of such rules. Alternatively, are the current general rules sufficient or more

appropriate? Are there algorithms or decision guidelines which have proven successful in ensuring adequate financial assurance; should EPA adopt these guidelines as guidance or in regulation for corrective action financial assurance? How should financial capability enter into decisions on stabilization or corrective measures? How well is the current financial assurance for corrective action program working? EPA is interested in alternative approaches to ensuring the completion of corrective actions. For example, are there particular state rules which have proven effective in dealing with both financially sound and financially weak firms? Are there other clean up programs which address financial assurance more effectively than the current corrective action program? Should evidence of corporate commitments to cleanups such as continuing construction and progress affect financial assurance requirements? If so, how?

(d) *Cost estimates.* EPA requests that commenters address the accuracy and timing of FACA cost estimates. EPA is interested in comments which address the causes for differences among FACA estimates at various stages in the corrective action process, differences between estimates and actual figures, particular stages of the corrective action process which are more prone to cost errors than others, the time period over which cost estimates are most accurate, and the relationship between costs reported to permitting authorities and costs reported in financial reports. Some permittees have suggested that cost estimates cover only a period of two to three years with annual updates. Would this be adequate and appropriate?

(e) *Discounting.* EPA requests that commenters address the use of discounting in the FACA process. For example, would discounting produce better estimates of corrective action costs or change corrective action

decisions? If commenters believe discounting is appropriate, the Agency requests that comments address the effect of discounting on FACA instruments, appropriate discount factors and time frames and, if discounting is used, the bases for requiring or not requiring FACA for the whole process.

(f) *Use of the 1986 Proposal As Guidance.* EPA requests that commenters provide information on when the 1986 proposal has been useful as guidance. Have the mechanisms in the proposal provided for clean ups or clean up activities which would not have occurred without them? Have the mechanisms or requirements diverted resources from actual clean up activities? Are the proposal mechanisms unnecessary, insufficient, or outdated?

J. State Authorization

EPA requests comments on general issues associated with state authorization for corrective action and the relative roles of state and Federal agencies in authorized states. EPA is particularly interested in comments which address:

(a) *Rate and pace of authorization.* EPA intends for states to be the primary implementors of the RCRA program. Although 49 states and territories are authorized to implement the RCRA program, many of these states are also authorized for significant amendments to the RCRA program, including 29 states which are authorized for corrective action. EPA requests comments on incentives (and disincentives) to corrective action authorization and suggestions for improving the efficiency of authorization processes.

(b) *Role of EPA in authorized states.* As more states become authorized, EPA's role is changing. For example, in many states EPA is doing much less direct program implementation. EPA is interested in defining its role in

authorized states and in developing oversight models which use state and Federal resources most efficiently (e.g., focus on results, rather than process).

(c) *Effect of promulgation of corrective action rules on authorized state programs.* Final corrective action regulations will be promulgated pursuant to HSWA. Ordinarily, more stringent HSWA rules are immediately effective in authorized states (RCRA Section 3006(g)(1)). However, EPA is concerned about potential disruptions to ongoing cleanup being conducted pursuant to authorized state corrective action programs and does not want authorized state corrective action programs to revert back to EPA. Therefore, in 1990, EPA proposed that any revisions to final Subpart S corrective action regulations would not become effective in states authorized for Subpart S until those states had adopted the new rules. Currently 29 states are authorized for the existing corrective action regulations, EPA believes the same logic that led it to propose that revisions to the corrective action regulations proposed in 1990 would not become effective in authorized states until states adopted them could arguably be applied to the current situation; therefore, EPA requests comments on whether final corrective action regulations should not be effective in states authorized for the existing corrective action program until those states adopt the final rules. EPA also requests comments on approaches to authorization which will minimize disruption of existing state corrective action programs upon promulgation of new Federal corrective action requirements.

Dated: April 12, 1996.

Carol M. Browner,

Administrator.

[FR Doc. 96-9707 Filed 4-30-96; 8:45 am]

BILLING CODE 6560-50-P