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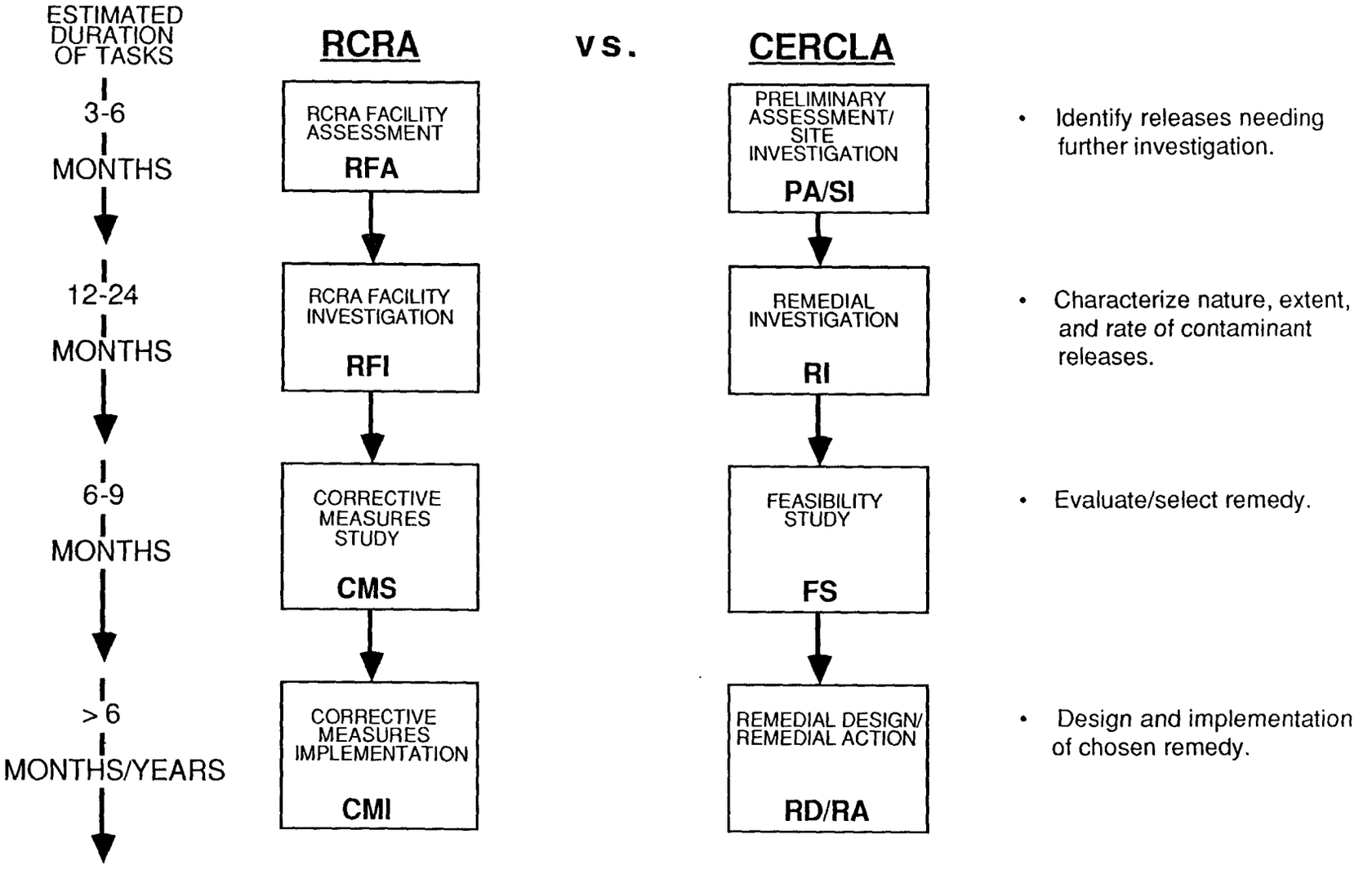
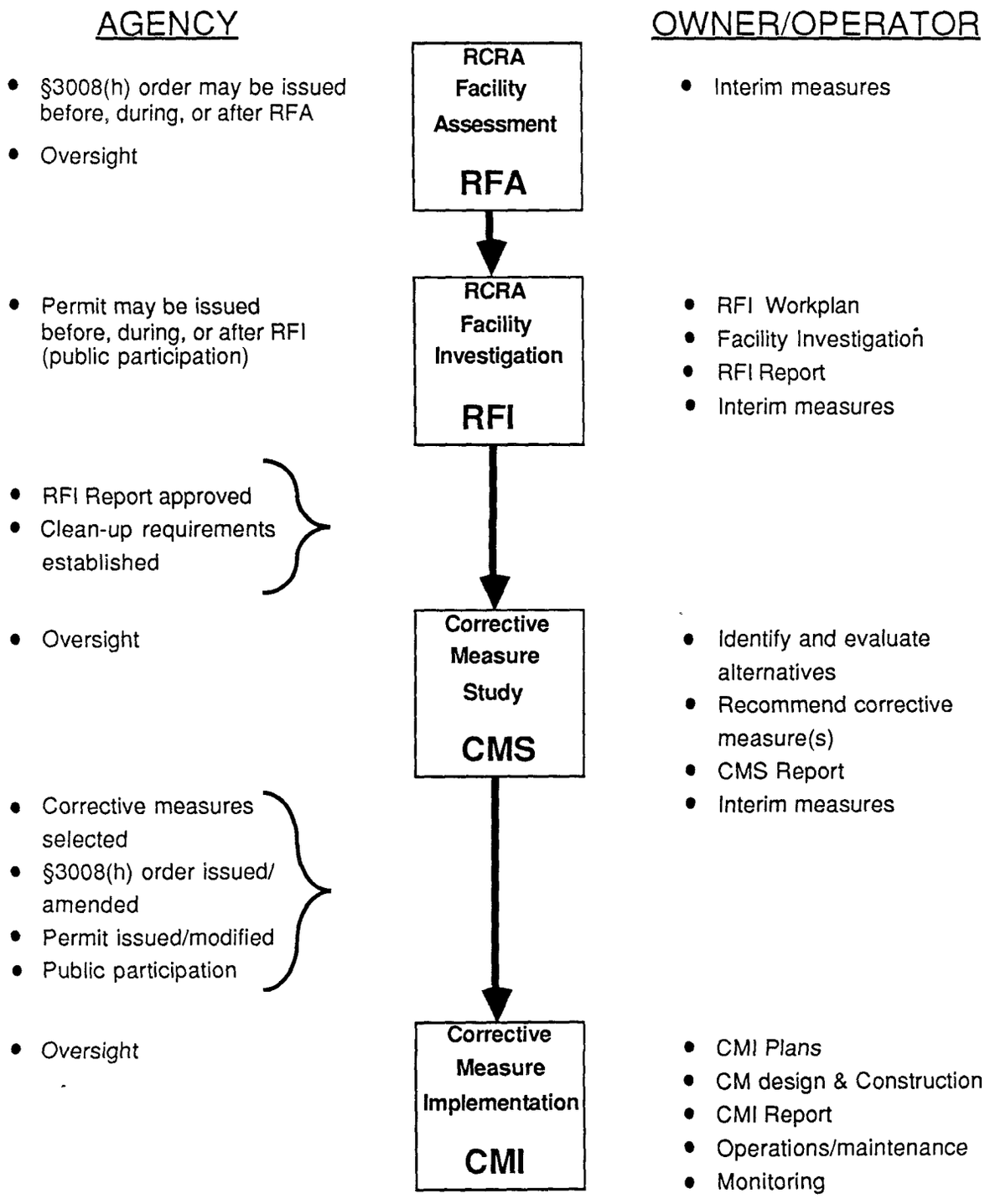


*Interim Measures may be performed at any point in the corrective action process.

CORRECTIVE ACTION PROCESS



COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA) COMMONLY-USED ACRONYMS

ADR - Alternate Dispute Resolution
ARAR - Applicable or Relevant and Appropriate Requirement
ATSDR - Agency for Toxic Substances and Disease Registry

CAG - Carcinogen Assessment Group
CEPP - Chemical Emergency Preparedness and Prevention
CERCLIS - CERCLA Information System
CLP - Contract Laboratory Program
CR - Community Relations

DQO - Data Quality Objectives

EDD - Enforcement Decision Document
ERA - Expedited Response Action
ERCS - Emergency Response Clean-Up Services

FIT - Field Investigation Team
FS - Feasibility Study

HEA - Health Effects Assessment
HRS - Hazard Ranking System

IRP - Installation and Restoration Program (Department of Defense)

NC - Noncarcinogen
NCP - National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL - No Observed Adverse Effect Level
NPL - National Priorities List
NRC - National Response Center

OSC - On-Scene Coordinator

PA - Preliminary Assessment
PC - Potential Carcinogen
PHE - Public Health Evaluation
PRP - Potential Responsible Party

QA/QC - Quality Assurance/Quality Control
QAPP - Quality Assurance Project Plan

RA - Remedial Action
RAS - Routine Analytical Services
RD - Remedial Design
REM - Remedial Contractor
RI - Remedial Investigation
ROD - Record of Decision
RP - Responsible Party
RQ - Reportable Quantity
RRT - Regional Response Team

CERCLA ACRONYMS (CONT.)

SARA	- Superfund Amendments Reauthorization Act
SCAP	- Superfund Comprehensive Accomplishments Plans
SI	- Site Investigation
SMP	- Site Management Plan
SOP	- Standard Operating Procedure
TAT	- Technical Assistance Team

RESOURCE CONSERVATION & RECOVERY ACT (RCRA)
COMMONLY-USED ACRONYMS

ACL - Alternate Concentration Limit
AO - Administrative Order

C/PC - Closure/Post-Closure
CA - Corrective Action
CAP - Corrective Action Plan
CEI - Compliance Evaluation Inspection
CME - Comprehensive Monitoring Evaluation
CMI - Corrective Measures Implementation
CMS - Corrective Measures Study

EIR - Exposure Information Report

FMP - Facility Management Plan

GWM - Ground-Water Monitoring
GWPS - Ground-Water Protection Standard

HSWA - Hazardous and Solid Waste Amendments of 1984
HWDMS - Hazardous Waste Data Management System

LCRS - Leachate Collection and Removal System
LOIS - Loss of Interim Status

MCL - Maximum Concentration Limit
MCLG - Maximum Concentration Limit Goal

NPS - National Permit Strategy

O/O - Owner/Operator

PIP - Public Involvement Plan
PR - Preliminary Review

RFA - RCRA Facility Assessment
RFI - RCRA Facility Investigation
RIP - RCRA Implementation Plan
RU - Regulated Unit

SNC - Significant Non-Complier
SOSG - Standard Operating Safety Guidance
SPA - State Program Advisory
SV - Sampling Visit
SWMU - Solid Waste Management Unit

T/A - Timely and Appropriate
TEGD - Technical Enforcement Guidance Document
TSDF - Treatment, Storage, Disposal Facility

VSI - Visual Site Inspection

NATIONAL RCRA CORRECTIVE ACTION STRATEGY

October 3, 1986

U.S. Environmental Protection Agency

Office of Solid Waste and Emergency Response

NATIONAL RCRA CORRECTIVE ACTION STRATEGY

I. INTRODUCTION

The Hazardous and Solid Waste Amendments of 1984 (HSWA) greatly expanded authorities under the Resource Conservation and Recovery Act (RCRA) for requiring corrective action for releases of hazardous wastes and constituents at facilities that manage hazardous wastes. Section 3004(u) of HSWA requires corrective action for releases of hazardous wastes or constituents from any solid waste management unit at a storage, treatment or disposal facility that is seeking or otherwise subject to a RCRA permit. Section 3004(u) also requires that these permits contain assurances of financial responsibility for complying with corrective action. Moreover, section 3004(v) authorizes EPA to require corrective action beyond the facility boundary. Section 3008(h) of HSWA authorizes the Environmental Protection Agency(EPA) to require corrective action or other necessary response measures whenever it is determined on the basis of any information that there is or has been a release of hazardous wastes or constituents from a facility authorized to operate under Section 3005(e) of RCRA.

This strategy is intended to inform Regions, States, the regulated community and the public how the Agency plans to approach implementation of the corrective action program. This section introduces the HSWA corrective action authorities and discusses the universe of RCRA facilities subject to these requirements. Section II discusses the basic technical process that applies generally to any corrective action. Section III discusses how the Agency will approach the corrective action program, including

establishing priorities, and factors influencing management of corrective action. Section IV discusses the EPA-State partnership in achieving corrective action goals. At the end of each section or subsection there are lists of guidance documents for the RCRA corrective action program that have been issued to date and planned documents and the current target dates for their issue. Also included are the training courses that are planned for each component of the program. Under each item a contact person is provided who can answer inquiries about the topic. Appendix 1 lists guidance issued by other programs that may be useful in implementing the corrective action program.

The success of the RCRA corrective action program depends on the cooperation between the States, EPA, regulated community and the public. Of critical importance is early involvement of the affected public in the corrective action process. EPA intends to develop a corrective action public participation program that provides information on the facility to the public, gives them an opportunity to make their views known to EPA or the State and that provides for consideration of their views in the decision making process.

These new corrective action authorities greatly expand EPA's ability to ensure that RCRA facility owners and operators correct releases at their facilities that may pose a threat to human health and the environment. The new 3004(u) authority applies to facilities subject to RCRA permits. This includes operating permits for new and existing facilities and post closure permits for land disposal facilities. At facilities that received RCRA permits prior to November 8, 1984, corrective action require-

ments will be imposed upon issuance of a new permit once the current permit expires or is reopened.

The scope of the 3004(u) authority is largely defined by its key terms. It requires that permits impose corrective action for releases of hazardous wastes or constituents which pose a threat to human health and the environment, from any solid waste management unit(SWMU) at a storage, treatment or disposal facility seeking a RCRA permit. To understand the scope of this authority it is necessary to understand the key terms of the statutory provision.

The term "release" is defined in the Final Codification Rule (July 15, 1985) to include any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. While similar to the CERCLA definition, it excludes discharges of hazardous wastes or constituents to the injection zone of a UIC permitted Class I injection well. It can also include releases that are authorized or otherwise permitted under other environmental statutes.

The term "solid waste management unit" is also explained in the Final Codification Rule (July 15, 1985). It includes any discernable waste management unit from which hazardous constituents may migrate, irrespective of whether the unit was intended for the management of solid or hazardous wastes. The following types of units are therefore included in the definition of SWMUs: landfills, surface impoundments, waste piles, land treatment units, incinerators, injection wells, tanks (including

90 day accumulation tanks), container storage areas and transfer stations. In addition to these types of units, certain areas associated with production processes at facilities which have become contaminated as a result of routine, systematic and deliberate releases of wastes, or hazardous constituents from wastes, are also considered to be solid waste management units. A product may become a waste if it is abandoned or discarded.

Some questions have been raised regarding the application of the concept of "solid waste management unit" to other types of contamination at facilities, such as spills, leakage from product storage, and releases from production processes that are not routine, systematic and deliberate. Such releases are not considered to be solid waste management units. As explained in the Final Codification Rule (50 FR 28712), one-time spills of wastes or constituents are considered subject to §3004(u) corrective action only if the spill occurred from a solid waste management unit. A spill which cannot be linked to a discernible solid waste managment unit is not of itself a solid waste management unit. Likewise, leakage from product storage and other types of releases associated with production processes would not be considered solid waste management units, unless those releases were routine, systematic and deliberate.

The term "facility" includes all contiguous property under the control of an owner or operator at which the units subject to permitting are located.

Section 3008(h), the enforcement corrective action authority, also vests broad discretion with the Agency to compel corrective action. This authority has been interpreted to authorize the

Agency to compel corrective measures or other actions necessary to protect human health or the environment whenever the Administrator determines, based on any information, that there is or has been a release of hazardous wastes or constituents from an interim status RCRA facility. The key terms in this provision are interpreted in a December 16, 1985 EPA memorandum entitled "Interpretation of Section 3008(h) of the Solid Waste Disposal Act." The terms release and facility are interpreted as they are for Section 3004(u). Appropriate information upon which to conclude there may have been a release for purposes of section 3008(h) include, but are not limited to the following: data from laboratory analyses (from soil, air, surface water or ground water samples), observations recorded during inspections, photographs and information obtained from facility records.

It should be noted that the §3008(h) authority is not confined to addressing releases from solid waste management units. It is the Agency's position that the coverage of the types of releases which can be addressed under §3008(h) is somewhat different in scope than that of §3004(u). In situations where a §3008(h) action has been initiated at a facility to address releases that are not from solid waste management units, and where a permit is subsequently issued to the facility, the Agency intends that those actions will be continued under the permit, under the authority of RCRA section 3005(c)(3). Comment is requested on this proposed approach.

Not only are these RCRA corrective action authorities broad, but the universe of RCRA facilities to which they potentially apply is diverse. Among the types of RCRA facilities that can

present environmental problems are land disposal, treatment and storage facilities. Corrective action requirements apply to these facilities regardless of whether they are continuing waste management operations or closing these operations. Moreover, these requirements apply regardless of whether a facility or part of it is subject to an action under the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA or Superfund).

The RCRA facilites subject to corrective action are also diverse in that there are varying amounts of existing information available on them. For example, in some cases there will be extensive information available on the regulated unit (and possibly the solid waste management units) from previous enforcement actions, the Part A and B applications, inspection reports, etc. In others, very little information may be available, thus increasing the initial information gathering burden. At some facilites there will be extensive and complex corrective action required, while at others little or no action may be necessary.

Federal facilities are subject to RCRA corrective action requirements. At this time EPA is working with other Federal agencies to determine how best to manage the corrective action program for the Federal establishment. This effort is dealing with several issues, including how to define facility ownership in light of the structure of many agencies, and how to coordinate the RCRA and CERCLA corrective action programs.

In developing the corrective action program it is EPA's intent to recognize the diversity of the universe subject to corrective action and to adopt a system for managing the program

which provides sufficient flexibility to ensure that corrective measures necessary to protect human health and the environment are taken expeditiously.

In order to establish a consistent and well-defined program for implementing the new RCRA corrective action mandate, the Agency intends to develop a comprehensive regulatory framework to define both procedural and substantive requirements for the program. This major rulemaking will provide the regulated community and other parties the opportunity to participate in the decision making process for setting standards for the program. Regulations will also provide a solid legal foundation to enforce these standards. Proposed regulations are tentatively expected to be issued in the Fall of 1987.

Among the most important decisions which must be made in implementing corrective actions at actual facilities is the determination of when corrective action is required, and when it is completed. Standards for these "how clean is clean" decisions will be a major component of the rulemaking effort described above. The Agency intends to develop guidelines for determining when corrective actions will be "triggered". "Target" levels will be established to define the objectives to be reached by corrective actions. It is the Agency's current intention to set these target levels using health and environmental based goals, within the limits of feasible technology.

The fundamental objectives of the RCRA corrective action program are essentially similar to those of CERCLA. Because some RCRA facilities can be expected to ultimately become Superfund sites (some RCRA facilities actually have CERCLA-mandated actions

already underway), there is need to maintain consistency between the two programs in making response decisions. Whenever feasible, the Agency will design corrective action policies and guidelines so as to foster consistency. It must be recognized, however, that there are statutory and programmatic differences between the RCRA and CERCLA programs which the Agency must consider in formulating the RCRA corrective action program. As the RCRA program is developed through policy, guidance and regulation, one of the Agency's primary objectives will be to maintain consistency with CERCLA, while tailoring the program to meet the specific needs and objectives of RCRA.

GUIDANCE:

Guidance on use of Section 3008(h); December 16, 1985; Contact: Ginny Steiner (202)475-9329

Agency Interpretation of 3004(u): Corrective Action for Continuing Releases; draft issued 1/30/85; Contact: Dave Fagan (202) 382-4740

TRAINING:

Seminars on use of 3008(h) and soon to be issued procedures are tentatively planned for FY 87 for EPA Regional personnel.

II. THE CORRECTIVE ACTION PROCESS

This section outlines the basic technical steps that will be taken to identify potential releases, characterize them and select and undertake appropriate response actions. Understanding these basic steps is central to implementing the corrective action process outlined in section III of this strategy. These steps apply to corrective action secured through a permit or completed through an enforcement order.

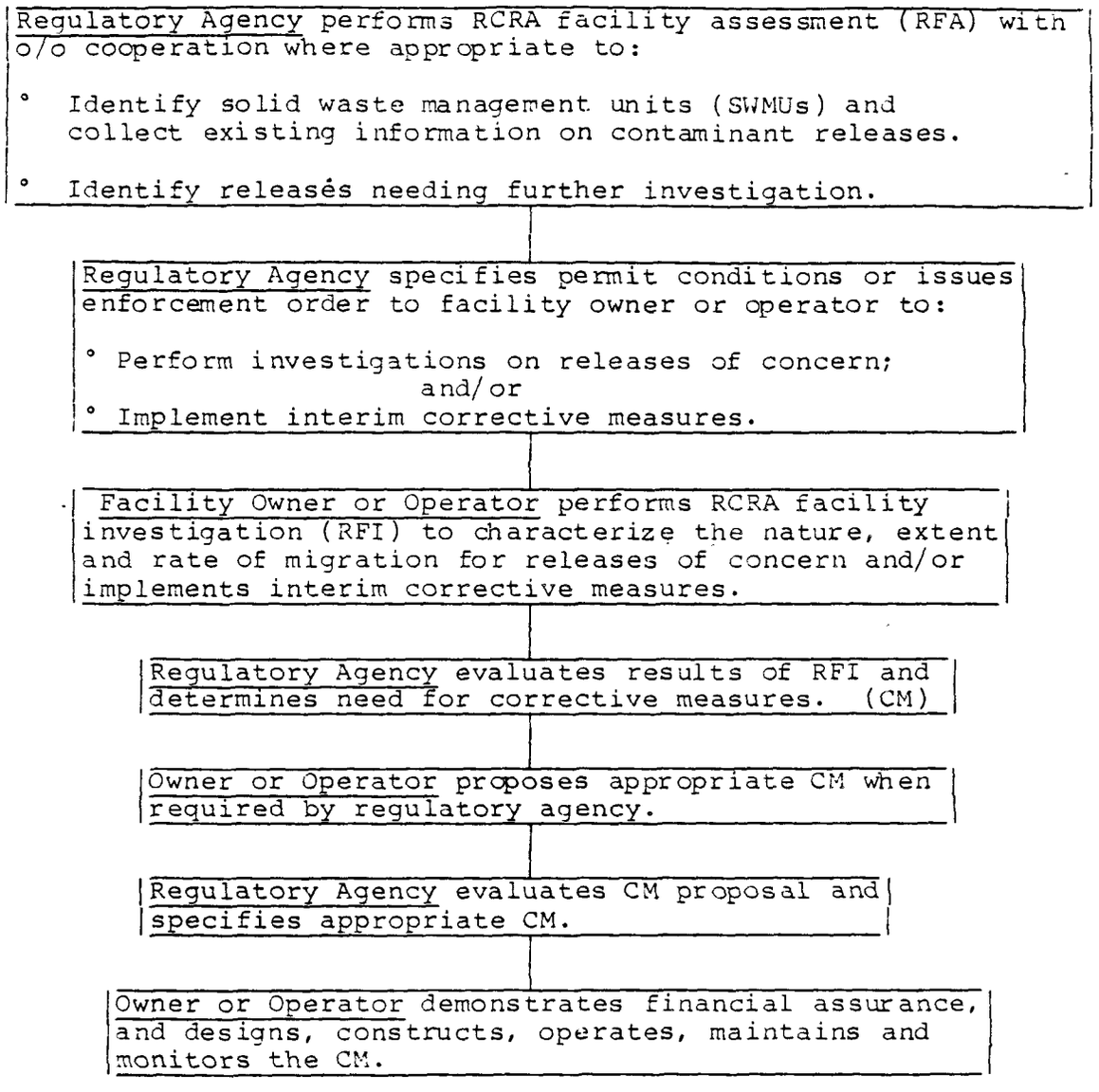
Specific policies, guidelines and regulations on various aspects of this process will be issued over the next several years. This section provides the basic framework against which these guidances will be developed. It should be understood, however, that these steps may vary in detail or be eliminated altogether depending on the individual facility situation. Examples of situations in which this may occur are outlined in section III below. The stages of a corrective action are illustrated in Figure 1. Figure 1 shows the steps of the corrective action process and also identifies the appropriate roles of the regulatory agency and the facility owner/operator in the various steps.

A. RCRA Facility Assessment (RFA):

The first step in any corrective action is the assessment of the facility to identify actual and potential releases from RCRA regulated units and other solid waste management units. The objective of this assessment is to determine whether there is sufficient evidence of a release to require the owner/operator to undertake additional investigations (a RCRA facility investigation) to characterize the nature, extent and rate of migration of contaminant releases of concern. For cases of likely releases, the RCRA Facility Investigation will include release verification procedures. Information gathered in the RFA should be used in developing a sound scope of work for a full remedial investigation. The RFA is intended to focus on investigating releases and potential releases from identifiable solid waste management units. It is not the Agency's intention that RFAs routinely examine facilities' entire production, handling and storage areas and activities.

FIGURE 1

RCRA CONTINUING RELEASES CORRECTIVE ACTION PROCESS



However, when conducting RFAs investigators may become aware of other types of releases (e.g., product releases) or sources of contamination not related to solid waste management units, but which merit further investigation and characterization by the owner/operator. Likewise, certain areas at facilities that are not solid waste management units may be identified as likely to be causing serious environmental problems, but about which little or no actual evidence of contamination is available; such situations may merit preliminary, RFA-type investigations to be conducted by owner/operators to verify releases.

As explained previously, releases which are not linked to solid waste management units may be addressed using §3008(h) or other enforcement authorities. It is the Agency's intention that when issuing a permit to a facility, the permit schedule of compliance may also, as necessary, require owner/operators to address releases that are not linked to solid waste management units, under the authority provided in RCRA section 3005(c)(3). EPA specifically invites comment on this proposed approach.

The scope of an RFA may vary from facility to facility. In most cases it is preferable to address all the solid waste management units at the facility in the RFA. This is especially true when dealing with a facility in which units are closely related and subsequent investigations will be more efficiently performed by addressing the entire facility. However, it may be permissible to perform an RFA for a particular unit or units in advance of the rest of the facility. This could occur, for example, when there is an immediate threat that needs to be addressed. The RFA is performed by EPA or the State and can

include use of sampling data gathered by the owner/operator of the facility. However, if there is any problem with owner/operator participation in the RFA (timeliness, reliability etc.) EPA or the State will perform the entire RFA.

B. Interim Measures:

These are corrective measures that may be taken at any point in the corrective measures process to abate threats. These actions are generally short term actions responding to immediate threats, such as actual or potential exposure to hazardous wastes or constituents, drinking water contamination, threats of fire and explosion, and other situations posing similar threats. Normally, minimum study and planning is necessary for interim measures. Interim measures can be quite effective in abating immediate problems and in keeping existing problems from worsening while studies are being completed. Interim measures can be particularly useful in dealing with facilities that are economically marginal and which may only be able to complete part of their RCRA corrective action obligations.

C. RCRA Facility Investigation (RFI):

The purpose of a RCRA Facility Investigation is to gather data sufficient to fully characterize the nature, extent and rate of migration of contaminant releases identified in the RFA. Of paramount importance to the RFI is that it provide sufficient data to determine appropriate response actions (i.e. appropriate corrective measures or document that no action is needed). The RFI is perfomed by the facility owner/operator pursuant to an enforcement order or a permit schedule of compliance. EPA or the State oversees this activity.

D. Corrective Measures Study and Selection of the Appropriate Measures

After the RCRA Facility Investigation is completed the owner/operator must identify the appropriate corrective measures and recommend them to EPA or the State. EPA or the State will then review the recommendation, provide the public an opportunity to review and comment on the proposed action and select the final measures.

The owner/operator must conduct a corrective measures study to assure that the proposed measures will be effective in correcting threats posed by releases. Depending on the facility situation, this study may include actions to control the source of the contamination (by preventing or mitigating the continued migration of contamination, by removing, stabilizing and or containing the contaminants) and/or actions to abate problems posed by the migration of substances from their original source into the environment.

In some cases it will be possible for the owner/operator to analyze and present to the Agency or State only a single alternative that meets public health and environmental requirements. This should be done when EPA or the State agree that the alternative the owner/operator is proposing to analyze is likely to effectively achieve corrective action goals, including health and environmental requirements and is technically sound. In other cases, however, it may be necessary to analyze more than one alternative to determine the appropriate response measure. For example, offsite or onsite alternatives may be considered or there may be a difference of opinion as to whether a particular alternative the owner/operator

proposes to analyze would be reliable or effective in abating threats expeditiously. In such cases, EPA or the State should require the analysis of several alternatives to ensure that appropriate response measures are completed on a timely basis and that response is not delayed by a sequential analysis of a series of alternatives.

The owner/operator must demonstrate that the response action proposed effectively abates the threats to human health and the environment posed by the release(s). This requires the owner/operator to analyze the alternative or alternatives in detail sufficient to show that the recommended measures are effective in abating the threats posed by the release. To do so the owner/operator must assess the alternative or alternatives in terms of its technical feasibility (including reliability and requirements for long term operation and maintenance), its ability to meet public health protection requirements, its ability to protect the environment and any adverse environmental effects of the measures. The owner/operator also should consider any institutional constraints to implementation of the measures, such as offsite capacity problems and potential public opposition.

EPA has not yet completed guidelines on this phase of the RCRA corrective action program. RCRA final remedies will, however, be required to meet applicable health and environmental standards promulgated under RCRA and other laws. At regulated units, groundwater releases are subject to the groundwater protection standards. The groundwater protection standard consists of the following: (1) for any constituents listed in Table 1 of 40 CFR

264.94, the respective value given in that table (MCL) if the background level of the constituent is below that given in Table 1; (2) the background level of that constituent in the groundwater; or (3) an approved Alternate Concentration Limit (ACL) where approval will be based on criteria set forth in 40 CFR 264.94(b). The Agency plans to issue guidance on ACLs during FY 1987. The Agency is currently assessing the appropriate technical approach to take to problems that cannot be addressed by existing standards. One alternative is to establish appropriate health based standards on a case by case basis.

EPA or the State will evaluate the owner/operator's recommendation and approve or disapprove it. The financial assurance demonstration will also be reviewed at this time. The views of the public on the proposed measures will be considered by the State and EPA in making these decisions.

E. Corrective Measures Implementation

After EPA or the State selects the remedy, the owner/operator will design and construct the selected response action. After construction the appropriate measures needed to operate, maintain and monitor the remedy will be taken by the owner/operator. These activities will be required by permit condition or order, and will be performed by the owner/operator with oversight by EPA or the State.

Effecting remedies (or interim measures) at facilities that do not have RCRA permits will, in some cases, involve creation of new treatment, storage or disposal units. Rather than going through the actual process of issuing RCRA permits to such new units, which could substantially delay implementation of the remedy, the Agency is considering using enforcement authorities

and closure plan regulatory authorities to allow those units to be constructed and operated without a formal RCRA permit. EPA may need to amend existing regulations to provide for this proposed approach. Such new units would nevertheless generally be required to comply with applicable Part 264 technical standards, and appropriate public review and comment would be provided for. If such new units are created at a permitted facility, the normal permit modification process would be followed. Comment is specifically solicited on this proposed approach.

GUIDANCE:

RCRA Facility Assessment Guidance: Draft: 8/5/85 Final: Target--10/86. For further information contact: Dave Fagan (202) 382-4740

RCRA Facility Investigation Guidance: Draft: Target--December, 1986 For further information Contact: Art Day-(202) 382-4680

Corrective Action Plan (model scope of work for CA): Target--September, 1986. For further information contact: Mark Gilbertson (202) 382-4849

Interim Measures Guidance: Final: Target--September, 1986 For further information contact: Jackie Moya (202) 382-3122

Corrective Measures Guidance: Target--Draft-Spring, 1987 For further information contact: Art Day (202) 382-4680

Guidance on Alternate Concentration Limits: Target: November, 1986 For further information contact: Vernon Myers (202) 382-4495

Implementation of RCRA Facility Assessments: From: J. Winston Porter To: Hazardous Waste Division Directors, Regions I-X, August 21, 1986

TRAINING: RFA training was delivered to EPA Regions and States during April-September 1986.

III. MANAGING THE CORRECTIVE ACTION PROGRAM

EPA and the States are responsible for management of the corrective action program. The steps in a corrective action will be imposed through permit conditions or through enforcement orders. In general, a permit may be issued with a schedule of compliance for an RFI and Corrective Measures study. After EPA or State approval of the appropriate corrective measures, the permit will be modified to provide a schedule of compliance for design, implementation and operation and maintenence. This modification will be considered a major modification to the permit, and will, therefore, provide for additional public involvement. Likewise, enforcement orders should be phased with one order being issued for the RCRA facility investigation and corrective measures studies and another for the implementation steps after approval of the corrective measures. The Agency is currently developing a policy on involvement of the public in Enforcement corrective actions. Owner/operators of facilities at which the corrective action process will be implemented over time will also be encouraged to develop their own community involvement and education programs.

In the case of both permits and enforcement, negotiations with the owner/operator on the scope of the initial studies and remedy implementation will be necessary. Depending on the status of a particular facility, Regions and States may choose to use permit schedules of compliance to secure some stages of corrective action and enforcement action for other stages. Where orders are used in advance of permit conditions, the schedule of compliance may later be incorporated into the permit. Subsections A. and B.

below give some examples of how Regions and States can use enforcement and permitting corrective action authorities in a complementary fashion. These management choices are shown in Figure 2. In general, permitting authorities should be used when the owner/operator is cooperative. When the owner/operator is recalcitrant, enforcement actions should be pursued.

Priorities for corrective action are established in the annual RCRA Implementation Plan (RIP). The Agency's general approach to assigning priorities for corrective action is to focus the resources available to the program on those facilities which pose the greatest overall threat to human health and the environment. In order to implement this general policy, the Agency has tentatively decided to target a limited number of facilities to be dealt with intensively, rather than attempting to implement the process simultaneously at all facilities subject to corrective action requirements. Regions, in conjunction with the States will, through the Facility Management Planning process, identify a limited number of facilities in the Region for priority attention in initiating and following through in the corrective action process. These priority facilities will be targeted to receive intensive EPA/State oversight, with sufficient resources allocated for the technical, administrative and enforcement support necessary to effectively and expeditiously effect corrective action for those facilities. EPA recognizes that focusing the program's resources on a limited number of higher priority facilities will require that lower priority facilities which nevertheless may have substantial environmental concerns will be dealt with less aggressively in following through the corrective

action process. For such facilities, compliance schedules may be drawn over longer time frames, and/or less intensive review given of owner/operator generated reports and data. Likewise, at some facilities with multiple sources of contamination, the releases which pose the greatest immediate threat to human health and the environment may be given priority attention, with the remainder of the facility dealt with as a lower priority. EPA invites comment on this proposed method of prioritizing for the corrective action program.

As discussed above, the progression of any particular facility through the corrective action process may vary due to the status of the facility. The following subsections describe considerations that may be relevant when managing a corrective action at facilities seeking operating permits and at facilities that are closing waste management operations.

A. Facilities seeking operating permits.

Prior to issuance of an operating permit the EPA or State should undertake a RCRA Facility Assessment covering the entire facility to determine whether there may be releases from units at the facility. RFAs on units being addressed by the permit should be completed prior to permit issuance.

At land disposal facilities, current regulations require that corrective action for groundwater releases at regulated units be identified and designed prior to permit issuance. This is not a requirement for regulated treatment units, such as incinerators and storage units. EPA is examining the land disposal regulations at this time to determine whether modification should be made to allow permitting following the determination that a

release exists, but in advance of design of the corrective action.

At a facility seeking an operating permit, all corrective action steps subsequent to the RFA should be compelled through a schedule of compliance in an operating permit when feasible and appropriate. EPA's ultimate goal is to ensure that all permits have enforceable schedules of compliance for corrective action activities. If necessary, enforcement orders can be used in advance of permit issuance to compel corrective action in response to immediate threats or to get corrective action investigation activities underway at a facility that is not near enough to permit issuance to use a schedule of compliance in the permit to secure corrective action. The use of the order ensures that there are enforceable requirements in place. This approach can be useful as the 1988 deadline for land disposal permit issuance approaches. Not all land disposal permits will be at the same stage at the same time. In order to keep the land disposal facilities moving toward 1988 permit issuance Regions and States should consider supplementing permit activities by using enforcement orders to support corrective action needs during permit processing.

The choice of using an order or permit to secure various steps of corrective action at facilities seeking permits should be made a part of the Facility Management Planning Process. In this process Regions and States should consider whether it is likely that the facility will remain in the operating universe or is likely not to receive an operating permit. If the facility

is not likely to receive an operating permit it may be appropriate to initially consider the use of an enforcement order to secure initial steps of corrective action in advance of permit denial and closure.

B. Closing Facilities

Facilities that are closing their waste management operations present a somewhat more complicated corrective action management problem than those that are seeking operating permits. Some closing facilities which are subject to post-closure permit requirements (i.e., land disposal facilities which received wastes after July 26, 1982) may investigate and complete all corrective measures under the post-closure permit. Other facility owner/operators will be unwilling or unable to undertake required closure and corrective measures and will ultimately become facilities that must be dealt with under CERCLA or other authorities.

As with the operating universe, the first step in taking a corrective action at a closing facility is for EPA or the State to perform a RCRA facility assessment to identify actual or potential releases from the facility. While the RFA provides an idea on the scope of investigation that may be necessary at a facility, it does not give EPA or the State any idea of whether a facility will have the financial ability to perform the necessary investigations or take appropriate response actions. One option is to assess the financial status of the facility early in the corrective action process to determine the ability of the owner/operator to take necessary response actions. During FY 1987 the Agency will be examining how to treat economically marginal facilities and whether financial assessments can be a useful tool in

this process. Such an assessment can assist in determining the best approach to take to secure corrective action by the owner/operator including use of CERCLA authorities. EPA is currently examining tools that could be used in making these determinations. Using the results of the RFA, the financial assessment (if appropriate and other available information on the facility, a decision on the best approach to corrective action can be made. The facility management planning process should be used to determine the appropriate management approach to the closing facility.

Several approaches can be taken to securing corrective action depending on the situation at the individual facility. The following authorities can be used individually or in combination with each other:

1. Post closure permit call in and/or issuance: The post closure permit application can be called in to secure additional information (part 270) from the owner/operator on the physical situation at the facility.[1] A 3008(a) order can be used to compel submission of any information that is missing or deficient in the post closure permit application. Once secured, this information can be used to support issuance of a 3008(h) order to compel corrective measures or to support post closure permit

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[1] A separate post closure permit call in is not necessary at a facility that submitted a permit application (in response to call) and then decided to close before receiving an operating permit. Since the post closure permit application requirements are a subset of those required for an operating permit, it is not necessary to initiate a separate call and experience the resulting six months delay before enforcing Part 270 requirements.

issuance. The RCRA program is focusing upon closure of regulated units via the closure plan approval process and the issuance of enforcement orders or post-closure permits to secure corrective action at environmentally significant facilities. Enforcement orders can later be incorporated into post closure permits when appropriate to do so.

2. 3008(h) orders: Many facilities in the closing universe requiring corrective measures should be addressed through 3008(h) orders. This is particularly true for those facilities that are likely to cease operations before fulfilling post closure obligations. Environmentally significant closing facilities are priority candidates for 3008(h) orders in FY 87. Use of a 3008(h) order to address closing facilities has several advantages. When an order is used at a facility that is in an uncertain financial state, it provides an opportunity to document whether the facility owner is able to fulfill obligations under the order or whether it is likely to become a site that must be dealt with under CERCLA authorities. In this respect it acts as a bridge to CERCLA. Moreover, if it becomes apparent that the facility can complete its obligations under RCRA, the provisions of the order can later be incorporated into the post-closure permit along with any additional requirements necessary to complete corrective action obligations.

At many facilities in the closing universe it will be difficult to determine initially whether the company will have sufficient financial resources to take all the appropriate corrective measures. In such situations emphasis should be placed initially on compelling interim measures at the facility to abate the most immediate problems and RCRA facility investigations to the extent feasible. Where it is apparent that the owner/operator is not financially viable and may be a candidate for CERCLA action, corrective action requirements should be tailored to achieved as much as possible before the o/o is no longer able to pay for the clean-up or other associated costs. If an owner/operator has the financial resources to take appropriate actions and refuses to do so, judicial action should be pursued.

3. CERCLA response: When a facility is clearly not able to fulfill its corrective action obligations, action should be taken as soon as possible to determine whether it should be managed under the CERCLA program. For example, a facility that is bankrupt is a prime candidate for referral to the CERCLA program. Several options are available under CERCLA for dealing with the facilities. In the majority of cases where the owner is insolvent, or efforts to secure action under RCRA have been unsuccessful, CERCLA section 104 action may be more appropriate due to the lack of viable responsible parties. Under section 104 a fund-financed removal may be pursued if the criteria outlined in the National

Contingency Plan are met (see 40 CFR 300). In general these criteria encompass more serious threats. Fund-financed remedial action can be pursued at facilities that are listed on the National Priorities List. The EPA has recently issued final criteria for listing RCRA facilities on the NPL and has proposed additional criteria for listing these facilities (see 51 FR 21054 and 51 FR 21109, June 10, 1986).

In addition to the authorities outlined above, the closure plan can also be a valuable tool to secure corrective action at closing facilities. Many of the activities taken to close a regulated unit are steps toward completion of a corrective measure. Accordingly, closure plan development, approval and implementation should be closely coordinated with corrective action activities at closing facilities. Further detail on how to coordinate these activities is included in Section IV below.

IV. FEDERAL STATE PARTNERSHIP IN THE CORRECTIVE ACTION PROGRAM

As a program delegated in phases, RCRA has always required close coordination between EPA and the States. With the advent of broad-based corrective action authorities, an effective Federal/State partnership is even more important. Because the Agency's new corrective action responsibilities derive from the HSWA amendments, the Federal government has responsibility for implementing the new authorities until states are specifically authorized for corrective action. Consequently, until states are authorized for the new §3004(u) authority, all permits

incorporating corrective action will have to be issued jointly by EPA and the State. Likewise, only the Federal government is expressly authorized to issue §3008(h) orders requiring investigation and clean up at interim status facilities. States, however, may have similar authorities under their own laws.

EPA intends to give States a considerable opportunity to participate in the corrective action process prior to official authorization. Through their closure regulations, for example, States can compel facilities to undertake various activities to mitigate or eliminate threats to public health or the environment (e.g., waste removal, soil decontamination, capping). Many States also have authority to compel investigation or clean up through non-RCRA enforcement authorities such as public nuisance law, state water laws, or state Superfunds. Use of these authorities is encouraged at RCRA facilities provided that states use their own authorities to achieve equivalent response as required by RCRA.

Given the varying authorities and responsibilities of Federal and state governments prior to full authorization, joint Federal/state planning will be particularly crucial to program implementation. Regions and states should use the Facility Management Planning process to decide on a facility-specific basis the timing of various corrective action initiatives, which authority(ies) should be used to compel the initiative, and which agency will take responsibility for implementing and overseeing the action. Where non-RCRA state authorities are used to compel corrective action activities, EPA will have ultimate responsibilty for ensuring that the activities mandated are consistent with and equivalent to the standards imposed by HSWA.

V. REQUEST FOR COMMENT

EPA invites comments on the general features of this draft strategy, as well as on the specific issues and policies which are expressed as part of the strategy. Comments should be directed to:

Matt Hale
Chief, Permits Branch (WH-563)
Office of Solid Waste
U.S. Environmental Protection Agency
Washington, D.C. 20460

APPLICATIONS OF RCRA AND CERCLA CORRECTIVE ACTION AUTHORITIES

TRIGGER SITUATIONS / POTENTIALLY LIABLE PERSONS	Non-Compliance with Subtitle C	Substantial Hazard	Imminent and Substantial Endangerment	Release of Hazardous Waste or Hazardous Constituents
Present generators, transporters, and owners/operators	§3008(a)			
Present owners/operators				§§3008(h) 3004(u) 3004(v)
Past or present owners/operators		§3013		
Past or present generators, transporters, and owners/operators			CERCLA §§104, 106 RCRA §7003	

RCRA SECTION 7003

statutory not regulatory definition more broad-

- **Any person who is handling or has handled solid waste or hazardous waste**
  - -- **including past or present generator, transporter, or o/o**

- **Substance handled, stored, treated, transported or disposed of is a solid waste or hazardous waste.**

- **Handling, storage, treatment, transportation or disposal may present an imminent and substantial endangerment to health or the environment.**

Risk of harm must be imminent.
Don't break chain of events will cause risk
May present AN IMMINENT AND SUBSTANTIAL endangerment

RCRA SECTION 3013

- Present o/o or most recent previous o/o of a facility or site
- Presence or release
- Of hazardous waste
- From a facility or site
- Which may present a substantial hazard to human health or the environment.

RCRA SECTION 3008(a)

- Any person subject to RCRA Subtitle C

- Who has violated or is in violation of any requirement under RCRA Subtitle C.

Whenever the RA has info of Release of haz waste or constituents that has T.S. can compel Facility to do C.A.

RCRA SECTION 3008(h)

- There is or has been a release
- Of hazardous waste or hazardous constituents
- Into the environment
- From a facility subject to interim status under Section 3005(e)
- Corrective action or other response measure is necessary to protect human health or the environment

RCRA SECTION 3004(u)

- Releases
- Of hazardous waste or hazardous constituents
- From solid waste management units
- At a permitted TSDF

RCRA SECTION 3004(v)

- Corrective action is required beyond the facility boundary of a TSDF for releases
- Of a hazardous waste
- Where necessary to protect human health and the environment.
- The owner/ operator is able to obtain the permission of the owner of the affected property.

CERCLA SECTION 104

- In the event of a release or substantial threat of release of:
  - a hazardous substance, or
  - any pollutant or contaminant which may present an imminent and substantial danger to public health or welfare
- Into the environment,
- EPA may take response actions consistent with the NCP as necessary to protect public health or welfare or the environment.
- EPA may seek cost recovery from generators, transporters or o/o's of facilities pursuant to Section 107.

CERCLA SECTION 106

- In the event of a release or threatened release of
- A hazardous substance
- From a facility
- Into the environment
- Which release or threatened release may present an imminent and substantial endangerment to the public health or welfare or the environment,
- EPA may initiate an abatement action, or take other action or issue orders to generators, transporters, or o/o's as may be necessary to protect public health and welfare and the environment.

COMPARISON OF RCRA AND CERCLA CORRECTIVE ACTION AUTHORITIES

	§7003	§3008(a)	§3013	§3008(h)	§3004(u)	§3004(v)	§104	§106
Trigger:	Handling, storage, treatment, transportation or disposal may present an imminent and substantial endangerment to health or the environment.	Violation of any RCRA Subtitle C requirement.	Presence or release from a facility or site may present a substantial hazard to human health or the environment.	Information that there is or has been a release.	Release from a solid waste management unit at a facility seeking a permit.	Release beyond the facility boundary.	Release or substantial threat of release into the environment.	Release or threat of release from a facility which may present an imminent and substantial endangerment to public health or welfare or the environment.
Substances Covered:	Solid waste or hazardous waste.		Hazardous waste.	Hazardous waste and hazardous constituents.	Hazardous waste and hazardous constituents.	Hazardous waste.	Hazardous substances, or any pollutant or contaminant which may present an imminent and substantial danger to public health or welfare.	Hazardous substances.
Those Potentially Liable	Any person who is or has handled solid waste or hazardous waste, including present generators, transporters or o/o's.	Any person subject to Subtitle C, including generators, transporters and o/o's of RCRA TSDFs.	Present o/o of a facility or site, or in certain cases the most recent previous o/o expected to have sufficient knowledge to carry out actions required.	o/o's of facilities subject to interim status under Sec. 3005(e).	o/o's of RCRA permitted TSDFs.	o/o's of RCRA permitted TSDFs.	Generators, transporters, o/o's of facilities.	Generators, transporters, o/o's of facilities.
Actions That Can Be Required:	Action to restrain party liable from handling, storage, treatment, transportation or disposal of waste, or other action as may be necessary, or both.	Immediate compliance or compliance within a specified time period; suspension or revocation of permit.	Such monitoring, testing, analysis and reporting as deemed reasonable to ascertain the the nature and extent of the hazard. May, under certain circumstances, recover costs incurred by EPA for monitoring, testing, etc.	Corrective action or such other response measure as deemed necessary to protect human health or the environment. Orders can include a suspension or revocation of authorization to operate under Sec. 3005(e).	Corrective action.	Corrective action beyond the facility boundary, if o/o can obtain permission of owner of affected property.	Removal or remedial action or other response measures consistent with the NCP deemed necessary to protect public health or welfare or the environment. EPA can seek reimbursement of response costs under Sec. 107.	Abatement or other actions as may be necessary to protect public health, welfare and the environment. EPA can seek reimbursement of response costs under Sec. 107.

DRAFT

COMPARISON OF RCRA AND CERCLA CORRECTIVE ACTION AUTHORITIES

	§7003	§3008(a)	§3013	§3008(h)	§3004(u)	§3004(v)	§104	§106
Procedures:	Administrator must notify affected State prior to issuing notice.	O/O has right to an adjudicatory hearing. Administrator must notify affected authorized State.	Opportunity for proposal conference with Agency.	Opportunity for administrative hearing must be provided.	Permitting procedures.	Permitting procedures or orders.	Notice letters to PRPs.	Administrator must notify affected State prior to issuing orders. Notice letters to PRPs.
Penalties:	Civil penalty not to exceed $5,000/day for violation of Sec. 7003(a) order.	Civil penalty not to exceed $25,000/day per violation.	Civil penalty not to exceed $5,000 per day of noncompliance with a Sec. 3013 order.	Agency may assess a civil penalty not to exceed $25,000 per day of noncompliance with a Sec. 3008(h) order.			RP may be liable for punitive damages up to 3 times amount of Fund monies used as result of RP's failure, without sufficient cause, to comply with Sec. 104 or 106 order.	RP may be liable for punitive damages up to 3 times amount of Fund monies used as result of RP's failure, without sufficient cause, to comply with Sec. 104 or 106 order.

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IMMINENT HAZARD

SEC. 7003. [6973] (a) AUTHORITY OF ADMINISTRATOR.—Notwithstanding any other provision of this Act, upon receipt of evidence that the past or present handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste may present an imminent and substantial endangerment to health or the environment, the Administrator may bring suit on behalf of the United States in the appropriate district court against any person (including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility) who has contributed or who is contributing to the alleged disposal to restrain such person from such handling, storage, treatment, transportation, or disposal, to order such person to take such other action as may be necessary, or both. A transporter shall not be deemed to have contributed or to be contributing to such handling, storage, treatment, or disposal taking place after such solid waste or hazardous waste has left the possession or control of such transporter if the transportation of such waste was under a sole contractual arrangement arising from a published tariff and acceptance for carriage by common carrier by rail and such transporter has exercised due care in the past or present handling, storage, treatment, transportation and disposal of such waste. The Administrator shall provide notice to the affected State of any such suit. The Administrator may also, after notice to the affected State, take other action under this section including, but not limited to, issuing such orders as may be necessary to protect public health and the environment.

(b) VIOLATIONS.—Any person who willfully violates, or fails or refuses to comply with, any order of the Administrator under subsection (a) may, in an action brought in the appropriate United States district court to enforce such order, be fined not more than $5,000 for each day in which such violation occurs or such failure to comply continues.

(c) IMMEDIATE NOTICE.—Upon receipt of information that there is hazardous waste at any site which has presented an imminent and substantial endangerment to human health or the environment, the Administrator shall provide immediate notice to the appropriate local government agencies. In addition, the Administrator shall require notice of such endangerment to be promptly posted at the site where the waste is located.

(d) PUBLIC PARTICIPATION IN SETTLEMENTS.—Whenever the United States or the Administrator proposes to covenant not to sue or to forbear from suit or to settle any claim arising under this section, notice, and opportunity for a public meeting in the affected area, and a reasonable opportunity to comment on the proposed settlement prior to its final entry shall be afforded to the public. The decision of the United States or the Administrator to enter into or not to enter into such Consent Decree, covenant or agreement shall not constitute a final agency action subject to judicial review under this Act or the Administrative Procedure Act.

SECTION 3008(a)

SEC. 3008. [6928] (a) COMPLIANCE ORDERS.—(1) Except as provided in paragraph (2), whenever on the basis of any information the Administrator determines that any person has violated or is in violation of any requirement of this subtitle, the Administrator may issue an order assessing a civil penalty for any past or current violation, requiring compliance immediately or within a specified time period, or both, or the Administrator may commence a civil action in the United States district court in the district in which the violation occurred for appropriate relief, including a temporary or permanent injunction.

(2) In the case of a violation of any requirement of this subtitle where such violation occurs in a State which is authorized to carry out a hazardous waste program under section 3006, the Administrator shall give notice to the State in which such violation has occurred thirty days prior to issuing an order or commencing a civil action under this section.

(3) Any order issued pursuant to this subsection may include a suspension or revocation of any permit issued by the Administrator or a State under this subtitle and shall state with reasonable specificity the nature of the violation. Any penalty assessed in the order shall not exceed $25,000 per day of noncompliance for each violation of a requirement of this subtitle. In assessing such a penalty, the Administrator shall take into account the seriousness of the violation and any good faith efforts to comply with applicable requirements.

(b) PUBLIC HEARING.—Any order issued under this section shall become final unless, no later than thirty days after the order is served, the person or persons named therein request a public hearing. Upon such request the Administrator shall promptly conduct a public hearing. In connection with any proceeding under this section the Administrator may issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and may promulgate rules for discovery procedures.

(c) VIOLATION OF COMPLIANCE ORDERS.—If a violator fails to take corrective action within the time specified in a compliance order, the Administrator may assess a civil penalty of not more than $25,000 for each day of continued noncompliance with the order and the Administrator may suspend or revoke any permit issued to the violator (whether issued by the Administrator or the State).

SECTION 3013

MONITORING, ANALYSIS, AND TESTING

SEC. 3013. [6934] (a) AUTHORITY OF ADMINISTRATOR.—If the Administrator determines, upon receipt of any information, that—

(1) the presence of any hazardous waste at a facility or site at which hazardous waste is, or has been, stored, treated, or disposed of, or

(2) the release of any such waste from such facility or site may present a substantial hazard to human health or the environment, he may issue an order requiring the owner or operator of such facility or site to conduct such monitoring, testing, analysis, and reporting with respect to such facility or site as the Administrator deems reasonable to ascertain the nature and extent of such hazard.

(b) PREVIOUS OWNERS AND OPERATORS.—In the case of any facility or site not in operation at the time a determination is made under subsection (a) with respect to the facility or site, if the Administrator finds that the owner of such facility or site could not reasonably be expected to have actual knowledge of the presence of hazardous waste at such facility or site and of its potential for release, he may issue an order requiring the most recent previous owner or operator of such facility or site who could reasonably be expected to have such actual knowledge to carry out the actions referred to in subsection (a).

(c) PROPOSAL.—An order under subsection (a) or (b) shall require the person to whom such order is issued to submit to the Administrator within 30 days from the issuance of such order a proposal for carrying out the required monitoring, testing, analysis, and reporting. The Administrator may, after providing such person with an opportunity to confer with the Administrator respecting such proposal, require such person to carry out such monitoring, testing, analysis, and reporting in accordance with such proposal, and such modifications in such proposal as the Administrator deems reasonable to ascertain the nature and extent of the hazard.

SECTION 3013(d)

(d) MONITORING, ETC., CARRIED OUT BY ADMINISTRATOR.—(1) If the Administrator determines that no owner or operator referred to in subsection (a) or (b) is able to conduct monitoring, testing, analysis, or reporting satisfactory to the Administrator, if the Administrator deems any such action carried out by an owner or operator to be unsatisfactory, or if the Administrator cannot initially determine that there is an owner or operator referred to in subsection (a) or (b) who is able to conduct such monitoring, testing, analysis, or reporting, he may—

(A) conduct monitoring, testing, or analysis (or any combination thereof) which he deems reasonable to ascertain the nature and extent of the hazard associated with the site concerned, or

(B) authorize a State or local authority or other person to carry out any such action,

and require, by order, the owner or operator referred to in subsection (a) or (b) to reimburse the Administrator or other authority or person for the costs of such activity.

(2) No order may be issued under this subsection requiring reimbursement of the costs of any action carried out by the Administrator which confirms the results of an order issued under subsection (a) or (b).

(3) For purposes of carrying out this subsection, the Administrator or any authority or other person authorized under paragraph (1), may exercise the authorities set forth in section 3007.

(e) ENFORCEMENT.—The Administrator may commence a civil action against any person who fails or refuses to comply with any order issued under this section. Such action shall be brought in the United States district court in which the defendant is located, resides, or is doing business. Such court shall have jurisdiction to require compliance with such order and to assess a civil penalty of not to exceed $5,000 for each day during which such failure or refusal occurs.

SECTION 3008(h)

(h) INTERIM STATUS CORRECTIVE ACTION ORDERS.—(1) Whenever on the basis of any information the Administrator determines that there is or has been a release of hazardous waste into the environment from a facility authorized to operate under section 3005(e) of this subtitle, the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary to protect human health or the environment or the Administrator may commence a civil action in the United States district court in the district in which the facility is located for appropriate relief, including a temporary or permanent injunction.

(2) Any order issued under this subsection may include a suspension or revocation of authorization to operate under section 3005(e) of this subtitle, shall state with reasonable specificity the nature of the required corrective action or other response measure, and shall specify a time for compliance. If any person named in an order fails to comply with the order, the Administrator may assess, and such person shall be liable to the United States for, a civil penalty in an amount not to exceed $25,000 for each day of noncompliance with the order.

SECTION 3004(u)

(u) CONTINUING RELEASES AT PERMITTED FACILITIES.—Standards promulgated under this section shall require, and a permit issued after the date of enactment of the Hazardous and Solid Waste Amendments of 1984 by the Administrator or a State shall require, corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit under this subtitle, regardless of the time at which waste was placed in such unit. Permits issued under section 3005 shall contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.

SECTION 3004(v)

(v) CORRECTIVE ACTIONS BEYOND FACILITY BOUNDARY.—As promptly as practicable after the date of the enactment of the Hazardous and Solid Waste Amendments of 1984, the Administrator shall amend the standards under this section regarding corrective action required at facilities for the treatment, storage, or disposal, of hazardous waste listed or identified under section 3001 to require that corrective action be taken beyond the facility boundary where necessary to protect human health and the environment unless the owner or operator of the facility concerned demonstrates to the satisfaction of the Administrator that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action. Such regulations shall take effect immediately upon promulgation, notwithstanding section 3010(b), and shall apply to—

(1) all facilities operating under permits issued under subsection (c), and

(2) all landfills, surface impoundments, and waste pile units (including any new units, replacements of existing units, or lateral expansions of existing units) which receive hazardous waste after July 26, 1982.

Pending promulgation of such regulations, the Administrator shall issue corrective action orders for facilities referred to in paragraphs (1) and (2), on a case-by-case basis, consistent with the purposes of this subsection.

CERCLA SECTION 104

(As amended by SARA. Words in italics represent additions made by SARA; bracketed items have been deleted by SARA.)

SEC. 104. (a)(1) Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare, the President is authorized to act, consistent with the national contingency plan, to remove or arrange for the removal of, and provide for remedial action relating to such hazardous substance, pollutant, or contaminant at any time (including its removal from any contaminated natural resource), or take any other response measure consistent with the national contingency plan which the President deems necessary to protect the public health or welfare or the environment [, unless the President determines that such removal and remedial action will be done properly by the owner or operator of the vessel or facility from which the release or threat of release emanates, or by any other responsible party]. *When the President determines that such action will be done properly and promptly by the owner or operator of the facility or vessel or by any other responsible party, the President may allow such person to carry out the action, conduct the remedial investigation, or conduct the feasibility study in accordance with section 122. No remedial investigation or feasibility study (RI/FS) shall be authorized except on a determination by the President that the party is qualified to conduct the RI/FS and only if the President contracts with or arranges for a qualified person to assist the President in overseeing and reviewing the conduct of such RI/FS and if the responsible party agrees to reimburse the Fund for any cost incurred by the President under, or in connection with, the oversight contract or arrangement. In no event shall a potentially responsible party be subject to a lesser standard of liability, receive preferential treatment, or in any other way, whether direct or indirect, benefit from any such arrangements as a response action contractor, or as a person hired or retained by such a response action contractor, with respect to the release or facility in question. The President shall give primary attention to those releases which the President deems may present a public health threat.*

CERCLA SECTION 106

(As amended by SARA. Words in italics represent additions made by SARA; bracketed items have been deleted by SARA.)

ABATEMENT ACTION

SEC. 106. (a) In addition to any other action taken by a State or local government, when the President determines that there may be an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from a facility, he may require the Attorney General of the United States to secure such relief as may be necessary to abate such danger or threat, and the district court of the United States in the district in which the threat occurs shall have jurisdiction to grant such relief as the public interest and the equities of the case may require. The President may also, after notice to the affected State, take other action under this section including, but not limited to, issuing such orders as may be necessary to protect public health and welfare and the environment.

	Imminent and Substantial Endangerment	Substantial Threat	Release	Statutory and Regulatory Violation
TRIGGER	7003 106	3013 104	104 3004(u,v) 3008(h)	3008(a) [Subtitle C] 7002

	Solid Waste	Hazardous Substances	Hazardous Waste (Statutory Def.)	Hazardous Const. Hazardous Waste (Regulatory Def.)
SUBSTANCES COVERED	7003	104 106 7003	7003 3013 104 106	3008(h) 3004(u,v) 7003 3013 106 104

	Present Owner/ Operator	Generator/ Transporter	Past Owner/ Operator
LIABILITY	7003 3013 3008(a) 3008(h) 3004(u,v) 104 106	7003 3008(a) 104 106	7003 3013 [most recent] 104 106

	Any and All Facility Wide Corrective Actn	Any and All Unit Specific Corrective Actn	Emergency Removals	Study
CORRECTIVE ACTIONS	7003 106 3008(h)	7003 106 3008(h) 3004(u,v)	104 106 7003 3008(h) 3004(u,v)	3013 106 7003 3008(h) 3004(u,v)

	Adjudicatory Hearing	Streamlined Hearing	Notify States	Permit Procedures	Notice to PRPs	Conference With EPA
PROCEDURES	3008(a)	3008(h)	7003 106	3004(u,v)	104	106 3013

	$5000/day	$25000/day	Treble Damages
PENALTIES	7003 3013	3008(a) 3008(h) 104 [under 122] 106 [under 122]	104 [under 107] 106 [under 107]

	None	Some to Substantial
PUBLIC INVOLVEMENT REQUIRED	7003 [unilateral] 3008(a) 3013 104	7003 [consent] [notice] 3004(u,v) [notice/comment/hearing] 3008(h) [notice/comment/meeting] 106 [notice/comment/meeting]

old employees Records Visual information

Information of Release - Don't need to have hard sampling data to show release. Best evidence is sampling ev. dence

DEFINITIONS

RELEASE OF HAZARDOUS WASTE

- Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing...

- From:

  - Hazardous Waste Management Units
  - Solid Waste Management Units with hazardous constituents
  - Hazardous waste management activities

- To:

  - Groundwater
  - Surface water
  - Air
  - Land surface and subsurface strata

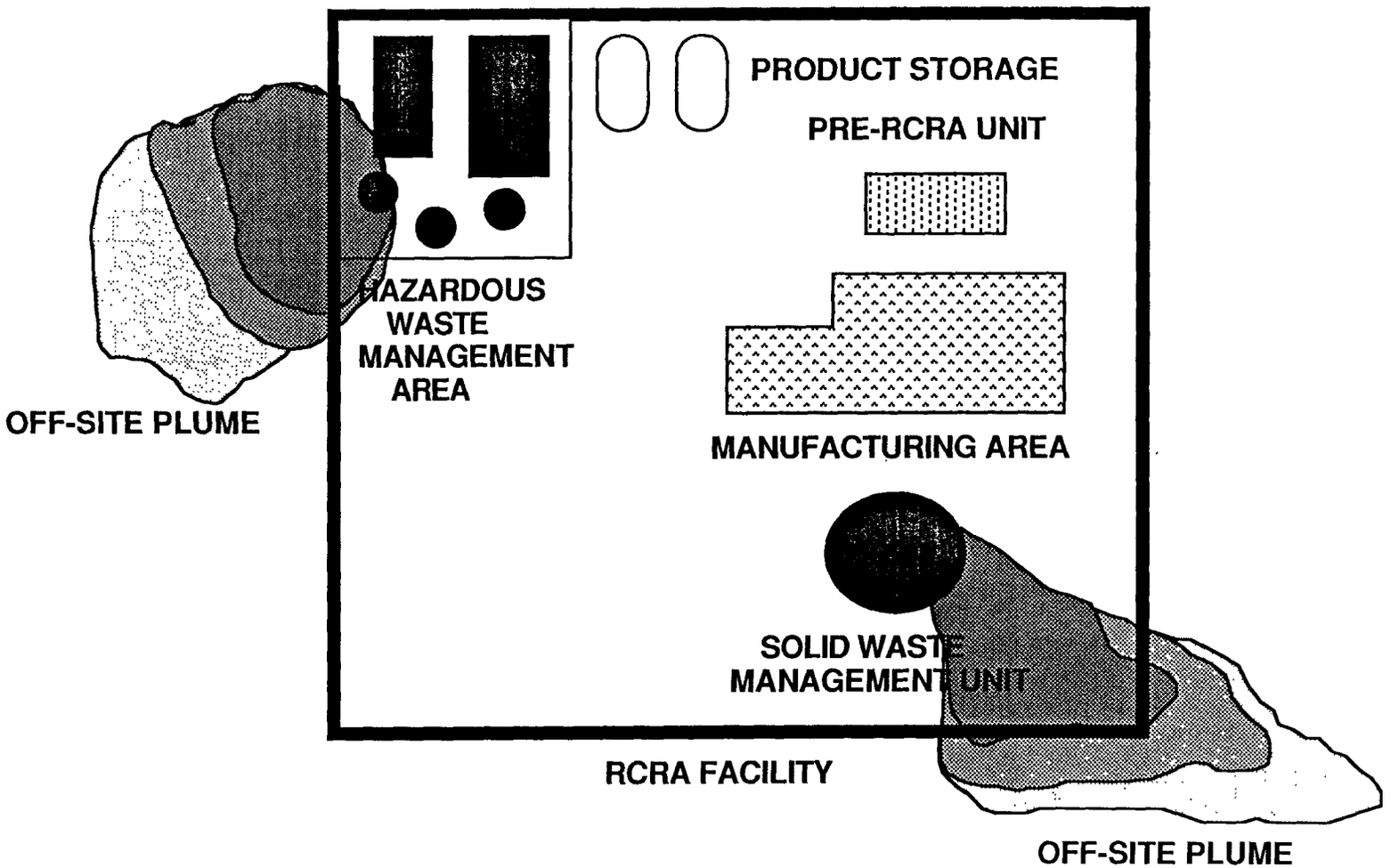
FROM A FACILITY

- All contiguous property, <u>not</u> limited to solid and/or hazardous waste management areas, under the control of an owner or operator at which units subject to RCRA permitting are located.

AUTHORIZED TO OPERATE UNDER SECTION 3005(e)

- Facilities that have interim status
- Facilities that should have interim status
- Facilities that had interim status

SCOPE OF CORRECTIVE ACTION



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 16 1985

MEMORANDUM

SUBJECT: Interpretation of Section 3008(h) of the Solid Waste Disposal Act

FROM: J. Winston Porter, Assistant Administrator
Office of Solid Waste and Emergency Response

Courtney M. Price, Assistant Administrator
Office of Enforcement and Compliance Monitoring

TO: Regional Administrators
Regional Counsels
Regional Waste Management Division Directors
Director, National Enforcement Investigation Center

As part of our effort to support case development activities undertaken by United States Environmental Protection Agency personnel, we are transmitting to you guidance on the use of Section 3008(h), one of the corrective action authorities added to the Solid Waste Disposal Act by the Hazardous and Solid Waste Amendments of 1984. As you are aware, Section 3008(h) allows the Agency to take enforcement action to require corrective action or any other response necessary to protect human health or the environment when a release is identified at an interim status hazardous waste treatment, storage or disposal facility. Because the authority is broad, both with respect to the kinds of environmental problems that can be addressed and the actions that the Agency may compel, we have produced the attached document to provide initial guidance on the interpretation of the terms of the provision and to describe administrative requirements. The document will be revised as case law and Agency policy develop. In addition, the Office of Solid Waste and Emergency Response intends to develop technical guidance on various types of response measures and the circumstances in which they might be appropriate.

In view of the need to issue RCRA permits and to ensure that the substantial number of interim status facilities expected to cease operation in the near future are closed in an environmentally sound manner, we encourage you to use the interim status corrective action authority as appropriate to supplement the closure and permitting processes. Questions or comments on this document or the use of Section 3008(h) authority in general can be addressed to Gene A. Lucero, Director of the Office of Waste Programs Enforcement (FTS 382-4814, WH-527) or Fred Stiehl, Associate Enforcement Counsel for Waste (FTS 382-3050, LE-134S).

Attachment

RCRA SECTION 3008(h)

THE INTERIM STATUS CORRECTIVE ACTION AUTHORITY

DECEMBER 16, 1985

I. INTRODUCTION

The Hazardous and Solid Waste Amendments of 1984 have substantially expanded the scope of the RCRA hazardous waste management program. One of the most significant provisions is the interim status corrective action authority, which allows EPA to take enforcement action to compel response measures when the Agency determines that there is or has been a release of hazardous waste at a RCRA interim status facility. Prior to the 1984 Amendments, EPA could require remedial action at interim status facilities by, inter alia, (1) using RCRA §7003 or CERCLA §106 authorities if an imminent and substantial endangerment may have been presented, or (2) when significant ground-water contamination was detected, calling in Part B of the RCRA permit application and requiring corrective action as a condition of the permit. The Amendments added Section 3008(h) to deal directly with environmental problems by requiring clean-up at facilities that have operated or are operating subject to RCRA interim status requirements.

The purpose of this document is to provide preliminary guidelines on the scope of Section 3008(h) and to summarize appropriate procedures. The document will be revised as case law and Agency policy develop. Other relevant RCRA guidances that may be consulted include:

- Final Revised Guidance on the Use and Issuance of Administrative Orders under Section 7003 of RCRA, Office of Enforcement and Compliance Monitoring and Office of Solid Waste and Emergency Response - September, 1984.
- Issuance of Administrative Orders under Section 3013 of RCRA, Office of Enforcement and Compliance Monitoring and Office of Solid Waste and Emergency Response - September, 1984.
- Draft Guidance on Corrective Action for Continuing Releases, Office of Solid Waste and Emergency Response - February, 1985.
- Final RCRA Ground-Water Monitoring Compliance Order Guidance, Office of Solid Waste and Emergency Response - August, 1985.

- Draft RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response - August, 1985.
- Draft RCRA Preliminary Assessment/Site Investigation Guidance, Office of Solid Waste and Emergency Response - August, 1985.

II. DELEGATIONS OF AUTHORITY

On April 16, 1985, the Administrator signed delegations enabling the Regional Administrators, the Assistant Administrator for Solid Waste and Emergency Response and the Assistant Administrator for Enforcement and Compliance Monitoring to exercise Section 3008(h) authority. There are three new delegations, 8-31, 32 and 33. The first enables the Regional Administrator or the Assistant Administrator for Solid Waste and Emergency Response to determine that there is or has been a release of hazardous waste at or from a RCRA interim status facility. The second and third delegate the authority to issue orders and sign consent agreements. The authority to refer civil judicial actions is found in Delegation 8-10.

Because Section 3008(h) is quite broad, both with respect to the types of environmental problems that may be addressed and the actions that EPA may compel, delegation of Section 3008(h) authority is subject to limitations. To issue an administrative order or sign a consent agreement, the Regions must obtain advance concurrence from the Director, Office of Waste Programs Enforcement, Office of Solid Waste and Emergency Response and must notify the Associate Enforcement Counsel for Waste, Office of Enforcement and Compliance Monitoring. Until the Agency as a whole gains experience in using the new authority, this requirement is necessary to ensure that sound precedent is established and national program priorities are addressed. The Office of Waste Programs Enforcement intends to waive advance concurrence, however, for those Regions that demonstrate sufficient experience in using Section 3008(h) as indicated by the number and quality of §3008(h) orders submitted for review in the next six months. Civil judicial actions will be handled in accordance with existing procedures for referrals.

To expedite §3008(h) actions, the Regions should establish procedures for drafting and reviewing orders and referrals and clearly delineate the roles and responsibilities of Regional RCRA enforcement and program personnel (including CERCLA personnel as necessary) and the Office of Regional Counsel in those processes. Draft orders should be sent to the Chief, Compliance and Implementation Branch, RCRA Enforcement Division, Office of Waste Programs Enforcement.

Headquarters is committed to conducting timely review of §3008(h) orders. To avoid the delays associated with discussion and review of rough drafts, we ask that orders be in "near final" form when they are submitted. Generally, the orders will be examined to determine whether (1) the elements of proof are adequately defined and documented, (2) the response to be compelled is practicable and environmentally sound, and (3) the action supports national RCRA program goals. Written comments or concurrence will be provided to the Regions within ten working days of receipt.

III. SCOPE OF SECTION 3008(h)

Section 3008(h) provides:

> " (1) Whenever on the basis of any information the Administrator determines that there is or has been a release of hazardous waste into the environment from a facility authorized to operate under Section 3005(e) of this subtitle, the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary to protect human health or the environment, or the Administrator may commence a civil action in the United States district court in the district in which the facility is located for appropriate relief, including a temporary or permanent injunction.
>
> (2) Any order issued under this subsection may include a suspension or revocation of authorization to operate under Section 3005(e) of this subtitle, shall state with reasonable specificity the nature of the required corrective action or other response measure, and shall specify a time for compliance. If any person named in an order fails to comply with the order, the Administrator may assess, and such a person shall be liable to the United States for, a civil penalty in an amount not to exceed $25,000 for each day of noncompliance with the order."

To exercise the interim status corrective action authority, the Agency must first have information that there is or has been a release of hazardous waste to the environment at or from an interim status facility. Second, the corrective action or other response measure, in the judgment of the Agency, must be necessary to protect human health or the environment. Key terms are discussed below in greater detail.

"Whenever on the basis of any information the Administrator determines ..."

The opening clause of Section 3008(h) authorizes the Agency to make the determination that there is or has been a release of hazardous waste into the environment on the basis of 'any information'. Appropriate information can be obtained from a variety of sources, including data from laboratory analyses of soil, air, surface water or ground water samples, observations recorded during inspections, photographs, and facts obtained from facility records.

The reference to a determination by the Administrator should be considered in the context of the term 'any information'. To satisfy any requirement imposed by the statute, an order should contain a specific determination. A civil referral should also be based on a written determination that there is or has been a release.

" ...that there is or has been a release...into the environment..."

The trigger for issuing §3008(h) orders and initiating civil referrals is the existence of information that there is or has been a release, which is a lower threshold than the showing of 'substantial hazard' under RCRA Section 3013 or 'imminent and substantial endangerment' under RCRA Section 7003 or CERCLA Section 106. While the statute does not define the term 'release', the Agency believes that, given the broad remedial purpose of Section 3008(h), the term should encompass at least as much as the definition of release under CERCLA. See 42 U.S.C. §9601(22). Therefore a release is any spilling, leaking, pumping,

pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The exemptions described in the CERCLA definition are considered inapplicable or inappropriate for RCRA purposes, however, and are not included in the RCRA definition.

The term 'environment' is also broad. The legislative history for Section 3008(h), which discusses use of the authority to respond to releases to various environmental media, makes it clear that Section 3008(h) is not limited to a particular medium. H. Rep. No. 1133, 98th Cong., 2d Sess. 111-112 (1984). The Agency will use Section 3008(h) to address releases to surface waters, groundwater, land surface or subsurface strata and air.

It is not necessary to have actual sampling data to show a release. An inspector may find other evidence that a release has occurred, such as a broken dike at a surface impoundment. Less obvious indications of release might also be adequate to make the determination. For example, the Agency could have sufficient information on the contents of a land disposal unit, the design and operating characteristics of the unit, and the hydrogeology of the area in which the unit is located to conclude that there has been a release to groundwater.

In addition to on-site information gathering undertaken specifically to support a §3008(h) action, other sources that may provide information on releases include:

- Inspection Reports.
- RCRA Part A and Part B permit applications.
- Responses to RCRA §3007 information requests.
- Information obtained through RCRA §3013 orders.
- Notifications required by CERCLA §103.
- Information-gathering activities conducted under CERCLA §104.
- Informants' tips or citizens' complaints corroborated by supporting information.

A determination that there is or has been a release does not require that specific amounts of hazardous waste or hazardous constituents be found in the environment. Quantities or concentrations of hazardous wastes or hazardous constituents should be considered when ordering interim or complete corrective actions, however, because response actions compelled by the Agency must be necessary to protect human health or the environment.

"...of hazardous waste..."

In contrast to many Subtitle C provisions, the language of Section 3008(h) refers to "hazardous waste" rather than "hazardous waste identified or listed under Subtitle C". The Agency believes that the omission of a reference to wastes listed or identified at 40 CFR Part 261 was deliberate, and Congress did not intend to limit Section 3008(h) only to materials meeting the regulatory definition of hazardous waste. The Conference Report specifically endorses the use of corrective action orders to respond to releases of hazardous constituents. H. Rep. No. 1133, 98th Cong., 2d Sess. 111 (1984). The legislative history also indicates that the new authority should be at least as broad as the corrective action authority in the federal RCRA permit program. Id. at 111-112. Those regulations address both hazardous waste and hazardous constituents. Moreover, Section 3004(u), the 'Continuing Releases' provision requiring clean-up of releases from any solid waste management unit at a treatment, storage or disposal facility seeking a RCRA permit, applies to releases of hazardous constituents as well as releases of listed and characteristic wastes. H. Rep. No. 198, 98th Cong., 1st Sess. 60 (1983). Therefore, Section 3008(h) may also be used to compel response measures for releases of hazardous constituents from hazardous or solid waste.

"Hazardous constituents" are the substances listed in Appendix VIII to 40 CFR Part 261. H. Rep. No. 198, 98th Cong., 1st Sess. 60-61 (1983). According to the legislative history for Section 3004(u), which is read in conjunction with Section 3008(h), the term also includes Appendix VIII hazardous constituents released from solid waste and hazardous constituents that are reaction by-products. S. Rep. No. 284, 98th Cong., 1st Sess. 32 (1983). It should be noted that the legislative history for the new underground storage tank provisions states that Section 3008 is not applicable to underground storage tanks regulated under Subtitle I. Such releases may be addressed by Section 7002 and Section 7003 authorities, however. H. Rep. No. 1133, 98th Cong., 2d Sess. 127 (1984). Section 3008(h) remains applicable to releases from underground tanks containing hazardous or solid waste subject to Subtitle C provisions.

"...from a facility..."

For interim status corrective action purposes, EPA intends to employ the definition of 'facility' adopted by the Agency in the corrective action program for releases from permitted facilities. The preamble to the permitting requirements for land disposal facilities indicates that the term 'facility' refers to ..."the broadest extent of EPA's area jurisdiction under Section 3004 of RCRA...[meaning] the entire site that is under the control of the owner or operator engaged in hazardous waste management." 47 FR 32288-89 (July 26, 1982). See also the Final Codification Rule. 50 FR 28712 (July 15, 1985). Therefore, the definition of facility encompasses all contiguous property under the owner or operator's control.

The permit program, as amended by Section 3004(u), requires corrective action for releases of hazardous waste and hazardous constituents from solid waste management units at a facility. EPA interprets 'solid waste management unit'

to include any discernable unit used for waste management. See 50 FR 28712 (July 15, 1985). Since the legislative history describes the interim status corrective action authority as a "supplement" to permitting authority and indicates that the interim status authority should be at least as broad as the permit authority, Section 3008(h) clearly authorizes EPA to require corrective action for any release of hazardous waste from discernable waste management units. The Agency's authority to use Section 3008(h) to address releases from solid waste management units as well as hazardous waste management units is discussed in the Final Codification Rule. 50 FR 28716 (July 15, 1985).

The language of Section 3008(h), however, suggests that Congress did not intend to limit EPA's authority to releases from discernable units. Unlike Section 3004(u), Section 3008(h) broadly authorizes corrective action for any release from a "facility". It does not require the Agency to find that a release originated in a discernable waste management "unit".

The legislative history supports this interpretation. Prior to enactment of Section 3008(h), the RCRA regulations required corrective action for releases to groundwater from permitted 'regulated units' (surface impoundments, waste piles, landfills and land treatment areas that received Subtitle C hazardous waste after a specified date). 40 CFR 264.100 and 40 CFR 264.90. Congress criticized this approach as too slow and too limited, however, and created the interim status corrective action authority to "deal directly with an ongoing environmental problem at interim status facilities." H. Rep. No. 1133, 98th Cong., 2d Sess. 110-112 (1984). Moreover, Congress clearly did not intend the authority to be limited to the scope of the existing permit program. For instance, the legislative history lists several examples of releases outside the regulatory program for which a §3008(h) action is appropriate, including

releases from waste management units not required to undertake corrective action or otherwise exempt from RCRA regulations and releases, such as air emissions, to environmental media other than groundwater. Id. at 112.

The text of the statute, the broad remedial purpose, and the clear intent to authorize action beyond the scope of the permit regulations support the position that Section 3008(h) authorizes EPA to address all types of releases of hazardous waste within a facility. As discussed previously, the term 'hazardous waste' encompasses 'hazardous constituents' from both hazardous and solid waste.

Section 3008(h) will also be used to address releases that have migrated from the facility. New Section 3004(v), which provides that EPA may issue orders requiring corrective action for releases that have crossed the facility boundary if the permission of the owner of the affected property can be obtained, supports the Agency's interpretation that such releases are subject to action under Section 3008(h). See also the Final Codification Rule. 50 FR 28716 (July 15, 1985).

In a §3008(h) order or judicial referral, Agency personnel should describe hazardous and solid waste management units within the boundary of the facility and hazardous and solid wastes (and associated hazardous constituents) managed by the facility in addition to information indicating that a release has occurred. Since Section 3008(h) unequivocally authorizes EPA to address releases from units, the order or complaint should establish some link between the hazardous constituents in a release and the hazardous or solid wastes in waste management units where possible. For example, the findings of fact might state that the facility treats, stores or disposes of certain listed Subtitle C wastes, that those wastes were listed because they contain the hazardous constituents cited in Appendix VII to 40 CFR Part 261 and that some or all of those constituents have been found in the environment, thereby indicating a release.

"...authorized to operate under Section 3005(e)..."

This clause encompasses several classes of hazardous waste treatment, storage and disposal facilities. First, facilities that have met each requirement for obtaining interim status in a timely manner are subject to Section 3008(h). With respect to those facilities brought into the hazardous waste management system when the Phase I RCRA rules went into effect, to establish interim status EPA must demonstrate that: (1) the facility was in existence on November 19, 1980, and; (2) the owner or operator complied with the requirements of Section 3010(a), regarding notification of hazardous waste activity, and; (3) the owner or operator submitted a Part A application in accordance with 40 CFR 270.10. As to those facilities in existence on the date of regulatory or statutory changes that render the facility subject to the requirement to obtain a permit under Section 3005, to establish interim status the Agency must demonstrate (1) that the facility was in existence on the appropriate date and (2) submitted a Part A permit application in accordance with the requirements of 40 CFR 270.10. If a statutory or regulatory change requires notification under Section 3010, EPA must also establish that the facility submitted the notification.

Second, Section 3008(h) applies to facilities that treat, store, or dispose of hazardous waste, but have not actually obtained interim status because the owner or operator did not fully comply with the requirements to submit a Section 3010 notification and/or a Part A. Such facilities have been allowed to operate in accordance with a formal enforcement action or an Interim Status Compliance Letter requiring compliance with Part 265 standards. Furthermore, the owners or operators are not relieved of the duty to apply for and obtain a final RCRA permit. See e.g., the notice of implementation and enforcement policy for loss of interim status under Section 3005(e), 50 FR 38947-48 (September 25, 1985).

The Agency believes that Congress intended the interim status corrective action authority to apply to such facilities. The legislative history for Section 3008(h) supports this position by making it clear that the authority can be used to address releases from units that do not have interim status, such as wastewater treatment tanks. H. Rep. No. 1133, 98th Cong., 2d Sess. 112 (1984).

Third, EPA considers Section 3008(h) to be applicable not only to owners or operators of facilities in the above two categories but also to units or facilities at which active operations have ceased and interim status has been terminated pursuant to 40 CFR Part 124 or Sections 3005(c) and 3005(e)(2) of RCRA. Section 3008(h) specifically provides that the interim status corrective action orders may include a suspension or revocation of the authority to operate under interim status, as well as any other response necessary to protect human health or the environment. Consequently, a corrective measures program can be imposed under Section 3008(h), even if a facility's interim status has been taken away as a result of an interim status corrective action order. The Agency also believes that Section 3008(h) can be used to compel responses to releases at facilities that lost interim status prior to a §3008(h) action. This approach is consistent with Congressional intent to assure that significant environmental problems are addressed at facilities that treat, store or dispose of hazardous waste but do not have a final RCRA operating or post-closure permit. H. Rep. No. 1133, 98th Cong., 2d Sess. 110-112 (1984).

Where a State is authorized to administer the RCRA program, the requirements for obtaining the State's equivalent to interim status may differ from those of the federal program. In authorized States that do not duplicate the federal procedures, hazardous waste treatment, storage and disposal facilities that have not been granted or denied a final RCRA permit are generally considered interim status facilities. Land disposal facilities that were issued State permits

after November 8, 1984 but have not yet received the federal portion of the permit applicable to continuing releases under Section 3004(u) are treated for purposes of this guidance in the same manner as interim status facilities. Similarly, hazardous waste underground injection wells that did not receive a UIC permit prior to that date will also be treated in the same manner as interim status facilities. See the notice of implementation and enforcement policy for loss of interim status under Section 3005(e). 50 FR 38947 (September 25, 1985).

"...Corrective action or such other response measure as he deems necessary to protect human health or the environment ..."

Prior to the Hazardous and Solid Waste Amendments of 1984, the term "corrective action", in the RCRA regulatory context, referred to removal or treatment in place of Appendix VIII hazardous constituents in groundwater. 40 CFR 264.100. Section 3008(h) is not restricted to remedial action for ground-water contamination, however. The statutory language and the legislative history indicate that a wide range of responses to releases to all media from waste management activities may be compelled. Financial assurance for any response measure may also be required.

The authority can be used to require implementation of one or more stages of a clean-up program, such as:

- Containment, stabilization or removal of the source of contamination,
- Studies to characterize the nature and extent of contamination and to assess exposure and health and environmental effects,
- Identification and evaluation of remedies,
- Design and construction of the chosen remedy,
- Implementation of the remedy, and
- Monitoring to determine the effectiveness of the remedy.

For example, a §3008(h) order might require that the owner or operator conduct a study to characterize the nature and extent of contamination, then select a remedy and submit a corrective action plan to EPA. The Agency and the owner or operator would then confer on the plan and amend the order to reflect any modifications. H. Rep. No. 1133, 98th Cong., 2d Sess., 111 (1984). Because a study on the nature and extent of contamination and the selection and design of a remedy may require a significant amount of time, Section 3008(h) should be employed to require interim measures as necessary to protect human health and the environment prior to completion of the study and selection of a remedy. Examples of interim remedies that could be compelled include removal of the waste or containment of the source of the contamination by lining a unit or erecting dikes. In some instances, preliminary pumping and treating of affected groundwater may be appropriate.

While the information needed to make a determination that there is or has been a release is minimal, more information may be needed to justify a specific interim or full remedy. The Administrator can require "corrective action or such other response measures as he deems necessary to protect human health or the environment." To show that a response may be necessary to protect human health or the environment, the present or potential threat posed by the release should be described. The Agency may consider a variety of factors, including the quantity of hazardous waste; the nature and concentration of hazardous constituents or other hazardous properties exhibited by the waste; the facility's waste management practices; potential exposure pathways; transport and environmental fate of hazardous constituents; humans or environmental receptors that might be exposed; the effects of exposure, and; any other appropriate factors. To compel corrective action investigations or studies, only a general threat to human health or the environment needs to be identified.

IV. ADMINISTRATIVE ACTIONS

Under Section 3008(h), the Agency can issue administrative orders or commence a civil judicial action. The decision to pursue an administrative or judicial remedy must be made on a case-by-case basis since each approach has advantages and disadvantages. An administrative order, for instance, can usually be issued quickly, while preparation for a judicial action may be more time-consuming and must be referred to the Department of Justice. On the other hand, a judicial order or consent decree can be enforced readily since the court already has jurisdiction of the matter.

EPA may issue a §3008(h) administrative order to require corrective action or any response necessary to protect human health or the environment. The order may include a suspension or revocation of authorization to operate. If any person named in the order fails to comply with the order, the Agency may impose a civil penalty not to exceed $25,000 for each day of noncompliance.

Notice to States

Section 3008(h) does not require that States be given notice of an impending action. To ensure that the Agency is fully informed of relevant facts and, in view of the Federal/State relationship, consultation with the State should usually precede an EPA action. To avoid misunderstandings, reasonable notice should be given to the State when an action is taken. The notice should include the location and a description of the facility, the names and addresses of the owners and operators, the conditions requiring a response and a description of the action that EPA will require.

Elements of Orders

Because it is the focal point in all proceedings subsequent to its issuance, the initial order must be as complete as possible. Failure to develop an adequate document may have adverse consequences if the Agency seeks judicial enforcement. All §3008(h) orders should contain the following general elements:

- A statement of the statutory basis for the order.
- Factual allegations showing that there is or has been (1) a release (2) of hazardous waste or hazardous constituents (3) into the environment (4) at or from an interim status facility. Facts indicating that the response is necessary to protect human health or the environment should also be presented.
- A determination, based on the factual allegations, that there is or has been a release of hazardous waste or hazardous constituents to the environment from an interim status facility.
- An order that clearly identifies the tasks to be performed, and a schedule of compliance accompanied by appropriate reporting and approval requirements.
- A statement informing the respondent that he has a right to request a hearing within 30 days of issuance concerning any material fact in the order or the terms of the order.
- A notice of opportunity for an informal settlement conference. It is the Agency's policy to encourage settlement of §3008(h) actions through informal discussions. The respondent should be cautioned, however, that a request for a conference does not affect the 30 day period for requesting a hearing.
- A statement that EPA may assess penalties not to exceed $25,000 per day of non-compliance with the order.

It may be appropriate to include a provision for stipulated penalties in orders on consent. Such a provision, however, should be drafted to make it clear that the stipulated penalty is not EPA's sole remedy and that Agency has not waived its statutory authority to assess penalties under Section 3008(h)(2). It is recommended that the Regions pursue judicial referrals to impose penalties for noncompliance with a §3008(h) administrative order rather than issuing a subsequent order for penalties.

Releases from liability and covenants not to sue may be sought by parties negotiating §3008(h) orders. These provisions terminate or seriously impair the Federal Government's right of action against a party. In general, the interim CERCLA Settlement Policy (December 5, 1984) may be followed. Releases generally will not be appropriate, however, where the extent of contamination, the reliability of the remedy or long-term operation and maintenance requirements are uncertain. If provided, they should be narrowly drawn. In addition, EPA personnel should exercise particular care in drafting such provisions to ensure that they do not restrict the operation and enforcement of the on-going RCRA regulatory program. Moreover, the order should also contain a provision reserving the Agency's right to take additional action under RCRA and other laws. For example, EPA should reserve the right to expend and recover funds under CERCLA; to bring imminent and substantial endangerment actions under RCRA §7003 and CERCLA §106; to assess penalties for violations of and require compliance with RCRA requirements under §3008(a); to address releases other than those identified in the order; to require further action as necessary to respond to the releases addressed in the order, and; to take action against nonparties if appropriate.

Hearing Requirement

To issue a unilateral §3008(h) order, EPA must comply with the requirements of Section 3008(b) with respect to an opportunity for a hearing. 130 Cong. Rec. S9175 (daily ed. July 25, 1984). Although procedures for §3008(a) administrative actions have been established by regulation (See 40 CFR Part 22), those regulations are not legally applicable to §3008(h) actions. Hearing procedures for §3008(h) actions are under development. Until formal guidance is available, a Region that intends to issue a unilateral order should contact the Office of Waste Programs Enforcement, Office of Solid Waste and Emergency Response.

Development and Preservation of the Administrative Record

§3008(h) orders might be reviewed in administrative or judicial proceedings. Therefore, it is essential that information required by the statute and all other relevant information or documents obtained by the Agency be compiled in an administrative record, preserved and readily retrievable. The EPA official initiating the action should maintain a file that contains the following:

- EPA investigative records, such as inspection reports, sampling and analytical data, copies of business records, photographs, etc.;
- Reports and internal Agency documents used in generating or supporting the enforcement action, including expert witness statements;
- Copies of all documents filed with the Regional Hearing Clerk or the Presiding Officer;
- Copies of all relevant correspondence between EPA and the respondent;
- Written records of conferences and telephone conversations between EPA and the respondents, and;
- Copies of all correspondence between EPA and State or other federal agencies pertaining to the enforcement action.

V. CIVIL JUDICIAL ACTIONS

Under Section 3008(h), EPA may initiate civil judicial action to compel appropriate relief, including a temporary or permanent injunction, or to enforce a §3008(h) administrative order. As noted previously, the decision to pursue administrative or judicial remedies will be made on a case-by-case basis. Generally, however, a civil judicial action may be preferable to issuance of an administrative order in the following types of situations:

- A person is not likely to comply with an order or has failed to comply with a §3008(h) order.
- A person's conduct must be stopped immediately to prevent irreparable injury, loss or damage to human health or the environment.
- Long-term, complex and costly response measures will be required. (Because compliance problems are more likely to arise during implementation of these actions than while carrying out a simple, short-term action, it may be better to have the matter already before the court for ease of enforcement.)

Other factors that could be considered include the value of a favorable decision as precedent and the need to deter noncompliance by other potential targets for EPA enforcement action under Section 3008(h).

A request to file a civil judicial action must be referred by the Assistant Administrator for Enforcement and Compliance Monitoring to the Department of of Justice. The procedures that Agency personnel should follow to develop a referral and support litigation are described in the RCRA/CERCLA Case Management Handbook (August, 1984) and the RCRA Compliance/Enforcement Guidance Manual (September, 1984).

VI. USE OF SECTION 3008(h) IN RELATION TO PERMITTING, CLOSURE AND OTHER AUTHORITIES

RCRA Permits

The pre-HSWA regulations applicable to corrective action at permitted facilities deal only with a remedial program for treatment in place or removal of groundwater contaminated by a release from a 'regulated unit'. (Prior to HSWA, the term 'regulated unit' meant a surface impoundment, landfill, land treatment unit or waste pile that operated after January 26, 1983. Enactment of new Section 3005(i), which provides that the Part 264 groundwater monitoring, unsaturated zone monitoring and corrective action requirements are applicable at the time of permitting to landfills, surface impoundments, waste piles and land treatment units that received Subtitle C hazardous wastes after July 26, 1982, necessitated a corresponding change in the definition of regulated unit). Enactment of Section 3004(u) enlarged the universe of units subject to corrective action at RCRA facilities by requiring that a facility seeking a RCRA permit address all releases of hazardous waste and hazardous constituents at any hazardous or solid waste management unit.

In addition to increasing the number and kinds of units subject to corrective action, EPA will use the Section 3004(u) authority to address releases to air, land and surface waters as well as to groundwater. Furthermore, Section 3004(v) allows EPA to require corrective action beyond the facility boundary where necessary to protect human health and the environment unless the facility owner or operator is unable to obtain permission from the owner of the affected property.

Permitting can be a lengthy process. Therefore, the interim status corrective action authority should be used to address significant environmental problems prior to issuance of the permit. With respect to 'regulated units', which cannot be permitted until the facility is in compliance with Part 270 requirements to assess ground-water contamination and develop a corrective action plan if necessary, Section 3008(h) may be particularly useful for compelling activities not addressed by the Part 265 and Part 270 regulations. For instance, interim corrective action measures could be required prior to permit issuance. For releases from solid waste management units and hazardous waste management units other than 'regulated units', Section 3008(h) may be used to compel interim measures, studies to characterize the nature and extent of contamination and the threat posed by the release, selection of remedy and design, construction and implementation of the remedy.

If an interim status facility is seeking an operating permit or will be required to obtain a post-closure permit, any §3008(h) action at that facility should be designed to meet the needs of the permitting process to the extent possible. If all necessary steps in a corrective measures program will not be completed prior to issuance of a permit, compliance schedules in the order should be developed so that they can be readily incorporated in the permit.

RCRA Closures

EPA believes that the interim status corrective action authority will be useful in assuring environmentally sound closures of RCRA hazardous waste management units. Section 3008(h) may be used to supplement the interim status closure regulations. Approval of a closure plan does not limit the Agency's ability to use Section 3008(h), as well as other applicable corrective action authorities, to deal with releases of hazardous waste or hazardous constituents. In view of the number of interim status closures anticipated as a result of new statutory and regulatory requirements, the Regions are encouraged to employ the interim status corrective action authority to assure that RCRA hazardous waste management units are closed in a manner that properly protects human health and the environment.

Other Enforcement Authorities

Because of the broad scope of Section 3008(h) and the variety of activities that can be compelled, the interim status corrective action authority may be employed in conjunction with other enforcement authorities, although it may be appropriate to issue separate,concurrent orders due to differing hearing requirements. For example, where a violation is associated with a release of hazardous waste or hazardous constituents, a Section 3008(a) action should be used to require compliance with the regulation and assess penalties while a Section 3008(h) action could be employed to compel response actions that go beyond regulatory requirements. Section 3013, which allows the Agency to compel owners or operators of treatment, storage or disposal facilities to conduct certain types of studies, may be used when the presence of hazardous waste may present a substantial threat but EPA does not have sufficient information to make a determination that there is or has been a release.

With regard to imminent and substantial endangerment actions, the legislative history makes it clear that enactment of Section 3008(h) does not alter the Agency's interpretation of Section 7003. H. Rep. No. 1133, 98th Cong., 2d Sess. 111 (1984). RCRA §7003 or CERCLA §106 actions are appropriate if conditions at an interim status facility may present an imminent and substantial endangerment and the Agency needs to move quickly to address the problem. The 'imminent hazard' provisions of RCRA and CERCLA may be especially helpful if the Agency wishes to take action against responsible parties other than or in addition to the current owner or operator.

VII. RESERVATION

The policies and procedures set forth herein and the internal office procedures adopted pursuant hereto are intended solely for the guidance of United States Environmental Protection Agency personnel. These policies and procedures are not intended to, do not, and may not be relied upon to create a right or benefit, substantive or procedural, enforceable at law by a party to litigation with the United States. The Agency reserves the right to take any action alleged to be at variance with these policies and procedures or that is not in compliance with internal office procedures that may be adopted pursuant to these materials.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 26 1984

MEMORANDUM

SUBJECT: Issuance of Administrative Orders Under Section 3013 of the Resource Conservation and Recovery Act

FROM: Courtney M. Price
Assistant Administrator for Enforcement
and Compliance Monitoring

Lee M. Thomas, Assistant Administrator
Office of Solid Waste and Emergency Response

TO: Addressees

Section 17 of the Solid Waste Disposal Act Amendments of 1980 (P.L. 96-482) added Section 3013 to the Resource Conservation and Recovery Act of 1976 (RCRA). This memorandum provides guidance on the use of that section and replaces earlier guidance issued September 11, 1981.

DELEGATION

Under current delegation authority Section 3013 Administrative Orders (Orders) are issued by Regional Administrators (RAs) with the advance concurrence of the Director, Office of Waste Programs Enforcement (OWPE), except in cases of national significance or in multi-regional cases, when the Director, OWPE, issues the Orders. The Assistant Administrator for Enforcement and Compliance Monitoring (OECM), consults as requested on Orders, refers Section 3013 judicial actions to the Department of Justice, and sends notices of such action to the appropriate RA and to the Director, OWPE. Further redelegation is currently under review.

FINDINGS REQUIRED FOR ISSUANCE

Section 3013 (a). AUTHORITY OF ADMINISTRATOR.

"If the Administrator determines, upon receipt of any information, that -

> (1) the presence of any hazardous waste at a facility or site at which hazardous waste is, or has been, stored, treated, or disposed of, or
>
> (2) the release of any such waste from such facility or site may present a substantial hazard to human health or the environment, he may issue an order requiring the owner or operator of such facility or site to conduct such monitoring, testing, analysis, and reporting with respect to such facility or site as the Administrator deems reasonable to ascertain the nature and extent of such hazard."

Under subsection (a), before an Order may be issued, the RA or, in cases of national significance or multi-regional cases, the Director, OWPE, must find that sufficient information has been received to determine that:

(a) the presence of hazardous waste[1/] at a site may present a substantial hazard to human health or the environment, or:

(b) the release of any such waste from the site may present a substantial hazard to human health or the environment.

The requirement for "information" means that some reliable information upon which a reasonable person would base a decision or take action has been gathered or presented before issuance of the Order. Such information may include laboratory analysis of samples, observations recorded in the course of an inspection, and citizens complaints corroborated by supporting information. Some background information regarding the type and quantity of waste likely to be found on the site can be located in EPA and State agency records, as well as by the use of site specific requests under Section 3007 of RCRA and/or Section 104 of the

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1/ Note that the exclusion of gasoline from the definition of hazardous substances under CERCLA is not applicable to the hazardous wastes as defined in RCRA. Accordingly, §3013 Orders may be useful enforcement tools in some situations involving leaking underground storage tanks (LUSTs). Note, too, that the statutory definition of hazardous waste (RCRA §1004(5)) is applicable in §3013 Orders, not the Subtitle C regulatory definition.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Section 3013 Orders may be used in situations where information required under Subtitle C has not been submitted if other factors support the determination that a substantial hazard may exist. In cases where information required to be submitted under Subtitle C has not been submitted, and no indication of substantial hazard is presented, enforcement action under Section 3008 may be appropriate. 2/

It should be noted that the mere presence of hazardous waste at a site or facility is sufficient to cause the issuance of an order, provided that the information indicates that the presence of the waste may present a substantial hazard. This is true even in the absence of definite evidence of an actual release of waste, and covers the cases where there is a threat of release, or where it is difficult, if not impossible, to ascertain, without extensive sampling, analysis and monitoring, whether a release has actually occurred or will occur.

Finally, a determination as to whether known and detectable or potential releases from the site may present a substantial hazard requires gathering of sufficient information to make a determination of two essential prerequisites:

2/ Section 106 of CERCLA also may be used to issue an order to prior owners/operators under circumstances where the "imminent and substantial endangerment" standard can be met. In such situations, it may be advantageous to issue a §3013 Order in conjunction with a §106 Order under CERCLA. In deciding whether to issue a §106 Order under CERCLA or a §3013 Order under RCRA, the main consideration should be whether available information can support a finding that there may be an "imminent and substantial endangerment." If such a finding can be supported, then a §106 Order or a §106 Order in conjunction with a §3013 Order is appropriate. The RI/FS policy regarding circumstances under which a potentially responsible party may be required to perform an RI/FS should be consulted. Section 3013 Orders should not be used to evade the RI/FS policy. Remedial investigations may be performed pursuant to a §3013 Order, but feasibility studies are beyond the jurisdictional scope of §3013.

(1) That there is a known or potential release of hazardous waste from the site.

(2) That the release "may present a substantial hazard" to human health or the environment.

Number (1) above may be determined in a variety of ways, including actual observation of escape from the site of a substance known to be hazardous, by governmental sampling or analysis, or through information supplied by the owner/operator. (See discussion of "information" above.) It is significant that Congress used the words "may present" rather than "is presenting", such as had been used in Section 7003 prior to the 1980 amendments. As in Section 7003, the effect of the words "may present" is to require that the information presented to the RA or Director, OWPE, show only that there is a possibility or potential of a substantial hazard to human health or the environment, rather than to show that the hazard actually exists.

Whether a "substantial hazard" may exist involves consideration of some of the same factors as those used to determine whether an "endangerment" exists under Section 7003. The standard itself, however, is a lesser standard than that under Section 7003. Again, actual harm to human health or the environment need not be shown, but only that the potential for harm may exist through a release or threat of release of hazardous waste from a site. Whether a release or threat thereof may present a "substantial hazard" essentially depends upon a number of factors, such as the likelihood of a release of hazardous wastes, the manner of release of the hazardous waste from the site (i.e., ground or surface water, air, etc.), the characteristics and amount of the waste discharged, current or potential use of the portion of the environment affected, potential for exposure to humans and the environment, and other related factors. If the site has been investigated and prioritized by the Federal government as to hazard presented, as required by Section 105 of CERCLA, that determination will be useful in assessing the risk.

TO WHOM THE ORDER MAY BE ISSUED

Section 3013(a) authorizes issuance of an order against the present owner or operator. Under the circumstances set forth in subsection (b), issuance of an order may also be appropriate against a prior owner or operator.

Section 3013 (b). PREVIOUS OWNERS AND OPERATORS.

> "In the case of any facility or site not in operation at the time a determination is made under subsection (a) with respect to the facility or site, if the Administrator finds that the owner of such facility or site could not reasonably be expected to have actual knowledge of the presence of hazardous waste at such facility or site and of its potential for release, he may issue an order requiring the most recent previous owner or operator of such facility or site who could reasonably be expected to have such actual knowledge to carry out the actions referred to in subsection (a)."

Subsection (b) entitles the Agency -- under certain circumstances -- to go back in time in the chain of title to a previous owner or operator of the site. The conditions which must be met for issuance of a Section 3013 Order to a previous owner or operator of a site are:

(1) The facility or site must be one which is not "in operation" at the time a determination is made under subsection (a) and (2) the present owner of the facility or site "could not reasonably be expected to have actual knowledge of the presence of hazardous waste at such facility or site and of its potential for release." While in many cases there will be little question as to whether a facility is "in operation" (e.g., a closed landfill), in other cases that determination will not be as clear. We believe that it was the intent of Congress to place an interpretation on the words "in operation" which would enable EPA to gather information concerning potentially hazardous sites from those in the best position to provide that information - the previous owners or operators. We therefore believe that a facility is not "in operation" if it has been abandoned or is not otherwise being actively operated as a hazardous waste facility by the current owner or operator.

It should be noted that if the present owner of the site could reasonably be expected to have actual knowledge of both the presence of the waste and its potential for release (even though the waste had been placed in or on the site by a previous owner or operator), this subsection would appear to prohibit the issuance of an Order to the previous owner or operator.

Assuming the two conditions discussed above are met, the Order may be issued only to the "most recent previous owner or operator of such facility or site who could reasonably be expected to have such actual knowledge. . . ." Whether an owner or a previous owner or operator of a site could "reasonably" be expected to have actual knowledge of the presence of the waste or its potential for release can best be determined through evidence showing the use of the facility during the period of ownership by the previous owners. For example, if a previous owner dumped uncontainerized waste into an unlined pit and then covered it with dirt, he can reasonably be expected to have the actual knowledge of both the presence and potential for release of the waste. The same determination could be made for an owner who stored waste in leaky containers on the bare ground without benefit of a pad or base and containment walls.

ELEMENTS OF AN ORDER

Section 3013 (c). PROPOSAL.

> "An order under subsection (a) or (b) shall require the person to whom such order is issued to submit to the Administrator within 30 days from the issuance of such order a proposal for carrying out the required monitoring, testing, analysis, and reporting. The Administrator may, after providing such person with an opportunity to confer with the Administrator respecting such proposal, require such person to carry out such monitoring, testing, analysis, and reporting in accordance with such proposal, and such modifications in such proposal as the Administrator deems reasonable to ascertain the nature and extent of the hazard."

Unless EPA and the respondent have agreed in advance on a work plan to be incorporated in the Order, the Order must require the respondent to prepare and submit a proposal for the monitoring, testing, analysis, and reporting Program for the site from which the waste is or may be escaping. Such proposal must be submitted within 30 days from the date of issuance of the Order. The Order should recite (1) the information and facts upon which it is based; (2) the threat or potential threat to human health and/or the environment; and, (3) outline with some degree of specificity the general areas

of concern which should be addressed in the proposal to be submitted by the respondent. Attached to this memorandum is an example of an Order (Appendix A) outlining the general areas of concern to be addressed in the requested sampling, analysis and monitoring program. 3/

The Order shall direct the respondent to conduct the monitoring, testing, analysis, and reporting program and should be specific as to details of the program. For example, the Order may require the proposal to set forth the number, location and depth of monitoring wells, the number and frequency of samples to be taken, the parameters of the analysis, reporting requirements and other related details, including dates by which each element should be commenced and completed and, where appropriate, requirements for submission of status reports to EPA as work on the program progresses.

The Order, if issued unilaterally, must advise the respondent of his right to submit in writing any legal or technical defenses, objections or contentions which he may desire to make, and that he is entitled to confer in person and/or by attorney with EPA regarding the proposal. The Order must also specify the name, address and telephone number of the appropriate official of EPA whom the respondent may contact to arrange a conference. The Order should be sent to the respondent by certified mail, return receipt requested.

In some instances, contacts with the owner/operator may result in issuance of a §3013 Order on a consensual basis. An example of an Order issued after conferring with the owner/operator ("Consent Order") is attached (Appendix B). In such cases, the Order should note that the respondent has already conferred with EPA and consents to issuance of the Order.

In addition, when a plan already has met with the approval of the parties, it is advisable to include in the Order a provision such as:

> Respondent agrees to implement the requirements of the work plan set forth below for carrying out investigative activities including monitoring,

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3/ The appendices are attached as examples only. They are not intended to dictate how Orders should be written. The unique circumstances of each case necessitates some latitude in the form of such Orders.

testing, analysis and reporting at the facility. This work plan has been developed jointly by EPA and Respondent. EPA and Respondent agree that incorporation of this work plan in the instant Order satisfies the requirement under Section 3013(c) that Respondent submit a proposal and that EPA provide an opportunity for Respondent to confer regarding such proposal.

An Order is "final" in that it requires the preparation and submission of a plan. However, no actual sampling, analysis or monitoring should be conducted until after approval of a satisfactory plan submitted by the respondent (except in cases delineated in subsection (d)(1) of §3013).

REVIEW OF THE PROPOSAL

The proposal submitted by the respondent is not required to be in any particular form. It must be critically reviewed by EPA to ensure that it covers the areas addressed by the Order, both from a legal and technical standpoint. The proposal should be as specific as the circumstances and knowledge of the site will allow, setting forth, for example, the number and location of monitoring wells, the frequency of samples from the wells, the location of soil samples, parameters and protocols for analysis, and so forth. In some cases the extent of the work required will be such that submission of a detailed plan may be difficult to accomplish in a 30 day period. In such cases, it may be sensible to require submission of a broader, less detailed plan within the 30 day period and a lengthier, detailed plan after the respondent has had an opportunity to confer with EPA. In cases in which the sampling, analysis, testing and monitoring program is to be carried out in stages, or over a significant period of time, the proposal should include a statement that EPA shall be furnished periodic status reports from the respondent regarding progress being made in implementation of the program. The Order should always state that EPA has a right to approve any proposed changes or modifications after initial approval has been given to the proposal.

In reviewing a proposal, EPA personnel should examine two areas: first, the adequacy of the proposal to achieve the goals of the sampling, analysis and monitoring programs; and second, the competence of the persons or firms who will be implementing the proposal to conduct the sampling, analysis, monitoring and reporting activities in a technically acceptable manner, so that the information produced thereby will be

reliable. The second area -- the competence of the contractor or consultant who will implement the program -- is delicate because EPA should not place itself in the position of formally approving or disapproving the professional qualifications of particular contractors and it should be made clear to the respondent that the respondent, not EPA, is responsible for the competence of the contractor. However, the design and implementation of the type of program which will be conducted under a §3013 Order requires engineers and other persons who are knowledgable in a variety of areas such as hydrology, geology and chemistry, among others.

While an owner or operator of a site should be at liberty to hire a contractor of his own choice, EPA should always require the technical aspects of the proposal to be very detailed and specific so as to avoid misunderstandings during the implementation of the program and should also require frequent status reports while the work is in progress.

In the event a conference results in a modified proposal, the respondent should either resubmit the entire proposal, as modified, or if the modifications are not extensive, the respondent may submit a separate amendment to the proposal. In all cases, the proposal, and any amendments or modifications, should be signed by the respondent.

PROPOSAL CONFERENCE

The Order must give the respondent an opportunity to confer on the proposal submitted for the monitoring plan. This conference will also afford the respondent the opportunity to indicate why the respondent should not be subject to the Order. A record in the form of a tape recording or stenographer's notes should be made and included in the case file. In the event of subsequent litigation over the Order, the recording or notes can then be transcribed for use, if necessary.

While the proposal must be submitted to EPA within 30 days after the date of the Order, we interpret §3013(c) to allow a conference requested by the respondent to be held either before or after the proposal is submitted. However, the holding of a conference cannot vary or extend the 30 day period for submission of the proposal, so that if a conference is requested for a time before the proposal is submitted, the conference must be held and the proposal submitted within the 30 day period. Conferences to be held after submission of the proposal should be scheduled as soon as possible after submission (i.e., not more than 30 days thereafter), so as to avoid delay in finalizing the proposal.

Under the statute, there is no requirement for public notice of the conference or any requirement that third parties be admitted to the conference. However, nothing precludes the admittance of a non-party to the conference, if the Region determines that such participation would be beneficial or desirable. In certain cases, the Department of Justice, the State or local pollution control agency and others may be appropriate attendees or participants.

Pursuant to information developed at the conference, EPA may modify the proposed sampling, analysis and monitoring requirements contained in the Order as may be reasonably required to ascertain the nature and extent of the hazard. This may include modifications making the requirements more strict or extensive, as well as less extensive.

APPROVAL OF PROPOSAL

An acknowledgement letter must be issued under §3013 after review of the respondent's proposal has been completed. The purpose of the letter is to acknowledge in writing the decision EPA has reached after review of the respondent's proposal. It should be signed, if possible, by the person who signed the Order. Section 3013(c) permits EPA to modify the proposal submitted by the respondent or to develop its own program of sampling, analysis and monitoring in order to determine the nature and extent of the hazard. The letter should state whether the proposal has been accepted and should specify what modifications, if any, have been made to the proposal. This can be accomplished by attaching a copy of the proposal, as modified, to the acknowledgement letter. In the unlikely event that EPA plans to incorporate any major changes in the Order that were not discussed at the conference, EPA should notify the respondent of such changes before issuing the acknowledgement letter and provide reasonable opportunity to the respondent to comment upon such modifications.

MONITORING PROGRAM BY EPA, STATE, OR OTHER PERSONS

Section 3013(d). MONITORING, ETC., CARRIED OUT BY ADMINISTRATOR

> "(1) If the Administrator determines that no owner or operator referred to in subsection (a) or (b) is able to conduct monitoring, testing, analysis, or reporting satisfactory to the Administrator, if the Administrator deems any such action carried out by an owner

> or operator to be unsatisfactory, or if the Administrator cannot initially determine that there is an owner or operator referred to in subsection (a) or (b) who is able to conduct such monitoring, testing, analysis, or reporting, he may--
>
> > (A) conduct monitoring, testing, or analysis (or any combination thereof) which he deems reasonable to ascertain the nature and extent of the hazard associated with the site concerned, or
> >
> > (B) authorize a State or local authority or other person to carry out any such action,
>
> and require, by order, the owner or operator referred to in subsection (a) or (b) to reimburse the Administrator or other authority or person for the costs of such activity.
>
> (2) No order may be issued under this subsection requiring reimbursement of the costs of any action carried out by the Administrator which confirms the results of an order issued under subsection (a) or (b).
>
> (3) For purposes of carrying out this subsection, the Administrator or any authority or other person authorized under paragraph (1), may exercise the authorities set forth in Section 3007."

The provisions of this subsection provide for three situations where the Agency may carry out the monitoring activities or authorize others to do so:

(1) Where no owner or operator is able to conduct these activities satisfactorily;

(2) Where the testing conducted by the owner/operator is determined to be unsatisfactory; or

(3) Where it cannot be determined initially whether there is an owner or operator able to conduct the required monitoring and testing.

Numbers (1) and (3) are similar; the distinction is that in number (3) no owner/operator can be identified or located initially, whereas in number (1) the owner/operator is identified but unable or unwilling to conduct the required activities.

In numbers (1), (2) and (3) the important consideration is whether the owner/operator will conduct the required activities in a manner satisfactory to EPA, i.e., in a timely manner and in a manner technically consistent with EPA requirements. Subsection (d) is intended to allow EPA to conduct the monitoring, testing, analysis or reporting itself or to authorize the State or other third parties to perform the required activities if delay or inadequate performance will result from relying on the owner/operator.

Once EPA or some other authorized person has performed monitoring, testing, analysis or reporting pursuant to §3013(d), an Order may be issued to require reimbursement of the costs. The Order for Reimbursement should be issued to the present owner or operator or the most recent previous owner or operator who could reasonably be expected to have actual knowledge of the hazardous waste. An example of an Order for Reimbursement is attached as Appendix C.

Note that subsection (d)(2) prohibits an Order for Reimbursement if the results obtained confirm the results of an Order issued under subsection (a) and (b). Our interpretation is that this provision prohibits seeking reimbursement in circumstance (2) above, where the Agency acted because of information leading to the belief that the results from the owner/operator tests were inaccurate or unreliable, and our subsequent tests, in fact, confirm the owner/operator test results.

ENFORCEMENT OF THE ORDER

Section 3013 (e). ENFORCEMENT.

> "The Administrator may commence a civil action against any person who fails or refuses to comply with any order issued under this section. Such action shall be

> brought in the United States district court in which the defendant is located, resides, or is doing business. Such court shall have jurisdiction to require compliance with such order and to assess a civil penalty not to exceed $5,000 for each day during which such failure or refusal occurs."

This subsection authorizes bringing a civil action to require compliance with any Order issued under Section 3013 and to assess a civil penalty of not to exceed $5,000 for each day of noncompliance with the Order. This authority includes commencement of a civil action to enforce an Order issued under Section 3013(d)(1) for reimbursement of costs incurred by EPA or other authorized person who conducts the monitoring, testing, or analysis in lieu of an owner/operator.

Any referral of a civil action under Section 3013(e) should follow the format used for other civil actions.

DEVELOPMENT AND PRESERVATION OF THE ADMINISTRATIVE RECORD

We attempt to emphasize throughout this memorandum the importance of obtaining the information required by the statute prior to the issuance of the Order. Equally important is the establishment and preservation of a record where the information and all documents relevant to the reimbursement or enforcement proceedings described herein should be kept, since the Order may eventually be reviewed by a court, and EPA must have a complete record of the information which formed the basis for its decisions and documentation of the opportunity afforded the respondents to confer. The acknowledgement letter is an important part of the documentation.

The Region should encourage communications with the respondent and his representatives to be in writing insofar as possible. Written records of communication should be made of all telephone conservations with the respondent and a record should be made of any conference held with respondents in accordance with this guidance.

In the event EPA should reject any objections, defenses or contentions of the respondent, or modify the respondent's proposal for monitoring, testing, analysis and reporting without the respondent's agreement, EPA should set forth the reasons for such rejection or modification and furnish those reasons in writing to the respondent.

Attachments

APPENDIX A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF: Environmental Protection Agency, Complainant, v. Respondent. Proceedings under § 3013 of the Resource Conservation and Recovery Act, 42 U.S.C. § 6934.	RCRA Docket FINDINGS OF FACT, DETERMINATION, AND ORDER REQUIRING SUBMISSION AND IMPLEMENTATION OF PROPOSAL FOR SAMPLING, ANALYSIS, MONITORING AND REPORTING

PRELIMINARY STATEMENT

1. This is an administrative action instituted pursuant to Section 3013 of the Resource Conservation and Recovery Act [42 U.S.C. Section 6934], hereinafter referred to as "the Act" or "RCRA". The Complainant is Region of the United States Environmental Protection Agency (EPA).

2. The Regional Administrator of EPA Region , by and through authority duly delegated from the Administrator of EPA, having been presented with information concerning the presence of hazardous wastes that are being stored, treated or disposed at the facility described below, with information concerning potential releases of hazardous wastes from this facility, and with information that these circumstances may present a substantial hazard to human health or the environment, hereby issues the following Findings of Fact, Determination and Order Requiring Submission, pursuant to Section 3013 of the Act [42 U.S.C. Section 6934] that are set forth below.

FINDINGS OF FACT

1. , submitted a Notification of Hazardous Waste Activity (EPA Form 8700-12) for its facility at , which was received by Complainant on August 15, 1980. This notification satisfied Section 3010 of the Act. This notification indicated that , was a generator, and treater, storer and/or disposer of hazardous waste. The facility is located

2. ., submitted a Part A application (EPA Forms 3510-1 and 3510-3) , which was received by Complainant on November 18, 1980, as required by 40 CFR Section 270.10(e)(i). This application stated that was a storer, treater and disposer of hazardous waste at the facility.

3. , has operated a facility at since at least (from Respondent's Part A application), and including a period of time November 19, 1980, the effective date of regulations promulgated pursuant to RCRA.

4. Respondent's facility included a landfill of approximately 55 acre-feet in size consisting of at least 12 trenches, each of which was approximately 10 feet wide, 20 feet long, and 4 feet deep. Wastes, including hazardous waste and hazardous waste constituents, generated by Respondent's facility were periodically placed on and into the landfill prior to and after November 19, 1980. Respondent thus owns and operates a hazardous waste management facility for the treatment, storage, and/or disposal of hazardous wastes.

5. Respondent, in correspondence dated , advised Complainant that Respondent was discontinuing the landfilling of hazardous wastes and requested withdrawal of the Part A application.

6. Complainant issued a letter to Respondent on , formally requesting the submission of the Part B application. The letter required Respondent to submit the Part B application to the Complainant within six (6) months of receipt of the request.

7. Respondent, in correspondence dated , advised Complainant that it would not submit a Part B application. Respondent stated that effective , Respondent was storing all hazardous waste in drums and storing such waste on-site for less than ninety (90) days.

8. Complainant issued a letter to Respondent on , requesting Respondent to provide documentation that the landfill units at the facility were properly closed and that the units would be properly maintained after closure, if necessary. Complainant specifically requested, in part, that Respondent demonstrate closure occurred in a manner that "controls, minimizes or eliminates to the extent necessary to protect human health and the environment, any post closure escape of hazardous waste constituents to the ground, groundwater, surface waters, or to the atmosphere."

9. Respondent, in correspondence dated and ., stated its contention that the landfilling activity at the facility was properly closed. Said correspondence included laboratory analyses of samples of landfilled material from the facility. These laboratory analyses show the presence of hazardous constituents, as defined in 40 CFR Part 261, in the landfilled material as summarized below:

Hazardous Constituents	Range of levels detected, ppm
Toluene	3.1 to 68.7
Lead	2.6 to 22.6
Chromium	13.5 to 49.6
Other Constituents	
Xylene	1.5 to 25.8
Methyl Isobutyl Ketone	1.2 to 9.8

Additionally, all of the samples of landfilled materials exhibited the hazardous waste characteristic of ignitability by having a flash point less than 60°F, indicating the hazardous waste had not been rendered non-ignitable prior to landfilling.

10. Respondent's correspondence dated stated that no analysis of groundwater quality has been performed. Consequently, no evidence exists to determine whether hazardous waste or hazardous waste constituents have migrated to groundwater.

11. The continued presence of hazardous waste constituents in the Respondent's landfilled material could result in release of hazardous waste constituents by leachate production and migration off-site by means of

surface run-off or groundwater flow. Respondent has not submitted to Complainant documentation that Respondent's facility is not or may not be releasing hazardous waste or hazardous waste constituents to ground or surface water.

DETERMINATION

Based upon the aforementioned data and information, it is hereby determined pursuant to Section 3013 of the Act that:

1. The facility, as described hereinabove, owned and operated by Respondent, is a facility at which hazardous wastes are present and at which hazardous wastes have been stored, treated, and disposed.

2. The methods and practices employed at the facility for treating and disposing of hazardous wastes are and were such that the presence of hazardous wastes at the facility may present a substantial hazard to human health or the environment.

3. Hazardous wastes and/or hazardous waste constituents released at the facility may have migrated to surface or ground waters. The release of hazardous wastes at and/or from the facility may present a substantial hazard to human health or the environment.

ORDER REQUIRING SUBMISSION AND IMPLEMENTATION OF PROPOSAL FOR SAMPLING, ANALYSIS, MONITORING AND REPORTING

Pursuant to Section 3013 of the Act [42 U.S.C. § 6934], and in order to ascertain the nature and extent of the hazard at the facility as described hereinabove, Respondent is hereby ordered to submit a written proposal to EPA for the sampling, analysis, monitoring and reporting of the hazardous wastes and hazardous waste constituents that are present at

or that may have been released from the facility, and is hereby ordered to implement such proposal, once approved by EPA. Such written proposal shall contain, but is not limited to, the following:

1. A plan and timetable for the determination of the horizontal and vertical permeabilities of the uppermost aquifer and the nature of the aquitards, or barriers, including a determination of the direction and velocity of groundwater flow in the uppermost water-bearing zones in the area likely to be affected by migration of hazardous wastes from the Facility. The plan shall consider means to determine areas of discharge and recharge of groundwater in the areas likely to be affected by migration of hazardous wastes from the facility.

2. A plan for determining whether hazardous wastes or hazardous waste constituents have leaked or are leaking from the landfill. This shall include a plan and timetable for the installation of a groundwater monitoring program, including proposals as to locations, depth, and construction thereof, designed to monitor groundwater elevation and water quality.

3. A sampling and analysis plan for monitoring groundwater at or near the landfill which describes analysis parameters, frequency of sampling, and procedures and quality assurance measures for sampling and analyzing for hazardous waste and hazardous waste constituents. The plan shall provide that groundwater be sampled and analyzed at least quarterly for one year. The plan shall also provide for analysis of all priority pollutants contained in Appendix VIII of 40 CFR Part 261 for at least one of the quarterly sampling periods.

4. A plan and timetable to collect and analyze soil samples of appropriate size, depth, and location to determine the nature and extent of contamination of the surface and of the soil column above the groundwater table at the facility.

5. A proposal, including timeframes, for determining the extent of any hazard presented by hazardous waste or hazardous waste constituents that may have been released to drainage ditches, surface waters, or sediments therein. This proposal shall specifically include sampling of water, sediment, and soils, both on and off-site, sufficient to document the extent of contamination by hazardous waste or hazardous waste constituents that may have resulted from past events such as rainfall and resulting run-off.

6. A provision for site access for employees, agents, and contractors of Complainant at all reasonable times for purposes of inspecting and verifying compliance with the provisions of this Order in accordance with and pursuant to the authority of §3007 of the Act, 42 U.S.C. §6927.

7. A description of the means of implementation of the items set forth above, a proposal for reporting to EPA on the progress of these items, and for reporting the results of the sampling, analysis and monitoring program.

OPPORTUNITY TO CONFER

Under the provisions of the Act, Respondent may confer with EPA at any time prior to submittal of the proposal. The proposal submitted by Respondent shall be subject to review, modification and approval by EPA. After submittal of the proposal, Respondent shall be afforded an opportunity to confer with EPA on a date specified by EPA to discuss the terms of the proposal. Following this conference and after review, modification (if any), and approval of the proposal by EPA, Respondent shall forthwith

conduct, carry out and implement the sampling, analysis, monitoring and reporting program according to its approved terms and schedules. The written proposal ordered herein must be submitted by Respondent to the Contact Person, , at the address listed below, within thirty (30) days of Respondent's receipt of this Order.

LIABILITY

If EPA determines that Respondent is not able to conduct the activities required by this Order in a satisfactory manner, is not able to conduct the activities contained in the approved proposal, or if actions carried out are deemed unsatisfactory, then EPA may conduct such actions deemed reasonable by EPA to ascertain the nature and extent of the hazard at the facility. Respondent may then be ordered to reimburse EPA for the costs of such activity pursuant to §3013(d) of the Act. In the event Respondent fails or refuses to comply with the terms and provisions of this Order, EPA may commence a civil action to require compliance with such order and to assess a civil penalty of not to exceed $5,000 for each day during which such failure or refusal occurs.

WITNESS MY HAND as Regional Administrator pursuant to the authority of the Administrator of the United States Environmental Protection Agency, on this _____ day of _____, 1984.

By: _____

Regional Administrator

Contact Person:

APPENDIX B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF: Environmental Protection Agency, Complainant, v. Respondent. Proceedings under §§ 3008 and 3013 of the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6928 and 6934.	RCRA Docket X83-11-08-3008 3013 FINDINGS OF FACT, AGREED COMPLIANCE ORDER, AND AGREED ORDER REQUIRING SUBMISSION AND IMPLEMENTATION OF PROPOSAL FOR SAMPLING, ANALYSIS, MONITORING AND REPORTING

PRELIMINARY STATEMENT

1. This is an administrative action instituted pursuant to Sections 3008(a) and 3013 of the Resource Conservation and Recovery Act [42 U.S.C Sections 6928(a) and 6934], hereinafter referred to as "the Act" or "RCRA". The Complainant is Region of the United States Environmental Protection Agency (EPA).

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2. Complainant has reason to believe that , ("Respondent") has violated Section 3005 of the Act [42 U.S.C §6925] as set forth below. Additionally, the Regional Administrator of EPA Region ., by and through authority duly delegated from the Administrator of EPA, having been presented with information concerning the presence of hazardous wastes that are being stored, treated, and disposed at the facility described below, with information concerning potential releases of hazardous wastes from this facility, and with information that these circumstances may present a substantial hazard to human health or the environment, hereby issues the following Findings of Fact, Determination, Compliance Order, and Order Requiring Submission, pursuant to Sections 3008 and 3013 of the Act [42 U.S.C. Sections 6928 and 6934] that are set forth below.

3. Respondent consents to comply with the penalty assessment, Compliance Order and Order Requiring Submission as described below.

FINDINGS OF FACT

1. submitted a Notification of Hazardous Waste Activity (EPA Form 8700-12) for its facility near which was received by Complainant on This notification satisfied Section 3010(a) of the Act. This notification indicated that was a generator, transporter, and treater, storer, and/or disposer of hazardous waste. The facility is located at : and was then and is now known as (hereafter "the facility").

2. submitted a Part A application (EPA Forms 3510-1 and 3510-3) dated , which was received by Complainant on November 18, 1980, as required by 40 CFR Part 270.10(e)(1). This application stated that ., was a storer and disposer of hazardous waste at the facility.

3. , had operated a facility at since , and including a period of time prior to and after November 19, 1980. At the facility, accepted waste including hazardous waste for storage and/or disposal as indicated on its notification and Part A permit application. Therefore, the . facility known as qualified for Interim Status pursuant to Section 3005(e) of the Act.

4. 40 CFR Part 265 establishes and sets forth standards, known as the Interim Status Standards (ISS), which were promulgated pursuant to Section 3004 of the Act, and which are applicable to all hazardous waste treatment, storage, and disposal facilities that qualify for Interim Status. These standards apply to such facilities until final administrative disposition has been made of permit applications submitted by owners and operators of such facilities. No such disposition has been made with respect to the facility. Thus, the standards of 40 CFR Parts 270, 124, and 265 apply to the facility.

5. In correspondence from , dated , Complainant was notified that Respondent intended to acquire all of the capital stock of and to liquidate the assets of . into

The letter further stated that would continue the

operations of at the facility. The notification was submitted pursuant to 40 CFR Part 122.23 (now 270.72).

6. In correspondence dated ., Respondent notified Complainant that the operating name of Respondent's facility would be . , the date that formal closing of the ownership transaction would occur. After that date, Respondent has owned and operated the facility, known as

7. Respondent on , submitted a revised Part A permit application and requested approval to add treatment as a hazardous waste management process to be conducted at the facility. Complainant approved the request on

8. Respondent thus owns and operates a hazardous waste management facility (IDD) for the treatment, storage, and/or disposal of hazardous wastes, which is subject to the Interim Status provisions of Section 3005(e) of the Act and regulations promulgated under the Act.

9. Complainant issued a letter to Respondent on formally requesting the submission of the Part B permit application. The letter required Respondent to submit the Part B application to the Complainant within six (6) months of receipt of the request.

10. Respondent requested, in correspondence dated , a four (4) month extension for submittal of the Part B application. Complainant approved the request and extended the submittal date to

11. Complainant has conducted and/or participated in several inspections of Respondent's . facility to determine compliance with the Interim Status Standards. An inspection was conducted by Complainant on . Several violations of the ISS were noted during the inspection. Respondent was advised of these findings, which were

attached to correspondence dated . Corrective action was required as a part of the Part B permit application but, in any event, within six (6) months of Respondent's receipt of the letter.

12. Complainant again inspected the facility on ., 1983, to determine compliance with the ISS. Copies of several documents required to be developed and maintained by the facility were collected and were reviewed in detail after on-site inspection. Several violations of Interim Status Standards were noted and made known to Respondent in a Notice of Violation and Warning (NOVW) dated . Among those noted were violations of requirements for the Waste Analysis Plan (40 CFR §265.13), General Inspections (40 CFR §265.15), Personnel Training (40 CFR §265.16), Contingency Plan (40 CFR §265.52), Groundwater Monitoring (40 CFR Part 265 Subpart F), and Closure and Post-Closure (40 CFR Part 265 Subpart G). In the NOVW, Respondent was required to submit a plan and schedule for compliance.

13. Respondent submitted a plan and schedule dated ., 1983 for compliance with the items noted in the , NOVW, and requested an extension of the 30 day submittal requirement for 40 CFR 265 Subpart F violations, until . Complainant granted the extension, in correspondence dated , to allow completion of geotechnical work then underway at the site. Respondent subsequently submitted the plan and schedule, in correspondence dated ., in which Respondent proposed installation of a groundwater monitoring program. Complainant accepted Respondent's plan and schedule, with some revisions, in correspondence dated , 1983, and advised Respondent that full compliance with ISS groundwater monitoring requirements was required to be achieved by .

. A ground water waiver demonstration was developed by Respondent. Based on an inspection in and subsequent review of the waiver demonstration Complainant advised Respondent in the NOVW dated that the waiver demonstration was inadequate. Respondent therefore has not implemented a groundwater monitoring program (or developed a complete waiver demonstration) capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility as required by 40 CFR Part 265 Subpart F.

14. A storm and flash flood occurred at Respondent's facility on the night and/or morning of , which may have exceeded a 25-year storm event. Complainant conducted an inspection of the facility on during which erosion and other signs of runoff from the site were noted at two areas of the facility. The erosion noted was due to runoff from the storm. Inspectors noted liquid in an active hazardous waste disposal trench (Trench). This liquid had flowed into the disposal trench from surrounding areas during the storm. After the storm, facility personnel constructed a berm at the end of Trench to deflect future storm run-off into that trench. Failure to prevent flow of surface water into an active hazardous waste disposal trench constitutes a violation of 40 CFR §265.302(a).

15. Complainant was advised on or about by the County Prosecutor that violations of the Interim Status Standards had allegedly occurred at Respondent's facility during the approximate period of through . Respondent was alleged to have disposed of large quantities of drums of improperly solidified and unsolidified liquid waste in Respondent's disposal trench

used for disposal of hazardous waste (Trench).

16. On or about , Respondent voluntarily began excavating and exhuming drums of waste previously disposed in Trench . Complainant has continually observed excavation activities since . Excavation of drums continues to date by Respondent. As drums have been recovered from the disposal trench they have been individually opened and examined by representatives of Respondent and Complainant.

17. During the period of . Respondent removed 1412 drums from the disposal trench (Trench). Of these, 528 drums were determined to contain liquid in whole or in part as follows:

a. 145 drums full or containing greater than approximately 75% liquid

b. 33 drums containing between approximately 50% and 75% liquid

c. 44 drums containing between approximately 25% and 50% liquid

d. 226 drums containing between approximately 5% and 25% liquid

e. 80 drums containing less than approximately 5% liquid

18. At the request of Complainant, Respondent provided control records that document the dates that some of the above-mentioned 528 drums containing liquids were placed in the disposal trench. These records disclosed that drums found to contain liquids were placed in Trench on at least the following occasions:

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Date	Control No.	No. of Drums
5/27/83	2352	21
	2358	7
	2281	3
5/20/83	2323	1
6/10 and 8/9/83	2330	9
8/3/83	2343	32
	2361	4
	2392	16
6/3/83	2370	7
	2374	47
6/10/83	2381	2
6/21/83	2386	6
	2384	5
6/18/83	2443	13

Such placement of liquids in Trench was in violation of 40 CFR §265.314. Some of the control documents provided to Complainant fail to clearly account for all containers in each shipment of hazardous waste manifested to the facility.

19. On and , Complainant again inspected Respondent's facility. The purpose of the inspection, in part, was to determine compliance with RCRA Interim Status Standards. More specifically, the inspection was to examine facility operations and physical conditions at the facility. The inspection disclosed the following:

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a. Approximately 8,500 drums were in storage at the facility. The number of drums in storage is increasing.

b. Several drums containing hazardous waste in storage on-site were corroded or badly deteriorated; specifically, drums of hazardous waste designated as D007 were bulging and had not been managed in accordance with 40 CFR §265.171.

c. Several drums containing hazardous waste in storage on-site were leaking either from the top seals or openings or through the drum; specifically, drums of hazardous waste designated by waste codes on the labels as containing F003, F005, D001, D006, and phosphoric acid, were leaking, and had not been managed in accordance with 40 CFR §265.171.

d. Several drums containing hazardous waste were stored with open tops; specifically, drums designated by waste codes on the labels as containing D002/D007 and F003/F005 had open tops, in violation of 40 CFR §265.173(a).

e. Drums containing hazardous waste were stored in a manner which may cause them to leak; specifically, drums were stored directly on the ground surface and in areas of poor drainage which may cause or accelerate drum deterioration or rusting, in violation of 40 CFR §265.173(b).

f. Run-off from active portions of the facility was not collected in a collection system. Prevailing grade determines the course of run-off and natural ponding. Ponds formed by run-off or run-on were allowed to evaporate or percolate into

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the soil, in violation of 40 CFR §265.302(b).

g. The diversion structure (a berm) which had been constructed to cause run-on into Trench 11 was still in place, in violation of 40 CFR §265.302(a).

h. Inspections by Respondent of containers in storage had not been adequate to detect deterioration and releases of hazardous waste constituents to the environment, in violation of 40 CFR §265.15(a). Remedial action had not been initiated to correct such drum management problems in violation of 40 CFR §265.171.

i. Respondent's facility was not then currently maintained and operated to minimize the possibility of unplanned sudden or non-sudden releases of hazardous waste or hazardous waste constituents to air, soil, or surface water; specifically, any spill during use of the stabilization pad could result in hazardous waste flow to surrounding soil, and failure of any container of hazardous waste in storage would result in discharge to the soil or surface water, in violation of 40 CFR §265.31. Additionally, Respondent's facility is not equipped with a facility or system to prevent the release of hazardous waste or hazardous waste constituents from trucks or other vehicles leaving the site.

20. At Respondent's facility there are underground structures. These structures were filled with liquid and solid hazardous waste and hazardous waste constituents prior to November 19, 1980. The integrity of the

underground structures is unknown. Respondent, in correspondence dated ., advised Complainant that groundwater had been encountered beneath the site near a depth of 200 feet.

21. A well reaching a deep artesian aquifer was constructed as part of the original facility. An integral part of that well is its steel casing. The water produced by this well contains natural chemical compounds which may be destructive to metals such as the steel well casing. The well and construction materials are approximately 25 years old. The condition and integrity of the casing and well head are unknown. The well head is situated in an underground structure (the power house) which is connected by a series of tunnels, structures, and access doors to underground structures containing hazardous waste. The potential of a well casing failure exists. Such a failure could result in the release of a large volume of water to the soil and to hazardous waste disposal units, which might result in the release of hazardous waste by leachate production and migration off-site by means of surface run-off or groundwater flow. The well presents a potential risk of unplanned sudden and non-sudden release of hazardous waste or hazardous waste constituents.

CIVIL PENALTY

In view of the violations noted in the Findings of Fact above, Complainant hereby assesses a civil penalty of ONE HUNDRED FIFTY THOUSAND DOLLARS [$150,000].

DETERMINATION

Based upon the above information, it is hereby determined pursuant to Section 3013 of the Act that:

1. The facility as described hereinabove, owned and operated by the Respondent, is a facility at which hazardous wastes are present and at which hazardous wastes have been treated, stored, and disposed.

2. The methods and practices employed at the facility for treating, storing, and disposing of hazardous wastes are such that the presence of the hazardous wastes at the facility may present a substantial hazard to human health or the environment.

3. The releases of hazardous wastes and/or hazardous waste constituents at the facility may have migrated to surface or groundwater. Several off-site wells on adjacent or nearby property exist which could be or could become contaminated as a result of such releases. Therefore, the release of hazardous wastes at the facility may present a substantial hazard to human health or the environment.

COMPLIANCE ORDER

Based upon the foregoing and pursuant to Section 3008 of the Act, it is hereby ordered that the Respondent take the following corrective actions within the time periods specified:

1. Respondent shall upon its receipt of this Order initiate telephone contact with all known generators and transporters of hazardous waste who ship or transport hazardous waste to Respondent's facility and advise each:

a. to immediately cease shipping any containerized hazardous waste or bulk hazardous waste which contains free liquids to the facility until further notice; and

b. to allow shipments of hazardous waste already in transit to the facility to continue to the facility; and

c. that any shipments of containerized hazardous waste or bulk hazardous waste which contain free liquids will not be accepted at the facility if shipped after the telephone notice.

The telephone notifications shall be completed as soon as possible but in any event all such generators and transporters must be so notified within three (3) working days of Respondent's receipt of this Order.

2. Respondent shall follow the above telephone notification with written confirmation to each such generator and transporter and shall provide a written summary to Complainant within five (5) working days of Respondent's receipt of this Order, which includes:

a. a copy of each written notification (a single copy of the notification will suffice if the text of all such notifications is identical).

b. a list of the companies to which the notification is sent, including company name, company EPA ID number, mailing address of the company, company contact, and company telephone number.

c. a record of the dates the telephone contacts were made.

3. Respondent shall, upon its receipt of this Order, immediately cease and thereafter desist from accepting at the facility any containerized hazardous waste or bulk hazardous waste which contains free liquid and which was shipped from any generator after the aforementioned telephone notification to that generator. In no event shall Respondent

accept at the facility any containerized hazardous waste or bulk hazardous waste which contains free liquids shipped later than three (3) working days after Respondent's receipt of this Order; with respect to hazardous waste containing free liquid that is unknowingly accepted at the facility, such waste shall not remain on the facility for a period longer than 24 hours. This prohibition shall remain in effect until Respondent has complied with Paragraph 4 below and further, until Complainant by its Contact designated hereinbelow has notified the Respondent, orally or in writing, that this prohibition has been removed.

4. Respondent shall immediately upon its receipt of this Order implement procedures which assure that no container containing free liquids is placed in a landfill. These and/or alternative procedures shall be documented in writing and submitted to Complainant for review and approval. Until Complainant has advised the Respondent, orally or in writing, that the procedures are approved, Respondent shall open and inspect all containers of hazardous waste prior to placement in a landfill and shall verify that no free liquids exist in any such container. Following Complainant's approval, orally or in writing, Respondent shall immediately implement the approved procedures.

5. Respondent shall remove from Trench all liquids disposed therein in violation of 40 CFR §265.314. In order to accomplish this, Respondent shall continue to excavate, exhume, and examine for liquids, drums and/or containers disposed in Trench at the facility. This activity shall continue until Complainant notifies Respondent in writing that such activity may cease. Respondent shall remove for solidification drums containing free liquid in accordance with EPA guidance and Complainant's on-site representative when such is present.

6. Respondent shall within fifteen (15) working days of its receipt of this Order create and maintain a current written record of the total inventory of containers of hazardous waste in storage on-site. This inventory shall include all containers which are or have been exhumed from the landfill and which contained free liquids when exhumed. Respondent shall not allow the storage inventory of containers to exceed the design capacity of the facility which is currently defined by the Part A application on file with Complainant.

7. Respondent shall develop, install, and put into operation equipment and/or procedures to remove hazardous waste or hazardous waste constituents from exterior surfaces of vehicles which leave the site. Respondent shall, within fifteen (15) working days of its receipt of this Order, submit to Complainant for approval a written plan and proposal for this purpose, including a proposed schedule for installation and implementation. This plan and proposal must assure that no vehicle leaving the facility is visibly contaminated with hazardous waste and must assure that any dirt, soil, or other material which has become adhered to the exterior of the vehicle, is removed prior to leaving the site. The plan and proposal shall provide that all such materials removed, including any washing solutions or wastewater, shall be treated as hazardous waste unless it can be demonstrated otherwise. Upon approval of the plan by Complainant, Respondent shall immediately implement the plan.

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8. Respondent shall, within fifteen (15) working days of its receipt of this Order, develop a written plan and schedule to divert run-on away from active portions of the facility and to collect and manage, as hazardous waste, run-off from active portions of the facility in accordance with 40 CFR §265.302. The plan and schedule shall be submitted to Complainant for review and approval. The plan and schedule as approved by Complainant shall be implemented by Respondent immediately upon receipt of written approval by Complainant.

9. To the extent Respondent has not already done so, Respondent shall, by , attempt to enter into arrangements or agreements with local authorities such as police and fire departments, emergency response teams, contractors and equipment suppliers, and local hospitals, in compliance with 40 CFR §265.37(a). Where such arrangements or agreements have not been reached by , Respondent shall document the refusal of such State, County, or other local authorities to enter into such arrangements, in compliance with 40 CFR §265.37(b).

10. To the extent Respondent has not already done so, Respondent shall, within fifteen (15) working days of its receipt of this Order, maintain a written operating record at the facility, including records of the dates of disposal and location and quantities of hazardous waste, in compliance with 40 CFR §265.73(b).

11. Respondent shall, within fifteen (15) working days of its receipt of this Order, cease and thereafter desist from the storage of drums of hazardous waste in a manner which may cause them to deteriorate and/or leak, including the closing of all drums in storage and removal of drums from storage on the ground surface and/or in areas of poor drainage, in compliance with 40 CFR §265.173.

12. Respondent shall upon its receipt of this Order implement procedures to inspect daily all containers of hazardous waste on-site. Respondent shall further, within fifteen (15) working days of its receipt of this Order, transfer any hazardous waste contained in corroded, deteriorated, leaking, or bulging drums, or drums not in good condition, into sound drums in good condition or shall otherwise comply with 40 CFR §265.171. Thereafter, Respondent shall comply with 40 CFR §265.171.

13. To the extent Respondent has not already done so, Respondent shall, within thirty (30) days of its receipt of this Order, equip its facility with a continuously operable and operating internal communications or alarm system in compliance with 40 CFR §265.32(a) and (b).

14. Respondent shall, within thirty (30) working days of its receipt of this Order, prepare and submit to Complainant a written plan and schedule to maintain and operate Respondent's [illegible] facility so as to minimize the possibility of unplanned sudden or non-sudden releases of hazardous waste to soil or surface water. The plan shall provide for at least the following specific measures:

a. such measures as are necessary to eliminate the threat of failure of the well casing in the on-site artesian well. The plan shall contain provisions to permanently plug the well. The plan, as approved by Complainant, shall be implemented immediately upon approval.

b. such measures as are necessary to minimize, contain, or prevent the release of hazardous waste to the soil or surface

water upon the failure of any container or tank.

c. such measures as are necessary to minimize, contain, or prevent:

(1) any release due to spillage during off-loading of hazardous waste into the stabilization pond, and

(2) any release due to failure of the berm surrounding the stabilization pond during use and/or treatment of hazardous waste for stabilization or solidification.

15. Respondent shall implement and comply with the groundwater monitoring proposal and schedule submitted to Complainant in correspondence dated Respondent shall also, within seven (7) working days of its receipt of this Order, provide a written response to Complainant's letter of which provided comments on the Respondent's proposal. The written response shall document the actions Respondent has taken or intends to take with respect to the fourteen (14) comments in Complainant's letter, except for item twelve (12), which is covered under the Section 3013 Order, infra. Additionally, Respondent shall include in the Part B application for the facility (due) a plan and proposal, including timeframes, for installation and implementation of a groundwater monitoring system and program that fully complies with 40 CFR Parts 264 and 265, Subparts F.

16. Respondent shall immediately upon its receipt of this Order provide access to to employees, agents, and contractors of Complainant at all reasonable times, for the purposes of inspecting and verifying the status of Respondent's compliance with this Order, in

accordance with and pursuant to the authority of §3007 of the Act, 42 U.S.C. §6927.

ORDER REQUIRING SUBMISSION AND IMPLEMENTATION OF PROPOSAL FOR SAMPLING, ANALYSIS, MONITORING AND REPORTING

Pursuant to Section 3013 of the Act [42 U.S.C. §6934], and in order to ascertain the nature and extent of the hazard at the facility as described hereinabove, Respondent is hereby ordered to submit a written proposal to EPA for the sampling, analysis, monitoring and reporting of the hazardous wastes and hazardous waste constituents that are present at or that may have been released from the facility, and is hereby ordered to implement such proposal, once approved by EPA. Such written proposal shall contain, but is not limited to, the following:

1. A determination of whether hazardous waste or hazardous waste constituents have leaked or are leaking from the underground structures. This shall include a plan and timetable for the installation of a groundwater monitoring program, including recommendations as to locations, depth, and construction thereof, designed to monitor groundwater elevation and water quality.

2. A sampling and analysis plan for groundwater at or near the underground structures containing waste which describes frequency of sampling, and procedures and quality assurance measures for sampling and analyzing for hazardous waste and hazardous waste constituents. The plan shall provide that groundwater be sampled and analyzed at least quarterly for one year. The plan shall also provide

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for analysis of all priority pollutants contained in Appendix VIII of 40 CFR Part 261 for at least two of the sampling periods.

3. A proposal, including timeframes, for determining the chemical composition of the contents of any container which has been exhumed from [redacted] and which contained free liquid at the time of exhumation. Such determination shall include, as a minimum, sampling and analysis of a representative number of such containers. Such proposal shall be sufficient to determine whether Respondent's records and record-keeping procedures accurately reflect drum contents and the chemical composition of liquid hazardous wastes disposed by Respondent. Nothing in this paragraph shall limit the exhumation, processing, and disposal activities required by this Order prior to approval and implementation of this proposal.

4. A proposal, including timeframes, for determining the extent of any hazard presented by hazardous waste or hazardous waste constituents that have leaked or otherwise been released to the environment from tanks, containers, vehicles, or other containment devices, or that have otherwise orginated from active treatment, storage, or disposal units at the site. This proposal shall specifically include sampling of soils, both on and off-site (assuming access can be obtained), sufficient to document the extent of contamination by hazardous waste or hazardous waste constituents that may have resulted from past events, including:

a. rainfall and resulting run-on and run-off;

b. liquid waste solidification activities;

c. waste transfer between process units at the facility;

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d. vehicle entry, vehicle unloading, and vehicle exit from the facility;

e. other on-site waste management practices including, inter alia, container storage, tank storage, treatment, and disposal of hazardous waste.

5. A provision for site access for employees, agents, and contractors of Complainant at all reasonable times for purposes of inspecting and verifying compliance with the approved proposal in accordance with and pursuant to the authority of §3007 of the Act, 42 U.S.C. §6927.

6. A description of the means of implementation of the items set forth above, a proposal for reporting to EPA on the progress of these items, and for reporting the results of the sampling, analysis and monitoring program.

OPPORTUNITY TO CONFER

Under the provisions of the Act, Respondent may confer with EPA at any time prior to submittal of the §3013 proposal. The proposal submitted by Respondent shall be subject to review, modification and approval by EPA. After submittal of the proposal, Respondent shall be afforded an opportunity to confer with EPA on a date specified by EPA to discuss the terms of the proposal. Following this conference and after review, modification (if any), and approval of the proposal by EPA, Respondent shall forthwith conduct, carry out and implement the sampling, analysis, monitoring and reporting program according to its approved terms and schedules.

CONTACT

The written proposal ordered herein must be submitted by Respondent to at the address listed above, within thirty (30) days of Respondent's receipt of this Order. Submittals required by the Section 3008 Compliance Order, supra, as well as any questions, shall likewise be addressed to

LIABILITY

If EPA determines that Respondent is not able to conduct the activities required by this §3013 Order in a satisfactory manner, is not able to conduct the activities contained in the approved proposal, or if actions carried out are deemed unsatisfactory, then EPA may conduct such actions deemed reasonable by EPA to ascertain the nature and extent of the hazard at the facility. Respondent may then be ordered to reimburse EPA for the costs of such activity pursuant to §3013(d) of the Act. In the event Respondent fails to comply with the terms and provisions of this §3013 order, EPA may commence a civil action to require compliance with such order and to assess a civil penalty of not to exceed $5000 for each day during which such failure or refusal occurs.

CONSENT

1. In connection with this matter, the Respondent consents to the following:

a. To pay the assessed civil penalty of $150,000, on the terms described below.

b. To comply in full with the Compliance Order issued pursuant to Section 3008 of the Act.

c. To comply in full with the Order Requiring Submission and Implementation of Proposal for Sampling, Analysis, Monitoring and Reporting.

2. The consent of both Respondent and Complainant to settle this matter on the terms and conditions set forth in the penalty assessment and order provisions of this document (hereafter collectively referred to as the "Order") is based upon the following:

a. Respondent neither admits nor denies any factual or legal allegations contained in this Order. Nevertheless, in full and complete settlement of this matter, Respondent agrees to be bound by the terms of this Order, consents to the assessment of the civil penalty set forth herein, and explicitly waives its right to request a hearing regarding any provision of this Order.

b. The provisions of this Order imposing duties (other than the payment of penalties) upon Respondent shall apply to and be binding upon not only Respondent, but also its officers, agents, servants and employees, and upon all those in active concert or

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participation with them who receive actual notice of this Order by personal service or otherwise.

c. It is the intention of this Order to bring Respondent and all operations at the facility in compliance with the provisions of RCRA and applicable RCRA regulations. It is not Complainant's intention by this Order to impose standards or conditions more stringent than those specified in the aforementioned provisions except to the extent that it may be necessary to remedy existing alleged violations at the facility.

d. This Order shall in no way relieve the Respondent of its obligation to comply with any other local, State or Federal law in any way related to the substance of this Order.

e. This Order is not and shall not be interpreted to be a permit for treatment, storage or disposal of hazardous waste under Section 3005 of RCRA (or under the terms of a State program operating in lieu of the Federal program under Section 3006 of RCRA), nor shall this Order in any way affect the Respondent's obligation, if any, to secure such a permit, nor shall this Order be interpreted in any way to affect or waive any of the conditions or requirements that may be validly imposed as conditions for the issuance of such permit nor of Respondent's right to appeal any conditions of such permit.

f. This Order is being entered into between Complainant and Respondent in full settlement of all civil penalties for the alleged violations identified herein. Nothing in this Order

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shall restrict the right of Complainant to initiate further enforcement action for penalties or otherwise only in the event additional facts are uncovered which are unknown to Complainant at the time this Order is entered and which justify such action.

g. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for abatement of any imminent and substantial endangerment to the public health, welfare or the environment posed by this facility.

h. Within 60 days of the date hereof, Respondent shall pay by cashier's or certified check, a civil penalty in the amount of $150,000.00 in full and complete settlement of all violations alleged herein. Such check shall be payable to the Treasurer, United States of America, and shall be remitted to

, Regional Administrator.

i. Complainant shall expeditiously review all plans and proposals submitted pursuant hereto and shall not unreasonably withhold its approval.

j. The terms of the Order may be modified by written mutual agreement of the parties.

k. This Order shall terminate two years from the date it is entered or on the date of issuance of the Part B permit, whichever is earlier.

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3. By the following signatures, the Complainant and Respondent hereby consent to the entry of the Order on the terms and conditions herein stated:

DATED:

Respondent

Secretary

DATED:

, Regional Counsel
EPA, Region
Attorney for Complainant

Assistant Regional Counsel
EPA, Region
Attorney for Complainant

ENTRY OF FINAL CONSENT ORDER

It is so Ordered as set forth above. This ORDER, including each and every portion hereof, shall become effective immediately.

Regional Administrator
EPA, Region 10

DATED this

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MODIFICATION OF AGREED ORDER
ENTERED INTO [illegible] BETWEEN ENVIRONMENTAL
PROTECTION AGENCY REGION AND

Upon the mutual agreement of the parties to the above-referenced Agreed Order as evidenced by the signatures below, and pursuant to Paragraph 2.j. of the "CONSENT" section thereof (p. 25 of 26), the Agreed Order is hereby modified as follows:

1. Page 13 of the Agreed Order shall be amended as follows:

   a. On line 11 thereof, omit "three (3)", and insert "ten (10)" in place thereof;

   b. On line 14 thereof, omit "five (5)", and insert "twelve (12)" in place thereof.

2. Page 14 of the Agreed Order shall be amended as follows: On line 2 thereof, omit "three (3)", and insert "ten (10)" in place thereof.

3. Noncompliance with Paragraph 4 on Page 14 of the Agreed Order prior to shall, in the sole discretion of the Complainant by its Contact designated on Page 22 of the Agreed Order, and without further notice or opportunity for a hearing, effect a further unilateral modification of any of the three provisions modified above, but such modification shall maintain the existing date relationship of Paragraphs 1, 2 and 3 on Pages 12-14 of the Agreed Order of .

DATE

DATE for Environmental Protection Agency Region

ENTRY OF ORDER AMENDING AGREED ORDER

IT IS SO ORDERED.

DATE

Regional Administrator

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APPENDIX C

BEFORE THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF:	)	
	)	RCRA Docket
	)	
	)	
	)	ORDER
	)	
	)	
Respondents.	)	
	)	
Proceedings under §3013 of the Resource Conservation and Recovery Act, 42 U.S.C. 6934	)	

ORDER FOR REIMBURSEMENT OF

MONITORING, TESTING, AND ANALYSIS COSTS

This Order is issued pursuant to Section 3013(d) of the Resource Conservation and Recovery Act [42 U.S.C.6934 (d), hereinafter referred to as "the Act"], by the undersigned, the Assistant Administrator for the Office of Solid Waste and Emergency Response, a duly authorized designee of the Administrator of the United States Environmental Protection Agency (EPA), to

Respondents.

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DETERMINATIONS AND FINDINGS OF FACT

The undersigned makes the following determinations and findings of fact:

1. The Facility [hereinafter referred to as, "the Facility"] is located at , near the junction of Road Street in . The Facility is owned and operated by .

2. is managing owner, operator and Chairman of the Board of Directors of Company, Inc.

3. was, until , the President of .

4. and each have personally participated in each and every operation conducted at the Facility. Together they exercise or have exercised control over all activities occurring at the Facility.

hereinafter referred to as "Respondents".

5. The EPA Administrator determined, on or before August , 198 , that the presence of hazardous waste at the Western Processing facility and the release of hazardous waste from the facility may be presenting a substantial hazard to human health or the environment and that determination required monitoring, sampling, analysis and reporting. The basis for that determination is documented in an Order issued to Respondents signed by Administrator - on August , 198., pursuant to the authority of

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Section 3013 of the Act.

6. The §3013 Order was served on the Respondents on August 17, 1982.

7. The §3013 Order required the Respondents to submit to EPA a proposal for monitoring, testing, analysis, and reporting of hazardous waste and hazardous waste constituents that are present at or that have been released from the facility, and to implement such proposal, once approved by EPA. The Respondents were required to submit the proposal to EPA within thirty (30) days of receipt of the Order.

8. Notwithstanding such Order, Respondents failed to submit any proposal and on September , 198 , notified EPA that the Respondents were unable to develop the proposal and to implement monitoring, testing, analysis, and reporting.

9. Based upon the Respondents' failure to submit the required proposal and the notification by the Respondents of their inability to develop the proposal and implement the required investigation, the Assistant Administrator for the Office of Solid Waste and Emergency Response determined that no owner or operator was able to conduct the required monitoring, testing, analysis, and reporting .

10. Accordingly, and pursuant to the authority contained in §3013(d) of the Act, the Assistant Administrator for the Office of Solid Waste and Emergency Response, acting through the Regional Administrator of Region 10 EPA, undertook to conduct monitoring, sampling, and analysis of the site to ascertain the nature and extent of the hazard associated with the site. Such activity was initiated on September , 1982.

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11. Monitoring, testing, and analysis conducted through November , 198 , have resulted in expenditures of funds in the sum of $184,450. This sum has been expended for conducting monitoring, testing, and analysis on or in the vicinity of the Western Processing site deemed necessary and reasonable to ascertain the extent of the hazard associated with the site.

12. The $184,450 has been expended as follows:

Prime Contractor Personnel Costs.

Field Invesigation Team	1,958 hrs	@ $35.00	$68,530.00
Technical Assistance Team	395 hrs	35.00	13,825.00
Prime Contractor Total			$82,355.00

Sub-Contractor Costs

South Seattle Asphalt	$1467.98	
RJB Wholesale	2729.27	
RJB Wholesale	518.82	
Sanikan	209.34	
National Barricade	468.77	
Rental Mart-submersible pump	332.28	
Analytical Services Center (Buffalo)	2400.00	
Burns Security	1542.30	
Brooks Truck Line-forklift, flatbed	339.99	
Story and Dodge (well driller)	20444.50	
Crosby and Overton- barrel storage	360.00	
City of Kent - Water	45.00	
Sub-Contractor Total		$30,858.25

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Equipment and Supplies

Sears- fencing gate	$ 324.39
Sears- come-along hand wrench	85.18
Burdic Feed and Hardware - wire stretcher	56.90
N.W. Stationers - stencil and paint for drums	68.05
Cascade Bag - sample bags	79.82
Seattle Barrel Company	1427.10
Lone Star Industries	223.66
Glacier Sand and Gravel	275.84
J.C. Penny's - lantern	45.78
MSA - supplies, cartridges, respirator supplies	896.53
check valve, hydrant wrench	35.52
pipe without gasket	152.61
drive caps	46.86
disposable gloves	114.60
diesel, gas, ice, small equipment	156.59
personal mileage, supplies, maintenance	172.85
film development and purchase	54.00
Seattle Skin Diving - refill air bottles	38.07
Andrews Machinery - pressure release valve	17.34
Sears paint for drums	28.46
Label Master Labels	27.96
Equipment and Supplies Total	$4328.11

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Car Rental

3 vehicles @ $6.10 per day (157 days)	$ 957.70	
1 vehicle @ 6.50 per day (5 days)	32.50	
Mileage	891.00	
Gasoline	645.00	
Car Rental Total		$ 2526.20

Analytical Support (Laboratory) (includes 10% Mgmt. overhead)

Soil samples - inorganics	122 samples @$ 93	$11,346.00	
- organics	124 samples @$ 305	37,820.00	
Water samples - inorganics	25 samples @ 93	2,325.00	
- organics	25 samples @ 305	7,625.00	
Special services			
high hazard samples	1 @ $398	398.00	
Filter samples	35 @ 8	280.00	
% moisture	124 @ 5	620.00	
Analytical Support total			$ 60,414.00
Sample Transportation and Packaging		3,968.68	
Grand Total to November 29, 1982			$ 184,450.24

The above sum covers only activities which were carried out under contract to EPA. Activities carried out by EPA personnel are not included in the above sum.

ORDER

Based upon the determinations and findings of fact above, the Respondents are hereby ordered to pay a sum of ONE HUNDRED EIGHTY FOUR THOUSAND FOUR HUNDRED FIFTY dollars ($184,450) to reimburse the United

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States for incurred costs of the monitoring, testing and analysis conducted through November , 198 . This sum shall be paid within 15 days of the date of this Order by a certified check payable to "Treasurer, United States of America." This payment must be remitted to the contact person at the address below.

Failure to comply with the terms of this Order may subject Respondents to a civil action by EPA for assessment of a penalty of an amount not to exceed $ 5,000.00 for each day of such failure to comply.

The contact person shall be:

Witness my hand as Assistant Administrator for the Office of Solid Waste and Emergency Response pursuant to the Authority of the Administrator of the United States Environmental Protection Agecy.

Dated this _____ day of _____ ___, 198.

_____ _____

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-76 DOJ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 21 1984

MEMORANDUM

SUBJECT: Issuance of Final Revised Guidance on the Use and Issuance of Administrative Orders Under Section 7003 of the Resource Conservation and Recovery Act (RCRA)

FROM: Courtney M. Price
Assistant Administrator for Enforcement
and Compliance Monitoring

Lee M. Thomas
Assistant Administrator for Solid Waste
and Emergency Response

TO: See Attached List

Attached is the Final Revised Guidance on the Use and Issuance of Administrative Orders Under Section 7003 of RCRA.

The responses to the drafts of this guidance were very positive. A considerable effort has been made to incorporate the comments received where appropriate. We greatly appreciate your involvement in the development of this important policy.

If you have any questions, please contact Susan Conti, of OECM-Waste, at FTS-382-3103.

Attachment

Regional Counsels, Regions I-X
Regional Administrators, Regions I-X
Hazardous Waste Coordinators, Regions I-X
RCRA Branch Chiefs, Regions I-X'

FINAL REVISED GUIDANCE MEMORANDUM ON THE USE AND ISSUANCE OF ADMINISTRATIVE ORDERS UNDER SECTION 7003 OF THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

September 26, 1984

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I. INTRODUCTION

RCRA's administrative enforcement authority is an important component of the Agency's overall hazardous waste enforcement program. The effectiveness of EPA's enforcement program will be demonstrated as respondents implement site remedies in compliance with administrative orders, the Agency pursues enforcement actions vigorously against respondents who fail to comply with such orders, and the Agency defends aggressively judicial challenges to orders.

Section 7003 of the Resource Conservation and Recovery Act (RCRA) provides EPA with a broad and powerful enforcement tool that may be used to abate imminent hazards that are caused by the handling, storage, treatment, transportation or disposal of solid waste or hazardous waste. Under §7003, the Administrator may seek injunctive relief in the appropriate United States District Court or, after notice to the affected State, take appropriate action "including, but not limited to, issuing such orders as may be necessary to protect public health or the environment."

The §7003 administrative order authority provides strong incentives for respondents to expeditiously undertake response actions deemed necessary by EPA to ensure protection to public health or the environment. Therefore, the Regions are urged to consider the use of unilateral RCRA §7003 orders in appropriate cases wherever it is necessary to compel response action. It is essential that the RCRA enforcement program combines both administrative and judicial enforcement authorities to ensure protection of health and the environment from the improper handling of hazardous waste.

The following guidance has been prepared to assist the Regional offices in developing and issuing administrative orders pursuant to §7003. It supersedes the earlier Agency guidance issued on September 11, 1981, by Douglas MacMillan, Acting Director, Office of Waste Programs Enforcement, entitled "Issuance of Administrative Orders Under §7003 of the Resource Conservation and Recovery Act."

Since §7003 is similar in scope to §106 of the Comprehensive Environmental Response, Compensation, and Liability Act, the reader should consult the guidance issued on September 8, 1983, entitled "Guidance Memorandum on Use or Issuance of Administrative Orders Under §106(a) of

CERCLA." A fuller treatment of the following areas, common to both 7003 and 106, is found in the (1983) 106 Guidance: Necessity for Determination Based on Evidence; Necessity for Actual or Threatened Release; Necessity that Release or Threat of Release be from a facility (applicable in the case of joint 7003 & 106 orders); and Necessity for Existence of Imminent and Substantial Endangerment. Where joint orders under §§7003 and 106 are issued, the Regions should adhere to the requirements set out in both guidance memoranda. The reader should also consult the CERCLA §106 guidance, "Issuance of Administrative Orders for Immediate Removal Actions" (Lee Thomas, OSWER, February 21, 1984).

It should be noted that the reauthorization of RCRA by Congress may affect some aspects of §7003, regarding the participation of the public in the settlement of administrative orders and liability for past activities. If RCRA is amended, supplemental guidance will be provided as appropriate.

II. SCOPE OF RCRA §7003 */

In order to issue a §7003 order, the Administrator must possess evidence "that the handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste may present an imminent and substantial endangerment to health or the environment" (42 U.S.C. §6973). Additionally, §7003 requires that the Administrator provide notice to the affected State prior to issuance of the order. Each of these requirements is discussed in further detail below.

A. Evidence

Because the recipient of a §7003 order may seek administrative or judicial review of the order, the Region must have all the evidence necessary to demonstrate that the

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*/ Note: the terms "hazardous waste" and "solid waste" in RCRA §7003 refer to the statutory definitions, §§1004(5) and 1004(27), of RCRA and not to the regulatory provisions promulgated pursuant to §3001 and codified at 40 CFR Part 261. These regulatory provisions are meant for application only in the Subtitle C regulatory program. As long as a waste meets the §1004 definition of solid or hazardous waste, it need not be listed in Part 261 or satisfy one of the characteristics specified in Part 261.

statutory criteria have been satisfied at the time the order is issued. The evidence must establish that the respondent has handled, treated, stored, transported or disposed of a solid or hazardous waste, and that such activity has resulted in a condition that may present an imminent and substantial endangerment to health or the environment. Necessary evidence may be documentary, testimonial, or physical and may be obtained from a variety of sources including inspections, investigations, or requests for production of documents or other data pursuant to RCRA §§3007, 3013 or CERCLA §104. The evidence must be sufficiently probative and reliable to enable a reasonable person to conclude that issuance of an order is appropriate. For example, an unsubstantiated citizen's complaint would normally not be sufficient to justify issuance of an order. If that complaint were supported by corroborating evidence, however, such as laboratory analyses, the complaint and corroboration could normally be considered a sufficient basis for issuance of the order.

B. What Constitutes Handling, Storage, Treatment, Transportation or Disposal.

It is undisputed that §7003 may be utilized to enjoin present conduct. Thus, persons who are presently handling, storing, treating, transporting or disposing of solid or hazardous wastes are potential recipients of a §7003 order. Whether §7003 may be used to abate present imminent hazards caused by past disposal practices is an issue that has been litigated repeatedly. The Agency has consistently maintained that §7003 applies to such past disposal. Although there has been some disagreement by courts considering this question, the prevailing view as expressed in U.S. v. Waste Industries, et al., No. 83-1320 (4th Cir., May 8, 1984) clearly supports the Agency's position. Thus, Regional Offices should consider the issuance of §7003 orders at presently inactive facilities, provided such issuance is consistent with this guidance.

C. Necessity for Existence of Imminent and Substantial Endangerment.

Evidence possessed to support the issuance of a RCRA §7003 order must show that the "handling, storage, treatment, transportation or disposal of any solid or hazardous waste may present an imminent and substantial endangerment to health or the environment." The words "may present" indicate that Congress established a standard of proof that does not require a certainty. The evidence need not demonstrate that an immi-

nent and substantial endangerment to public health or the environment definitely exists. Instead, an order may be issued if there is sound reason to believe that such an endangerment may exist.

Evidence of actual harm is not required. As the Court stated in Ethyl Corp. v. EPA, construing an endangerment provision in the Clean Air Act:

> The meaning of "endanger" is not disputed. Case law and dictionary definition agree that endanger means something less than actual harm. When one is endangered, harm is threatened; no actual injury need ever occur. 541 F.2d 1 at 13, footnotes omitted, original emphasis, D.C. Cir., cert. denied 426 U.S. 941 (1976).

It should also be noted that while the risk of harm must be imminent in order for the Agency to act under §7003, the harm itself need not be. (See the legislative history to the "imminent and substantial endangerment" provision of §1431 of the Safe Drinking Water Act, H. Rpt. 93-1185 at 3536.) For example, EPA could act if there exists a likelihood that contaminants might be introduced into a water supply which could cause damage after a period of latency. One must judge the risk or likelihood of the harm by examining the factual circumstances, including, but not limited to: 1) nature and amount of the hazardous substance; 2) the potential for exposure of humans or the environment to the substance; and 3) the known or suspected effect of the substance on humans or that part of the environment subject to exposure to the substance.

Legal analyses of the concept of imminent and substantial endangerment can also be found in Reserve Mining Co. v. EPA, 546 F.2d 492 (8th Cir. 1975); U.S. v. Vertac Chemical Co., et al., 489 F.Supp. 870 (E.D. Ark. 1980); U.S. v. Solvents Recovery Service, 496 F.Supp. 1127 (D. Conn. 1980); U.S. v. Midwest Solvent Recovery, 484 F.Supp. 138 (N.D. Ind. 1980); U.S. v. Diamond Shamrock Corp., 17 E.R. 1329, (N.D. Ohio 1981); U.S. v. Price, 688 F.2d 204 (3rd Cir. 1982); and, U.S. v. Reilly Tar and Chemical Corp., 546 F.Supp. 1100 (D. Minn. 1982).

The nature of the endangerment and the basis for the finding of an imminent and substantial endangerment must be set forth in the order. If sampling and analysis data are being relied upon, a summary of such data should ordinarily be set

forth in the order. At any rate, all evidence supporting the finding of any imminent and substantial endangerment in the order must be compiled into a single, concise document constituting the endangerment assessment. [An Endangerment Assessment Guidance is presently being prepared by the Office of Solid Waste and Emergency Response.]

D. Persons to Whom an Order May be Issued.

Section 7003 provides that an order may be issued to "any person" who contributed to conduct or lack of conduct that may present an imminent hazard. The term encompasses, if applicable, the present owners and operators of a site, including an inactive site. Similarly, the term includes persons whose ongoing conduct may result in the risk of an imminent hazard. Whether previous owners of a site or past non-negligent off-site generators are also covered by §7003 is an issue that has received much judicial attention.

Although the case law is unsettled, two courts have upheld EPA's position that previous owners of a site may be held liable under §7003. U.S. v. Price, 688 F.2d 204; U.S. v. Reilly Tar and Chemical Co., 546 F. Supp. 1100. Thus, if otherwise appropriate, Regions should consider issuing §7003 orders to previous owners of a site, even an inactive one, in cases where the previous owner's conduct may have caused or contributed to conditions at the site which may present an imminent hazard and substantial endangerment.

To date, the courts have been unwilling to include past, non-negligent, off-site generators within the scope of §7003. See, U.S. v. Wade, 546 F. Supp. 785 (E.D. Pa., 1982); U.S. v. NEPACCO, 579 F. Supp. 823 (W.D. Mo., 1984) [U.S. filed cross-appeal June 29, 1984; decision pending]. It is recommended, therefore, that the Regional Offices utilize CERCLA §106 to order such generators to perform necessary cleanup work. While an early decision was unfavorable, the majority and all recent decisions have held that §106 does apply: U.S. v. Wade, 546 F. Supp. 785 [held §106 is not applicable to past, non-negligent generators]; U.S. v. Price, 577 F. Supp. 1103 (D. N.J., 1983) [held §106 does apply to past, non-negligent generators]; U.S. v. NEPACCO, 579 F. Supp. 823 [held §106 does apply to past, non-negligent generators]; U.S. v. Conservation Chemical Company, No. 82-0983-CV-W-5, Order (W.D. Mo., Feb. 3, 1984) [held §106 does apply to past, non-negligent generators]; and U.S. v. A&F Materials, et al., No. 83-3123 (S.D. Ill., Jan. 20, 1984) [held §106 does apply to past, non-negligent generators]. The Agency's position is that §106 does apply to past, non-negligent, off-site generators.

E. Notice to Affected States

Finally, before an Order may be issued, the "affected state" must be given notice of the Agency's intention to issue the Order.

The Agency is not held to a statutory period of time for notice. Normally, written notification to the state should precede federal action by at least one week. Circumstances may arise, however, where a more rapid response at a site is necessary. In such cases, issuance of an order may follow an abbreviated notice period or even a telephone call made by EPA to the director of the agency responsible for environmental protection in the affected state. Written confirmation must follow such telephone notice. In some cases, the draft order may be subject to a State's Freedom of Information Act prior to issuance of the order by EPA. If this situation arises, the Agency may delay notice to the affected state(s) until (no later than) one week before issuance of the final order. It is unlikely that a state FOIA request would result in early disclosure of the draft order during that short period of time.

As indicated above, the notification should be directed to the director of the state agency having jurisdiction over hazardous waste matters. A suggested form for a notification letter is attached to this memorandum as the Appendix. This form also provides the format for oral notice.

An "affected state" is a state in which the conduct or condition which may present an imminent and substantial endangerment is occurring or is located, and in which the response activity required by the proposed order will be taken. In some cases, this may involve more than one state, such as where a facility is located near the border of a state and the hazardous wastes have migrated from the facility into another state(s). In those cases, all of the states in which the hazardous wastes are found and in which response activity may be performed pursuant to the order should be notified. (Note: Consult the following guidance for more information on the State/Federal relationship: "Implementing the State/Federal Relationship in Enforcement: State/Federal Enforcement Agreements", OECM, June 6, 1984.)

III. SELECTING ENFORCEMENT OPTION

Although §7003 administrative orders are a potent enforcement tool, there will be instances when it will be more appropriate for the Agency to use other enforcement options, including a RCRA §7003 judicial action, a CERCLA §106 adminis-

trative or judicial action, or a Superfund financed cleanup of a hazardous waste site. The Regions should examine each of these options and select the option which will result in the most efficient use of limited enforcement resources and Superfund monies while still quickly abating the threat. (See also, the memorandum on "Issuance of Administrative Orders for Immediate Removal Action", supra, for additional guidance on selecting enforcement options.)

A. Administrative Order or Civil Referral

Initially, the Agency must determine whether it is more appropriate to use administrative or judicial enforcement action; each has definite advantages and drawbacks. An administrative order has the benefit of being a relatively speedy method of enforcement. The Agency can issue an order that establishes a timetable for compliance, unilaterally or on consent, in a short period of time. A judicial action, on the other hand, is usually a more time-consuming process. The referral of a case to the Department of Justice and filing of a complaint may delay the initiation of remedial activities. Even though a judicial action can be time-consuming, any resulting judicial order or consent decree can be more quickly enforced in the event of noncompliance since the Court already has jurisdiction of the matter, and an additional referral to DOJ generally is not needed.

Because AO's can be issued quickly, the general rule is that an administrative order, whether issued unilaterally or on consent, is appropriate absent some indication that the respondent will not comply with its terms. Where noncompliance is anticipated, Regions should prepare a civil referral. Should immediate remedial action be necessary, EPA should consider requesting a preliminary injunction or temporary restraining order.

B. Use of RCRA or CERCLA

Once a decision has been made to proceed administratively, the Region must then decide whether an order under RCRA §7003 or CERCLA §106 is more appropriate. Upon examination, both statutory provisions appear quite similar. When faced with the need to abate an imminent hazard, the Agency can often use a joint order if the RCRA "hazardous waste" is also a CERCLA "hazardous substance." [Consult the CERCLA §106 (1983) guidance for a discussion of the issuance of joint orders.]

There are three situations where a joint order is not available, more specifically, where a RCRA §7003 order can be used but a CERCLA §106 order cannot.

The first situation would result when the imminent hazard is caused by a RCRA "solid waste" but not a "hazardous waste." RCRA §7003 orders can be used to abate imminent hazards presented by "solid wastes" (RCRA §1004(27)) as well as "hazardous wastes" (RCRA §1004(5)). By contrast, CERCLA §106 orders are limited to abating imminent hazards presented by "hazardous substances" (CERCLA §101(14), CERCLA §101(14)(c) defines "hazardous substances" as including "hazardous wastes" under RCRA §3001, but not RCRA "solid wastes" under §1004(27). Therefore, when an imminent hazard is caused by a RCRA "solid waste", which is not a RCRA "hazardous wastes" (or CERCLA hazardous substance) RCRA §7003 orders can be issued, whereas CERCLA §106 orders cannot.

The second situation would result when a waste meets the definition of "hazardous wastes" under §1004(5) of RCRA but does not qualify as a "hazardous waste" under 40 CFR Part 261. The term "hazardous waste" in §7003 refers to the broad statutory definition (§1004 (5)) of RCRA and not to the more narrow regulatory provisions promulgated pursuant to §3001 and codified at 40 CFR Part 261. These regulatory provisions are meant to be applied only in the Subtitle C regulatory program. Because the CERCLA definition of "hazardous substances" (§101 (14)) includes "hazardous wastes" under RCRA §3001 but not under RCRA §1004(5), a CERCLA §106 order could not be used in the above situation.

The third situation would result when the waste involved is excluded from regulation under CERCLA because it is a petroleum product. [See, CERCLA §101(14) for the definition of "hazardous substances"]. Gasoline is not a listed "hazardous waste" or commercial chemical product under RCRA regulations (40 CFR 261 Subpart D). Residues of a spill or a release of gasoline are not automatically listed as hazardous. Even so, gasoline leaking from underground storage tanks can be controlled under RCRA as a "solid waste". As stated earlier, §7003 can be used to address wastes that satisfy the statutory definition of "hazardous waste" under RCRA §1004(5) even if they are not listed or do not exhibit a RCRA hazardous waste characteristic under 40 CFR Subpart C. Orders have been issued under RCRA §7003 to owners of underground storage tanks that were leaking gasoline or other petroleum products.

C. Deciding to Use a §7003 Order

This section discusses factors to consider when deciding whether or not to use a §7003 order. These factors include:

- financial status of the respondents
- number of potential respondents
- specificity of the necessary response action

As a general proposition, a §7003 order should be issued only in those situations in which compliance with the terms of the order is feasible, i.e., where the respondents are in a position to perform the ordered response actions within specified time periods. This does not mean that EPA must make a pre-issuance determination that respondents will comply with an order, but rather that compliance is practicable. If the Agency anticipates non-compliance with an order it is considering issuing, the use of the order mechanism may serve only to delay initiation of an injunctive action under §7003 or, if appropriate, a Fund-Financed response. In addition, it is an inefficient use of resources.

1) Respondent's Financial Status

Before an administrative order requiring remedial work is issued, the Agency should assess, to the extent possible, whether the responsible party has sufficient financial resources to comply with the order. This assessment is only a factor to be considered in the decision to issue an order when the necessary information is available. Financial information may be available from several sources:

° Agency files may contain financial information collected as part of the identification of parties responsible for the hazards posed by sites on the National Priorities List.

° The Securities and Exchange Commission (SEC) requires publicly traded companies to submit detailed financial statements. This information is publicly available. (Consult NEIC's manual entitled "Identifying Responsible Parties" for additional information on obtaining SEC files.)

- Responsible parties may submit financial information to the Agency during discussions or negotiations held prior to the issuance of an Order.

- The Agency collects financial data as part of the RCRA permitting process.

In addition, NEIC can provide further financial information on respondents who are publicly held companies or companies previously the subject of EPA action(s).

2) Number of Respondents Subject to the Order

The Agency's position that §7003 provides for joint and several liability has been challenged by U.S. v. Stringfellow, No. 83-2501 - MML (C.D. Cal., April 5, 1984). That decision held that neither RCRA §7003 nor CERCLA §106 provides for joint and several liability. In the case of a multiple party administrative order, the Stringfellow Court stated that "...such would have to state with specificity the steps to be taken and the party to take them. If steps were ordered taken jointly, the Court would have to prescribe the participation of each defendant". (Slip. op. at 12.)

At present, the Agency has not changed its position on §7003 and joint and several liability. Even so, the Stringfellow decision may affect future §7003 orders issued to multiple respondents without an allocation of individual responsibilities.

Some factors to consider before issuing a RCRA §7003 order to multiple parties are as follows:

i) Coordination of Response Action

An order issued to multiple respondents who are jointly and severally liable generally will not allocate individual clean up responsibilities. */ Instead, the order will require the same response action to be conducted by each responsible party. Multiple parties must organize and coordinate their response to ensure compliance with the order's requirements. Thus, compliance with orders may depend upon group agreement on each member's share of the response cost. In a large group of responsible parties, it may be difficult for the group to develop a consensus on individual liability and perform response activities as quickly as necessary to

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*/ However, the Agency may issue an order to a respondent requiring a response to a discrete, separable aspect of the hazard at a site, notwithstanding the existence of other responsibile parties or other less divisible problem areas.

abate imminent hazard conditions at a site. Accordingly, issuing Orders to all responsible parties may not be appropriate where there are a large number of parties who are unlikely to agree on a concerted response. Instead, the Agency will pursue judicial remedies or consider issuing Orders to a selected subset of responsible parties.

Even in situations where Orders are issued to a large number of parties, Agency policy, which should be reflected in the terms of the Order, is that each Respondent is individually liable for compliance with the Order's requirements.

ii) Supervision

After an order is issued, the Agency conducts compliance monitoring at the site to ensure that responsible parties comply with the terms of the order. Although no specific number of responsible parties can be considered ideal, it is clear that the Agency's oversight responsibility is most effective when there are a limited number of responsible parties or a single contractor (hired by the responsible parties) doing the work at the site.

3) Specificity of the Necessary Response Action

In order to minimize the potential for confusion between Respondents and the Agency concerning the required response action, orders should be used in situations where the nature of the required response action is relatively precise. Orders are particularly useful to require that respondents cease any ongoing activity that is causing the imminent hazard. When remedial work is required, an order may best be used to mandate discrete tasks such as the erecting of fences to secure the site and the removal of drummed wastes. Orders can be inappropriate in cases where the abatement will be very complex, cost more than several million dollars, or take more than a few years to complete. These are offered as factors to consider and not criteria to be rigidly followed.

A RCRA §7003 order, or succession of orders, may be used to require response action throughout the entire cleanup process. It is entirely appropriate to use §7003 to order immediate sampling or testing programs as part of a broader set of proposed response activities. For example, where it is important to respond immediately to an imminent hazard, a §7003 order may be used to determine the full extent of site contamination and to require immediate security and clean up action in response to hazards that have already been established.

Monitoring, sampling, analysis and reporting can, of course, also be required through use of a RCRA §3013 order. A §3013 order may be issued absent a finding of an imminent hazard although it does require a finding that the presence of, or release from a site of, hazardous waste "may present a substantial hazard to human health or the environment." RCRA §3013(a)(1)&(2). [See, Issuance of Administrative Orders Under Section 3013 of RCRA, issued September 1984.]

IV. ELEMENTS OF AN ORDER

All §7003 orders should contain the following elements:

° a statement of the statutory basis for the order.

° a statement of the agency's authority to issue the order and the liability that may be incurred if the respondent fails to comply.

° a specific determination supported by findings or reference to a separate endangerment assessment that states that the Agency has determined that an imminent and substantial endangerment may exist. Such an explicit finding is necessary even if the Respondent is willing to consent to the issuance of the order. Should EPA need to seek judicial enforcement of the order, even one issued on consent, it should be able to demonstrate that it acted within its statutory authority in issuing the order.

° the company is a facility as defined under CERCLA §101(9). (Note: required only when the A.O. is also based on CERCLA §106).

° a finding that the substances are solid or hazardous wastes.

° statements as to the liability of the respondents, i.e., that the responsible party is or has been engaged in the activities described in §7003.

° a compliance schedule that clearly sets forth the tasks to be performed, the time frames for performance, and quality and performance standards for tasks. Such specificity enhances the

operator's ability to comply and the Agency's ability to enforce the order judicially should the respondent violate its terms. A specific order provides the court with Agency articulated standards by which to judge the respondent's noncompliance.

° EPA authority to be on site during work, obtain split samples and other information generated, and stop work if an emergency arises.

° sampling and analytical procedures.

° health and safety procedures.

° notice to affected States. A statement should be included, where possible, that notice to the affected state(s) has been given.

° an opportunity to confer if the order is unilateral. Agency policy is to offer recipients of §7003 orders an opportunity to confer with the Agency concerning the appropriateness of its terms and its applicability to the recipient. (Note: The administrative record containing EPA's evidence should be available for the recipient to examine.) The conference will help EPA ensure that it has based its order on complete and accurate information and ensure that both sides have a common understanding of the work to be performed. Another benefit to such a conference is that it may reveal the unwillingness of the respondents to take necessary action. In this case, EPA can be better prepared to take necessary remedial action itself or seek judicial remedies. (See also, Conference Procedures, infra p. 14).

° an effective date of the order. Each order should specify the date on which it becomes effective. Because a §7003 order by definition addresses an imminent hazard, it should ordinarily become effective within 10-14 days of receipt by the respondent. In emergency situations the effective date may be shortened to as little as 48 hours. Any situation that requires an

affirmative response in less than 48 hours should be addressed under §104 of CERCLA as a fund-financed emergency removal. [See: Issuance of Administrative Orders for Immediate Removal Actions, supra, p. 2 (discussion of the timing of A.O.'s).]

° indemnification of EPA. The order should exempt the Agency from liability for damages, even if the damages occurred pursuant to an EPA enforced order.

° a public comment period for consent orders.

° a civil penalties section for unilateral orders and a stipulated penalties section for consent orders.

° EPA authority to take additional enforcement action if the respondent does not comply with the terms of this order.

V. CONFERENCE PROCEDURES

The conference will normally be held at the appropriate EPA Regional office and will be presided over by the Regional Administrator's designee. However, other arrangements may be agreed to for the sake of convenience to the parties. At any time after the issuance of the order and particularly at the conference, EPA should be prepared to provide the Respondent with information sufficient to explain the basis for the Order and to promote constructive discussions. (NOTE: The administrative record containing EPA's evidence must be available for the recipient to examine.) The Respondent will have the opportunity to ask questions and present its views through legal counsel or technical advisors. The schedule and agenda for the conference will be left to the discretion of the EPA official leading the conference, as long as the Respondent receives a reasonable opportunity to address relevant issues.

Following the conference, a written summary of the proceeding must be prepared and signed by the Agency official who presided over the conference. The written statement should contain:

° A statement of the date(s) and attendees of any conference(s) held; and

° A description of the major inquiries made and views offered by the Respondent contesting the terms of the order.

The presiding official must prepare a statement which addresses the significant arguments raised by the respondent, recommends how the order should be modified, if at all, and contains the reasons for the changes or revisions.

VI. MODIFICATIONS, REVOCATION, OR STAY OF THE ORDER

Based on a review of the file (on which the order was based) any probative information or argument made by the respondent (following receipt of the order) or by recommendation of the presiding official, the issuing official may modify or revoke the order. Any modification to the order must be communicated to the respondent as part of a copy of a written statement containing the elements listed in Section V above. The original should be kept in the Agency files along with the evidence supporting the order, copies of written documents offered in rebuttal by the respondent during the conference, and a copy of the request for a conference.

The issuing official may also stay the effective date of the order if the conference process could not be completed within the specified time period.

VII. NEGOTIATION OF ADMINISTRATIVE ORDERS

Although EPA recognizes that recipients of unilateral §7003 orders should be given an opportunity to confer, the Agency will not engage in lengthy negotiations with recipients after an order is issued. Limited negotiations, before or after issuance of an order, are useful in that they give EPA an opportunity to assess the likelihood that the respondents will perform the tasks set forth in the order. If negotiations look unpromising EPA must decide whether to issue an order unilaterally, refer a §7003 civil action or initiate a Fund-Financed response (if this option exists). EPA should not compromise its authority to secure necessary action simply to obtain an order on consent.

Should negotiations result in an agreement, the resulting order must contain all of the requirements set forth above; these requirements are necessary to ensure that the order is enforceable should the respondent decide not to comply. The same requirements apply even if the respondent has voluntarily begun cleanup efforts. In general, the negotiated order should set out specifically what each respondent must do to comply.

VIII. DELEGATIONS OF AUTHORITY

At the present time, the authority to issue RCRA §7003 administrative orders is delegated to the Assistant Administrator for Solid Waste and Emergency Response and the Regional Administrators. The Regional Administrator must consult with the Assistant Administrator for Enforcement and Compliance Monitoring or the designee and must obtain the advance concurrence of the Assistant Administrator for Solid Waste and Emergency Response or delegatee. The Assistant Administrator for the Office of Solid Waste and Emergency Response's authority to issue §7003 orders and to give advance concurrence has been redelegated to the Director, Office of Waste Programs Enforcement.

The RCRA Delegations of Authority are being revised and should be issued in the near future. The draft §7003 delegations which are found in Chapter 8, Section 22 of the draft delegations manual are divided into three parts: determination of imminent and substantial endangerment; abatement through a unilateral order; and, abatement through an order on consent.

According to the draft delegations, the Regional Administrator (RA) must consult with the Office of Regional Counsel before issuance of either a RCRA §7003 unilateral order or order on consent. Regarding Headquarters, the RA must consult with the Office of Solid Waste and Emergency Response (OSWER) prior to issuing RCRA §7003 orders to determine an imminent and substantial endangerment and to abate such an endangerment through a unilateral order. The RA is not required to consult with the Offices of Enforcement and Compliance Monitoring (OECM) or the Office of General Counsel (OGC) to issue the above. For orders on consent under §7003, the RA must obtain advance concurrence of OSWER or a waiver of such concurrence by advance memorandum, before issuance of such an order. The RA does not have to consult with or procure concurrence from OECM or OGC prior to issuance of §7003 Orders on consent. Consultation with OECM and OGC is recommended in relatively new areas such as the use of a RCRA §7003 order for underground gas tanks and where there are other novel legal issues involved.

Appendix

STATE NOTIFICATION LETTER

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. R. Jones
State Agency
Division of Environmental Control

Dear Mr. Jones:

Enclosed for your information is a copy of an order [stamped "DRAFT" and "CONFIDENTIAL"] that the Agency intends to issue on or after [date], to the XYZ Company, pursuant to Section 7003 of the Resource Conservation and Recovery Act (42 U.S.C. §6973). The order requires certain activities to be taken at the company's site located at [location]. Please refer to the enclosed copy of the proposed order for the specific actions required of the company and the time within which such actions must be taken. If you have any comments or questions concerning the order, please contact [EPA official] at [office].

Sincerely yours,

Assistant Administrator for
Solid Waste and Emergency Response

[or]

Regional Administrator

[or their designees]

Enclosure

cc: Honorable J. Smith, Governor

GUIDANCE MEMORANDUM

ON

USE AND ISSUANCE OF ADMINISTRATIVE ORDERS

UNDER

SECTION 106(a)

OF CERCLA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

MEMORANDUM

SUBJECT: Guidance Memorandum on Use and Issuance of Administrative Orders Under §106(a) of CERCLA

FROM: Lee M. Thomas
Acting Assistant Administrator for Solid Waste and Emergency Response

Courtney M. Price
Special Counsel for Enforcement

TO: Regional Administrators, Regions I-X
Regional Counsels, Regions I-X
Air and Waste Management Division Directors Regions I-X
Regional Superfund Coordinators
Director, Office of Waste Programs Enforcement
Director, Office of Emergency and Remedial Response
Associate Enforcement Counsel, Waste Division

I. Introduction

The administrative order authority which the Environmental Protection Agency (EPA) exercises under §106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Executive Order 12316 is one of the most potent administrative remedies available to the Agency under any existing environmental statute.

Section 106(a) of CERCLA authorizes the issuance of "such orders as may be necessary to protect public health and welfare and the environment," after notice to the affected state, upon a determination that "there may be an imminent and substantial

endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from a facility." A fine not exceeding $5,000 per day may be imposed for willful violation, failure or refusal to comply with a §106(a) Order (Order), and punitive damages of up to three times the cost of clean-up of the site may be imposed under §107(c)(3) for failure, without sufficient cause, to properly provide removal or remedial action pursuant to such an Order. In view of the magnitude of these penalties, the Agency expects that the regulated community will comply with administrative Orders. At the same time, the Agency's obligation is to ensure that Orders are properly issued.

It is the current policy of EPA that, whenever possible, parties who have caused or contributed to a release or a threat of a release of hazardous substances at a site should rectify the problems at the site. This action is necessary to ensure that the Agency efficiently manages the limited funds available under CERCLA and to ensure that the maximum number of sites are addressed.

Accordingly, after the Agency discovers a site and in advance of completing a Remedial Investigation and Feasibility Study (RI/FS), (and has conducted an endangerment assessment, or their equivalent), responsible parties normally will be sent a notice letter requesting them to clean up the site. Following completion of the feasibility study, the Agency normally engages in discussions with

responsible parties in an attempt to obtain promptly the agreement of such parties to voluntarily undertake the necessary response actions. If the discussions are successful, the terms of the agreement will be embodied in a judicial consent decree or a §106 administrative consent Order.

In circumstances where the Agency wishes to compel a responsible party to undertake the response actions, including instances where no settlement can be reached, the Agency will consider issuing a unilateral §106 Order in accordance with this guidance.

The administrative enforcement authority is an important component of the Agency's enforcement program authorized under CERCLA. This guidance is being issued to assist the regional offices in developing and maintaining an effective CERCLA administrative enforcement program. The effectiveness of the program will be enhanced as site remedies are implemented by Respondents in compliance with administrative orders, and as enforcement of Orders with which Respondents are not in compliance is successfully and expeditiously pursued by EPA. The Agency will aggressively defend judicial challenges to Orders and enforce instances of non-compliance to validate the CERCLA administrative enforcement program. Regional offices should issue Orders consistent with the criteria and procedures contained in this guidance to ensure the legal sufficiency of the program.

The §106 administrative order authority provides strong incentives for Respondents to undertake expeditiously response actions deemed necessary by EPA to ensure protection of public health or

welfare or the environment. Therefore, Regional offices are urged to consider the use of unilateral CERCLA administrative orders in every case where compelling enforcement authority is necessary. Criteria are provided herein to assist regional offices in determining whether Orders are appropriate in any case. It is essential that a balanced CERCLA enforcement program is implemented by EPA, combining administrative and judicial enforcement authorites, to ensure protection of health and the environment from the hazards of releases or threats of releases of hazardous substances.

II. Requirements for Issuance and Scope of Section 106 CERCLA Orders

A comparison of §106(a) and §7003 of the Resource Conservation and Recovery Act (RCRA) reveals similarities in the two sections, and therefore many of the criteria for issuance of a §7003 Order also apply to §106 Orders.1/ In many situations, either Order would be appropriate. Where the hazardous substances are also "hazardous waste" under RCRA, the Order should cite the authority of both sections.

Section 106(a) of CERCLA provides as follows:

> In addition to any other action taken by a State or local government, when the President determines that there may be an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened

1/ Guidance on the use of RCRA §7003 administrative orders may be found in a memorandum entitled, "Issuance of Administrative Orders under Section 7003 of the Resource Conservation and Recovery Act" dated September 11, 1981.

> release of a hazardous substance from a facility, he may require the Attorney General of the United States to secure such relief as may be necessary to abate such danger or threat... The President may also, after notice to the affected State, take such action under this section including, but not limited to, issuing such orders as may be necessary to protect public health and welfare and the environment.2/

In order for an Order to be issued, the following legal pre-requisites must be met:

A. Necessity for a Determination Based Upon Evidence

A determination must be made that, because of a release or threat of a release, an imminent and substantial endangerment may exist. This determination will depend upon documentary, testimonial, and physical evidence obtained through investigations and inspections. Other information concerning the nature of the threat posed by a site may already be contained in Agency files, such as data generated pursuant to §103 of CERCLA or the permit and notification sections of RCRA. The Order, therefore, must include a finding that an imminent and substantial endangerment may exist, in order to ensure that this statutory requirement is met. (See sample order, Appendix B, Finding No. 7).

2/ The President has delegated his authority under this Section to the Administrator of EPA and the U.S. Coast Guard by Executive Order No. 12316 dated August 24, 1981. EPA and the Coast Guard have entered into a Memorandum of Agreement dated October 9, 1981, that all site-related releases in the Coast Guard's jurisdictional areas (coastal zones, Great Lakes, ports and harbors) shall be the responsibility of EPA.

B. Necessity of Actual or Threatened Release of Hazardous Substances

Section 106 requires that the imminent and substantial endangerment be caused by "an actual or threatened release 3/ of a hazardous substance" from a facility. A "hazardous substance" is defined in Section 101(14) of CERCLA, and is generally any substance, waste or pollutant designated pursuant to Sections 307(a) and 311(b)(2)(A) of the Clean Water Act, Section 3001 of RCRA, Section 112 of the Clean Air Act, Section 7 of TSCA, or Section 102 of CERCLA. (Crude oil, fractions thereof, natural gas, and liquefied natural gas are exempted from statutory coverage.)

Whether a release from a facility is "actual" or "threatened" primarily depends upon temporal considerations. Actual releases should be observable in some form, either visually or through analysis showing contaminants present in samples of soil, water or air. A "threat" of a release, on the other hand, involves releases which have yet to occur or have yet to find their way into the environment. A bulging tank containing a hazardous substance in which pressure has built up, and a surface impoundment

3/ A "Release" is defined in CERCLA §101(22) as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, ejecting, escaping, leaching, dumping or disposing into the environment," with certain specific exemptions (e.g. release solely in work place; engine exhaust; release of certain nuclear material; and normal application of fertilizer).

which is about to overflow because of heavy rainfall, present obvious threats of a release. A threat is also presented by corroding or leaking drums containing incompatible wastes mingled in a common area. Accordingly, the determination of whether a "threat" of a release warrants issuance of an Order is a judgment decision to be made on a case-by-case basis.

The nature of both the hazardous substances present at the site and the release or threat of release should be set forth as findings in the order, together with the bases for such findings.

C. Necessity That Release or Threat of Release be From a Facility

The release or threat of release must be from a "facility," which is defined in CERCLA §101(9) as:

> (A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publically owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel (a watercraft or other contrivance used, or capable of being used, as a means of transportation on water).

This definition of "facility" includes on-shore or off-shore sites, including land transportation facilities, from which releases or threats might originate. The Order must specify the physical location that is the source of the release.

D. Necessity for Existence of Imminent and Substantial Endangerment

Evidence presented to support the issuance of a §106(a) order must show "that there may be an imminent and substantial endangerment" to public health or welfare or the environment.

The words "may be" indicate that Congress established a standard of proof that does not require a certainty. The evidence need not demonstrate that an imminent and substantial endangerment to public health or the environment definitely exists. Instead, an Order may be issued if there is sound reason to believe that such an endangerment may exist.

Evidence of actual harm is not required. As the Court stated in Ethyl Corp. v. EPA, construing an endangerment provision in the Clean Air Act:

> The meaning of "endanger" is not disputed. Case law and dictionary definition agree that endanger means something less than actual harm. When one is endangered, harm is threatened; no actual injury need over occur. (541 F.2d 1 at 13, footnotes omitted, original emphasis, D.C. Cir., cert. den. 426 U.S. 941 (1976).)

It should also be noted while the risk of harm must be imminent in order for the Agency to act under §106, the harm itself need not be. (See the legislative history to the "imminent and substantial endangerment" provision of §1431 of the Safe Drinking Water Act, H. Rpt. 93-1185 at 35-36.) For example, EPA could act if there exists a likelihood that contaminants might be introduced into a water supply which could cause damage after a period of latency. One must judge the risk or

likelihood of the harm by examining the factual circumstances, including, but not limited to: 1) nature and amount of the hazardous substance involved; 2) the potential for exposure of humans or the environment to the substance, and 3) the known or suspected effect of the substance on humans or that part of the environment subject to exposure to the substance.

Legal analyses of the concept of imminent and substantial endangerment can also be found in Reserve Mining Co. v. EPA, 514 F.2d 492 (8th Cir. 1975); U.S. v. Vertac Chemical Co. et al, 489 F.Supp. 870 (E.D. Ark. 1980); U.S. v. Solvents Recovery Service, 496 F. Supp. 1127 (D. Conn. 1980); U.S. v. Midwest Solvent Recovery, 484 F. Supp. 138 (N.D. Ind. 1980); U.S. v. Diamond Shamrock Corp., 17 E.R. 1329, (N.D. Ohio 1981); U.S. v. Price, 688 F. 2d 204 (3rd Cir. 1982); U.S. v. Reilly Tar and Chemical Corp., 546 F. Supp 1100 (D. Minn. 1982).

The nature of the endangerment and the basis for the finding of an imminent and substantial endangerment must be set forth in the Order. The link between the endangerment and the relief mandated by the Order should also be evident.

E. Notice to Affected States

Finally, before an Order may be issued, the "affected state" must be given notice of the Agency's intention to issue the Order.

The Agency is not held to a statutory period of time for notice. Normally, written notification to the state should precede federal action by at least one week. Circumstances

may arise, however, where rapid response at a site is necessary. In such cases, issuance of an Order may follow an abbreviated notice period or even a telephone call made by EPA to the Director of the agency responsible for environmental protection in the affected state. Written confirmation must follow such telephone notice.

As indicated above, the notification should be directed to the Director of the state agency having jurisdiction over hazardous waste matters. A suggested form for a notification letter is attached to this memorandum as Appendix A. This form also provides the format for oral notice.

An "affected state" is interpreted to be the state where the facility is located from which the discharge is being released or threatens to be released, and in which the response activity required by the proposed order will be taken. In some cases, this may involve more than one state, such as where the facility is located near the border of a state and the hazardous substances have migrated from the facility located in one state into another state(s). In those cases, all of the states in which the hazardous substances are found and in which response activity may be performed pursuant to the order should be notified.

III. Persons To Whom an Order May Be Issued

Section 106 does not specify any person or persons to whom an Order may be issued, but permits the issuance of "such orders

as may be necessary..." Section 104(a), however, refers to the "owner or operator" or "other responsible party" as the persons to whom the Agency could look to determine whether clean-up of a site will be done properly before expending CERCLA funds. Section 107(a), designating those who shall be liable for response costs, specifies present owners and operators of a facility, persons who were owners and operators at the time of disposal of a hazardous substance, and generators and certain transporters who, according to available evidence, contributed hazardous substances to the facility. It follows that those same persons could be recipients of an Order issued under Section 106(a), (see U.S. v. Outboard Marine Corp., 556 F. Supp. 54, 57 (N.D. Ill. 1982). In addition, in appropriate cases, it may be possible to issue orders to parties other than those listed in Section 107(a), if actions by such parties are necessary to protect the public or the environment.

IV. Criteria for Issuance of §106 Orders

Other parts of this guidance document examine the legal requirements for issuing an Order. This section's purpose is to list specific factors which favor the use of Orders over other possible enforcement responses. These factors include:

- Responsible parties' financial status
- Number of potentially responsible parties
- Certainty of the necessary response action
- Agency's readiness to litigate the merits of the Order

The theme common to these factors is that Orders should be issued in those situations in which compliance with the terms of the Order is feasible, i.e., where the Respondents are in a position to perform the ordered response actions within specified time periods. This does not mean EPA must make a pre-issuance determination that Respondents will comply with an Order, but rather that compliance is practicable. If the Agency does not anticipate compliance with an Order it is considering issuing, the use of the Order may serve only to delay direct injunctive action under §106 or the initiation of Fund-financed response. On the other hand, the Agency may wish to issue an Order in any situation where the needed response action and the liability therefor are clear and straight-forward, so that refusal to comply with the terms of the Order would not, in all probability, be with "sufficient cause" (CERCLA §107(c)(3)). Such refusal would render the Respondent liable for civil penalties or punitive damages in the event of federal cleanup.

A. Responsible Parties' Financial Status

Before an administrative order requiring remedial work is issued, the Agency should assess, to the extent possible, whether the responsible party has sufficient financial resources to comply with the Order. Financial information is available from several sources:

- Agency files contain financial information collected as part of the identification of parties responsible for the hazards posed

by sites on the National Priorities List.

- The Securities and Exchange Commission (SEC) requires publicly traded companies to submit detailed financial statements. This information is publicly available. (Consult NEIC'S manual entitled "Identifying Responsible Parties" for additional information on obtaining SEC files.)
- Responsible parties may submit financial information to the Agency during discussions or negotiations held prior to the issuance of an Order.

In addition, NEIC can provide further information on Respondents' financial status.

B. Number of Responsible Parties Subject to the Order

For two primary reasons, the success of Orders for remedial action is enhanced where there are relatively few responsible parties.

1) Coordination of Response Action

An Order issued to multiple Respondents who are jointly and severally liable generally will not allocate individual clean up responsibilities.4/ Instead, the Order will require the same response action to be conducted by each responsible party. Multiple parties must organize and coordinate their response to ensure compliance with the Order's requirements. Thus, compliance with Orders may depend upon group agreement

4/ However, the Agency may issue an Order to a Respondent requiring a response to a discrete, separable aspect of the hazard at a site, notwithstanding the existence of other responsible parties or other less divisible problem areas.

on each member's share of the response cost. In a large group of responsible parties, it may be difficult for the group to develop a consensus on individual liability and perform response activities as quickly as necessary to abate imminent hazard conditions at a site. Accordingly, issuing Orders to all responsible parties may not be appropriate where there are a large number of parties who are unlikely to agree on a concerted response. Instead, the Agency will pursue judicial remedies or consider issuing Orders to a selected subset of responsible parties.

Even in situations where Orders are issued to a large number of parties, Agency policy, which should be reflected in the terms of the Order, is that each Respondent is individually liable for compliance with the Order's requirements. Individual liability also extends to penalties and punitive damages imposed by CERCLA for failure to comply with the Order.

2) Supervision

After an Order is issued, the Agency conducts compliance monitoring at the site to ensure that responsible parties comply with the terms of the Order. Although no maximum number of responsible parties can be specified as optimum, it is clear that the Agency's oversight responsibility is most effectively accomplished where there are a limited number of responsible parties.

C. Specificity of the Necessary Response Action

In order to minimize the potential for confusion between Respondents and the Agency concerning the required response action, Orders should be used in situations where the nature of the required response action has been relatively precisely

identified. Orders are normally better suited to mandating discrete tasks such as drum removals rather than less exact actions such as planning. Otherwise it may be difficult for the Agency to supervise compliance activities, and for responsible parties to reach agreement on a compliance plan. In most cases, information sufficient to describe the required response actions will be generated by the RI/FS.

An Order should contain the following elements (see Appendix B):

- The steps the Respondent must take to comply with the Order;
- The effective date of the Order;
- A mandatory time-table for completion of remedial work; and, where appropriate,
- A statement to the effect that other actions or orders may follow.

Specific remedial action Orders benefit both the Agency and responsible parties. Responsible parties are provided clearly defined compliance standards which will facilitate agreement among the responsible parties on a remedial plan. If the responsible parties then determine that the remedial work is best accomplished by a third party contractor, the Order provides a basis for their contract negotiations.

Specific Orders benefit the Agency by reducing the difficulty of supervision and judicial enforcement. In noncompliance situations, the Agency may seek to enforce an Order in court. A specific Order provides the court with Agency-articulated standards by which to judge the responsible party's non-compliance with its terms. Therefore, EPA should make every effort to clearly articulate the response activities required by an Order.

D. Agency's Readiness to Litigate the Merits of the Order

After the Agency issues an Order, the respondent may seek judicial review to stay the Order. Respondents may challenge their liability or the appropriateness of the remedy specified in the Order. On the other hand, the Agency may promptly seek to enforce the Order in court. In light of these possibilities, the Agency must be ready to defend the Order in court at the time it is issued. This means that the site problem, the reasonableness of the required response, evidence of liability, and the Agency's response to issues raised by the recipient must be thoroughly documented, and that the documentation be organized and easily retrievable. The documentation will constitute the administrative record for any litigation.

E. Competing Considerations

The absence of the factors listed above may argue in favor of pursuing a judicial or Fund-financed, rather than an administrative, remedy. For example, EPA should not normally issue an

order if the necessary response actions have not been clearly identified. In addition, Agency enforcement personnel should strongly consider the judicial course of action if:

- the responsible parties have violated provisions in several environmental statutes;
- the opportunity for public comment on the terms of a settlement agreement warrants the use of a judicial consent decree, (where there is a 30-day comment period before the decree is finalized) 5/; and
- there is a need for long term court oversight of a settlement agreement, (such as in cases where an agreement calls for separately enforceable response milestones prior to completion of the cleanup).

V. Orders Relating to Removals and Remedial Actions

Guidance on conducting removal actions issued by the Office of Emergency and Remedial Response (OERR) divides the statutory concept of removals into "immediate" and "planned" removals.

A. Immediate Removals

Immediate removal actions are to be taken only if a response is needed within a relatively short time frame to prevent or mitigate significant harm to human health or the

5/ However, it should be noted that the Agency is exploring mechanisms which provide for public comment on both unilateral and consent administrative Orders. Guidance on this matter will be provided at a later date.

environment, and such action will not otherwise be provided on a timely basis.

Orders may be used to compel various immediate removal measures, including:

1. Suspension of activities which aggravate an existing release or substantial threat of a release (e.g., active use of a storage tank judged by the OSC to be in imminent danger of failure).
2. Suspension of activities which interfere with Federal removal actions (e.g., plant traffic in area of cleanup).
3. Movement or non-movement of a transport vehicle (railway tank car, tank truck, tank vessel) which is the source of a release or substantial threat of a release.
4. Measures to limit access, such as fencing.
5. Use of readily available equipment, owned by the responsible party, to contain or remove a release during the initial stages of a response before the OSC is able to obtain comparable equipment from other sources.
6. Dikings; construction of berms; or removal of the hazardous substance to an approved facility.

(This list illustrates various uses for an Order; it is not an exclusive compendium.)

Section 106(a) Orders, both in immediate and non-immediate situations, must contain a statement notifying the party of EPA's authority and the liability that may be incurred by failure to comply. As specifically as possible the Order prescribes the response activity and sets the date for its completion. To ensure enforceability of the Order, EPA should not undertake its own CERCLA-funded response activity during the period of time given to the party to respond, unless (i) such CERCLA-funded response activity becomes necessary due to the immmediacy of the release or threat of release or (ii) the Respondent formally and unequivocally states an unwillingness to comply with the Order. In the event the party undertakes response activity, the OSC should remain on-site to ensure that the work is being conducted in accordance with the Order.

B. Planned Removals and Remedial Actions

Planned removal situations are those that allow several days or weeks to execute the response. Remedial actions, on the other hand, are generally those intended to provide a permanent resolution to the release and require a longer time and more expensive efforts to implement.

As in the case of immediate removals, an Order is available to compel response measures routinely taken during planned removal and remedial actions. "Removal activity" includes assessment programs to evaluate the nature of the problem, and removal of

material from the site. "Remedial actions" are those consistent with a permanent remedy, and include such activity as capping the area, trenching, and provision of an alternate water supply.6/ EPA's position is that any activity that the Government might undertake at a site - from planning and studies to complete cleanup-could be ordered pursuant to §106(a). Of course, the issuance of more than one Order may be necessary if the cleanup is performed in stages, or if additional responsible parties become known to EPA who should participate in the cleanup.

VI. Procedures for Issuance of §106(a) Orders.

CERCLA designates the President as the primary official responsible for taking response and enforcement action under the Act. The authority to issue administrative orders under §106(a) has been delegated to the Administrator of EPA by Executive Order No. 12316, and redelegated by the Administrator to the Regional Administrators and the Assistant Administrator for Solid Waste and Emergency Response (AA-OSWER). The RAs and the AA-OSWER must consult with the Associate Administrator for Legal and Enforcement Counsel (AA-OLEC) prior to exercising this authority, and the RAs must obtain advance concurrence from the AA-OSWER. (See Delegations Manual: 14-14.) The AA-OLEC has

6/ See §101(23) of CERCLA for definition of "remove" or "removal", and §101(24) of CERCLA for definition of "remedy" or "remedial action". Those definitions contain detailed examples of the types of activities that fall within these categories.

redelegated the consultation authority to the Associate Enforcement Counsel-Waste and the Regional Counsels. The AA OSWER has redelegated his advance concurrence authority to the Director, Office of Waste Programs Enforcement (OWPE). The Office of Waste Programs Enforcement will develop and issue criteria in separate guidance which will be used to evaluate circumstances under which this advance concurrence requirement will be waived on a Region by Region basis. Regional offices are expected to develop strong administrative enforcement programs, on an expeditious schedule, which will permit them to initiate and issue legally and technically adequate administrative orders with only prior notice to Headquarters.

A. Planned Removals and Remedial Actions

For planned removals and remedial actions, Orders are drafted by the Regional program office with the cooperation of the Regional Counsel's office. The draft Order is forwarded to the Office of Waste Programs Enforcement for review and concurrence. The Regional Administrators will usually issue the Order and provide prior notice of the action to the state.

B. Immediate Removals

For those Orders which require emergency or quick handling, usually in response to situations warranting an immediate removal, the following approval sequence will be used:

The Regional Administrator first must determine whether to issue an Order based on communication with the OSC and consultation with Regional Counsel. The Region then prepares an order with any supporting information and electronically

transmits the material to the Office of Waste Programs Enforcement for review and concurrence. Notification to the State of our intent to issue the Order should be accomplished orally, and followed up by formal written notice.

VII. Opportunity to Confer

Agency policy is to offer parties to whom EPA has issued a unilateral §106 Order an opportunity to confer with the Agency concerning the appropriateness of its terms and its applicability to the recipient. The conference will help EPA ensure that it has based its Order on complete and accurate information and help EPA and Respondents reach a common understanding of how the Order should be implemented or modified. The procedures for exercising this option are communicated to respondents through the text of the Order itself. (See sample Order, page 4 of Appendix B.)

A. Planned Removals and Remedial Actions

Each Order will specify a date when the Order becomes effective. For actions other than immediate removals, the effective date should ordinarily be twenty calendar days from the day the Order is received by the Respondent. Certain Orders, such as those requiring that long term remedial actions be taken, may warrant a more extensive examination of the facts. In such cases, the Order may specify an effective date more than twenty days removed to permit the Respondent an opportunity to discuss the Order with the Agency beyond that accorded by the procedures set forth in Subpart C below.

If the Respondent seeks to confer with the Agency about the Order, the Respondent must provide written notification to the EPA official listed in the Order within ten calendar days of the date of receipt. The conference should be scheduled and held as soon thereafter as practicable, but prior to twenty days from the date the Order was received by the Respondent.

B. Emergency Situations

The applicable time periods for the effective date and for requesting a conference may be shortened, (e.g., to 72 and 48 hours respectively), or the conference procedures may be eliminated entirely, if the immediacy of the hazard posed by a site and other surrounding circumstances so warrant. In the former situation, the Order should permit the Respondent to request a conference orally, later followed by written notification.

C. Conference Procedures

The conference will normally be held at the appropriate EPA Regional office and will be presided over by the Regional Administrator's designee. However, other arrangements may be agreed to for the sake of convenience to the parties. At the conference, EPA should be prepared to provide the Respondent with information sufficient to explain the basis for the Order and to promote constructive discussions. The Respondent will have the opportunity to ask questions and present its views through legal counsel or technical advisors. The schedule and agenda for the conference will be left to the discretion of the EPA official leading the conference, as long as the Respondent

receives a reasonable opportunity to address relevant issues.

Following the conference, a written summary of the proceeding must be prepared, signed by the Agency official who presided over the conference. The written statement should contain:

- A statement of the date(s) and attendees of any conference(s) held; and
- A description of the major inquiries made and views offered by the Respondent contesting the terms of the Order.

In addition, the presiding official must prepare a statement which addresses the significant arguments raised by the Respondent and which recommends whether and how the Order should be modified, together with the reasons therefor.

D. Modification, Revocation, or Stay of the Order

Based upon a review of the file upon which the Order initially was based, any probative information or argument proffered by the Respondent following receipt of the Order, and the recommendation of the presiding official, the issuing official may modify or revoke the Order. Any modification to the Order must be communicated to the Respondent as part of a copy of a written statement containing the elements listed in Subpart C above. The original should be kept in the Agency files along with the evidence supporting the order, copies of written documents offered in rebuttal by the Respondent during the conference, and a copy of the request for a conference.

The issuing official may also stay the effective date of the Order if the conference process could not be completed

within the specified time period. Before substantially modifying or revoking an Order, the issuing official must consult with the appropriate Headquarters or Regional counsel and obtain the advance concurrence of the Director, OWPE.

VIII. Procedure If Order Is Not Obeyed

In the event the party to whom the Order is issued does not comply with its terms, the Agency must quickly decide whether to attempt to enforce the Order by referring the case to the Department of Justice for filing of a suit to force compliance, or whether to undertake cleanup of the site by use of CERCLA funds, and then file suit against the party for reimbursement of the costs expended plus statutory penalties for failure to comply with the Order.

The determination of which action to pursue depends on the type of response action to be taken. Obviously, if an immediate removal action is required by the hazard at the site, EPA will clean up the site and attempt recovery of costs and penalties in a subsequent recovery action. The same course of action applies to a planned removal where the removal action must be quickly undertaken and cannot await the filing of a suit. However, planned removal or remedial responses which require an extended period of time to perform, and in which initiation of action may be delayed for a brief period without jeopardizing human health and the environment, may allow sufficient time for the filing of a suit to enforce the Order, or at least that portion of the Order which calls for the planned removal or

remedial action to be taken.

Other factors which may enter into this determination include the strength of evidence and the financial ability of the party to perform the desired response activity. The decision of which option to pursue is initially to be made by the Regional Administrator, in the same manner and using the same procedures as previously prescribed for any other enforcement action. The Regional Administrator's recommendation is then forwarded to Headquarters for action.

IX. Note on Purpose and Use of This Memorandum

The policy and procedures set forth herein, and internal office procedures adopted pursuant hereto, are intended solely for the guidance of attorneys and other employees of the U.S. Environmental Protection Agency. They are not intended to nor do they constitute rule-making by the Agency, and may not be relied upon to create a right or benefit, substantive or procedural, enforceable at law or in equity, by any person. The Agency may take any action which is at variance with the policies or procedures contained in this memorandum, or which is not in compliance with internal office procedures that may be adopted pursuant to these materials.

Attached to this memorandum as Appendices A and B are

- A sample letter to a state providing notification of the Agency's intent to issue a §106 Order; and
- A sample Order.

If you have any questions or problems concerning any matter contained herein, please call the Director, OWPE , (382-4814), or Russell B. Selman (426-7503) or Steve Leifer (382-4548) of the Office of Legal and Enforcement Policy.

Attachments

Appendix A

STATE NOTIFICATION LETTER

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. R. Jones
State Agency
Division of Environmental Control

Dear Mr. Jones:

Enclosed for your information is a copy of an order [stamped "DRAFT" and "CONFIDENTIAL"] that the Agency intends to issue on or after [date], to the XYZ Company, pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, (42 USC 9606). The order requires certain activities to be taken at the company's site located at [location]. Please refer to the enclosed copy of the proposed order for the specific actions required of the company and the time within which such actions must be taken. If you have any comments or questions concerning the order, please contact [EPA official] at [office].

Sincerely yours,

Assistant Administrator for
Solid Waste and Emergency Response

[or]

Regional Administrator

[or their designees]

Enclosure

cc: Honorable J. Smith, Governor

Appendix B

SAMPLE ORDER

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In The Matter Of (Name of Person, Firm or Corporation)	)	
Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 USC Section 9606(a))	)	Docket No._____

ORDER

The following Order is issued on this date to (insert name and address of person, firm or corporation, along with facility name or place of business if the Respondent is not the owner or operator) ("Respondent(s)"), pursuant to §106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (42 USC 9606(a)), by authority delegated to the undersigned by the Administrator of the United States Environmental Protection Agency (EPA). Notice of the issuance of this Order has heretofore been given to the State of _____ .

There is an imminent and substantial endangerment to the public health and welfare and the environment due to a (threat of a release)(release) of (a) hazardous substance(s) as defined in §101(14) of CERCLA (42 USC 9601(14)), from the following location (the "Facility"):

(insert legal description, if known;
otherwise, use street or route address)

This order directs you to undertake action to protect the public and the environment from this endangerment.

FINDINGS AND CONCLUSIONS

1. (Choose one or more of 1A through 1E, as appropriate under the factual situation of the case. Do not include headings.)

1A. [(Present Owner)- Respondent is now, and has been since _____, 19___, the (owner)(and)(operator) of the Facility, as determined from (source of information)].

1B. [(Former owner/operator) - Respondent was, from _____, 19___, until _____, 19___, the (owner)(and)(operator) of the Facility, as determined from (source of information). During that time, hazardous substances, including those described herein, were disposed of at the facility. Respondent sold or otherwise transferred and conveyed the Facility to _____ on _____, 19___, according to (property records)].

1C. [(Generator) - Respondent (disposed of) (arranged, by contract or agreement, for the disposal or transport for disposal) of hazardous substances at the Facility as determined from (source)].

1D. [(Transporter) - Respondent chose to accept hazardous substances for transport to, and disposal at, the Facility as determined from (source)].

1E. [(Other Party) (Insert reasons why ordered actions are necessary to facilitate the abatement of the hazard, prevent the aggravation of the hazard, or otherwise protect the public health and welfare and/or the environment.)]

2. (Describe the nature of the facility.)

3. On or about the _____ day of _____, 19___, an inspection of the Facility was conducted by ___(names)_____, (a) duly authorized representative(s) of (EPA, State agency). At the time of that inspection, the inspectors observed the following conditions existing at the Facility:

A. Approximately 1000 drums of liquid, semi-solid and solid material, which were leaking, without covers and in various stages of corrosion, rusting and other deterioration, located directly on the ground. Material leaking from said drums was observed running approximately 25 yards across the site into Crystal Creek, which adjoins the Facility, and which is a tributary of Pristine River, a navigable water. According to records at the Facility, materials contained in the drums include:

(describe hazardous substances)

B. An area in the Facility (the "Landfill area") of approximately four (4) acres in size, without vegetation, from which leachate was

observed flowing approximately forty (40) yards into Crystal Creek. Vegetation had been killed in the area of the leachate. According to records at the Facility, the following hazardous substances had been placed in the Landfill area:

(list Hazardous substances- then continue with the following)

At the time of the inspection, _____ samples of the drummed waste, samples of the leachate from the Landfill area, and _____ samples of (soil, surface water, groundwater, air, etc.) were obtained by the inspector(s).

4. An analysis of the samples taken at the time of the inspection disclosed the presence at the Facility of the following substances in the concentrations set forth:

(list hazardous substances and concentrations confirmed by analysis - then continue with following sentence)

These substances are "hazardous substances" as defined in §101(14) of CERCLA, and are subject to the terms and provisions of that Act.

5. The hazardous substances described above are treated or disposed of at the Facility in such manner that they (are being) (threaten to be) released and discharged from the Facility into the (soil, groundwater,, surface water, air, etc.) and other parts of the environment.

6. (Describe population or environment at risk and route of exposure). Exposure to said hazardous substances may cause illness, disease, death or other harmful effects to plant and animal life and humans.

7. The (release) (and/or) (threat of release) of said hazardous substances may present an imminent and substantial endangerment to public health and welfare and the environment.

8. In order to protect human health and welfare and the environment, it is necessary that action be taken to contain and terminate the (release) (and/or) (threat of release) of hazardous substances from the Facility into the environment.

ORDER

Based upon the foregoing determinations and Findings of Fact, it is hereby Ordered and Directed that:

(NOTE - the Respondent may be ordered to undertake any response activity that may be required to protect public health, welfare and the environment, including, but not limited to, those actions which the government is authorized to carry out under CERCLA.)

(Insert here the response actions which EPA directs the Respondent to take at the site. Each activity, (i.e., redrumming of waste, construction of fencing, levees, submission of plans for installation of monitoring wells, etc.), and the date for compliance with each activity, should be listed separately.)

(Insert a statement to the effect that other orders or action may follow.)

EFFECTIVE DATE - OPPORTUNITY TO CONFER

This Order is effective on the twentieth calendar day following receipt thereof by Respondent, and all times for performance of response activities shall be calculated from that date. (Note: For immediate removal situations, the effective date will be considerably abbreviated.)

You may, within ten calendar days after receipt of this Order, request in writing a conference with (Official) to discuss this Order and its applicability to you. (Note: For immediate removal situations, the time for requesting a hearing will be abbreviated. In addition, the Respondent should be informed that he or she may make an oral request for a conference, to be followed up by written notice within two to three days.)

At any conference held pursuant to your request, you may appear in person and by attorney or other representatives for the purpose of presenting any objections, defenses or contentions which you may have regarding this Order. If you desire such a conference, please contact (name, title, address and telephone number of EPA contact) within the time set forth above for requesting a conference.

PENALTIES FOR NON-COMPLIANCE

Respondent is advised that willful violation or failure or refusal to comply with this Order, or any portion thereof, may subject you under §106(b) of CERCLA, (42 U.S.C. §9606(b)), to a civil penalty of not more than $5000 for each day in which such violation occurs or such failure to comply continues. Failure to comply with this Order, or any portion thereof, without sufficient cause, may subject you under §107(c)(3) of CERCLA, (42 U.S.C. §9607(c)(3)), to liability for punitive damages in an amount up to three times the amount of any costs incurred by the government as a result of your failure to take proper action.

WITNESS my hand in the City of _____, State of _____, as (title of authorized EPA issuing official), on this _____ day of _____, 19___.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: _____

ADMINISTRATIVE PROCEDURES FOR §3008(h) UNILATERAL ORDERS

- §3008(b) provides for hearing on request

- §3008(h) procedures streamlined

§3008(a) PROCEDURES APPLY WHEN:

- Joint §3008(a)/ §3008(h) order

- §3008(h) orders seeking to revoke/suspend authority to operate under §3005(e)

- §3008(h) (2) orders seeking penalties for noncompliance with §3008(h) order

ADMINISTRATIVE RECORD

- Prepare prior to issuance of order
- Exclude confidential business information
- Exclude deliberative documents
- Index and make available
- Order should state when and where available

PHASED APPROACH TO ORDERS

- Studies
- Remedies
- Interim Remedies

GENERAL PROVISIONS

- Issued by designee of RA

- Service effective upon receipt

  - Personal service
  - Certified mail

- Evidentiary hearing not required

- Ex parte contacts allowed

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 19 1987

MEMORANDUM

SUBJECT: Final Administrative Hearing Procedures for RCRA Section 3008(h) Orders

FROM: Thomas L. Adams, Jr.
Assistant Administrator
for Enforcement and Compliance Monitoring

J. Winston Porter
Assistant Administrator
for Solid Waste and Emergency Response

TO: Regional Administrators
Regional Counsels
Regional Waste Management
Division Directors
Office of General Counsel

We are hereby transmitting to you the final version of the Administrative Hearing Procedures for RCRA Section 3008(h) Orders (and related General Guidance). These procedures reflect the input of a number of commenters from the Regions and other Headquarters offices to whom we extend our thanks.

In response to suggestions made on the draft procedures circulated for comment on November 21, 1986, we have made several changes in the procedures. These include: (1) allowing the Presiding Officer and Regional Administrator to engage in ex parte contacts, while insuring that any new and relevant information gleaned from such contacts is served on opposing parties, who will have an opportunity to respond to same; (2) adopting alternative language in the draft of the "study order" procedures which will permit respondents to ask questions during the hearing only when the Presiding Officer in his discretion deems it appropriate; (3) returning to earlier "remedy order" procedure language which requires that the Agency respond to written questions in 14 (rather than 30) days, so as to insure that Agency responses are available before the hearing; (4) allowing use of the study order procedures for orders directing that limited interim measures in conjunction with studies be undertaken; and (5) restricting

respondent's ability to make major evidentiary submissions at the hearing rather than during prehearing procedures while insuring that the Agency may seek leave to respond after the hearing to late submissions. We have also included in the "General Guidance" which accompanies the Administrative Hearing Procedures a requirement that the public be afforded an opportunity to comment on the Agency's proposed remedy and be given notice of the final remedy before it is implemented.

Please also note that these procedures require that initial corrective action orders be issued by a Regional official other than the Regional Administrator. This requirement insures that the Regional Administrator, who will issue the final Agency decision affirming, modifying, or withdrawing the initial order, is not "tainted" as a decisionmaker by reason of having earlier performed a prosecutorial function in the same proceeding. Accordingly, it will be necessary for Regional Administrators, who have not already done so, to redelegate authority to issue initial (and final) [1]corrective action orders.

Several commenters have asked whether a request for a hearing under these procedures would prevent an order from becoming effective, or, stated differently, whether an initial corrective action order may be enforced after a request for hearing, but before issuance of the Regional Administrator's final decision. The Office of General Counsel has determined that, in light of the language of RCRA Section 3008(b) which indicates that an order becomes final unless the respondent requests a hearing, the order may not be enforced once a hearing is requested until a final Agency decision on the matter is issued.

In developing these administrative hearing procedures it has become clear that the regulations in 40 CFR Part 22 governing adjudicatory hearings on RCRA Section 3008(a) orders for injunctive relief and/or penalties, may in certain respects exceed minimum due process requirements. Accordingly, we have decided to re-evaluate these regulations to determine whether, as they apply to certain RCRA Section 3008(a) and similar proceedings, they are unnecessarily cumbersome or burdensome. Your thoughts on these questions will be invited at a later date.

Attachment

cc: Lisa Friedman
Bruce Weddle
RCRA Enforcement Branch Chiefs, Regions I-X

---

[1] The procedures contemplate that final orders would be signed by the same official who issued the initial order.

FEB 19 1997

GENERAL GUIDANCE ON ISSUANCE OF RCRA SECTION 3008(h) ORDERS

1. To satisfy the public hearing requirement of Section 3008(b), unilateral RCRA administrative orders issued pursuant to Section 3008(h) must provide the named person or persons with the opportunity for a hearing. This guidance document and the attached hearing procedures set forth the procedures for issuing an administrative order for corrective action and conducting a hearing, except for hearings for the following types of orders: (1) Section 3008(h) orders that are combined in one order with claims under Section 3008(a); (2) Section 3008(h) orders that include a suspension or revocation of authorization to operate under Section 3005(e); and (3) orders issued under Section 3008(h) seeking penalties under Section 3008(h)(2) for noncompliance with a Section 3008(h) order. Hearings for the three above-outlined categories of orders must be held under 40 CFR Part 22. The procedures in 40 CFR Part 22 do not apply to other orders issued under Section 3008(h).

2. Except in unusual circumstances, for orders not issued on consent, separate orders will be issued for distinct phases of work rather than a single, multiple phase order. Consent orders may also be issued in a similar fashion.

Accordingly, when a particular corrective action is likely ultimately to involve studies, interim measures, and remedy, the first order should address the studies (including both the RCRA Facility Investigation, during which the nature and extent of any releases are characterized, and the Corrective Measures

Study, during which proposals for remediation are developed) and any known interim measures. A subsequent order(s) should address additional actions to be undertaken. A copy of the "Administrative Hearing Procedures for RCRA Section 3008(h) Orders" (not to include the "General Guidance on Issuance of RCRA Section 3008(h) Orders") should accompany each initial administrative order. A hearing under these procedures may be requested by a respondent whenever a new order is issued.

3. Prior to the issuance of an initial administrative order or a final administrative order on consent, the EPA office issuing the order shall prepare an administrative record supporting the findings of fact, determinations of law and relief in the initial order or final order on consent. The administrative record must have an index and be available for review during normal business hours, after issuance of an order. The order must state when and where the record is available for review.

4. The record shall include, subject to applicable law restricting the public disclosure of confidential information and deliberative material, all relevant documents and oral information (which has been reduced to writing) which the Agency considered in the process of issuing the order, including: (1) EPA records on conditions at the facility, such as inspection reports, sampling and analytical data, business records, and photographs; (2) other reports and internal Agency documents used in generating or supporting the enforcement action; (3) copies of all relevant correspondence between EPA and the respondent; (4) written records

of relevant conferences and telephone conversations between EPA and the respondent; (5) copies of correspondence between EPA and State or other federal agencies pertaining to the enforcement action; and (6) comments submitted by the public during the public comment period on the RCRA Facility Investigation/Corrective Measures Study results and proposed remedy, EPA's responses to significant comments, and any statement of the basis and purpose of the proposed corrective measures prepared by EPA.

5. Following the respondent's submission of its report on the RCRA Facility Investigation and Corrective Measures Study the Agency shall develop a proposed plan for corrective measures. The Agency shall prepare a document that summarizes the data relating to releases, outlines the recommendations contained in the Corrective Measures Study, and indicates briefly why EPA has adopted the proposed plan for corrective measures.

The Agency shall then (1) publish a notice and brief analysis of the proposed plan for corrective measures and make such plan available to the public, and (2) provide a reasonable opportunity (ordinarily 30-45 days) for submission of written comments and (in the event the Regional Administrator deems it appropriate) a public meeting on the plan. If the Regional Administrator denies a request for a public meeting, he shall explain his decision in writing.

The Agency shall, as necessary, modify its proposed plan for corrective measures on the basis of written and oral comments received. Prior to issuance of the initial order for corrective

measures the Agency shall prepare a responsiveness summary indicating whether and why it has accepted or rejected any significant comments. Following finalization of the order for corrective measures but before implementation of corrective measures, notice of the final plan for corrective measures shall be published and the plan shall be made available to the public.

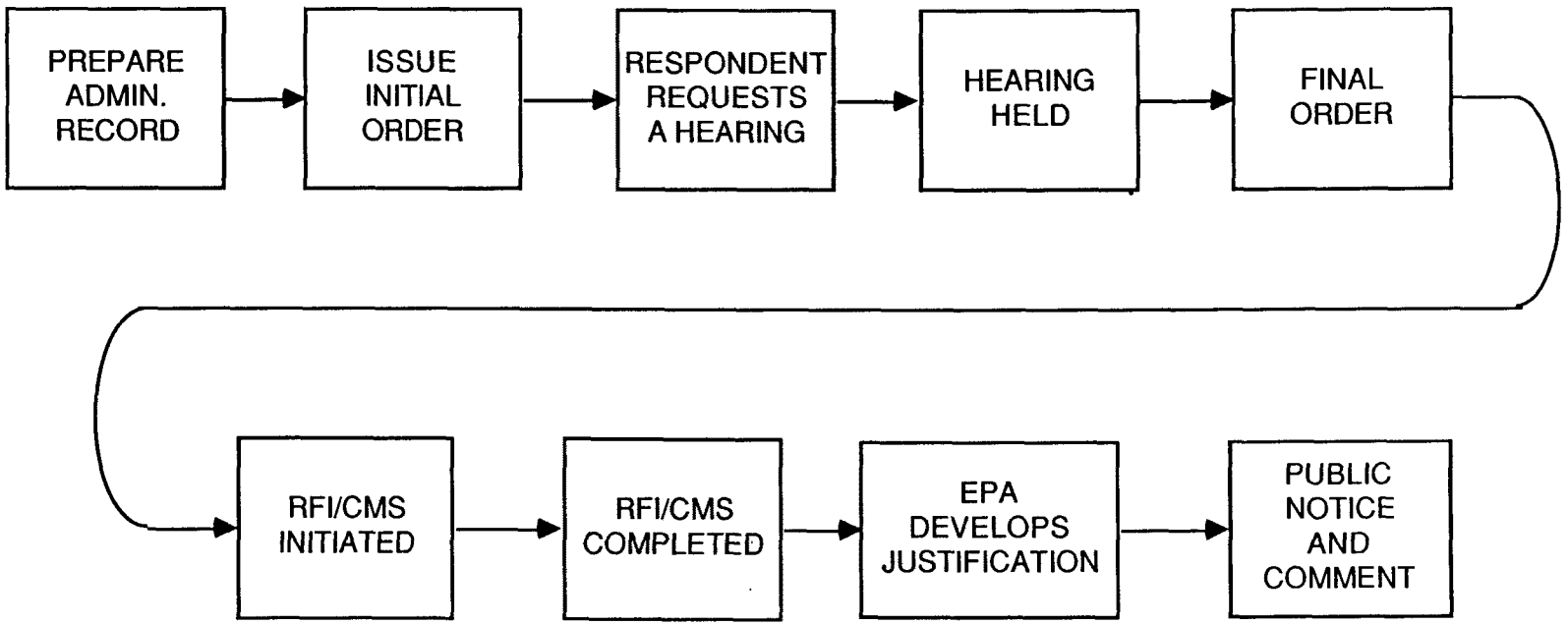
Where, in the interest of protecting human health and the environment, it is important that interim corrective measures be implemented quickly, no advance opportunity for written or oral comments will have to be afforded to the public. Here, EPA will simply provide substantially contemporaneous notice to the public of interim measures implemented. It is further contemplated that, where the Agency has directed the owner/operator to undertake certain remedial investigations but later determines that no corrective measures are required, the public shall have an opportunity to comment on this determination to the same extent as it may comment on a proposed plan for corrective measures.

Public involvement beyond that provided for herein is allowable at the discretion of the Regional Administrator. If a facility is on the National Priorities List, those additional procedures for public participation contained in the National Contingency Plan at 40 C.F.R. 300 et seq. must be followed.

6. A flow chart of the 3008(h) corrective action process indicating the points at which opportunities for public involvement or notice will normally occur is attached.

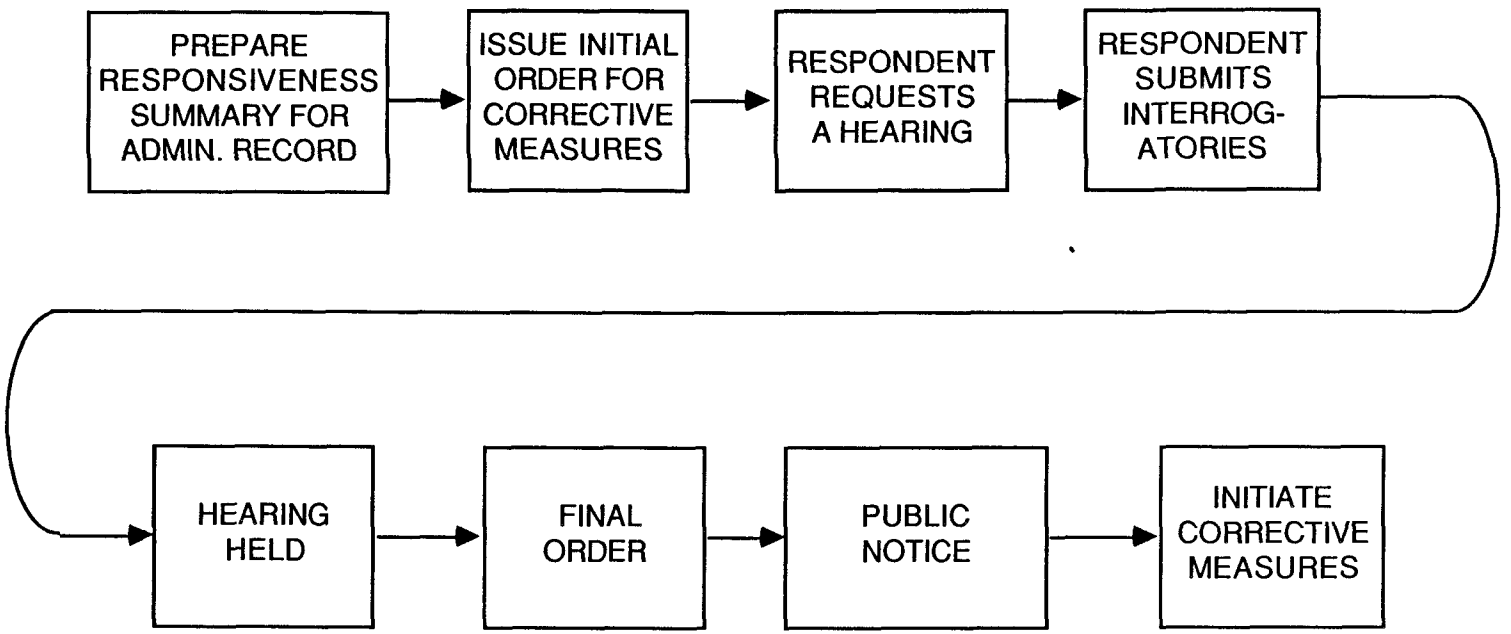
§3008(h) ADMINISTRATIVE HEARING PROCEDURES

Procedures to develop Orders for Studies/Investigations



§3008(h) ADMINISTRATIVE HEARING PROCEDURES

Procedures to develop Orders for Full Remedies



ADMINISTRATIVE HEARING PROCEDURES FOR RCRA SECTION 3008(h) ORDERS

I.

1. An administrative action under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA) shall be commenced by issuance of an administrative order. When the order is issued unilaterally, the order shall be referred to as an initial administrative order and may be referenced as a proceeding under Section 3008(h). When the order has become effective, either after issuance of a final order following a final decision by the Regional Administrator or after thirty days from issuance if no hearing is requested, the order shall be referred to as a final administrative order. Where the order is agreed to by the parties, the order shall be denominated as a final administrative order on consent.

2. The initial administrative order shall be executed by an authorized official of EPA (petitioner), other than the Regional Administrator or the Assistant Administrator for the Office of Solid Waste and Emergency Response. For orders issued by EPA Headquarters, rather than by a Regional office, all references in these procedures to the Regional Administrator shall be understood to be to the Assistant Administrator for the Office of Solid Waste and Emergency Response or his delegatee.

3. A Clerk shall be designated by the Regional Administrator to receive all initial orders, final orders, responses, memoranda, and documents regarding the order and to maintain the official record and docket.

4. The original and one copy of the initial administrative order, the final decision and the final administrative order, and one copy of the administrative record and an index thereto must be filed with the Clerk designated for Section 3008(h) orders. In addition, all memoranda and documents submitted in the proceeding shall be filed with the Clerk.

5. The Clerk (or some other designated EPA employee) shall arrange for the effectuation of service of the initial administrative order, the final decision, and final administrative order. Service of a copy of the initial administrative order together with a copy of these procedures, the final decision, or a final administrative order, shall be made personally or by certified mail, return receipt requested, or, if personal service can not be effectuated or certified mail is returned refused or unsigned, by regular mail, on the respondent or his representative. The Clerk shall serve other documents from the Presiding Officer by regular mail.

6. Service of all documents, filed by the parties, shall be made by the parties or their representatives on other parties or their representatives and may be made by regular mail, with the original filed with the Clerk.

7. Service of the initial administrative order and final administrative order is complete upon receipt by respondent (or the respondent's agent, attorney, representative or other person employed by respondent and receiving such service), personally or by certified mail, or upon mailing by regular mail if personal service or certified mail can not be accomplished, in accordance with Paragraph 5. Service of all other

pleadings and documents is complete upon mailing, except as provided in Paragraphs 15 and 25.

8. The initial administrative order becomes a final administrative order thirty (30) days after service of the order, unless the respondent files with the Clerk within thirty (30) days after service of the order, a response to the initial order order and requests a hearing.

9. The response to the initial order and request for a hearing must be in writing and mailed to, or personally served on, the Clerk of the Region which issued the order.

10. The response to the initial order shall specify each factual, or legal determination, or relief provision in the initial order the respondent disputes.

11. Upon receipt of a request for a hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

12. The respondent may request an informal settlement conference at any time by contacting the appropriate EPA employee, as specified in the initial administrative order. A request for an informal conference will not affect the respondent's obligation to timely request a hearing.

Whether or not the respondent requests a hearing, the parties may confer informally concerning any aspect of the order. The respondent and respondent's representatives shall generally be allowed the opportunity at an informal conference to discuss with the appropriate Agency technical and legal personnel all aspects

of the order, in particular the basis for the determination that a release has occurred and the appropriateness of the ordered corrective action.

13. If the initial order directs the respondent (a) to undertake only a RCRA Facility Investigation and/or Corrective Measures Study, which may include monitoring, surveys, testing, information gathering, analyses, and/or studies (including studies designed to develop recommendations for appropriate corrective measures), or (b) to undertake such investigations and/or studies and interim measures, which are neither costly nor technically complex and are necessary to protect human health and the environment prior to development of a permanent remedy, the hearing procedures set forth in Section II, A., Paragraphs 14 through 19, shall be employed for any requested hearing. If the respondent seeks a hearing on an order directing that corrective measures or such corrective measures together with studies be undertaken, the hearing procedures set forth in Section II, B., Paragraphs 20 through 30, shall be employed. The procedures contained in Section I, Paragraphs 1 through 13 and Section III, Paragraphs 31 through 33 shall be followed regardless of whether the initial order directs respondent to undertake an investigation or implement corrective measures.

II.

A. Hearings on Orders Requiring Investigations or Studies

14. The Presiding Officer shall be any employee of the Agency designated by the Regional Administrator other than a person

who drafted or participated in drafting the order in question.

If, after issuance of the initial order and prior to issuance of the final order, the Regional Administrator, Presiding Officer, or any person who will advise these officials in the decision on the case receives from or on behalf of any party in an ex parte communication information which is relevant to the decision on the case and to which other parties have not had an opportunity to respond, a summary of such information shall be served on all other parties, who shall have an opportunity to reply to same within ten (10) days of service of the summary.

15. The Presiding Officer shall establish the date and time for the requested public hearing. Subject to Paragraph 16, the hearing shall be scheduled and held within thirty (30) days of the Agency's receipt of the request for a public hearing.

At any time up to five (5) business days before the hearing respondent may, but is not required to, submit for inclusion in the administrative record information and argument supporting respondent's positions on the facts, law, and relief, as each relates to the order in question. All factual representations made by respondent must be in writing by affidavit. A copy of any information or argument submitted by respondent shall be served such that the Clerk and petitioner receive same at least five (5) business days before hearing.

16. The Presiding Officer may grant an extension of time for the conduct of the hearing, upon written request of either party, for good cause shown, and after consideration of any

prejudice to other parties. The Presiding Officer may not extend the date by which the request for hearing is due under paragraph 8.

17. The hearing shall be held in the city in which the relevant EPA Regional Office is located, unless the Presiding Officer determines that there is good cause to hold it in another location.

18. The Presiding Officer shall establish the agenda for the hearing and conduct the hearing in a fair and impartial way, taking action as needed to avoid unnecessary delay, exclude redundant material, and maintain order during the proceedings. Representatives of EPA shall introduce the administrative record and be prepared to summarize the basis for the order. The respondent shall have a reasonable opportunity to address relevant issues and present its views through legal counsel or technical advisors. The Presiding Officer may also allow technical and legal discussions and interchanges between the parties, including responses to questions to the extent deemed appropriate. It is not the Agency's intent to provide EPA or respondent an opportunity to engage in direct or cross examination of witnesses. Where respondent can demonstrate that, through no fault of its own, certain documents supportive of its position could not have been submitted before hearing in accordance with the requirements of Paragraph 15, it may submit such documents at hearing. Otherwise no new documentary support may be submitted at hearing. Unless otherwise directed by the Presiding Officer, factual

representations made by respondent shall be in writing by affidavit. The Presiding Officer may upon request grant petitioner leave to respond to submissions made by respondent pursuant to this paragraph or Paragraph 15.

19. As soon as practicable after the conclusion of the hearing a written summary of the proceeding shall be prepared. This summary shall, at a minimum, identify (a) the dates of and known attendees at the hearing, and (b) the bases upon which the respondent contested the terms of the order. The summary must be signed by the Presiding Officer.

The Presiding Officer will evaluate the entire administrative record and, on the basis of that review and the representations of EPA and respondent at the hearing, shall prepare and file a statement recommending to the Regional Administrator that the initial order be modified, withdrawn, or issued without modification. The statement must address all significant arguments raised by respondent and provide support, through citation to material contained in the record or adduced at the hearing, for any decision to modify a term of the order, withdraw the order, or issue the order without change.

The statement shall be based on the administrative record, including the hearing and supplemental submissions. If the Presiding Officer finds that there is not adequate support in the record for the initial order, the Presiding Officer may recommend that the order be modified and issued on terms that are supported by the record, or withdrawn.

B. Hearings on Orders Requiring Corrective Measures

20. The Presiding Officer shall be either the Regional Judicial Officer, or another attorney employed by the Agency who has had no prior connection to the Section 3008(h) initial order that is the subject of the proceeding.

If, after issuance of the initial order and prior to issuance of the final order, the Regional Administrator, Presiding Officer, or any person who will advise these officials in the decision on the case receives from or on behalf of any party in an ex parte communication information which is relevant to the decision on the case and to which other parties have not had an opportunity to respond, a summary of such information shall be served on all other parties, who shall have an opportunity to reply to same within ten (10) days of service of the summary.

21. The Presiding Officer shall establish an expeditious schedule for: (a) the submission by respondent of a memorandum, with appropriate affidavits and exhibits, stating and supporting respondent's position on the facts, law and relief, specifying the bases upon and manner in which such determinations or relief provisions, if erroneous, require modification or withdrawal of the order; (b) submission of a response by EPA; and (c) a public hearing. Subject to paragraph 22., a hearing shall be scheduled within 45 days of the order setting the schedule.

22. The Presiding Officer, as appropriate, may grant an extension of time for the filing of any document, other than a request for a hearing under paragraph 8, or may grant an extension of

time for the conduct of the hearing, upon written request of either party, for good cause shown and after consideration of any prejudice to other parties.

23. In accordance with the schedule set by the Presiding Officer, the respondent shall file a memorandum stating and supporting respondent's position on the facts, law and relief. The memorandum must identify each factual allegation and all issues regarding appropriateness of the terms of the relief in the initial order that respondent contests and for which respondent requests a hearing. The memorandum must clearly state respondent's position with respect to each such issue. Respondent must also include any proposals for modification of the order. Respondent must submit affidavits and exhibits which support any of its factual contentions on relief and defenses. The memorandum shall also present any arguments on the legal conclusions contained in the order.

24. The respondent may file a request with the Presiding Officer for permission to submit written questions to the EPA Regional Office issuing the order concerning issues of material fact in the order. Requests shall be accompanied by the proposed questions. In most instances, no more than twenty-five (25) questions, including subquestions and subparts, may be posed. The request and questions must be submitted to the Presiding Officer at least twenty-one (21) days before the hearing.

The Presiding Officer may direct EPA to respond to such questions as he designates, if he determines that such questions

are required for full disclosure and adequate resolution of the facts. No questions shall be allowed regarding matters of policy or privileged internal communications relating to the deliberative process. The Presiding Officer shall grant, deny, or modify such requests expeditiously. If a request is granted, the Presiding Officer may revise questions and may limit the number and scope of questions. Questions may be deleted or revised in the discretion of the Presiding Officer for reasons, which may include the fact that he finds the questions to be irrelevant, redundant, unneccessary, or an undue burden on the Agency. The Presiding Officer shall transmit the questions as submitted or as modified to EPA. EPA shall respond to the questions within fourteen (14) calendar days of service of the questions by the Presiding Officer, unless an extension is granted.

25. The Presiding Officer shall have the discretion to order either party to submit additional information in whatever form he deems appropriate. The Presiding Officer may issue subpoenas for the attendance and testimony of persons and the production of relevant papers, books, and documents. Since these hearing procedures provide elsewhere that the parties are not to engage in direct or cross examination of witnesses and must make any factual representations in writing by affidavit, the subpoena power is to serve only as an adjunct to the Presiding Officer's authority to ask questions and otherwise take steps to clarify factual matters which are in dispute. Upon request of the respondent, the Presiding Officer may, in his discretion, allow

submittal by the respondent of additional information in support of its claim, if it is received by the Clerk and petitioner at least five (5) business days before the hearing.

26. The hearing shall be held in the city in which the relevant EPA Regional Office is located, unless the Presiding Officer determines that there is good cause to hold it in another location.

27. The Presiding Officer shall conduct the hearing. The Presiding Officer shall conduct a fair and impartial hearing, take action to avoid unnecessary delay in the disposition of the proceedings, and maintain order. The Presiding Officer shall permit oral statements on behalf of the respondent and EPA. The Presiding Officer may address questions to the respondent or the EPA representative during the hearing. Although oral statements will be permitted at the hearing, unless otherwise directed by the Presiding Officer, all factual matters to be presented by respondent must be in writing by affidavit. Apart from questions by the Presiding Officer, no direct examination or cross-examination shall be allowed.

Upon commencement of the hearing, a representative of EPA shall introduce the order and the record supporting issuance of the order, and summarize the basis for the order. The respondent may respond to the administrative record and offer any facts, statements, explanations or documents which bear on any issue for which the hearing has been requested. Any such presentation by respondent may include new documents only to the extent that

respondent can demonstrate that, through no fault of its own, such documents could not have been submitted before hearing in accordance with the requirements of Paragraphs 23 and 25. The Agency may then present matters solely in rebuttal to matters previously presented by the respondent. The Presiding Officer may allow the respondent to respond to any such rebuttal submitted. The Presiding Officer may exclude repetitive or irrelevant matter. The Presiding Officer may upon request grant petitioner leave to respond to submissions made by respondent pursuant to this paragraph or Paragraph 25.

28. The hearing shall be either transcribed stenographically or tape recorded. Upon written request, such transcript or tape recording shall be made available for inspection or copying.

29. The transcript or recording of the hearing and all written submittals filed with the Clerk by the parties subsequent to initial issuance of the order including post-hearing submissions will become part of the administrative record for the proceeding, for consideration by the Presiding Officer and Regional Administrator.

30. The Presiding Officer will, as soon as practicable after the conclusion of the hearing, evaluate the entire administrative record and, on the basis of the administrative record, prepare and file a recommended decision with the Regional Administrator.

The recommended decision must address all material issues of fact or law properly raised by respondent, and must recommend that the order be modified, withdrawn or issued without modification.

The recommended decision must provide an explanation, with citation to material contained in the record, for any decision to modify a term of the order, to issue the order without change or to withdraw the order.

The recommended decision shall be based on the administrative record. If the Presiding Officer finds that there is not adequate support in the record for any contested required action, the Presiding Officer may recommend that the order be modified and issued on terms that are supported by the record, or withdrawn.

III

31. As soon as practicable after receipt of either the summary and statement or the recommended decision, the Regional Administrator will either sign, or modify such statement or recommended decision, and issue it as a final decision. The Regional Administrator's decision shall be based on the administrative record.

32. If the Regional Administrator does not adopt portions of the initial order, or finds that modification of the order is necessary, the signatory official on the initial administrative order shall modify the order in accordance with the terms of the final decision and file and serve a copy of the final administrative order. If the Regional Administrator finds the initial order appropriate as originally issued, the final decision shall declare the initial administrative order to be a final order, effective upon service of the final decision. If the Regional Administrator declares that the initial order must be withdrawn,

the signatory official on the initial administrative order will file and serve a withdrawal of the initial administrative order. This may be done without prejudice.

33. The final decision and the final administrative order are final agency actions that are effective on filing and service. These actions are not appealable to the Administrator.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

9901.3

MAY 5 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Guidance for Public Involvement In RCRA Section 3008(h) Actions

FROM: J. Winston Porter
Assistant Administrator

TO: ADDRESSEES

EPA is committed to providing meaningful opportunity to the public to be informed of and participate in decisions that affect them and their communities. This memorandum provides guidance on public involvement actions taken under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA).

It is highly likely that corrective action activities, which differ from normal operations at a facility, will generate public concern. The nature of the problem and the visibility of corrective action activities are two reasons for EPA to involve the public during the corrective action process. If the public is informed early, and allowed to be involved in the decision-making, it is less likely that there will be opposition to the decisions that are made. Also, valuable information can be obtained from concerned citizens who may know the site and facility's history.

Section 3008(h), the interim status corrective action authority, allows EPA to take enforcement action to require clean-up at a RCRA interim status facility when the Agency has information that there has been a release of hazardous waste or hazardous constituents. We anticipate that the cleanup program under Section 3008(h) will frequently be implemented with two orders. The first order would require the owner or operator to conduct a study to characterize the nature and extent of contamination, and to develop a remedy or alternative remedies as needed. Once a remedy has been selected, a second order would require design, construction, and implementation of that remedy.

MINIMUM PUBLIC INVOLVEMENT REQUIREMENTS

Although there will be many situations where much additional public involvement will be necessary, I would like to emphasize that there are minimun requirements for all 3008(h) orders, whether on consent or unilateral. Following the respondent's submission of its report on the RCRA Facility Investigation and Corrective Measures Study, the Agency will develop a proposed plan for corrective measures, or make the decision that no corrective measures are necessary. The Agency shall then (1) publish a notice and brief analysis of the proposed plan for corrective measures, or of its decision that no corrective measures are necessary, and make such information available to the public, and (2) provide a reasonable opportunity (ordinarily 30-45 days) for submission of written comments and, if the Regional Administrator deems it appropriate, a public meeting on the plan. If the Regional Administrator denies a request for a public meeting, he shall explain his decision in writing.

The Agency shall, as necessary, modify its proposed plan for corrective measures on the basis of written and oral comments received. Prior to issuance of the initial order for corrective measures the Agency shall prepare a responsiveness summary indicating whether and why it has accepted or rejected any significant comments. Following finalization of the order for corrective measures but before implementation of corrective measures, notice of the final plan for corrective measures shall be published and the plan shall be made available to the public.

Where, in the interest of protecting human health and the environment, it is important that interim corrective measures be implemented quickly, the public will have no advance opportunity for written or oral comments. Here, EPA will simply provide substantially contemporaneous notice to the public of interim measures being implemented.

EXPANDED PUBLIC INVOLVEMENT MAY BE NECESSARY

The degree of public involvement in a corrective action program will be determined by the amount of public interest in the site, the actual or potential hazard to human health or the environment and the type of clean-up action that will be undertaken. In general, if the Agency has identified releases and determined that they require investigation, the public should be informed that studies are underway. The Region may also want to hold additional public meetings if there is a lot of interest in the facility. The public should be made aware of significant technical issues at the site. There will be occasions where affected citizens can make valuable contributions to remedy selection through participation in technical discussions with owners or operators and government representatives.

We strongly urge the use of a public involvement plan for sites in which there is likely to be significant public interest. At appropriate points during the process, fact sheets can be developed that should both inform the public and allay fears that could surface if no substantive knowledge were made available. A public involvement plan tailored to each site can also be very helpful. You may refer to Community Relations in Superfund: A Handbook March 1986, and Public Involvement Guidance in the Permitting Program, March 1986, Directive 9500.01, for further information on public involvement techniques and process. The regional RCRA public involvement coordinator can also offer valuable information and assistance.

There are limitations on the release or discussion of certain information during the §3008(h) enforcement process. This is especially true during negotiations. The confidentiality of statements made during the course of negotiations must be maintained. Our goal during negotiations is to encourage frank discussion of all issues, and try to resolve differences. Public disclosure of this information would jeopardize the success of the negotiations. Disclosures of strengths and weaknesses of a case, information that is privileged and protected under the law, enforcement strategy and timing would also jeopardize the government's enforcement position. If a case is referred to the Department of Justice to initiate litigation, further constraints may be placed upon public involvement. In this situation, the scope of public involvement should be discussed with the lead DOJ attorney.

Coordination among EPA and/or State personnel is very important. At some sites, RCRA Permits and Enforcement Personnel and Superfund will be involved, and a coordinated approach will serve the Agency and the public best. In order to establish a network whereby information can be exchanged, I would like each region to appoint a coordinator for public involvement in §3008(h) orders. This person may be from either your public involvement or enforcement staffs. Please call Jackie Tenusak of my staff at FTS 475-8729 with the name of your contact.

Thank you for your attention to this matter. Please do not hesitate to call me, or any of our public involvement staff, if you have questions.

ADDRESSEES

Regional Hazardous Waste Management Division Directors,
Regions I-X

RCRA Enforcement Section Chiefs
Regions I-X

RCRA Enforcement Branch Chiefs
Regions I-X

Public Involvement/Community Relations Coordinators
Regions I-X

cc: Pamela Garrow, OWPE
Olga Corey, OWPE
Vanessa Musgrave, OSW
Melissa Friedland, OERR

PUBLIC INVOLVEMENT IN CORRECTIVE ACTION

RCRA PERMITTING

- Conduct Field Assessment
- Public Involvement Plan
  - Mailing List

* Public Notice

* Public Comment Period

* Public Hearing, if requested

- Fact Sheet

RCRA FACILITY ASSESSMENT
RFA

DRAFT PERMIT

RCRA ENFORCEMENT

- Conduct Field Assessment
- Public Involvement Plan
- Public Meetings

PRELIMINARY ASSESSMENT/ SITE INVESTIGATION
PA/SI

CERCLA

* Public Comment Period on the Proposed NPL

* Community Interviews

* Community Relations Plan

* Information Repository

- Fact Sheets
- Public Meetings

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* Required
• Suggested
`---` Refers to Permits only

PUBLIC INVOLVEMENT IN CORRECTIVE ACTION

RCRA
PERMITTING

RCRA FACILITY INVESTIGATION
RFI

- Fact Sheets
- Public Meetings

RCRA
ENFORCEMENT

- Fact Sheets
- Public Meetings

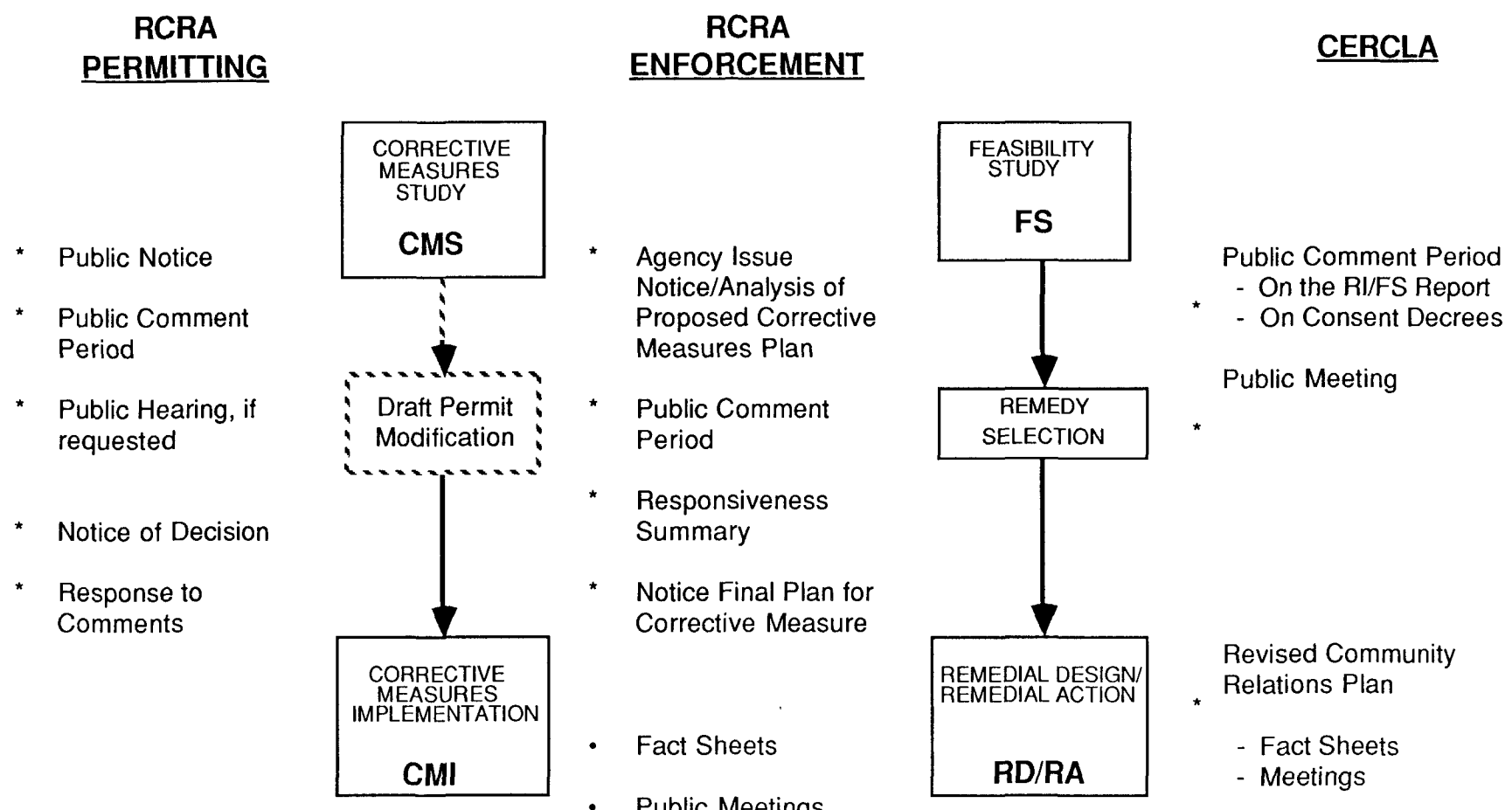
REMEDIAL INVESTIGATION
RI

CERCLA

- Progress meetings
- Fact sheets

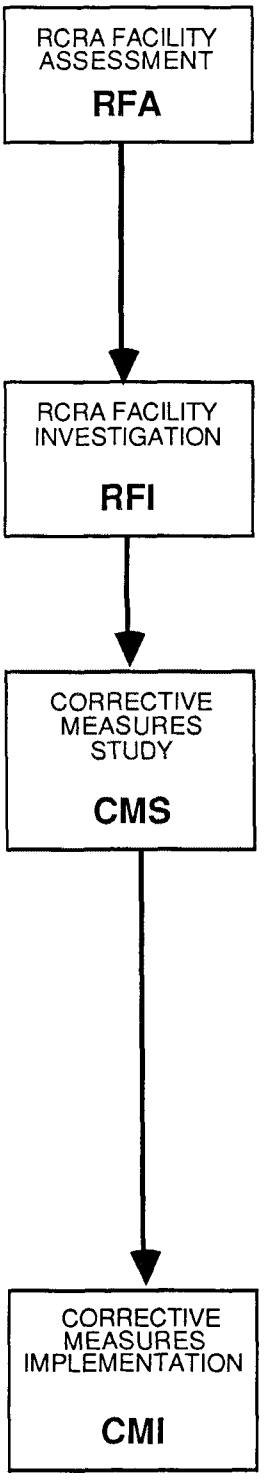
- Suggested

PUBLIC INVOLVEMENT IN CORRECTIVE ACTION



* Required
• Suggested
- - - Refers to Permits only

PUBLIC INVOLVEMENT IN RCRA §3008(h)



- Conduct Field Assessment
- Public Involvement Plan
- Public Meetings

- Fact Sheets
- Public Meetings

* Agency Issue Notice/Analysis of Proposed Corrective Measures Plan
* Public Comment Period
* Responsiveness Summary
* Notice Final Plan for Corrective Measure

- Fact Sheets
- Public Meetings

* Required
• Suggested

OSWER Policy Directive
No. 9500.00-1A

GUIDANCE ON PUBLIC INVOLVEMENT IN THE RCRA PERMITTING PROGRAM

Office of Solid Waste

U.S. Environmental Protection Agency

January 1986

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PREFACE

This guidance document was developed by the Office of Solid Waste with support from ICF Incorporated under Contract No. 68-01-6861. It is intended to assist the EPA regional offices and state agencies in expanding public involvement in RCRA permitting, as suggested in EPA's National Permits Strategy.

This guidance document incorporates strategies and techniques previously developed for and already used by EPA. It includes excerpts or adaptations from the following documents:

Community Relations in Superfund: A Handbook. Prepared by ICF Incorporated for the U.S. EPA. September 1983.

EPA and the Public: A Handbook on Public Participation Concepts and Skills. Barry Lawson Associates, Inc. 1981.

"Responsiveness Summary and Preamble on Public Participation Policy," Vol. 46, Federal Register, No. 12. 1981.

How to Write a Public Notice: A Collection of Examples. Barry H. Jordan. U.S. EPA Water Programs Operations. December 1979.

Implementation of the Resource Conservation and Recovery Act, U.S. EPA, No. EPA/530-SW-84-007. 1984.

Citizen Participation Handbook for Public Officials and Other Professionals Serving the Public. Annemarie and Hans Bleiker. 1981.

1. INTRODUCTION

This guidance has been prepared for staff in U.S. Environmental Protection Agency (EPA) regional offices and in authorized states to facilitate public involvement in the permitting of hazardous waste management facilities under the Resource Conservation and Recovery Act (RCRA). It outlines a basic approach to involving the local community in decision-making on a facility's permit, and identifies a series of key activities that should be conducted during the permitting process. The emphasis is on explaining how to plan and organize public involvement efforts. Suggested techniques for issuing public notices, holding meetings, responding to comments, and performing similar activities are also explained.

This guidance reflects EPA policy as stated in the National Permits Strategy (August 1984). It incorporates public participation requirements in RCRA section 7004(b)(1) and in EPA regulations on procedures for decision-making in 40 CFR Part 124, Subpart A.

The organization of this guidance is as follows. Chapter 2 presents EPA's policy and general guidelines for public involvement in RCRA permitting. Chapter 3 suggests activities for particular points in the permitting process to aid in planning, designing, and organizing a public involvement effort for a facility. Chapter 4 is a "how to" presentation. It consists of discussions of typical public involvement activities, with explanations of techniques for preparing and conducting these activities in the context of hazardous waste management facility permitting. Chapter 5 (reserved) addresses special issues that may require particular attention in planning a public involvement effort. There are two appendices. Appendix A provides a format for the plans to be used to help prepare public involvement efforts, and Appendix B provides samples of materials for public distribution.

For further information on this guidance, contact Vanessa Musgrave in the Office of Solid Waste at (202) 382-4751.

2. POLICY AND GUIDELINES FOR PUBLIC INVOLVEMENT

Public involvement in the permitting of hazardous waste treatment, storage, and disposal facilities provides an opportunity for all potentially affected and interested parties to become informed about and involved in the permitting process. Whether the final determination is to issue or deny a permit, public involvement ensures that decision-makers are better informed. Early public involvement can provide decision-makers with advance notice of citizens' concerns. It can also provide valuable information and ideas for consideration in developing environmentally protective permit conditions. The result will be permits better matched to particular facilities and their respective communities, and which will ultimately serve more effectively as a basis for sound hazardous waste management practices. Indeed, an active and early public involvement program may reduce delays in the permit process by decreasing the likelihood of time-consuming and expensive litigation by parties whose concerns have not been heard or addressed.

Accordingly, EPA's National Permits Strategy assigns high priority to early and expanded public involvement in facility permitting under RCRA. This guidance has been developed by the Permits Branch of EPA's Office of Solid Waste to support the implementation of an early and expanded public involvement program. The guidelines it offers are presented pursuant to the National Permits Strategy and to the public participation provisions of RCRA section 7004 and EPA regulations in 40 CFR Part 124. It has been prepared for use both by the EPA regional offices and by states authorized to issue RCRA permits.

This chapter of the guidance document is a policy statement that outlines the objectives of public involvement in the permitting program and offers basic guidelines for ensuring opportunities for the public to participate. Chapter 3 explains how to integrate public involvement with decision-making on a facility permit.

2.1 OBJECTIVES AND RATIONALE

The objectives of encouraging public involvement in RCRA permitting are as follows:

- Create early and continuing opportunities for public participation in RCRA permitting activities.
- Ensure public understanding of the RCRA program and of the implications of not awarding a final RCRA permit to a facility.
- Obtain the public's input to assist in evaluating a permit's environmental soundness.

- Create equal and open access to the permitting process.
- Ensure agency understanding of and responsiveness to public concerns.
- Anticipate conflicts and provide early means for resolution.
- Foster trust and openness between EPA or the state and the public.
- Emphasize the responsibilities of agency and program management for promoting effective public involvement in decision-making.

2.2 SCOPE OF APPLICABILITY OF PUBLIC INVOLVEMENT PROGRAM

The National Permits Strategy establishes as a key priority of the RCRA program the focusing of permitting and enforcement resources on environmentally significant facilities. While some of these facilities may also be significant in terms of public interest and concern, others may not. Because resources for expanded public involvement activities should be concentrated on the facilities that generate the most public concern, all environmentally significant facilities should be seriously considered, but not automatically targetted, for expanded public involvement.

The National Permits Strategy specifies the following criteria, in summary, for an environmentally significant facility:

- The facility is a recipient of wastes from a Superfund site;
- The facility has caused environmental damage, violated environmental standards, or disregarded RCRA regulations;
- The facility is a suspected source of ground or surface water contamination; or
- The facility poses significant environmental risk, based on proximity to population centers or ground or surface water; size; amount, nature, or complexity of wastes; and age.

The highest-priority environmentally significant facilities for expanded public involvement -- which will be referred to as **"targetted facilities"** throughout this guidance manual -- are further clarified as the following:

(1) All existing, environmentally significant, commercial hazardous waste treatment/storage/disposal/incineration facilities.

(2) All existing hazardous waste treatment/storage/disposal facilities about which significant public interest or concern has already been expressed, or about which significant public interest can reasonably be anticipated.

Predicting which facilities will generate significant public interest is not always possible. However, a number of factors have been shown to be typically associated with significant public interest or concern. In order to target facilities for public involvement efforts, an attempt should be made to discover if any of the following situations exist for a facility:

- The owner or operator lacks credibility with, or the trust of, the public or local officials;
- The permit allows the transportation of Superfund hazardous wastes to or from the facility;
- The public perceives that the facility poses major health risks;
- The type of technology proposed in the permit (e.g., incineration, underground injection, landfill, etc.) has a negative reputation in that particular area;
- Facility non-compliance or violations have been highly publicized or will be made known by the permit process (in general, the more serious the continuing non-compliance, the more public interest likely to be generated);
- The facility has been or will likely become an election issue; or
- Major hazardous substance releases or accidents have been recently publicized in the area.

Public involvement efforts are also very important in the siting of new facilities or the expansion of existing facilities. The local public may have special concerns about proposals for a new waste management facility in the community. Moreover, new incineration and treatment facilities offer alternatives to land disposal of hazardous wastes. Thus, a third type of targetted facility for public involvement efforts is the following:

(3) All proposed (not yet sited, constructed, or permitted) treatment or incineration facilities, both at new sites and as additions to existing sites.

2.3 GUIDELINES

The following guidelines should be considered in planning for public involvement in the RCRA permitting program and in conducting the activities described in Section 2.6 and Chapter 3:

- Public involvement efforts should be tailored to the distinctive issues and individual features of the facility and the surrounding community.

- The applicant and other responsible government agencies should have a role in public involvement efforts, especially to help clarify or resolve issues that may be related to the permit but are not or cannot be appropriately addressed by the RCRA permit process.

- Small-scale, low-profile, informal communications techniques are preferred. Public meetings may be held in informal settings, before small audiences, without elaborate presentations (e.g., in living rooms). They need not be conducted by high-level staff.

- In general, public involvement actions should extend beyond providing information to the public; they should actively reach out to the public, encourage participation, and provide an opportunity for public input on permit decisions made by EPA or the state.

2.4 KEY AREAS OF PUBLIC INTEREST

Because of certain provisions in the 1984 RCRA amendments, and the debate over enactment of those amendments, public interest in the RCRA permitting program has broadened and public involvement in the program will become more complex. The following issues, in particular, are likely to be of special concern.

1. Groundwater protection. There have been reports of widespread failure to comply with RCRA's groundwater protection requirements. The removal of wastes from Superfund sites to RCRA facilities has intensified concern over the possibility of groundwater contamination and its effects on human health.

2. Protective standards and enforcement for operating units. Public interest is already strong on the question of whether RCRA's design standards and operating specifications (e.g., landfill liner requirements) are strong enough and are being met. Citizens may not be aware of new RCRA standards. They may also question the federal or state agency's ability to adequately monitor permit requirements.

3. Exposure assessments and ATSDR referrals. Section 247 of the 1984 RCRA amendments requires each final permit application for a landfill or

surface impoundment to be accompanied by information on the potential for the public to be exposed to hazardous constituents through releases from the facility. There may be considerable local interest in this information. It is anticipated that referrals to the Agency for Toxic Substances and Disease Registry (ATSDR) will also be of concern to the public.

4. Corrective action. Significant public interest can be expected in all facets of corrective action requirements. Have releases occurred from a facility? Have any releases been cleaned up? Will corrective action be sufficient to prevent future releases? What kinds of investigations will be conducted to determine the need for corrective action?

5. Permit process itself. The length of time involved in issuing a permit as well as the adequacy of public involvement opportunities are examples of issues related to the permit process (as opposed to the contents of permits) that may be of public concern. When joint EPA/state RCRA permitting is conducted, the public may also have difficulty understanding the coordination process and the differences between federal and state requirements.

6. Transportation of hazardous wastes. Many times the public's strongest concern centers on hazardous wastes being transported to or from a facility. The common nature of traffic accidents and the proximity of transportation routes to homes and schools heighten the public's concern over releases during transportation. Often, though, the sheer volume of traffic and the associated noise and congestion are of even greater concern.

7. Evacuation plans. The very existence of evacuation plans implies that accidents can and will occur. Beyond the concern raised by that implication, the public has shown interest in the adequacy of evacuation plans. Who will be evacuated? How will they be notified? Who pays for alternative living arrangements?

8. Fire and explosion emergency plans. Like evacuation plans, these contingency plans acknowledge the potential for threats to the public's safety and undercut assurances that such occurrences are unlikely. The public is interested in the probability that fire and explosions will occur and the precautions being taken to prevent or reduce their danger. If local police and fire units are involved, the public may also be concerned over who pays for emergency responses, and whether or not local fire departments are adequately equipped or trained to respond.

9. Omnibus provision. Section 212 of the 1984 RCRA amendments states that "each permit...shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment." The public may be inclined to read great flexibility into this provision.

10. Consequences of permit denial. Whether an operating permit is approved or denied, the consequences will be of interest to the public. Economic impacts on employment, property values, and the local tax base are

all likely to generate concern. Denial may lead to special concerns because the public may not at first appreciate its environmental implications. Denying a permit for incineration, for example, might mean that the applicant has to continue to landfill wastes.

To derive full benefit from expanded public involvement, it is important to ensure the members of the community in which the facility is located the **opportunity to provide input on permit conditions as early as possible before the draft permit has been written**. For example, the local public should be enabled to comment on conditions requiring corrective action. If there is no opportunity for public input before the draft permit has been prepared, it may be impossible to provide the local public a meaningful voice in decision-making on the permit. While the public may comment on and provide input to the development of permit conditions, however, the final decision on permit conditions and on whether to issue or deny a permit rests with EPA or authorized states.

2.5 ROLES AND RESPONSIBILITIES

Each EPA regional office, and each state authorized to issue final permits, should designate someone on its staff as the RCRA permitting program public involvement coordinator. The coordinator will work with permit writers, enforcement personnel (both EPA and state), facility owner/operators, and other appropriate individuals or groups to implement public involvement activities, and will also serve as liaison to the Office of Solid Waste and the Administrator's office in the event of a permit appeal.

The RCRA public involvement effort should be viewed as a team effort. In certain instances, particularly during the field assessment (as explained in Sections 2.6 and 3.1) and development of the public involvement work plan for specific facilities, a contractor may also become part of the team.

It is anticipated that the roles and responsibilities of the various members of the public involvement team will vary depending on the region or state and individual permit circumstances. While it is not necessary that the following functions and activities be carried out in all cases by the individuals indicated, in general the responsibilities of each team member include (but are not necessarily limited to) the following:

Public Involvement Coordinator

(a) Identify potentially affected, concerned, or interested members of the community, including local and state officials and the local media.
(b) Develop public involvement plan and evaluate progress of public involvement activities. Update plan upon final determination of permit.
(c) Initiate and maintain lines of communication between the agency and the public.
(d) Identify the need for and develop educational and informational materials; take lead in other outreach activities regarding the RCRA permit process in general.

(e) Depending on the level of technical detail involved, lead or participate in dialogue activities regarding development of permit conditions to address citizen concerns.
(f) Coordinate public involvement activities with other programs and agencies.
(g) Provide feedback and reporting within the agency on public involvement.

Permit Writer and Other Technical Staff

(a) Participate in or take the lead in dialogue activities with public and owner/operator, including detailed discussion or negotiations on specific permit conditions on facility operations.
(b) Respond to, or provide the public involvement coordinator with information sufficient to respond to, the public's or owner/operator's specific technical questions related to the facility and its operation.
(c) Establish and maintain close communication with the public involvement coordinator relative to all aspects of permit development to ensure coordinated and consistent communications with the public.

Enforcement Personnel

(a) Participate in or take the lead in dialogue activities with the public and owner/operator regarding enforcement/compliance activities being developed for the facility.
(b) Respond to, or provide the public involvement coordinator with information sufficient to respond to, public and owner/operator questions and concerns regarding the facility's past and present compliance record.
(c) Establish and maintain close communications with the public involvement coordinator relative to all aspects of enforcement and compliance and corrective actions activities developed for the facility.

If a state is authorized or operates under a cooperative agreement with EPA, the above responsibilities can be assumed by state personnel. In unauthorized states, state agencies can still serve a supportive role by providing the regional public involvement coordinator with information, such as names for inclusion on a mailing list or background information on a facility's history and community attitudes towards the facility, and by coordinating state requirements on permits, public involvement, and administrative procedures. Regardless of the level of authorization, states should be encouraged to play an active role in expanded public involvement efforts.

During the same time that EPA or an authorized state is conducting public involvement activities at a facility, it is not uncommon for the owner/operator to initiate public outreach efforts of his own. Attempts by the owner/operator to inform and involve the public should be encouraged by

the public involvement coordinator. For example, the owner operator could conduct facility tours or hold public meetings. Owners or operators who do not initiate public involvement activities should be made aware of their responsibility to inform the public.

It is appropriate, in some instances, for EPA or state staff to participate in activities in which the owner/operator has taken the lead. At a public meeting held by the owner/operator, for instance, EPA or state staff could deliver a presentation on design and operating standards for that type of facility. In so doing, however, it is essential to distinguish EPA's (or the state's) cooperation with owner/operator educational efforts from support for public relations efforts aimed at gaining community support for the facility's permit. The regulatory role of EPA (or the state) must be clearly defined for the public and distinguished from the owner/operator's interests, regardless of whether the agency's involvement in owner/operator activities is to observe, participate, mediate, or simply to receive a report.

There may also be instances in which the owner or operator may contribute to public involvement efforts conducted by EPA or the state (although state requirements may preclude owner/operator participation in some activities.) For example, the owner/operator could be invited to provide panelists for discussion forums or participate in dialogue activities sponsored by the agency. Care should be taken, however, to ensure that the owner/operator's participation is constructive, coordinated with EPA's efforts, and supportive of EPA's policy for the RCRA permitting program as much as possible. The public, as well as the owner/operator, should recognize that decisions on permitting a waste management facility are made by EPA (or authorized states) on the basis of RCRA's mandate to protect human health and the environment, not on the basis of the owner/operator's interests.

There will be times when the owner/operator conducts public involvement activities separately from EPA or the state. The public involvement coordinator will need to be cognizant of these activities, because they will provide the public with information that may influence opinions. Conversely, the public involvement coordinator should inform the owner/operator of the public involvement program that the agency intends to conduct during the facility's permit process. Optimally, the efforts of the owner/operator and EPA (or the state) should complement each other without compromising the integrity of the agency's regulatory role.

2.6 CRITICAL ELEMENTS

The specific suggestions for public involvement in the RCRA permitting program have been kept to a minimum to provide the flexibility to adjust public involvement efforts to the extent of public interest, the environmental significance of the facility, and the status of the permit application. Because the intended result of this policy is for public involvement to facilitate the ability of EPA or the state to process permit applications, the activities included in each specific public involvement effort should be tailored to the particular needs of the community and facility.

The following, however, are three critical elements for public involvement in the RCRA permitting program for targetted facilities (as defined in Section 2.2 above).

(1) Field Assessment. A field assessment should be conducted for each targetted facility by the public involvement coordinator (or other appropriate EPA or state staff, or a contractor) for the following purposes:

- To identify major community concerns regarding the facility;
- To identify the citizens, officials, and groups in the area who are especially interested in the facility and should be kept apprised of developments;
- To identify the best means to provide information to the public and, in return, to obtain public comment and input.

As explained in Chapters 3 and 4 below, the field assessment consists primarily of interviews in the local community with key citizens, officials, and other interested parties.

(2) Public Involvement Plan. Based on the field assessment, a public involvement plan detailing appropriate public involvement activities keyed to milestones in the RCRA permit process should be developed. This plan indicates the actions EPA or the state will take to facilitate public involvement in the decision-making process for the permit based on the interests and concerns of the public and the best channels for communicating with the local public, as identified in the field assessment. The plan should be a concise document that identifies the distinctive features of a facility and a community relevant to public involvement efforts and the key public involvement activities that need to be undertaken.

(3) Public Involvement Activities. Public involvement activities will vary by facility and by the stage in the permitting process at which public involvement efforts are initiated. The following types of activities, however, will be necessary in each instance:

(a) Outreach activities, such as informal informational briefings and meetings, including the public notice of the draft permit and attendant requirements under RCRA section 7004 and 40 CFR 124 Subpart A;

(b) Dialogue and assimilation activities, such as work sessions, public meetings, and public hearings (if appropriate);

(c) Response activities, including informal responses to questions, concerns, and requests from the public during the permit process as well as formal, final responsiveness summaries.

The next chapter of this guidance document explains how such activities may be scheduled and integrated with technical milestones in the typical permitting process for a facility.

3. KEY ACTIVITIES DURING THE PERMITTING PROCESS

This chapter explains how to structure and schedule a public involvement effort for a typical targetted facility in accordance with the policy outlined in Chapter 2. It recommends key public involvement activities and indicates when, in relation to technical milestones in the permitting process, such activities could be conducted. Also discussed are the first two critical elements in the public involvement effort -- the field assessment and the preparation of a public involvement plan -- and the time at which these actions should be conducted.

It should be emphasized that public involvement efforts should be tailored to the specific circumstances of a facility and the specific needs of a community. Thus, the sequence of activities described here is solely illustrative. Public involvement coordinators have the flexibility to choose whichever activities are best in each instance, varying the sequence of activities outlined in this chapter, or adding other activities, depending on circumstances. If the draft permit has already been prepared, public involvement efforts will of necessity be more limited. Even when there is insufficient time to conduct a formal field assessment, however, an attempt should be made to identify key members of the community and their concerns through telephone calls or some other means.

It should also be noted, however, that some of the activities discussed in this chapter are regulatory requirements. These requirements are indicated in the text.

In general, preference should be given to small-scale, low-profile, informal activities rather than large-scale, formal activities. For example, face-to-face discussions with a small group of community members in someone's living room are preferred to a public meeting with presentations before a large audience. The more personal the activity, the greater the likelihood of mutual communication between government staff and the community.

The four subsequent sections of this chapter correspond to four milestones in the typical permitting process. Exhibit 3-1 summarizes these milestones and the activities recommended in the text.

3.1 PUBLIC INVOLVEMENT FOLLOWING SUBMISSION OF THE PERMIT APPLICATION

(a) One of the first actions to be taken to facilitate public involvement is to conduct a **field assessment**. If possible, in fact, the field assessment should be conducted prior to the submission of the permit application. The field assessment is a critical element under EPA's policy for public involvement in the RCRA permitting program. It consists of interviews by the public involvement coordinator (or other appropriate EPA or state staff, or a contractor) with several local citizens, members of community organizations, and officials for the following purposes:

EXHIBIT 3-1

SUMMARY OF MILESTONES AND PUBLIC INVOLVEMENT ACTIVITIES

Permit Milestone	Required Activities*	Suggested Activities
Submission of permit application	• Mailing list	• Field assessment • Public involvement plan • Introductory notice • Repository • Informal meetings • Fact sheet on facility
Completion of draft permit (or intent to deny)	• Fact sheet/statement of basis • Public notice • Public comment period • Public hearing (if requested)	• Informal meetings
Permit issued (or denied)	• Notice of decision • Response to comments	
Final determination of permit		• Update public involvement plan • Update repository • Informal meetings • Publications as needed (fact sheets, press releases, etc.)

* Requirements under RCRA section 7004 and 40 CFR 124 Subpart A.

- To identify major community concerns regarding the facility;

- To identify the citizens, community leaders, and officials in the area who are especially interested in the facility and should be kept apprised of developments;

- To identify the best means to provide information to the public and, in return, to obtain public comment and input.

The information collected during the field assessment is the basis for the public involvement work plan and enables the public involvement effort to be structured to meet the needs of a specific community.

The field assessment may involve one or two days of interviews in the community, as appropriate. Efficiency in the use of travel resources, as well as optimal timing considerations, may lead to the field assessment being conducted at the same time as the site visit made by permit writers and enforcement personnel, that is, within 90 days after the permit application request (unless the permit application has already been submitted). Even if the permit writer is well-acquainted with the facility, in most cases the field assessment will be necessary at targetted facilities to update and expand knowledge of the parties and issues involved and to make public involvement efforts visible and documentable.

(b) A **public involvement plan** is the second critical element of EPA's policy for targetted facilities. This plan indicates the actions EPA or the state will take to facilitate public involvement in the decision-making process for the permit. Public involvement plans are flexible documents that reflect the dynamic nature of the public involvement process. As the public involvement team becomes more involved in the community, and as the community learns more about the facility and the permitting process, new (and more effective) public involvement activities and additional concerns may suggest themselves. The initial plan should, therefore, be a <u>brief</u> document -- concise and to the point -- that:

- Identifies major community concerns and leaders;

- Outlines the minimum actions EPA or the state will use to facilitate public involvement; and

- Identifies the timing of these activities.

Public involvement plans prepared by states and regions should be retained in the facility files and repositories. These plans will be reviewed at the time of the mid-year and end-of-year reviews of the state, and during regional program reviews. Plans prepared by the regional offices will be appraised by EPA headquarters during annual reviews of the region's RCRA permitting program.

(c) At the same time as this plan is prepared, EPA or the state should assemble a **mailing list** for the community in which the facility is located. The individuals or organizations identified during the field assessment can be the core for the mailing list. If a mailing list is already available, it should be updated based on the field assessment. Chapter 4 provides additional techniques for developing a comprehensive mailing list.

(d) An **introductory notice** should be provided to the community as soon as possible after the submission of the permit application. If enough is known about the community in advance to identify adequate means of providing the notice, the introductory notice may precede the field assessment. The purpose of this notice is to explain EPA's permit application review process and the opportunities for public involvement in that process. It should include some mechanism (e.g., a telephone number for a contact person, a return slip to request additional information) to allow the public to express its interest in opening and continuing dialogue with the agency.

The notice should take whatever form is most useful in a particular community. Options include a fact sheet or newsletter sent to residents on the mailing list, a radio or television public service announcement, or a newspaper advertisement.

(e) Regulations require that the administrative record for a RCRA draft permit, including the permit application, be placed into a file for public inspection. **Information repositories**, however, should contain more than the administrative record to aid the public's understanding of the facility and the permit under consideration. Non-technical descriptions of the facility and its operation, brochures explaining the permit process and public involvement, and generic fact sheets describing the meaning of exposure assessments are examples of materials that could be included in a repository. More examples are given in Chapter 4.

Selection of a repository site should take into account the convenience and ease of access for the general public. A location that does not allow access after normal work hours will have limited usefulness. More than one repository may be necessary.

(f) If public interest or response to the introductory notice is sufficiently great, in the judgment of the public involvement coordinator, an **informal meeting** (or series of meetings) may be held to review more fully the permitting process and to provide opportunities for public comment. Informal meetings at this stage allow the public to understand and to contribute information to the development of a draft permit, although state requirements prohibiting ex parte communication should be taken into consideration.

(g) In addition to generic fact sheets and brochures being developed by headquarters and in the regions, facility-specific **fact sheets** should be considered when a significant number of citizens appear to be interested or concerned about a facility's permit. This fact sheet should be sent to persons on the mailing list, included in repositories, and distributed by any

other means suitable for the specific community. The fact sheet could include background information on the facility, provide a timeframe for permitting activities at the facility, identify opportunities for the public to provide information and input, address specific concerns of the public about the facility, and identify repository locations.

As explained in Chapter 2, for public involvement in the permitting process to be meaningful, the public must have access to the decision-making process early enough to understand and provide input to that process. In the case of permit issuance, the actions described above should be conducted as soon as possible following the submission of the permit application to enable the public to provide input to permit conditions before the draft permit is written. When an application has not yet been submitted for a facility, actions intended to anticipate and facilitate public involvement, such as the field assessment and the public involvement plan, can gain additional effectiveness by being completed **before submission of the permit application**.

Early public involvement can introduce the problem of contacting the public before having answers to facility-specific questions the public might raise. It will be necessary to explain clearly to the public the purpose of early contacts and the limits on the information available at early stages of the permitting process. A clear explanation can prevent false expectations from being formed and reduce any negative impact on the agency's credibility that could result from not being able to answer the public's questions.

Under the 1984 RCRA amendments, each land disposal facility owner/operator must provide EPA (or the state) information on the potential for exposure of the public to hazardous constituents through releases from the facility. The public may also contribute such exposure information. Since this information is expected to be of significant interest to the public, the exposure assessment should be considered an agenda item for any contact with the public, including public notices.

3.2 PUBLIC INVOLVEMENT UPON COMPLETION OF THE DRAFT PERMIT

Most public involvement actions to be taken at this point are required under 40 CFR Part 124.

(a) EPA or the state must provide **public notice** that a draft permit has been prepared. The public notice must be published in a major local newspaper and broadcast over local radio stations.

(b) At least 45 days must be allowed for **public comment** on the draft permit.

(c) If there is written notice of opposition to the draft permit, EPA or the state must hold an informal **public hearing** with 30 days prior notice. A written transcript or tape recording of the hearing must be made part of the repository's files.

(d) A **fact sheet** must be prepared for every draft permit for a major hazardous waste management facility. The fact sheet must include the significant factual, legal, methodological, and policy questions considered in preparing the draft permit.

(e) Despite earlier public involvement efforts, some members of the public may not take an active interest in the permit process until a draft permit has been completed and announced. **Informal meetings** should be held with members of the public to discuss elements of the draft permit that are poorly understood or are of interest or concern to them. These opportunities for dialogue confirm to the public that the draft permit is indeed a draft and still open for additional modifications to address issues that might not have surfaced to that point.

3.3 PUBLIC INVOLVEMENT UPON A DECISION ON THE PERMIT

EPA regulations require two actions at this time.

(a) When a final decision is reached on whether to issue, deny, or modify a permit, **notice of the decision** must be given to each person who submitted written comments or who requested such notice.

(b) In addition, EPA or the state must issue a **response to comments**.

The response to comments should include a summary of significant comments received and an explanation of either how they were incorporated or addressed in permit conditions or why they were rejected. Comments that are referred to other agencies should also be indicated. The response document should be sent to those who submitted comments, attended the public hearing, or who requested to receive it. Any documents cited in the response to comments should be included in the administrative record for the final permit decision and placed in the information repositories.

3.4 PUBLIC INVOLVEMENT UPON FINAL DETERMINATION OF A PERMIT

Whether a facility is ultimately denied or granted a permit, public concern does not necessarily end at that stage of the permitting process. Continuing long-term issues of public interest may require additional public involvement efforts. Public involvement after a permit denial, for instance, could address the public's interest in these issues:

- Corrective actions;
- Release of ongoing monitoring data;
- Release of additional exposure information; or
- Closure plans.

If a permit is issued, continuing public involvement can address these same issues and also accomplish several other objectives, including:

- Provide information to the public regarding changes in transportation or emergency evacuation plans;
- Receive information from the public on adherence to permit conditions (both construction and operation phases);
- Provide a mechanism to address new or continuing concerns resulting from facility operations;
- Facilitate permit appeals, renewals, and revisions; and
- Increase overall agency credibility.

The type and level of public involvement effort needed at this stage should be decided on a case-by-case basis. If, at the time of final determination, the level of interest or the types of concerns that the public has differ substantially from those described in the public involvement plan, or continuing public involvement activities are anticipated, the plan may need to be updated to coordinate continuing public involvement efforts. Updating the repository may also be necessary to keep the public informed as additional information is obtained, changes to the permit or facility are made, or subsequent agency actions are taken.

When significant issues will continue to be of concern or can be anticipated to arise after the final determination on a permit, additional informal meetings or publications may be necessary to accomplish the aforementioned objectives. Press releases, fact sheets, continuation of newsletters, and other types of written public information (as described in the next chapter) should be considered. Informal meetings with the public may also be needed when public concern continues to be substantial or the public desires to play a role in monitoring a facility to ensure adherence to permit conditions.

Chapter 4 of this manual explains how to conduct the activities noted in this chapter. Chapter 5 discusses certain issues and circumstances that merit special attention in designing and organizing a public involvement effort.

4. TECHNIQUES FOR CONDUCTING PUBLIC INVOLVEMENT ACTIVITIES

The following discussions have been selected from various sources (see the preface) and are provided as a reference in planning and implementing a sensible and sensitive public involvement program. The discussion of each activity focuses on general techniques for conducting the activity; these are "how to" discussions.

As previously noted, the recommendations for this program have been kept to a minimum to allow for maximum flexibility for each facility-specific work plan and public involvement effort. It must be noted, however, that simple adherence to the recommendations will not, in most instances, produce a successful public involvement process, nor will it necessarily speed issuance of the permit.

A skillfully selected blend of both specifically recommended activities, and activities appropriately tailored to the needs and concerns of the community and the owner/operator, will produce far preferable results.

This chapter is divided into eight sections, as follows: 4.1 - Identifying Potential Participants and Building Mailing Lists; 4.2 - Field Assessment; 4.3 - Public Information Programs and Publications; 4.4 - Information Repositories; 4.5 - Public Notices; 4.6 - Public Meetings; 4.7 - Public Hearings; and 4.8 - Responsiveness Summaries.

4.1 IDENTIFYING POTENTIAL PARTICIPANTS AND BUILDING MAILING LISTS

4.1.1 Focus

A mailing list is an important communications tool which allows an agency or organization to reach broad or targetted audiences with its messages. The better the mailing list, the better the public outreach and delivery of information. A well-developed mailing list will reach a group of potentially active participants -- people who want to be involved in an agency program or plan, or those who wish to be involved simply by staying informed. The process of developing a mailing list begins early in the public involvement effort.

The mailing list is used to send announcements of meetings, hearings, events, and available reports and documents to the public. In addition, it is used to identify members of the public who may be considered for work groups or attendance at meetings and briefings. A wide variety of approaches are available to collect names for the list. Several, but not all, of these approaches should be employed.

4.1.2 Techniques

A. The names of people interviewed during the field assessment, as well as other names these people recommend, should be placed on the mailing list.

B. All nearby residents and owners of land adjacent to the facility should be included on a mailing list.

C. Seek out existing lists. Other EPA and federal programs, as well as state and local programs, may have developed mailing lists which can be used in whole or in part. Sometimes, lists are exchanged or traded among agencies. Prepared lists should be carefully scrutinized, however, to make sure they are applicable.

   Borrowed lists may be out of date. Verify some of the names and addresses on the list to test its current validity.

D. Organizations with a potential interest in an agency program or action may have mailing lists of members important to the agency, although some organizations may be reluctant to give these lists. Each agency or program with a mission must consider different types of groups. Representative groups include:

   1. Outdoor recreation organizations such as hiking associations, rod and gun clubs, cross country skiing groups, sports fisheries' associations, and recreational boaters and sailors.

   2. Commerce and business groups such as manufacturer associations, associated industries, Chambers of Commerce, and the Jaycees.

   3. Labor leaders and unions.

   4. Environmental leaders and groups.

   5. State and district farmers' associations, including the farm bureau, dairyman's cooperatives, conservation districts, and water districts.

   6. Health organizations such as the American Lung Association.

   7. University extension and county agricultural extension agents.

E. Many civic and social organizations, such as the League of Women Voters or the Chambers of Commerce, have their own newsletters. For applicable groups consider requesting a copy of the group's newsletter mailing list, and ask if they would run notices in their paper.

F. Specialized directories of organizations and businesses can provide additional names and addresses of potential participants. Examples include state directories of manufacturers, environmental groups and chemical society members.

The business and reference section of the library is a good starting point for reviewing various directories.

G. Any individual who attends a public meeting of the agency, or one with a related mission, or calls or writes to the agency seeking information, should be added to the mailing list. Careful attention to the affiliations of various individuals or groups attending meetings or corresponding with the agency can yield entire categories of people to be added to the list.

H. The applicant should be included on the mailing list.

I. According to Executive Order 12372, the state may designate a single point of contact (SPOC) or delegate intergovernmental review responsibility to an agency or organization for the purpose of reviewing proposed RCRA permit actions. At the very least, the SPOC or delegated entity should be sent a copy of the draft permit and notified of the public comment period.

J. Local newspaper stories often contain substantial information of use to public involvement specialists, including the names of people with a potential interest in the agency.

K. The names of local reporters and editors, and appropriate newsletter editors, should be added to the mailing list. If time permits, interview reporters and editors with knowledge of an area or subject. Placing their names on the mailing list is one way of assuring that these "gate keepers" have direct access and accurate information about a program.

L. Elected and appointed officials with a potential interest (substantive or political interest) should be placed on the list.

M. Consider placing the names of local educators (primary, secondary, high school, and college and university) on the list. Aside from their personal interest, these people can use project information to develop classroom learning packages and programs, and tell their students about the project and underlying issues. Often, children will communicate information and ideas on class projects and current events to their parents, thus affecting a secondary communication.

N. State agency technical, enforcement, public affairs, and public staff should be contacted.

O. Public notices for draft permits, public comment periods, and intended denials are required to be sent to state agencies that have authority

under state law with respect to the construction or operation of a RCRA facility and to any unit of local government having jurisdiction over an area where a facility is located.

P. Secondary or miscellaneous sources of names for mailing lists include:

1. State revenue departments which maintain lists of non-profit organizations in the state.

2. For states, the Secretary of State or offices of the legislative leadership maintain lists of legal lobbyists. In Washington, lobbyists register with the Senate Office of Public Records and the House Office of Records and Registration.

3. Local, regional, and state League of Women Voters, environmental, planning commissions, and land use chairpeople may have lists of potential participants. The national League maintains other lists.

4. University scientists, senior administrators, and technical experts (such as soil scientists, hydrologists, and law and political science faculty who specialize in land use and environmental law) might be placed on mailing lists. They may recommend the names of others who should be added to the list.

5. The public affairs or environmental control directors of major industries might be consulted for additional names and addresses.

6. Local neighborhood associations -- formal and informal -- may prove helpful.

7. Churches and church organizations.

8. Telephone directories, especially the yellow pages, provide lists of associations. Zip code directories may be useful when trying to reach one small part of a city or state. Consider developing a list of all landowners within one mile of the facility in question.

9. Multi-service centers, community development corporations, community centers, and health centers might prove helpful in attempts to reach senior citizens organizations.

10. Local fire, police, and disaster agency officials should be located and listed.

4.1.3 Evaluation

A. Is the mailing list comprehensive, encompassing all of the key categories or target publics?

B. Is the mailing list updated regularly?

C. Has an easy to access system been devised for adding and subtracting names easily and efficiently?

D. Has the list been broken down by zip codes if bulk mailing is anticipated?

E. Have adequate funds been allocated in the budget to cover the costs of maintaining the list and the cost of printing and postage?

4.2 FIELD ASSESSMENT

4.2.1 Focus

On-site interviews with local residents, government officials, community groups, and media representatives are extremely useful techniques to help gain an understanding of the facility's history, the community issues connected with the facility, the level of citizen concern, and the political climate. Community interviews are also useful to identify credible sources and disseminators of information.

4.2.2 Techniques

A. Arranging the interviews:

At this stage of the permit process, the names and phone numbers of the people involved with the facility may already be known or have been obtained. Ideally, the meeting place should be at the interviewee's office or home, whichever may be most conducive to candid discussions. While government and media representatives are likely to prefer meeting in their offices during business hours, local residents and community groups may be available only after-hours.

B. Planning the interviews:

Prior to or during the interview, time may be spent reviewing files at EPA, the state agency, or a local library or Chamber of Commerce that contain news clippings, documents, letters, and other sources of information relevant to the facility. Ideally, only people with a thorough understanding of the RCRA program, the facility itself, and interview techniques should conduct the interviews.

C. Telephone interviews:

Some information may be efficiently obtained over the telephone. In telephone interviews, explain how the interviewee's name was acquired, the type of information needed, the reason the information is needed, and how it will be used. Be brief.

D. Interviewing residents and community groups:

Interviews involving local residents or community groups are likely to require more time. Be prepared with a set of questions in mind; questionnaires may seem too formal and are likely to elicit curt responses. Be sensitive to the residents' needs and concerns, but remind them that the purpose of the interview is to gather preliminary information to be used in planning an appropriate public involvement effort. In this way, unrealistic expectations are not raised.

In many cases, the interviewee will ask questions and express concerns about the facility. The field assessment, in some cases, can be a useful technique for providing interested citizens with timely information on the RCRA permitting process and on facility and Agency activities prior to development of the draft permit conditions. With adequate preparation, the interviewer can thus acquire information useful for later planning, as well as respond to initial citizen concern with accurate information and allay unwarranted concerns.

E. Interviewing government officials:

Interviews with government officials should include a brief introduction explaining why they are being interviewed and what kind of information is needed (facility history, government activity at the site, a political perspective on citizen's expectations, etc.).

F. Confidentiality:

At the beginning of each interview, explain that the field assessment will be used to prepare a public involvement work plan. If the interviewee would like to remain anonymous, explain that the information will be used to understand community concerns and that a record of the contact will be made, but EPA or the state will not attribute any specific statements or information to the interviewee.

G. Other possible contacts:

During the field assessment interviews, ask for names and phone numbers of persons who could provide additional information on the facility and community views and concerns.

H. Information on public involvement activities:

Ask whether the interviewee would like to receive any fact sheets or other printed information as the permitting process continues. Also, for future reference, keep a list of persons interested in attending public meetings.

4.3 PUBLIC INFORMATION PROGRAMS AND PUBLICATIONS

4.3.1 Focus

The outreach activities which this guidance recommends should include the development of accurate and timely written information for distribution to the public, for example, fact sheets and newsletters.

Overall, such materials should promote understanding and highlight and summarize critical issues. The environmental consequences of potential actions, options, or decisions should be clearly stated in materials distributed to the public. The public should also have access to complete reports and documents in information repositories.

At a minimum, site-specific materials should include:

- Background information
- Legal justification for the action
- Timetable of proposed actions or planning phase
- Summaries of lengthy or technical material
- Delineation of issues
- Alternatives or tentative determinations made by the agency
- Ways to encourage public involvement
- Names of people to contact for further information
- Opportunities for public involvement

The public may also be provided with general descriptions of the RCRA permitting process, hazardous waste management techniques, or similar topics.

4.3.2 Techniques and Methods

The first step in developing an effective information program is to plan for a publication effort that is integrated with the overall public involvement plan for a facility. The public involvement plan must realistically balance the cost, timing, quality, scope, variety of publications, and identify target audiences for various publications. Using the plan for guidance, work can proceed on individual publications with knowledge of how each publication will contribute to the total public involvement effort.

Written communication should meet the five criteria embodied in the acronym ANSVA: ATTENTION, NEED, SATISFACTION, VISUALIZATION, ACTION

(a) Attention: Each information product should capture the attention of its intended audience by using a theme or issue important to that audience.

(b) Need: Each publication should demonstrate that the reader has a need or problem.

(c) Satisfaction: The written piece should show how the government's program can meet or satisfy the readers' need or problem.

(d) Visualization: People often comprehend and retain complex ideas and material better if they can see the material visualized. Materials should make liberal use of charts, diagrams, illustrations, photographs, or mathematical displays. The adage "a picture is worth a thousand words" has proved true in many studies of reader/audience comprehension and retention rates.

(e) Action: Each piece of public information should invite action. Attending a public meeting or placing a name on a mailing list are examples of action steps. Public information is effective only if it provides the basis for potential change. The action step reinforces learning.

4.3.3 General Guidelines for Developing Public Information Products

A. Begin each writing project by developing a detailed outline of the purpose and content of the material to be covered. The audience for whom the material is intended should also be clearly stated.

B. Every information program must operate on at least two levels -- the publics that are already interested and involved, and those that are not. The information directed toward the involved group may include more complex or detailed information or progress reports. Fact sheets and lengthy information pieces fall under this category. The information directed to the less involved group might be considered preliminary to participation. These materials should be attractive and brief, and appeal to the needs and concerns of laypeople.

C. In headlines and initial paragraphs, attract attention and interest with thought-provoking statements or questions. Link problems and issues with the reader's life and experience. Personalize messages; demonstrate how the agency's programs affect people's lives.

D. Early in the text introduce the content of the publication.

E. Write clearly, simply, and directly, avoiding technical terminology, acronyms and professional jargon. Translate technical language into terms the public can understand, or define technical terms the first time they are used in a publication. Write general purpose materials at the same reading level as the local paper is written.

F. Use short declarative sentences with active verbs to make key points. Avoid the use of long and complex sentences. Say it simply.

G. Use conversational English. For example, use "do" for "accomplish" and "because" for "in view of the fact that."

H. Consider using human scale comparisons, rather than technical terms, to communicate a point. For example, "the facility will generate noise approximately equal to that of a typical city street," or "the cost per family will be about $100 per year."

I. Limit the length of the material. Five double-spaced pages (about 1,500 words) is all the general interest citizen will typically take the time to read. If the material requires greater length, prepare a one-page summary for readers with limited time. Another approach is to design a longer piece so that someone with limited time can read highlights in five minutes, more in-depth material in 15 minutes, and complete the entire piece in 30 minutes. By telling the reader how a piece is structured on the first page, the reader can choose how much time to invest in the piece.

J. Don't lose sight of broad perspectives and goals when developing materials. For example, in technical documents, provide a summary that stresses concepts, not just facts. Organize materials conceptually with facts and data providing the foundation for basic themes.

K. Each individual element in an information and education program should be easily linked to the overall program. The reader should easily see the relationship between a particular topic or product and the total project.

L. Pre-test all public information products by asking several lay citizens or officials to read and evaluate drafts for clarity, order, comprehensiveness, and detail. This final review can help ensure high quality publications that meet their intended goals.

M. Use graphics and illustrations to support the written content of a publication. Photographs, charts, and drawings can communicate ideas quickly, directly using few words. Using several type faces, such as a standard and an italic type, can lend emphasis and clarity. Capitalization and underlining add emphasis, too.

N. Always make full reports and technical information available to the public for review, in addition to providing summaries. Materials should be available at easily accessible repositories. Let the public know where and when the materials are available.

O. For general purpose publications, such as brochures and newsletters, distribute copies to people whose names are on the mailing list, including elected and appointed officials. Mail copies of

publications to media outlets in the project area. Make publications readily available to the general public at libraries, government buildings, shopping centers, and other public places. Include publications as a part of a project display.

4.3.4 Types/Uses of Specific Publications

A. Brochures

1. A general pamphlet or brochure is a useful tool to explain the background and mandate of a program, the role of the public in the planning process, and the expected outcomes of the project. A brochure should be an easy-to-read, quick summary of agency and program goals and objectives. It should provide answers to common questions.

2. A brochure should include a brief background on the program, the planning process, schedules for upcoming events, and the points where public involvement is most important.

3. The publication should give the reader a sense of the scope of the issue, how planning will proceed, possible alternatives, potential impacts on the area's growth and development, and possible effects on taxes and quality of life.

4. The brochure should be written with a long-term perspective in mind, so the publication remains timely throughout the process or is useful in a number of cases.

5. Distribute the brochure widely in the early stages of a project. Timing is important for establishing credibility and for informing the public early.

   Mail copies of the brochure to all media outlets in the planning area, accompanied by a cover letter offering a name and address to contact for further information. The letter should explain why the project is important and how it might affect the community and region.

6. Include a pre-addressed mail-in form as a part of the brochure so that people with an interest in the program can be added to the mailing list. Let the public know that other materials will follow as the program develops (i.e., newsletters, report summaries, etc.).

7. Include a name, address, and phone number in the brochure for the public to contact for additional information.

B. Newsletters

1. Newsletters facilitate a regular flow of information to the primary audiences of a public involvement effort. They provide timely and useful information to citizens. They are an inexpensive way to regularly promote understanding, dialogue, and public involvement.

2. Newsletters should inform without bias. They should not be used as an advocacy tool. Newsletter editors must maintain credibility if the newsletter is to remain effective over time.

   (a) Separate opinion from objective or historical material, and label it as such.

   (b) Sometimes credibility can be enhanced by printing statements developed by representatives of opposing points of view.

3. Link key issues to subjects and ideas the general public can understand and appreciate.

4. Newsletters can provide timely information such as:

   a. Articles on new developments.

   b. Reports on public involvement activities, and how to join them.

   c. People stories are particularly good for reader interest, but should not be over used. Describe the activities of citizens and officials working on various aspects of a project. Use people stories to encourage citizens to participate. Avoid long lists of names.

   d. Feature articles on major issues in a project, the most common questions asked by the public, or the primary concerns of officials or other professionals. Also, consider reprinting relevant articles from other publications.

   e. Calendar of upcoming meetings.

   f. Summaries of meeting comments and responses. If used as an informal responsiveness summary, newsletters reach the most important audience with timely and useful information documenting the value, history, and impact of public involvement.

   g. A regular column written by a citizen (an option). If stories are invited from guest authors, detail editing ground rules in advance.

h. The names and addresses of people to contact for further information.

i. Maps and other forms of graphic information.

j. Lists of information and audio-visual materials available to the public, and the locations of resource material.

5. More than any other information tool, newsletters can be used imaginatively. Maps for citizens to evaluate, mark-up, and return, and attitude and opinion questionnaires are just a few unusual suggestions for newsletters. These techniques make newsletters an enjoyable and interesting experience for readers.

6. Newsletters should be mailed to local and regional media representatives as another way of keeping them informed of progress.

7. The editors of other newsletters with a potential interest in the subject of your newsletter should receive copies as well. They may find information of importance they would like to pass on to their readers.

8. Many citizens will keep all issues of a newsletter as a historical record of their involvement in a project. Number and date all newsletters.

C. Fact Sheets

1. Fact sheets are an adjunct to newsletters and other publications. They are most useful for providing an in-depth analysis of specific, complex issues of public concern. They may be longer than newsletters and contain more detail.

2. Some fact sheet topics will be chosen in advance; others will evolve from questions and concerns raised during the public involvement process.

3. Fact sheets can be distributed as a part of a newsletter or as a separate publication. They can be mailed to the entire mailing list or to selected groups. They should be available to anyone for the asking.

4. They are most useful for presenting key information at crucial decision points in a project.

5. They provide excellent background for citizen activities at public meetings and conferences.

6. Fact sheets can be produced inexpensively, and are easily up-dated as projects mature and become more refined.

D. Length of time it usually takes to prepare a typical public information product

1. Scheduling adequate writing, review, and production time is an important element of information planning. Plenty of lead time is required to produce a high quality document. For example, for a state government to produce a twelve-page newspaper tabloid that serves as an executive summary and public hearing notice, the following time schedule is suggested (in person days):

a.	Writing first draft	10 days
b.	Typing the first draft	2 days
c.	Agency staff reviews/citizen reviews of first draft	5 days
d.	Consolidation of reviews and rewrite	5 days
e.	Retyping	2 days
f.	Graphic design, typesetting, paste-up (If portions are copied this time may be reduced)	3 days
g.	Printing	4-7 days
h.	Preparation for mailing (100-500 copies)	3 days
i.	In the mails	5 days
j.	Date in citizen's hands	14 days before public meeting or hearing

4.3.5 Evaluation

A. Information Planning

1. Have information needs been identified in the public involvement plan?

2. Do the program elements in the information plan work together to support one another?

3. Do information products precede public meetings and public hearings in the plan? Has the schedule been maintained?

4. Are the goals of the information program and each program element clearly stated?

5. Does each information piece have a definite goal and targetted audience?

6. What types of information products are anticipated? Are a variety of methods used to communicate with various target publics? From the list below check the information products anticipated in the public involvement plan.

   Brochures
   Fact Sheets
   Direct Mail Letters
   Flyers
   Posters
   Articles in Other Community or Agency newsletters
   Issue Papers and Option Documents
   Executive Summaries
   Speakers Bureau
   Weekly Newspapers
   Daily Newspapers
   Radio and Television Talk and Public Affairs Programs
   Radio and Television News Programs
   Slide Program
   Slide Tape Program
   Films
   Other Media

B. Information Products

1. For each public information product, are the issues and alternatives defined in an accurate, realistic, and understandable manner? Are the decisions requiring public involvement clearly stated?

2. Are the environmental impacts and consequences clearly defined and stated for each alternative?

3. Do explanatory materials contain clear, concise, and factual information?

4. Are technical and professional terms and government acronyms defined and explained? Has a glossary of terms been prepared?

5. Have individual information products been pre-tested with citizens and officials prior to printing and distribution?

6. Are information products provided free of charge to the public? If there is a cost, is the cost nominal?

7. Do all information materials contain the name, address, and phone number of a contact person within the agency who can answer questions and provide information?

4.4 INFORMATION REPOSITORIES

4.4.1 Focus

Information repositories should allow free and convenient access to information either required or deemed useful to be made available to the public. An information repository is a central file where citizens can review all permit-related documents approved by EPA or a state for public disclosure. Information in the repositories should be updated as necessary.

4.4.2 Techniques

Select one or more locations early in the permit process. Locations should be easily accessible to members of the community, and should be open after work hours. Possible repository sites might include libraries, government buildings, and shopping centers. Contact individuals at the selected repository locations in order to:

- Identify special needs of the repositories to keep contents together (e.g., in a 3-ring binder).
- Discuss how additions will be handled.
- Learn where information will be located.
- Discuss possible special displays at the repositories to highlight information.
- Discuss methods to have a sign-up sheet for mailing list development.
- Receive approval from the repositories.

Select and deposit the materials to be included in the repository file. Potential materials for the file include:

- Permit application;
- Draft permit;
- News releases about the permit and facility;
- A facility description;
- Technical data concerning the facility and relevant permit issues;
- Non-technical descriptions of the facility and relevant permit issues;;
- RCRA fact sheets;

- Pertinent Federal Register notices;
- Copies of orders and decrees;
- Information concerning the RCRA permit process and opportunities for public involvement;
- Any reference materials relevant to the facility (e.g., maps, chemical references, etc.);
- Announcements of all public involvement activities;
- Transcript of public hearing, agendas, handouts;
- Responsiveness summary;
- A list of agency personnel (with addresses and telephone numbers) from whom further information can be requested;
- Any other documents that are part of the administrative record.

Combine these materials in a 3-ring binder or any similar format. Deliver to repositories with instructions on how to add future information. Display materials should also be developed and delivered as part of the repository. Publicize the existence of the repository. Notify local government officials, citizens groups, the local media, and individuals on the mailing list of the repository files' locations and hours of access.

4.4.3 Evaluation

A. Have information repositories been established? In central locations? Are there convenient access hours?

B. Are the appropriate documents available at the repositories?

C. Are the files kept current?

D. Have the existence and location of the repositories been adequately publicized?

4.5 PUBLIC NOTICES

4.5.1 Focus

Public notices are intended to stimulate interest in and increase attendance at upcoming meetings and hearings. Other communication devices, discussed in the public meeting and public information sections, should also be used. Just publishing a public notice in a local newspaper, however, does

not guarantee that the public will be adequately notified of public events. Direct mail and one-to-one telephone contact, for example, work effectively if the goal is to generate attendance at public meetings.

4.5.2 Techniques

A. Public notices must be seen to be effective. They may be in the form of letters, newspaper advertisements, posters, or other graphic formats. They should entice readers so that they are read. Using eye-catching headlines or photographs, or personalizing issues, helps to do this. Notices should explain why it is important to attend the meeting or hearing and what influence or responsibility attendees will have. The notice should highlight issues to be covered at the event, decisions to be made, and the potential impact of decisions. Avoid the use of a strict legal notice format, such as those in the legal notices section of newspapers; these notices are rarely seen or read by the primary audiences of public involvement programs. Public notices should be distributed so that they are highly visible to the targetted audiences.

B. Distribution should occur at least 30, but preferably 45, days in advance of the meeting or hearing. Respect the requirement for 45 days notice when a public hearing on a draft permit or tentative denial is to be held. This length of time allows busy people to schedule the event in their calendars, and to prepare comments and testimony. A reminder notice five to seven days in advance is also helpful.

C. Keep public notices brief and to the point. Conceptualize issues from the public's point of view. Present the information in language familiar to lay people; avoid the use of jargon, government acronyms, and complex technical terms.

D. Notices should highlight the environmental and health issues of concern, the implications of the issues, and the decisions to be made.

E. The notice should indicate how participation in the event will relate to subsequent decisions and the resolution of issues.

F. Where possible, use graphics to capture the attention of the audience, to tell a story, and to increase recall.

G. If possible, have public information specialists and graphic designers prepare the notice. If this is not possible, have an information specialist review the notice.

H. Whenever possible, pre-test public notices with the public before their distribution. Make sure the public receives the message intended by the agency.

I. Distribute the notice through direct mail to organizations and individuals with a potential interest in the meeting or hearing.

1. In one major survey of how people who attended meetings and hearings heard about the event, the largest number said they received something in the mail that told them about the gathering. The second most common response was that someone told them about the event. Word-of-mouth proved to be an effective communications channel. Less than five percent of those surveyed said they saw a notice in the newspaper or heard about it on radio or television.

2. Consider the use of a telephone network to initiate the word-of-mouth communications system. This is especially effective in small communities and in neighborhood organizing.

J. Distribute the notice widely to the print and broadcast media.

1. Provide a camera ready copy to newspapers for placement as a display advertisement or as a free calendar announcement. "Run-of-paper" or display advertising rates are higher than classified rates applied to legal matters. Display advertising is generally more expensive, but is more visible and effective. If budgetary constraints make display ads prohibitively expensive, legal notices can be used.

2. Provide a slide of the notice to television stations for them to use as a background image when announcing the event.

3. For radio and television, include a public service spot announcement or press release, along with the notice, to increase the likelihood of the notice getting "air time."

4.5.3 Evaluation

A. Was the public notice part of an overall plan of notification and information? Were the elements of the plan, such as the use of advertisements, public service spots, and public speaking events, well coordinated?

B. Did the public notice appear 30-45 days before the event, allowing adequate time for the public to prepare?

C. Was the public notice attractively designed? Did it capture the reader's eye, and quickly communicate the intent of the event?

D. Was the method of distribution relevant to the community? Did it build upon existing communication channels?

E. Did notices reach all of the potentially affected individuals and organizations? How was distribution coordinated? Were both opponents and proponents included in the distribution?

F. Was the notice displayed prominently in the media and posted in visible locations at least 30-45 days in advance of the event?

G. Did a press release accompany the notice? Were other media events organized, such as briefing reporters or preparing feature articles?

H. Did the notice emphasize why the event was to be held? Did it identify the important decisions, issues, and program impacts?

I. Did the notice stress the importance of citizen attendance and participation? Did it explain how participation would affect decisions and choices?

J. Did the written notice include:

1. An identification of issues under consideration?

2. A description of alternative courses of action?

3. A brief listing of applicable laws and regulations?

4. An identification of locations where relevant documents were obtainable?

5. The names of individuals to contact for additional information?

4.6 PUBLIC MEETINGS

4.6.1 Focus

Public meetings are one means of establishing a dialogue with a community. The goal in any form of dialogue, such as meetings and workshops, is to encourage an exchange of views and open exploration of issues, alternatives, and consequences.

Public meetings must be preceded by the timely distribution of information. They should occur sufficiently in advance of decision-making to make certain that the public's opinions are considered and to permit response to public views prior to agency actions.

Meetings should be held at times and places that encourage attendance and participation. Whenever possible, they should be held during non-work hours, such as evenings and weekends, and at locations accessible by public transportation.

4.6.2 Techniques

Public meetings are agency-sponsored gatherings, open to the general public, and held to inform or involve the public in planning and

decision-making. If a question-and-answer period is included, they allow for two-way communication, and generate interest and participation in a project. They should be used selectively, integrated with other public involvement techniques, and designed to meet specific objectives.

A. Planning

1. Identify the agency's objectives, expectations, and desired results for the meeting.

2. Identify the audience's objectives, expectations, and desired results.

3. Match the composition and size of the group invited to attend a meeting with agency objectives.

4. Decide on the level of participation and involvement expected, and choose the meeting structure and format that can best meet agency objectives for dialogue.

   Then, choose the specific methods and techniques for discussion, planning, problem-solving, and decision-making.

5. Choose a meeting location, keeping in mind necessary room arrangements, equipment and supply requirements, and accessibility by public transportation.

6. Identify the roles and responsibilities of various staff members and of local officials or citizens who will participate in the meeting.

7. Make sure that everyone who wants to speak has an opportunity to do so.

B. When to Use

1. When the agency wants to inform people, clear up misunderstandings on agency actions or plans, or generate public discussion on proposals, plans, or recommendations.

2. When the agency wants to reach a large number of people at once, both directly (at the meeting) and indirectly through follow-up media coverage in local and regional newspapers, and on radio and television.

3. When the agency wants to encourage comment and debate among various groups interested in the facility's permit and to encourage more community dialogue.

4. When community interest on an issue is high.

5. When participants in a project feel the need to share information and ideas with the rest of the community.

6. When an agency seeks to communicate with an audience larger and more diverse than can be included in workshops.

7. If the sole purpose of conducting a public meeting is to educate the public, consider whether the public meeting is the most effective technique. The use of newsletters, fact sheets, slide programs, or sending public speakers to the regularly scheduled meetings of organized groups, may prove more successful.

4.6.3 Evaluation

A. Did the staff or participants have a good reason for holding this meeting? What was the goal of the meeting? Was the goal clearly stated? Did the goal of the agency match that of the audience? Was the goal of the meeting attained?

B. Did the meeting precede and relate to a key decision point? Was the audience aware of this fact?

C. Was attendance at the meeting consistent with the meeting's goals?

D. Did the staff provide written background material? What products were provided to attendees? Examples:

- Executive Summary
- Technical Summary
- Fact Sheet
- Newsletter
- Technical Report
- Maps and Graphs
- Other

E. How long was the program? Was the agenda followed closely? Was the program just right in length, too long, or too short? Did the audience remain attentive for the entire program?

F. Were the moderator, speakers, and supporting staff appropriate for meeting the session's goals?

G. Was the informational program well presented? Was the speaker(s) well informed? Did audio-visual materials contribute to the informational aspects of the program? Was the informational program well balanced, too technical, or not detailed enough?

H. Did the sponsoring agency ask attendees to evaluate the meeting?

1. If so, were the attendees representative of the affected community?

2. If so, did the attendees seem to understand the purpose of the meeting? Plan? Project? Timetable? The public's role? The timing of the key decision points? How the public's comments would influence decisions? The government agencies involved? Costs? The source of funds?

I. Did the public receive complete answers to their questions?

J. Did a staff member take notes at the meeting for use in permit development and in a responsiveness summary?

K. Was formal public notice sent 30-45 days prior to the meeting? Did the notice clearly state: (check)

- Purpose
- Date and Place
- Time
- Directions to the meeting site
- Parking, transportation, and other supporting information

4.7 PUBLIC HEARINGS

4.7.1 Focus

While hearings are the most familiar form of dialogue, they should not serve as the only forum for citizen input. When used, they should occur at the end of a process that has given the public earlier access to information and opportunities for involvement.

4.7.2 Techniques

A. Information

At the beginning of the hearing, the agency must inform the audience of:

- The issues involved in the decisions to be made;
- The considerations the agency will take into account under laws and regulations;
- The agency's tentative conclusions, if any; and
- The information the agency solicits from the public.

Certain regulations require the preparation of a formal hearing record, such as a verbatim transcript or an audio tape recording. Hearing records must be left open for at least 10 days to receive additional public comment, and be available for inspection and copying.

Public hearings provide highly structured opportunities for hearing and collecting public testimony on projects and issues. Public hearings are most likely to be held during the public comment period on the draft permit, at which time they often serve to encourage the preparation of written comments by the public.

Holding a public hearing does not mean that an agency has conducted a full public involvement program. Under normal circumstances, many other public participation events must occur prior to a hearing so that the public has had an opportunity to gain considerable knowledge and understanding of the issues in advance and thereby be able to offer informed comments at the hearing.

While public hearings are formal events, a variety of hearing formats exist. A format should be chosen that meets the needs and conditions of the project.

B. Procedures

1. Begin with an opening statement that includes a summary of major recommendations or conclusions, a description of the public involvement effort, and explanation of the hearing rules.

2. Consider having a question-and-answer period so that issues are clarified and proposals explained. Questions can be taken in the hearing room or in an adjacent room.

3. Accept public testimony scheduled in advance, but avoid giving one category of testimony the "best" time periods, which may alienate general citizens who may also want to speak. Set a time limit for oral testimony (such as five or ten minutes) and encourage participants to submit longer written testimony.

4. Have an additional period of testimony for those who did not schedule their remarks in advance. Consider taking them in the order in which they signed up at the hearing, or schedule blocks of time for particular points of view. When many people sign up at once, names can be drawn at random.

5. End with a closing statement in which the schedule for additional hearings, the length of the comment period, procedures for providing additional testimony, and a statement on how to view or obtain copies of the complete hearing record (if one has been prepared), are described.

Note: A public hearing is a type of public meeting. Consequently, much of the material in the preceding section on effective meetings applies here. Please see that section for further information.

6. Attempt to hold to a set schedule for those participants who have signed up in advance to speak at the hearing.

7. Have some type of registration card available at the hearing for people who wish to speak but did not pre-register.

4.7.3 Evaluation

A. Was the purpose of the hearing stated to the public in attendance? Were the issues clearly stated to the public? Was the purpose of the hearing fulfilled?

B. Were hearing notices sent out 30-45 days in advance? Did participants indicate that they were notified well in advance? Did they receive reminders a week or two before the hearing?

C. Were notices sent to a cross section of the population? To whom?

- Officials
- Organized Groups
- Affected Citizens
- Others

D. Were any significant groups omitted? If so, which ones?

E. Were communication efforts beyond public notices used to reach people? Which techniques were used?

- Direct mail letters
- Posters in prominent places
- Phone calls to opinion leaders
- Media or publicity events
- Other

F. Were background information documents available to the public at least 30 days before the hearing? What was provided?

- Executive summary
- Fact sheets
- Copies of full technical reports
- Newsletters
- Other

G. Did participants at the hearing seem to have a sufficient knowledge of the issues discussed? Had the public read the educational materials prepared in advance of the hearing? According to the participants, were the materials helpful in clarifying issues or explaining proposals?

H. How many hearings were conducted? Were some hearings held after working hours? Were hearings conducted at one location or at

several? Would hearing participants prefer to have hearings scheduled at a different time, place, or location, in the future?

I. Was the hearing organized so that there was advance scheduling of speakers? Did all those who wished to speak have an opportunity to do so? Did the speakers seem to represent a balance of perspectives?

J. Were the hearing examiners attentive to the various speakers throughout the length of the hearing? Did they just receive testimony silently, or did they respond to points raised by the various people presenting testimony? What was their appropriate role for this hearing?

K. Was a hearing transcript prepared? Was it an accurate reflection of the hearing's events? Did citizens know in advance that their comments would be part of a formal hearing transcript?

L. Was an "open record period" announced and explained to the public? Was additional testimony submitted to the agency during the open period?

M. Was the hearing record made available to the public? Was a summary of the hearing record made available to the public? To the media? How did citizens and officials request copies of the transcript, if they desired one?

N. Did the agency prepare a responsiveness summary following the hearing? Did the summary fairly reflect the points of view stated in written and oral testimony?

4.8 RESPONSIVENESS SUMMARIES

4.8.1 Focus

A responsiveness summary is a document that summarizes the comments made by the public and states specific agency responses to the comments. A responsiveness summary is used to inform citizens of how their comments affected agency decisions. It keeps the public informed about the status of the permitting process. It provides decision-makers and reviewers with an overview of public reaction and concern. It provides the public with a device to track the consequences of involvement.

Responsiveness summaries should be brief and concise documents summarizing the comments and responses of various publics and government agencies. Complex issues and comments should be broken down into component elements. Similar comments from several groups or individuals should be re-phrased into a single comment with a single response, unless this would obscure important variations. Comments should be rephrased where necessary for clarity or conciseness. Organize the responsiveness summary so that participants can

find their comments easily and logically. Do not avoid negative points of view; the responsiveness summary should contain an honest assessment of public comments.

Some of the benefits derived through preparing responsiveness summaries include the following:

A. Responsiveness summaries aid in determining if program and public participation objectives are being met.

B. They provide feedback to citizens on their comments and interpretation.

C. They help to determine if public information products are being read, understood, and used in a timely and meaningful manner.

D. They provide insight into the degree of success of public hearings and meetings.

E. They provide a check on the ability of innovative participation and information techniques to inform and elicit meaningful comments.

F. They can be used in a mid-course assessment of the public involvement effort; this review may suggest changes for the remaining phases.

G. The final responsiveness summary gives the participating public a chance to provide the agency with an evaluation of the public involvement effort.

H. They provide opportunities to organize the issues raised by the public and to view them from a new perspective.

I. They help to document the decision-making process.

4.8.2 Techniques

A. The responsiveness summary (or similar report) must explain the type of participation activity conducted, identify participants and their affiliation, describe matters on which the public was consulted, summarize viewpoints, comments, criticisms and suggestions, disclose the agency's process in reaching a decision, set forth the agency's specific responses in modifying proposed actions or rejecting public proposals, and the reasons for such actions.

B. The final responsiveness summary should describe:

1. The number and effectiveness of meetings, mailings, public notices, and hearings at which the public was informed or consulted about the project.

2. The numbers and kinds of diverse interests which were involved in the project (e.g., What organizations and special interest groups provided advice?).

3. The extent to which citizen's views were taken into account in decision-making (e g., Were comments used or rejected? Why?)

4. The specific changes, if any, in project design or scope (e.g., What changes in permit conditions occurred as a result of citizen input?)

4.8.3 Evaluation

A. Did the responsiveness summary provide a reasonable description of the events, a summary of comments and points of view represented, and a summary of the responses of the agency?

B. Did the responsiveness summary provide adequate depth to the comments and responses? Would someone not present at the event(s) have a clear idea of what transpired?

C. Is there an indication that the public had an impact on the permit? If so, how is this impact expressed in the responsiveness summary?

D. Who are the organizations and individuals cited in the summary? Do they represent a good mix of community leaders, business interests, government agencies, potentially impacted neighbors, and the other major targetted publics? Are any key groups or individuals unrepresented, and if so, why?

E. Do the comments suggest a strong and coordinated opinion from a particular perspective, such as abutters to a facility's site? Should these organized and vocal views receive more attention than some others?

F. Did the comments suggest a sound understanding of the issues? Did the public education program contribute to a better understanding of the issues?

G. Does the summary suggest that citizens and officials had ample opportunity to express their views and perspectives?

H. Does the summary indicate that citizens and officials had adequate notice of meetings and hearings?

I. Do the responses to comments seem complete and reasonable? Do they make a strong and convincing argument for decisions or directions taken? Are they responsive to the difficult issues raised by the public?

J. Did the preparers of the summary use a design and format that makes it easy for the reader to find key issues, and differentiate between comments and responses?

K. Did the preparers of the summary include aids such as an introductory description of the purpose of the summary, a brief description of the facility as a part of the introduction, and an outline of the organization of the summary?

L. Did the summary include copies of sign-in sheets, notifications, handout material, agendas, and questionnaires and evaluations? Were they helpful, or just extraneous material in the summary? Would a brief description of the materials have proved more useful to the reader?

M. How was the responsiveness summary distributed? Was it sent to affected decision-makers? To those people who made comments? To the people who attended hearings or meetings? To potentially impacted groups and individuals? To information repositories and libraries?

N. Was notice of its availability sent to the news media and the editors of newletters with a potential interest in the project?

O. Was the length of the summary short enough so that people might, in fact, read it? On the other hand, did it seem like a long and weighty government report destined to be placed on a shelf and not read?

5. SPECIAL ISSUES

[Reserved]

5.1 PUBLIC INVOLVEMENT IN EXPOSURE ASSESSMENTS

5.2 PUBLIC INVOLVEMENT IN INCINERATOR CERTIFICATION

5.3 PUBLIC INVOLVEMENT IN CORRECTIVE ACTIONS

5.4 PUBLIC INVOLVEMENT IN SITING NEW FACILITIES

APPENDICES

Appendix A provides a suggested format for public involvement plans. While this format is intended to provide direction, strict adherence is not required. As is the case with public involvement in general, the format should be used flexibly, allowing for adaptation and creativity.

Appendix B contains samples of both required and suggested RCRA permit public involvement materials. Here again, the format and content of these samples is intended to be illustrative, not prescriptive. The reader may use any ideas or language contained within the samples, either verbatim or paraphrased. These samples have not, however, been reviewed for content, and are intended solely to familiarize the reader with these types of public involvement materials.

APPENDIX A

FORMAT FOR PUBLIC INVOLVEMENT PLANS

A. Overview of Public Involvement Plan

Purpose: This section should provide a general introduction to the document by briefly stating the purpose of the public involvement plan and the distinctive or central features of the public involvement effort planned for this specific facility. It should also note any special circumstances of the community and the facility that the plan has been designed to address. This statement should not be a repetition of general program goals (e.g., "Keep the community informed").

Length: One paragraph.

B. Capsule Facility Description

Purpose: This section should provide a reader unfamiliar with the facility with the historical, geographical, and technical details necessary to understand why the facility has been targetted for expanded public involvement.

Suggested topics: Facility location and proximity to other landmarks; history of facility use and ownership; date and type of any releases; public's perception of any threat to public health or environment posed by the facility; the permitting process to date; and responsibility for developing permit (e.g., state or federal).

Length: One page.

C. Community Background

Purpose: This section should provide an understanding of the community and its involvement with the facility. It should be divided into three parts:

1. Community Profile: a discussion of the economic and political structure of the community, and key community issues and interests.

2. Chronology of Community Involvement: a discussion of how the community has reacted to the facility and its owners or operators in the past, actions taken by citizens, and attitudes toward government roles and responsibilities.

3. Key Community Concerns: an analysis of the major concerns of the community regarding the perceived risks or problems posed by the facility.

In all three sections, but particularly in the last, the focus should be on the community's perceptions of the facility and its effects on the community.

Length: May vary between three to seven pages, depending on the history and level of community involvement and concern regarding the facility.

D. Highlights of Public Involvement Program for the Facility

Purpose: This section should provide concrete details on public involvement approaches to be taken at the facility. These approaches should follow directly and logically from Section C's discussion of the community and its perceptions of the problems posed by the facility. This section should not restate the goals or objectives of public involvement in RCRA permitting in general. Instead, it should develop a strategy for communicating with a specific community. The most effective avenues for communicating with the public that were identified in the field assessment should be emphasized.

Suggested topics:

- Resources to be used in the public involvement program (e.g., local organizations, meeting places);
- Key individuals or organizations which will play a role in public involvement activities;
- Areas of sensitivity that must be considered in conducting public involvement efforts.

E. Public Involvement Techniques and Timing

Purpose: This section should state what public involvement activities will be conducted at the facility, and when they should be implemented. This section should also suggest additional techniques that might be conducted at the facility, depending on circumstances as the permit process proceeds, and when in the process they are likely to be most effective.

Length: Two to three pages. Matrix format may be suitable for this section.

Appendices

- Mailing List of Interested Parties and Key Contacts
- Suggested Locations for Meetings and Information Repositories

APPENDIX B

SAMPLES OF WRITTEN MATERIALS AND PUBLICATIONS

STATEMENT OF BASIS

Columbus Steel Drum Co.

OHD 000-723-676

This is a statement of basis for the Draft Hazardous Waste Permit for the subject facility. It briefly describes the derivation of the conditions of the draft permit and the reasons for them. Under 40 CFR 124.7 (Title 40 of the Code of Federal Regulations, Section 124.7), the Statement of Basis is sent to the applicant and to any other person who requests it.

A. FACILITY DESCRIPTION

1. RCRA Activities

Columbus Steel Drum is located in Blacklick, Ohio at 1385 Blatt Blvd. Columbus Steel Drum is primarily a reconditioner of used steel drums, but operates, as an extension of its business, a small hazardous waste storage facility. The hazardous waste that is stored originates either from (1) residues found at the bottoms of incoming "empty" drums, or (2) spent solvents used to clean out the drums. Hazardous waste storage occurs only in closed drums in a specially-designated drum storage area, or in one underground storage tank. The wastes involved are considered "hazardous" under Federal law because they are either "ignitable" (a regulatory term roughly meaning " very flammable") or because they contain lead and/or cadmium. Lead and cadmium are elements found in some of the paints used on the incoming barrels, and these elements can be toxic if ingested at sufficiently high concentrations. This draft permit includes all of the necessary Federal requirements to ensure that the wastes handled will pose no threat to public health or the environment. No burial, or disposal of wastes in any manner, occurs on-site.

2. Permit Actions Other Than RCRA

a. Water

Columbus Steel Drum does not require a National Pollutant Discharge Elimination System (NPDES) permit as all of their process and sanitary wastewater is discharged to the public sewer owned and operated by the City of Gahanna.

b. Air

Columbus Steel Drum has applied for and received Ohio air permits from the Central District Air Pollution Control Agency limiting the discharge of air emissions from four point sources. These are:

1) drum lining line;
2) drum exterior coating line;
3) lid coating line; and
4) oxidizer.

c. Other Federal Acts Considered

Columbus Steel Drum will not require other permits to satisfy any other Federal Acts. The facility will not have an adverse effect on the historical, architectural, archeological or cultural characteristics of the properties either listed or eligible for listing on the National Register for Historical Places.

B. PERMIT APPLICATION

The permit application cited herein is the August 29, 1983, permit application as amended on November 22, 1983, January 4, 1984, January 10, 1984, January 23, 1984, February 1, 1984, February 22, 1984, and March 30, 1984.

C. PURPOSE OF THE PERMITTING PROCESS

The purpose of the permitting process is to afford the United States Environmental Protection Agency (U.S. EPA), interested citizens and other governmental agencies the opportunity to evaluate the ability of the applicant to comply with the applicable hazardous waste management requirements under the Resource Conservation and Recovery Act (RCRA). The U.S. EPA is required to prepare a draft permit which sets forth all the applicable requirements which the Agency intends to require the Permittee to comply during the ten year duration of the permit.

D. PROCEDURES FOR REACHING A FINAL DECISION

Under Section 7004(b) of RCRA and 40 CFR §124.10, the public is given forty-five days to review the application and comment on the draft permit conditions prior to EPA taking any final permitting action on the application for a hazardous waste management permit. The comment period will begin on the date of publication of the public notice in a major local newspaper of general circulation. When the Regional Administrator of the U.S. EPA makes his final permit decision, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final permit decision. If none of the comments received requested a change in the draft permit conditions, the permit will become effective immediately upon issuance of the permit. If comments received during comment period requested changes in the draft permit conditions, then the final permit will become effective thirty (30) days after service of notice of the decision or at a later date if review is under 40 CFR §124.19.

The issuance of a Hazardous Waste Permit will be coordinated by both U.S. EPA and the Ohio Environmental Protection Agency (OEPA). At this time, each Agency has regulations which require a permit to be issued for all facilities which treat, store, or dispose of hazardous waste. If the state receives final authorization for the hazardous waste program, the the state will assume the administration of the Federal hazardous permitting program and this permit.

E. BRIEF SUMMARY OF THE PERMIT CONDITIONS

The attached Section provides a brief summary of the permit conditions in the draft permit. The column titled "Regulation" provides the regulatory authority for the permit condition specified in the column titled "Permit Condition."

Permit Condition	Subject	Regulation (40 CFR)
I. STANDARD CONDITIONS		
I.A.	Effect of Permit	§270.4 & 270.30(g)
I.B.	Permit Actions	§270.30(f), 270.41, §270.42, 270.43, §264.112 & §264.343(d)
I.C.	Severability	Standard Practice
I.D.1.	Duty to Comply	§270.30(a)
I.D.2.	Duty to Reapply	§270.30(b) & 270.10(h)
I.D.3.	Permit Expiration	§270.51
I.D.4.	Need to Halt or Reduce Activity not a Defense	§270.30(c)
I.D.5.	Duty to Mitigate	§270.30(d)
I.D.6.	Proper Operation and Maintenance	§270.30(e)
I.D.7.	Duty to Provide Information	§270.30(h) & §264.74(a)
I.D.8.	Inspection and Entry	§270.30(i)
I.D.9.	Monitoring and Records	§270.30(j)
I.D.10.	Reporting Planned Changes	§270.30(l)(1)
I.D.11.	(Not Used)	
I.D.12.	Anticipated Noncompliance	§270.30(l)(2)
I.D.13.	Transfer of Permits	§270.30(l)(3), 270.40 & 264.12(c)
I.D.14.	Compliance Schedules	§270.30(l)(5) & 270.33
I.D.15.	Twenty-Four Hour Reporting	§270.30(l)(6) & 264.56(d)(i)(j)

Permit Condition	Subject	Regulation (40 CFR)
I.D.16.	Other Noncompliance	§270.30(1)(10)
I.D.17.	Other Information	§270.30(1)(11)
I.E.	Signatory Requirement	§270.11 & 270.30(k)
I.F.	Confidential Information	§270.12
I.G.	Not Used	
I.H.	Documents to be Maintained at Facility Site	§264.13(b), 264.16(d), §264.53(a), 264.122(a), §264.142(a), 264.73, §264.15(b)

Permit Condition	Subject	Regulation (40 CFR)
II.	GENERAL FACILITY CONDITIONS	
II.A.	Design and Operation of Facility	§264.31
II.B.	Required Notice (Not Applicable)	
II.C.	General Waste Analysis	§264.13
II.D.	Security	§264.14
II.E.	General Inspection Requirements	§264.15
II.F.	Personnel Training	§264.16
II.G.	General Requirements for Ignitable, Reactive and Incompatible Waste	§264.17
II.H.	Location Standards (not applicable)	
II.I.1.	Required Equipment	§264.32
II.I.2.	Testing and Maintenance of Equipment	§264.33
II.I.3.	Access to Communications or Alarm System	§264.34
II.I.4.	Required Aisle Space	§264.35
II.I.5.	Local Authorities	§264.37
II.J.1.	Implementation of Contingency Plan	§264.51
II.J.2.	Copies of the Contingency Plan	§264.53
II.J.3.	Amendments to the Contingency Plan	§264.54
II.J.4.	Emergency Coordinator	§264.55
II.K.	Manifest System	§264.71, §264.72, §264.76, §270.30(l)(7), §270.30(l)(8)
II.L.1.	Operating Record	§264.73
II.L.2.	Biennial Report	§264.75, §270.30(l)(g)

Permit Condition	Subject	Regulation (40 CFR)
II.M.1.	Closure Performance Standard	§264.111
II.M.2.	Amendment to Closure Plan	§264.112(b)
II.M.3.	Notification of Closure	§264.112(c)
II.M.4.	Time Allowed for Closure	§264.113
II.M.5.	Disposal or Decontamination of Equipment	§264.114
II.M.6.	Certification of Closure	§264.115
II.N.	Closure Cost Estimate	§264.142
II.O.	Financial Assurance for Facility Closure	§264.143
II.P.	Liability Requirements	§264.147
II.Q.	Incapacity of Owners or Operators, Generators or Financial Institutions	§264.148

Permit Condition	Subject	Regulation (40 CFR)
III.	STORAGE IN CONTAINERS	
III.A.	Waste Identification	§270.13(1)
III.B.	Condition of Containers	§264.171
III.C.	Compatibility of Wastes with Containers	§264.172
III.D.	Management of Containers	§264.173
III.E.	Containment	§264.175
III.F.	Special Requirements for Ignitable or Reactive Waste	§264.176
III.G.	Special Requirements for Incompatible Waste	§264.177

Permit Condition	Subject	Regulation (40 CFR)
IV. STORAGE IN TANKS		
IV.A.	Waste Identification	§270.13(1)
IV.B.	Design of Tanks	§264.191
IV.C.	General Operating Requirements	§264.192
IV.D.	Special Requirements for Ignitable or Reactive Waste	§264.198
IV.E.	Special Requirements for Incompatible Waste	§264.199

Letter To Library To Set Up Repository

Ms. Ruth Berman
Head Librarian
New London Public Library
406 South Pearl Street
New London, Wisconsin 54961

Dear Ms. Berman:

Per my telephone conversation on June 3, 1985, with Ms. Vicki Crznarich, the United States Environmental Protection Agency (U.S. EPA), Region V, will receive comments on the permit application and U.S. EPA's draft permit for Curwood, Incorporated which is located in New London. Please make the items listed below available for public review at the New London Public Library as soon as they are received. I am requesting that you complete the enclosed verification form in order for our Agency to be assured that these materials were received.

- A copy of the Curwood Incorporated permit application
- A copy of the U.S. EPA, Region V, draft permit for Curwood
- A copy of the U.S. EPA, Region V, Fact Sheet for Curwood
- A copy of the Public Notice to be published in the New London Star-Press and Appleton Post Cresent on June 27, 1985, advising the availability of these materials at the Library
- A copy of the U.S. EPA, Region V, pertinent Public Participation Regulations

Please retain the materials on file for public access until further notice. Enclosed are self-addressed, stamped labels and envelopes to be used for the return of these materials upon notice.

Thank you very much for your cooperation in assisting our effort to serve the public. Please contact me at (312) 886-3715, if you have any questions.

Sincerely,

Christine Klemme
Environmental Protection Assistant

Enclosures

Public Notice (Without Corrective Action)

NOTICE OF DRAFT PERMIT AND PUBLIC HEARING

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

Date of this Notice: December 26, 1982 Public Notice No: RCRA 2002

The United States Environmental Protection Agency (EPA) proposes to issue a permit for the storage and incineration of hazardous waste to the Union Carbide Corporation for its facility which is located on 437 MacCorkle Avenue, SW, South Charleston, WV 25303. The EPA permit is to be issued under the authority of the Resource Conservation and Recovery Act. This facility has been assigned EPA identification Number WVD 98 055 4885.

A draft permit which contains conditions for the operation of a hazardous waste storage and incineration facility has been proposed by EPA. The permit conditions are proposed and are open to comment from the public.

Persons wishing to comment on the draft permit must submit such comments in writing or provide comments at the public hearing described below. Written comments must be sent to the Environmental Protection Agency, 6th & Walnut Streets, Philadelphia, PA 19106, Attention: Joan Henry (3AW32) and must be received by EPA on or before February 11, 1983.

This is to notify the public that a hearing to receive comments on the permit will be held by EPA on January 27, 1983 in the South Charleston High School located at 1 Eagle Way, South Charleston, WV at 7:00 p.m.

All comments should address the appropriateness of the decision to prepare a draft permit or the appropriateness of any condition of the draft permit. All comments must raise reasonably ascertainable issues and should be accompanied by all reasonably available arguments, factual grounds and supporting material. It is EPA's present intent to limit comments at the hearing to a maximum of five minutes per speaker so persons wishing to participate in the hearing are encouraged to prepare written material to be submitted along with any oral comments.

All written comments received by the above date and all comments received at the hearing will be considered in the formulation of final determination regarding the permit. After considering all comments and the requirements and policies in RCRA and its implementing regulations, the EPA Regional Administrator will make a decision regarding permit issuance.

The administrative record, including the application, all data submitted by the applicant, the fact sheet, the draft permit, maps showing the exact facility location, and comments received, may be reviewed and copied at EPA Region III, 6th & Walnut Streets, Philadelphia, PA 19106, between the hours of 8:30 a.m. and 4:30 p.m. Monday through Friday. A copying machine will be provided for public use at a charge per page. Any person desiring further information, copies of portions of the administrative record, or an appointment to review the record should contact Joan Henry at the above address or call (215) 597-8751.

An additional copy of the application, draft permit and fact sheet will be available for review at the West Virginia Department of Natural Resources, Division of Water Resources, 1201 Greenbrier Street, Charleston, WV 25311.

PUBLIC NOTICE REGARDING TENTATIVE DETERMINATION
OF CONFORMITY WITH CORRECTIVE ACTION REQUIREMENTS
AND AMENDMENT OF PART B APPLICATION

The United States Environmental Protection Agency (U.S. EPA) Region V, is hereby giving notice of its tentative determination that there have been NO uncorrected releases of hazardous waste or hazardous constituents to the environment, from any current or previous solid waste management units, at the site on which CECOS International, Incorporated Processing Center currently operates a storage and treatment facility at 4879 Spring Grove Avenue, Cincinnati, Ohio 45232.

This tentative determination is one of the steps U.S. EPA is undertaking to fulfill its obligations under the recently enacted (November 8, 1984) Hazardous and Solid Waste Amendments of 1984 (HSWA; the Amendments). Section 206 of the Amendments requires that all hazardous waste management permits issued after November 8, 1984, must require corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage or disposal facility seeking a permit. It further requires that permits issued must contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to the issuance of the permit) and assurances of financial responsibility for completing such corrective action.

U.S. EPA gave notice to the public of a draft permit for CECOS International, Incorporated's Processing Center on August 31, 1984, and held a public hearing on the draft permit on October 2, 1985. The technical review of the permit application, coupled with the above public participation activities constituted the whole of the application review process prior to HSWA.

A final determination by U.S. EPA concerning any releases of hazardous waste or hazardous constituents to the environment will also decide whether or not an additional condition is placed in any final RCRA permit. Should U.S. EPA determine that such releases have occurred, any permit issued to CECOS International, Incorporated's Processing Center would require that corrective action be taken to address such releases, to prevent any threat to public health and the environment. Should U.S. EPA determine that such releases have not occurred, no such corrective action requirement would be necessary.

Today's tentative determination is based on a review of files and documents readily available to U.S. EPA. The review has not discovered any evident of any such releases to the environment.

Comments are hereby solicited from the public as to whether any such releases have ever occurred at this site. Comments must be in writing, and should provide factual information (type of release, location, date) which would cause U.S. EPA to modify today's tentative determination. Comments must be postmarked no later than September 30, 1985, and be addressed to Ms. Christine Klemme, Solid Waste Branch, 5 HS-JCK-13, 230 South Dearborn Street, Chicago, Illinois 60604.

This notice also serves to amend the Part B application. CECOS International, Incorporated's Processing Center will increase the capacities of the multi media filters to 22,500 gallons and the activated carbon absorbers to 15,000 gallons in the wastewater treatment system. This increase in capacities will enable CECOS to treat a maximum of 360,000 gallons of wastewater per day.

Joint EPA/West Virginia Public Notice

JOINT PUBLIC NOTICE OF PROPOSED ISSUANCE OF A PERMIT UNDER RESOURCE CONSERVATION AND RECOVERY ACT

United States Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

in conjunction with the

West Virginia Department of Natural Resources
Division of Water Resources
Hazardous Waste/Groundwater Branch
1201 Greenbrier Street
Charleston, West Virginia 25311

Date of this Notice: June 28, 1985

The United States Environmental Protection Agency (EPA) and the West Virginia Department of Natural Resources (DNR) propose to issue a permit for storage and incineration of hazardous waste to Union Carbide Technical Center which is located at 3200 Kanawha Turnpike, South Charleston, WV, 25303. The EPA permit is to be issued under the authority of the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA) while the State permit is to be issued under authority of the West Virginia Code Chapter 20, Article 5E. The facility has been assigned EPA permit number WVD 06 068 2291.

The State of West Virginia is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of RCRA in effect at the time of the authorization which was prior to the enactment of HSWA.

HSWA imposes additional requirements on hazardous waste management facilities which will be administered and enforced by EPA until the State of West Virginia receives additional authorization for those requirements. Therefore, EPA, the Department of Natural Resources and Air Pollution Control Commission will determine whether to issue permits to Union Carbide. APCC announced its tentative determination to issue a permit to Union Carbide on May 16, 1985.

Facility Description

Union Carbide Corporation has applied to West Virginia for a permit to operate a hazardous waste incinerator, and two container storage areas at their South Charleston Technical Center. The incinerator is used to dispose of many small bottles of waste laboratory chemicals and drums of waste solvents generated by pilot plant washing operations. In addition, the incinerator is used to dispose of bags of experimental polyurethane foam which are non-hazardous waste.

The Union Carbide Corporation Technical Center incinerator is a Brule' Model FG4-T20 with three chambers. The incinerator is equipped with two auxiliary fuel burners and a liquid/gas burner. The auxiliary fuel burners

are natural gas burners and are able to provide a total of 3 MM Btu/hr while the third burner will be used to burn ignitable waste (D001) and/or natural gas and can provide up to 5 MM Btu/hr. The incinerator is also equipped with a quench (for cooling the combusion gases) and a packed bed scrubber (for removing HCL and particulate from the gases).

The two storage units include a hazardous waste container storage area which will be used to store drums of waste and laboratory samples and a refrigerated bunker used to store relatively small quantities of reactive and ignitable materials under controlled temperature conditions.

DNR Tentative Decision

DNR will issue a permit for the hazardous waste incinertor and two storage units.

EPA Tentative Decision

EPA will issue a separate permit with the following requirements: The permit includes "boilerplate" requirements which must be in all EPA permits per regulation 40 CFR §270.30. In addition, it addresses Section (3004u) of the Hazardous and Solid Waste Amendments of 1984, concerning Continuing Releases at Permitted Facilities. A permit issued by the Administrator or authorized representative after the date of enactment of the Hazardous and Solid Waste Amendments of 1984 shall require corrective action for all releases of hazardous waste or hazardous constituents from any solid waste management unit at a facility seeking a permit regardless of the time at which waste was placed in such units. The Permittee is required by the draft permit to locate all present and former solid wastes management units on the facility property and determine whether there have been or are releases of any hazardous constituents from these units and submit a preliminary assessment to EPA within thirty (30) days of the effective date of this permit. If any release has occurred or is occurring, the facility will be required to undertake any activity necessary to clean up these releases.

The preliminary assessment includes requirements to:

1. Identify all solid waste management units (SWMU) on a topographic map.

2. Provide construction design information for each SWMU.

3. Provide information on the waste handled at the SWMU and other operational data.

4. Provide data and descriptions of a potential release or evidence of no release.

5. Complete a site investigation of the units identified.

6. Submit the preliminary assessment site investigation report to EPA within 30 days.

Public Participation

Persons wishing to comment on the draft permit, permit application or object to permit issuance must submit their comments in writing. Duplicate copies of comments should be sent to the:

Environmental Protection Agency
841 Chestnut Street
Philadelphia, PA 19107
Attention: Robin Cole (3HW31)

and

West Virginia Department of Natural Resources
Division of Water Resources
Hazardous Waste/Groundwater Branch
1201 Greenbrier Street
Charleston, WV 25311
Attention: Kim Fetty

All comments received within 45 days of this public notice will be considered in the formulation of the final determinations regarding the permits.

In the event the Regional Administrator (EPA) or the Chief (Division of Water Resources) receives written notice of opposition to the draft permit and a request for a public hearing within the comment period referenced above, a hearing shall be scheduled at a location convenient to the nearest population center to the proposed facility. Any person requesting a hearing must raise all reasonably ascertainable issues and must include all reasonable available arguments, factual grounds and supporting material. If a public hearing is required, public notice will be given at least 30 days before the hearing. Any requests for a public hearing should be addressed to the Regional Administrator, Environmental Protection Agency Region III, 841 Chestnut Street, Philadelphia, PA 19107 and/or the Chief, Division of Water Resources, West Virginia Department of Natural Resources, 1201 Greenbrier Street, Charleston, WV 25311.

The EPA administrative record, including the application, all data submitted by the applicant, the fact sheet, the draft permit, maps showing the exact facility location, and comments received, may be reviewed and copied at EPA Region III, 841 Chestnut Street, Philadelphia, PA 19107, between the hours of 8:30 a.m. and 4:30 p.m. Monday through Friday. A copying machine will be provided for public use at a charge per page. Any person desiring further information, copies of portions of the administrative record, or an appointment to review the record should contact Joan Henry at the above address or call (215) 597-7259.

A copy of the State Administrative record, including the application, draft permit and fact sheet will be available for review at the West Virginia Department of Natural Resources, Division of Water Resources, Public Information Office, 1201 Greenbrier Street, Charleston, WV 25311. Any person desiring further information should contact Kim Fetty at the above address or call (304) 348-7861.

After consideration of all written comment and of the requirements and policies in RCRA and appropriate regulations, the EPA Regional Administrator and the WVDNR Chief, Division of Water Resources, will make their decisions regarding the permit issuance. If the determinations are substantially unchanged from those announced by this notice, the EPA Regional Administrator and the Chief will so notify all persons submitting written comments. If the determinations are substantially changed, the EPA Regional Administrator and the Chief will issue a joint public notice indicating the revised determinations.

JOINT NOTICE OF PREPARATION OF A
HAZARDOUS WASTE STORAGE PERMIT
RESOURCE CONSERVATION AND RECOVERY ACT

United States Environmental Protection Agency
Region III
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

in conjunction with the
Pennsylvania Department of Environmental Resources
Bureau of Solid Waste Management
90 E. Union Street
Wilkes-Barre, PA 18701

Date of this Notice: August 9, 1984

The United States Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Resources (DER) each has reviewed a permit application for storage of hazardous waste from Allied Corporation - Chemical Sector - Pottsville Plant, Pottsville, PA 17901. EPA has made a tentative determination to issue its permit. DER is still reviewing the application. Both EPA and DER will consider all public comments made at this time when deciding whether to grant or deny the permit. The EPA draft permit was prepared under the authority of the Resource Conservation and Recovery Act (RCRA), and the DER fact sheet was prepared under the authority of the Pennsylvania Solid Waste Management Act of 1980. The proposed facility has been assigned EPA draft Permit Number PAD 06 977 6185.

The Role of DER

The State of Pennsylvania is in the process of applying to EPA for Final Authorization of the State's hazardous waste management program. Until Final Authorization occurs, both DER and EPA will operate parallel programs, jointly review permit applications and issue permits, or deny permit applications jointly where possible. After that, all facilities will operate exclusively under State-issued permits.

Allied Corporation - Chemical Sector - Pottsville Plant Application

Allied Corporation - Chemical Sector - Pottsville Plant has applied for a RCRA hazardous waste permit to operate a container storage facility at Westwood Road in Pottsville, PA.

This facility will store hazardous waste in containers in a single storage shed. Wastes stored in the shed will consist of PVC Dry Blend Organic Liquid, Maintenance Oils and Solvents, and Nylon Extrusion Wastes.

The drums of hazardous waste will be collected and stored at this facility until sufficient quantities have been accumulated for removal. The storage capacity of the facility is 192 55 gallon drums (10,560 gallons).

PUBLIC PARTICIPATION

Persons wishing to comment on the EPA draft permit, DER fact sheet or permit application should submit their comments in writing. Duplicate copies of comments should be sent to:

Sherman L. Latchaw
Facilities Management Section (3HW32)
EPA Region III

and

David J. Lamereaux
Regional Solid Waste Manager
PA DER

at the addresses indicated above.

All persons, including the applicant, who believe any condition of the EPA draft permit is inappropriate or that a tentative decision to prepare a draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of the public comment period. All supporting materials shall be included in full and may not be incorporated by reference, unless they are already part of the EPA administrative record in this permit action or consist of State or Federal statues and regulations, EPA documents of general applicability, or other generally available reference materials. Commenters shall make supporting material not already included in the administrative record available to EPA/DER. All comments must be received within the 45-day period ending September 24, 1984.

In the event EPA and DER receive written objection to the draft permit conditions or permit application and a request for a public hearing within the comment period referenced above, a hearing shall be scheduled at a location convenient to the population center nearest to the proposed facility. Public notice of the public hearing shall be given at least 30 days before the hearing.

PERMIT APPLICATION FILES

EPA's administrative record, including the application, all data submitted by the applicant, the EPA draft permit and fact sheet and maps showing the exact facility location, and comments received, may be reviewed and copied at EPA, Region III, Sixth and Walnut Streets, 2nd Floor, Philadelphia, Pennsylvania 19106, between the hours of 8:30 AM and 4:30 PM Monday through Friday. A copying machine will be provided for public use at a charge per page. Any person desiring further information, copies of portions of the administrative record, or an appointment to review the record should contact Joan Henry at the above address or call (215) 597-8751.

Similar information will be available for review at the Pennsylvania Department of Environmental Resources, 90 E. Union St., Wilkes-Barre, Pennsylvania 18701 between the hours of 8:00 AM and 4:00 PM Monday through Friday. Any person desiring further information should call Mr. David Lamereaux, Regional Solid Waste Manager, Wilkes-Barre at (717) 826-2516.

Copies of the permit application are also available at the Schuylkill County Planning Commission Courthouse, Pottsville, PA and the Norwegian Township Board of Supervisors, Maple Avenue, Mar Lin, PA.

Any relevant comments received within 45 days of the date of this joint public notice will be considered in the formulation of final determinations regarding the permits. After consideration of all written comments and of the requirements and policies in RCRA and appropriate State regulations, EPA and DER will make their final decision to either issue, modify or deny the permit. At that time, EPA and DER will notify the applicant and each person who has submitted written comments or requested notice of the final permit decision. The final EPA permit decision will become effective thirty (30) days after the service of notice of the decision unless a later date is specified or review or appeal to the Administrator of EPA is requested under 40 CFR §124.19. If no comments requested a change in the draft permit, the final permit will become effective immediately upon issuance. The final DER permit action will be published in the Pennsylvania Bulletin and this action by the Department may be appealable to the Environmental Hearing Board, Third Floor, 221 North Second Street, Harrisburg, Pennsylvania 17101, (717) 787-3483), by any aggrieved person pursuant to Section 1921-A of the Administrative Code of 1929, 71 P.S. Section 510-21; and the Administrative Agency Law, 2 Pa. C.S., Chapter 5A. Appeals must be filed with the Environmental Hearing Board within thirty (30) days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the regulations

governing practice and procedure before the Board may be obtained from the Board. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

ISSUES OUTSIDE THE SCOPE OF THE PROPOSED ACTION

Comments are requested only on the storage facility described above. Comments outside the scope of this permit will not be accepted nor acted upon.

Public Service Announcement Cover Letter, Script, And Verification Form

Ref: 8AW-WM

KQIL Radio
P.O. Box 320
Grand Junction, CO 81502

Dear Linda Sparks

Enclosed please find a purchase order from the Environmental Protection Agency (EPA) to place a radio broadcast with your station. The announcement gives public notice regarding a period of review for a hazardous waste permit at the University of Colorado. The announcement should be aired on June 14 1984.

We have enclosed the announcement to be aired. Please return the enclosed verification form in the self-addressed envelope, in order to receive payment and to allow EPA to document the time and place of the radio advertisement.

If you need further information or find that the announcement must be changed in any way, please call Mrs. Pat Urquhart at (303)844-6258.

Thank you for your assistance.

Sincerely yours,

Al Broach
Purchasing Agent

Enclosures

RADIO ANNOUNCEMENT

(TO BE AIRED ON STATION KQIL ON JUNE 14, 1984)

FOR A PERIOD OF 45 DAYS ENDING ON JULY 30, 1984, ANY INTERESTED PERSON MAY SUBMIT WRITTEN COMMENTS AND MAY REQUEST A PUBLIC HEARING ON THE ENVIRONMENTAL PROTECTION AGENCY'S TENTATIVE DECISION TO DENY A HAZARDOUS WASTE PERMIT FOR USE OF WASTE PILES AT THE GARY REFINING COMPANY'S FRUITA, COLORADO, SITE. A REQUEST FOR A HEARING MUST BE IN WRITING AND MUST SPECIFY THE ISSUES TO BE RAISED. COMMENTS, QUESTIONS, AND REQUESTS FOR A HEARING SHOULD BE DIRECTED TO LAWRENCE A WAPENSKY, U.S. EPA REGION VIII, WASTE MANAGEMENT BRANCH, 1860 LINCOLN STREET, DENVER, COLORADO, 80295.

THE ADMINISTRATIVE RECORD, WHICH CONTAINS SUPPORTING DOCUMENTS AND OTHER INFORMATION ASSOCIATED WITH THE GARY REFINING COMPANY PERMIT DENIAL, IS AVAILABLE FOR REVIEW DURING REGULAR BUSINESS HOURS AT THE U.S. EPA LIBRARY, 1860 LINCOLN STREET, DENVER, COLORADO, AND AT THE COLORADO DEPARTMENT OF HEALTH, ROOM 232, 222 SOUTH 6TH STREET, GRAND JUNCTION, COLORADO.

VERIFICATION OF BROADCAST

This is to verify that a Public Announcement on the Environmental Protection Agency's notice of denial of a hazardous waste storage permit for Gary Refining Company was broadcast on KQIL on the following dates:

_____

_____

_____

Signature_____

Date_____

Public Notice Of Facility Closing

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295

U.S. ENVIRONMENTAL PROTECTION AGENCY - REGION VIII
PUBLIC NOTICE OF FACILITY CLOSURE
UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

Facility Closing

Name: Laramie Energy Technology Center, North Site (LETC)
EPA I.D. #: WY2890031874

Location: One mile North of Laramie on U.S. Highway 30
P.O. Box 3395 University Station
Laramie, Wyoming 82071

LETC operated a facility, which was identified on the RCRA Part A permit application, for storing hazardous waste in containers, with a proposed capacity of 500 gallons for 68 different hazardous wastes. The largest quantities of hazardous waste anticipated to be stored at the facility were benzene, toluene, and cyclohexane.

Public Comments

The Environmental Protection Agency (EPA) announces that until May 24, 1985, public comment will be accepted on the LETC closure plan, in accordance with hazardous waste regulations (40CFR 265.112 (d)). According to these regulations, the EPA Regional Administrator will approve, modify, or disapprove the plan. Comments, questions, and written communications should be directed to Lawrence Wapensky, U.S. EPA Region VIII, Waste Management Branch, 1860 Lincoln Street, Denver, Colorado, 80295, telephone number (303) 293-1662.

The closure plan and supporting documents are available for review during regular business hours (8:30 a.m. to 4:30 p.m.) at the U.S. EPA Library, 1860 Lincoln Street, Denver, Colorado, at the offices of the Department of Environmental Quality, Water Quality Division, Herschler Building, 122 West 25th Street, Cheyenne, Wyoming, and the Albany County Public Library, 310 South 8th Street, Laramie, Wyoming.

EPA

U.S. Environmental Protection Agency

PUBLIC MEETING REGISTRATION FORM

NAME_____

ADDRESS_____

CITY_____ ZIP_____

Do you represent a municipality, agency or group?

☐Yes Which?_____

☐No

Are you already on our mailing list?

☐Yes

☐No

EPA

U.S. Environmental Protection Agency

PUBLIC MEETING REGISTRATION FORM

NAME_____

ADDRESS_____

CITY_____ ZIP_____

Do you represent a municipality, agency or group?

☐Yes Which? _____

☐No

Do you want to submit written comments?

☐Yes

☐No

Do you want to make make verbal comments today?

☐Yes

☐No

DRAFT

SUGGESTED DOCUMENTS WHICH MAY BE INCLUDED IN ADMINISTRATIVE RECORD

- EPA INVESTIGATIVE RECORDS
  - Inspection Reports
  - Sampling and analytical data
  - Photographs
  - Expert Witness Statements
  - Statements/interviews with Facility's current or former employees
  - Informants' tips or citizen complaints corroborated by supporting information

- REPORTS AND INTERNAL EPA DOCUMENTS USED IN GENERATING OR SUPPORTING ENFORCEMENT ACTION
  - Relevant correspondence between EPA and Respondent
  - Records of conferences and telephone calls between EPA and Respondent

  Note: Deliberative documents are exempt from disclosure under the FOIA

- RCRA SOURCES
  - RCRA Part A and Part B Permit Applications
  - SWMU Response to Reauthorization Statutory Interpretation
  - Comprehensive Monitoring Evaluations (CMEs)
  - Exposure Information Report
  - RCRA Biennial Reports
  - RCRA Waste Manifests
  - RCRA Facility Assessment (if available)
  - RCRA Facility Investigation (if conducted)
  - Corrective Measures Study (if conducted)
  - Responses to RCRA Section 3007 Information Requests
  - Information Obtained Through RCRA Section 3013 Orders

- CORRESPONDENCE BETWEEN EPA & STATE OR OTHER FEDERAL AGENCIES RE: ENFORCEMENT ACTIONS AT FACILITY

- CERCLA SOURCES
  - Notifications of Reportable Quantities under Section 103(c)
  - Responses to Section 104 Information Requests
  - CERCLA Preliminary Assessment/Site Investigation (PA/SI)
  - Hazard Ranking System (HRS) Documentation
  - CERCLA Remedial Investigation/Feasibility Studies (RI/FS)

- OTHER FEDERAL ENVIRONMENTAL PROGRAM SOURCES
  - NPDES Permits and Permit Applications
  - Clean Air Act Permits and Permit Applications
  - TSCA/OSHA Inspections
  - DOD Installation Restoration Program Reports

- STATE INVESTIGATIVE RECORDS

- OTHER MISCELLANEOUS SOURCES
  - Aerial Photography
  - State/Local Well Permits
  - U.S. Geologic Survey and State Hydrogeologic Maps
  - Utilities Re: Population Data
  - Airports/ Weather Bureaus Re: Local Climate

- COPIES OF ALL DOCUMENTS FILED WITH REGIONAL HEARING CLERK OR PRESIDING OFFICER

MAJOR COMPONENTS OF SECTION 3008 (h) ORDER

- JURISDICTION
- FINDINGS OF FACTS
- CONCLUSIONS OF LAW AND DETERMINATIONS
- WORK TO BE PERFORMED
- LEGAL PROVISIONS
- PROCEDURAL PROVISIONS

COMPONENTS OF SECTION 3008(h) ORDER

I.	JURISDICTION
II.	APPLICABILITY
III.	STATEMENT OF PURPOSE
IV.	FINDINGS OF FACT
V.	CONCLUSIONS OF LAW AND DETERMINATIONS
VI.	WORK TO BE PERFORMED
VII.	QUALITY ASSURANCE
VIII.	PUBLIC COMMENT AND PARTICIPATION
IX.	[CORRECTIVE MEASURE IMPLEMENTATION]
X.	REPORTING
XI.	ON-SITE AND OFF-SITE ACCESS
XII.	SAMPLING AND DATA/DOCUMENT AVAILABILITY
XIII.	RECORD PRESERVATION
XIV.	PROJECT COORDINATOR
XV.	NOTIFICATION
XVI.	[REIMBURSEMENT OF OVERSIGHT COSTS]
XVII.	DELAY IN PERFORMANCE/PENALTIES
XVIII.	DISPUTE RESOLUTION
XIX.	FORCE MAJEURE AND EXCUSABLE DELAY

COMPONENTS OF SECTION 3008(h) ORDER (CONT'D)

XX. RESERVATION OF RIGHTS

XXI. OTHER CLAIMS AND PARTIES

XXII. OTHER APPLICABLE LAWS

XXIII. INDEMNIFICATION OF THE UNITED STATES

XXIV. [FINANCIAL ASSURANCE]

XXV. SUBSEQUENT MODIFICATION

XXVI. RESPONDENT'S RIGHT TO REVIEW ADMINISTRATIVE RECORD

XXVII. RESPONDENT'S OPPORTUNITY FOR INFORMAL CONFERENCE (if unilateral)

XXVIII. WAIVER OF HEARING (if order on consent)
RESPONDENT'S RIGHT TO A HEARING (if unilateral)

XXIX. TERMINATION AND SATISFACTION

XXX. EFFECTIVE DATE OF ORDER

CHECKLIST OF SECTION 3008(h) ORDER COMPONENTS

I. CAPTION

- Respondent, facility, city, state, region
- Whether unilateral or on consent
- EPA Docket number

II. JURISDICTION

- Statement of jurisdiction
- Delegation of authority to issuing official
- Respondent's waiver of defense to validity of order

III. APPLICABILITY

- Parties bound
- Copy of order to respondent's contractor, etc.
- Notice of order to successors in interest

IV. STATEMENT OF PURPOSE

- Objective of order (e.g., RFI, CMS, CMI)

V. FINDINGS OF FACT

- Identify Respondent
  - Name
  - Status (e.g., corporation, partnership)
  - Nature o business
  - Role (e.g., owner/operator)
- Describe facility
  - Address of facility
  - Nature of facility
  - Facility size, layout and operations
  - Specify property boundaries
  - Specify current and past uses of units
- Describe information that establishes the elements of Section 3008(h) --
  1. There is or has been a release
  2. Of hazardous wastes or Appendix VIII hazardous constituents

3. Into the environment

4. From a facility

   - Hazardous waste management units
   - Other solid waste management units
   - Contamination beyond the facility boundary

5. Subject to interim status under Section 3005(e)

6. The response is necessary to protect human health or the environment (the level of information will depend on the level of response ordered)

   - Quantities or concentrations of hazardous waste or constituents

   - Migration potential

   - Actual or potential receptors (i.e., humans, wildlife, vegetation)

   - Threat posed by hazardous waste or hazardous constituents to human or environmental receptors (e.g., toxic, carcinogenic, flammable, etc.)

V. CONCLUSIONS OF LAW AND DETERMINATIONS

. Based on the Findings of Fact and the administrative record, EPA (or the RA) has made the following conclusions of law and determinations --

1. Respondent is a person (Section 1004(15))

2. Respondent is the owner/operator of a facility subject to interim status (Section 3005(e))

3. There is or has been a release

4. Of hazardous wastes or hazardous constituents

5. From a Respondent's facility

6. Actions required by Order are necessary to protect human health or the environment

VI. WORK TO BE PERFORMED

- Activities to be suspended, if applicable
- State with specificity which of the following actions are to be performed --
  - Interim Measures
  - Preliminary Investigation
  - RCRA Facility Investigation
  - Corrective Measure Study
  - Corrective Measure Implementation
- Specify compliance schedule with firm deliverables tied to detailed Scope of Work to be attached to the Order and specifically incorporated in Order by reference
- Specify points at which EPA will review and approve/disapprove plans, activities, etc.
- Specify the following, as appropriate --
  - Quality Assurance/Quality Control Procedures
  - Sampling and Data/Document Availability
  - Sample Numbers, Locations
  - Sampling and Analytical Techniques
  - Monitoring Requirements
  - Health and Safety Procedures
  - Operation and Maintenance Procedures

VII. LEGAL PROVISIONS

- Record Preservation
- EPA's right to access facility when activity is being conducted
- Owner/operator's user of "best efforts" to obtain off-site access, if applicable
- EPA's right to take split samples
- EPA's right to halt work, if necessary
- Delay in Performance/Penalties
- Dispute Resolution
- Force Majeure and Excusable Delay

- Reservation of Rights -- Compliance with Order does not relieve owner/operator of obligations under RCRA and other applicable laws
- Other Claims and Parties
- Actions shall be consistent with other applicable laws
- Indemnification of the United States
- Reimbursement of Oversight Costs
- Financial Assurance
- Termination and Satisfaction
- Effective Date of Order

VIII. PROCEDURAL PROVISIONS

- Subsequent Modification
- Progress Reports
- Public Comment and Participation
- Respondent's right to a hearing (if unilateral)
- Respondent's right to review administrative record
- Respondent's opportunity for an informal conference (Note that request for conference does not stay 30-day period for requesting a hearing)
- Project Coordinators
- Notification -- EPA contact person
- Signatures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 9, 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Draft RCRA Section 3008(h) Model Consent Order

FROM: Lloyd S. Guerci, Director
RCRA Enforcement Division

TO: RCRA Enforcement Branch Chiefs
RCRA Enforcement Section Chiefs
Regions I - X

Enclosed for comment is a draft RCRA section 3008(h) model consent order.

This draft order contains general language that should be included in consent orders. It does not include technical language on scopes of work for RCRA Facility Investigations (RFIs) and Corrective Measure Studies (CMSs) or interim measures. For model technical language, you should refer to other guidance documents, as applicable. In particular, you should be using the RFI/CMS guidance and draft interim measures guidances in developing the technical provisions of orders.

This draft may be used on an interim basis in developing consent orders. Please provide your comments by February 23 to Jackie Tenusak of the Office of Waste Programs Enforcement (WH-527).

Thank you.

cc: Office of Regional Counsel
Waste Branch Chiefs
Regions I - X
Gene Lucero
Peter Cook
Steve Heare
Susan Bromm
Mark Gilbertson
John Cross
Michael Kilpatrick

* DRAFT *

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

(REGION (*Number)

IN THE MATTER OF'	)	
	)	
(*Name of Owner/Operator)	)	ADMINISTRATIVE ORDER ON CONSENT
	)	
(*Name, address and EPA 1.D.# of Facility)	)	U.S. EPA Docket No. (*Number)
	)	
RESPONDENT.	)	
	)	
	)	Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §6928(h).

[All Orders should include provisions dealing with Jurisdiction, Findings of Fact, Conclusions of Law and Determinations, and the requirements of the Order itself. It is of utmost importance that you develop an administrative record that will support the facts alleged in the order. Each of these provisions will vary somewhat from Order to Order as discussed below. The provision dealing with the actual activities ordered (Section VI) is generally the most individualized section of an order.]

I. JURISDICTION

This Administrative Order on Consent (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (hereinafter EPA) by Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. 6928(h). The authority vested in the Administrator has been delegated to the Regional Administrators by EPA Delegation Nos. 8-31 and 8-32 dated April 16, 1985.

This Administrative Order on Consent is issued to (corporate/individual name) (Respondent) Owner/Operator of (*Name and address of Facility). Respondent consents to (or agrees not to contest) EPA's jurisdiction to issue this Order and waives any defense to the validity of this Order.

II. APPLICABILITY

1. This Consent Order shall apply to and be binding upon (Respondent) and its officers, directors, employees, agents, successors and assigns, and upon all persons, independent contractors, contractors, and consultants acting under or for (Respondent).

2. No change in ownership or corporate or partnership status relating to the Facility will in any way alter (Respondent's) responsibility under this Consent Order.

3. (Respondent) and EPA shall provide a copy of this Consent Order to all contractors, subcontractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Consent Order within one (1) week of the effective date of this Consent Order or date of such retention.

4. Respondent shall give notice of this order to any successor in interest prior to transfer of ownership or operation of the Facility.

III. STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of EPA and (Corporate/individual name) are: [Describe objective of Order, e.g., to evaluate thoroughly the nature and extent of the release of hazardous waste and hazardous constituents and to gather necessary data to support the Corrective Measure Study.]

IV. FINDINGS OF FACT

1. Respondent is a company doing business in the State of (*State) and is a person as defined in section 1004(15) of RCRA, 42 U.S.C. §6903(15), and _____ (cite appropriate State regulation if the State has been authorize pursuant to RCRA Section 3006).

2. Respondent is (a generator and) an owner and/or operator of a hazardous waste management facility located (location) (Facility). Respondent engaged in (treatment, storage, or disposal) of hazardous waste at the Facility subject to interim status requirements (40 CFR Part 265) (and, if the State has been authorized pursuant to RCRA Section 3006, as those terms are defined in appropriate state regulations). (specify type of operation--landfill, incinerator etc.).

3. Respondent operated its Facility as a hazardous waste management facility [on and after November 19, 1980, or the date of any statutory or regulatory change rendering the facility subject to interim status requirements as a facility], the applicable date which renders facilities subject to the interim status requirements under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§6924, 6925.

4. [Pursuant to Section 3010 of RCRA, 42 U.S.C. §6930, Respondent notified EPA of its hazardous waste activity. In its notification dated (Date), Respondent identified itself as a (generator of hazardous waste and/or an owner/operator of a treatment, storage, and/or disposal facility).]

5. In its (Name of Facility submission/notification or Part A or Part B permit application) dated (date), Respondent identified itself as handling the following hazardous wastes at the Facility:

Example

(a) Hazardous wastes exhibiting the characteristics of ignitability, corrosivity, reactivity or EP toxicity identified at 40 CFR §261.20-§261.24; (D001-D017)

(b) Hazardous wastes from non-specific sources identified at 40 CFR §261.31; (F001-F028)

(c) Hazardous wastes from specific scurces identified at 40 CFR §261.32; (K001-K106)

(d) Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or manufacturing chemical intermediates identified at 40 CFR §261.33(e); (P001-P123); and

(e) Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or manufacturing chemical intermediates [identified at 40 CFR §261.33(f) (U001-U249]

[Note: Include finding (if applicable) that by filing a Part A permit application etc., the Facility achieved interim status]

6. Respondent's Facility includes:

[Note: Describe location and units regulated under RCRA Subtitle C and other Solid Waste Management Units generally. Note lack of liners on land disposal units. Attach and incorporate by reference a copy of a facility map from Permit application if available. Focus on and provide more detail on the unit(s) where a release has occurred and which are the specific subjects of this Order. Include material relating to:

- Size of facility
- Facility layout
- Number and type of units and operating status

° Specific wastes received at specific units
° Geological conditions
° Ground-water flow conditions.]

[Note: Where probative, this information should help to establish a connection between the units and any release of hazardous waste/constituents from them. Examples of where this information might be obtained are: a Part A, Part B, Exposure Information Report, Inspection Reports, etc. constitutents]

7. Documentation of Release

[Note: After having described the facility, it is necessary to establish and document that a release of hazardous wastes or Appendix VIII hazardous constituents into the environment from the facility has occurred. In addition, there should be a discussion that supports the premise of the Order that the response (as described and required in Section VI below), is necessary to protect human health or the environment.]

Sources of release information can be:

° Results of an inspection (RFA, CME, CEI);
° Company submittal of a ground-water assessment report;
° Other data/information submitted by Respondent (e.g., Part B submittal, exposure information report) or developed by EPA (e.g., sampling| analyses); and
° Knowledge of disposal into units not designed, constructed or operated to prevent releases.]

Example

Ground-water monitoring wells have been installed at Respondent's Facility. Wells (number/identification code) are up-gradient from (describe disposal unit/s). Wells (number/identification code) are down gradient from (describe disposal unit/s). Samples of ground water from these wells have been analyzed to determine contamination of ground water. Samples were collected by EPA personnel from ground-water monitoring wells, #8, #16, #24, #32. The results were as follows:

Well #	Sampling Date	Organics	Concentration
8	Aug. 14, 1985	Phenol	40,000 ppm

16	Aug. 17, 1985	Phenol	20,000 ppm
24	Sept. 9, 1985	phenol	32,000 ppm
32	Sept. 9, 1985	phenol	10,000 ppm

[NOTE: The chart should be concise, although multiple charts can be used if sufficient information is available. Only applicable data needed to support the Order should be included, some of which could be an attachment to the Order. Information such as chain of custody sheets, log analysis reports, QA/QC reports should not be attached to the Order or referenced. However, these forms should be identified and maintained in the administrative record.

Data other than ground-water data, e.g., soil and air, should be used if available. Such data should provide information comparable to that provided in the above table, i.e., medium sampled, location and dates of sampling, the substances found, and their concentrations. Further, Respondent's results can be used in lieu of EPA's if they support the Agency's case and are deemed reliable.]

8. The hazardous wastes and/or hazardous constituents may further migrate, from the Facility into the environment in the following pathways:

[NOTE: The next steps link the release of hazardous wastes or hazardous constituents to human or environmental concerns. It is important to define migration pathways. It is also important to note and distinguish between actual and potential receptors - human, wildlife, vegetation, etc.

Example

[NOTE: The following is an example which can be modified as appropriate depending upon the level of certainty concerning the nature and extent of contamination and whether a remedy has been devised/ implemented for the facility.]

9. The hazardous wastes and/or hazardous constituents identified in paragraphs five and seven above have the following characteristics (describe carcinogenic/toxic characteristics).

[Note: The Order is further strengthened by, and should include, a description of the toxic, carcinogenic, and hazardous properties of the contaminants. In particular, if the Order requires extensive activies (e.g., removal of materials or closure of units), then the documentation of migration pathways and potential affects must support the more extensive activity required.]

10. Respondent's Facility is located (Describe residences, aquifers, domestic water supplies, river/lake used for recreational purposes, wells (including number and type of use), fragile environment, etc. and their distance and location with respect to the facility.

[NOTE: health and environmental concerns are very broad and include aquifers that may be used some day.]

11. Releases from Respondent's Facility (are likely to/have) migrate(d) toward (Describe potential and actual receptors).

12. The Regional Administrator, EPA Region (Number), has concluded that the actions ordered below are necessary to protect human health or the environment.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set out above, and the administrative record, the Regional Administrator of EPA has made the following conclusions of law and determinations:

1. Respondent is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. §6903(15);

2. Respondent is/was the owner or operator of a facility that has operated or is operating subject to section 3005(e) of RCRA, 42 U.S.C. section 6952(e).

3. Certain wastes and constituents thereof found at the facility are hazardous wastes or hazardous constituents thereof as defined by section 1004(5) of RCRA, 42 U.S.C. section 6903(5). These are also hazardous wastes or hazardous constituents within the meaning of section 3001, of RCRA, 42 U.S.C. §6921 and 40 C.F.P. Part 261.

4. There is or has been a release of hazardous wastes and/or hazardous constituents into the environment from Respondent's Facility.

5. The actions required by this Consent Order are necessary to protect human health or welfare or the environment.

VI. WORK TO BE PERFORMED

[NOTE: This is an example which should be modified as appropriate depending upon the situation at the facility.]

Pursuant to Section 3008(h) of RCRA, 42 U.S.C. §6928(h), Respondent agrees and is hereby ordered to perform the following acts in the manner and by the dates specified herein. All work undertaken pursuant to this Order shall be performed in a manner consistent with, at a minimum, [the Interim Measures Plan (IM), RCRA Facility Investigation (RFI) Corrective Measures Study (CMS) plan, Corrective Measures Implementation Program Plan (CMI), RCRA and its substantive implementing regulations, and applicable EPA guidance documents such as the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" (October 1986).] (Note where any of these documents are referenced, they are to be incorporated by reference and attached.)

[1.[Within (number) days of the effective date of this Consent Order, (Respondent) shall submit to EPA a plan for the implementation of interim measures (IM). The plan and activities conducted pursuant to this Consent Order are subject to approval by EPA and shall be performed in a manner consistent with the scope of work contained in Attachment (number). [This attachment will require specific activities to be performed which mitigate a potential threat to human health and/or the environment and/or are consistent with and integrated into any long term solution at the facility. A facility specific program of interim measures can be developed using the Draft Interim Measures Guidance and sections from the Scope of Work for the Corrective Measure Implementation in the RCRA Corrective Action Plan.] Attachment (number) to this Consent Order is incorporated as if fully set forth herein. The Interim Measures Plan shall be developed in accordance with, at a minimum, RCRA, its implementing substantive regulations, and EPA guidance documents.]

2. [The activities called for in the Interim Measures Plan shall be designed to mitigate a potential threat to human health and/or the environment and/or consistent with and integrated into any long term solution at the facility. The plan shall include explicit detailed tasks for the implementation of Interim Measures including: the objectives of the interim measures; design, construction, operation, and maintenance requirement; and schedules for design, construction and monitoring.]

3. [Within (number) days of the effective date of this Consent Order, Respondent shall submit to EPA a plan for a RCRA Facility Investigation (RFI) and Corrective Measure Study (CMS) (the "Work Plan"). The Work Plan and activities conducted pursuant to this Consent Order are subject to approval by EPA and shall be performed in a manner consistent with the scope of work contained in Attachment (number). Attachment (number) to this Consent Order is incorporated as if fully set forth herein. The Work Plan shall be developed in accordance with, at a minimum, RCRA, its implementing substantive regulations, and EPA guidance document (Specify).]

4. [The Work Plan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes and hazardous constituents, within and beyond the Facility boundary. The Work Plan shall include explicit detailed tasks explaining how (Respondent) will determine: (1) the presence or absence of hazardous wastes and hazardous constituents;

(2) the nature and extent, and the rate of movement of contamination on and off the (Respondent's) property; (3) the possible routes of migration of hazardous wastes and hazardous constituents on and off the facility including characterization of the geology and hydrology of the facility which delineates possible routes of migration; (4) the extent and potential for migration of hazardous wastes and hazardous constituents through each of the environmental media; and (5) corrective measure alternatives to remediate the observed and potential contamination. The Work Plan shall include a specific schedule for implementation of all activities described in the Work Plan.]

5. [In accordance with Section (number) herein, the Work Plan will include: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan with supporting graphics and flow charts; (3) a specific Data Management for each site/source or interpretation with cross reference; (4) a Health and Safety Plan; (5) a schedule for implementation of the Work Plan, including preparation and submission of preliminary and final reports to EPA; and [(6) a Community Relations Plan.] The submission of the final report on the corrective measures study in the schedule shall be targeted within (number) months of the date of this order.]

6. [Within (number) days of the effective date of this Consent order, (Respondent) shall submit to EPA a Corrective Measures Implementation (CMI) Program Plan. The Program Plan and activities conducted pursuant to this Consent Order are subject to approval by EPA and shall be performed in a manner consistent with the Scope of Work contained in Attachment (number). Attachment (number) to this Consent Order is incorporated as if fully set forth herein. The Program Plan shall be developed in accordance with, at a minimum, RCRA, its implementing substantive regulations, and EPA guidance documents. (Specify)]

7. [The Program Plan shall be designed to facilitate the design, construction, operation, maintenance and monitoring of the corrective measures at the Facility. In accordance with Section (number) herein, the Program Plan will include: (1) a Program Management Plan; [(2) a Community Relations Plan;] (3) Design Plans and Specifications; (4) an Operation and Maintenance Plan; (5) a Cost Estimate; (6) a Project Schedule; (7) a Health and Safety Plan; and (8) a Construction Quality Assurance Plan.]

° The operation of the corrective measure shall be targeted for within (number) months of the date of this order.]

8. EPA shall promptly review the proposed plans and inform (Respondent) in writing of its approval or disapproval of the Plans or any part thereof. In the event of any disapproval, EPA shall specify the deficiencies and reasons for disapproval and any necessary modifications. Within (number) days of receipt of such disapproval, (Respondent) shall have the opportunity to meet with EPA to discuss problems with the Plans and to propose alternative

or suggestions to resolve them. Within (number) days of this meeting or the receipt of EPA's disapproval of the Work Plan, whichever is later, (Respondent) shall amend, making the changes to the Plans required by EPA, and resubmit the Work Plan. The EPA approved plans shall be deemed incorporated into and part of this Consent Order. The final EPA approval of corrective measures, is subject to consideration of public comment by EPA pursuant to paragraph VII.

9. Within (number) days of approval or modification by EPA of the Work Plan, (Respondent) shall commence work and implement the tasks required by the Plans, in accordance with the requirements, specifications and schedules stated in the Plans as approved or modified by EPA.

10. (Respondent) shall provide preliminary and final IM, RFI/CMS and CMI reports to EPA in accordance with the schedule contained in the approved Plans.

11. EPA shall review any preliminary or final reports, and notify (Respondent) in writing of EPA's approval or disapproval of the report or any part thereof. In the event of any disapproval, EPA shall specify in writing the deficiencies and reasons for such disapproval and any necessary modifications. Within (number) days of receipt of such disapproval, (Respondent) shall have the opportunity to meet with EPA to discuss the problems with the report(s) and to propose alternatives or suggestions to resolve them. Within (number) days of the date of this meeting or the receipt of EPA's disapproval of any report, whichever is later, (Respondent) shall amend and resubmit a revised report, making the changes to the reports required by EPA, and resubmit the work plan. EPA approved reports shall be deemed incorporated into and part of this Consent Order.

12. (Numbers) copies of all documents, including preliminary and final reports, EPA approvals, EPA disapprovals, and other correspondence to be submitted pursuant to this Consent Order shall be hand delivered or sent by certified mail, return receipt requested, to the Project Coordinator designated pursuant to Section (Number) of this Consent Order.

13. Consistent with the objectives of this order, EPA may determine that certain tasks, including investigatory work or engineering evaluation, are necessary in addition to the tasks and deliverables included in the Plans. If EPA determines that such additional work is necessary, EPA shall request in writing that (Respondent) perform the additional work and shall specify the basis and reasons for EPA's determination that the additional work is necessary. Within (Number) days after the receipt of such request, (Respondent) shall have the opportunity to meet with EPA to discuss the additional work EPA has requested and to propose alternatives. Within (Number) days of this meeting or the receipt of EPA's request for additional work, whichever is later, (Respondent) shall notify EPA in writing of its decision whether or not to undertake the additional work. Any additional work performed by (Respondent) under this paragraph shall be performed in a manner consistent with this Consent Order.

14. All work performed pursuant to this Consent Order shall be under the direction and supervision of a professional engineer or geologist with expertise in hazardous waste site investigations and remediation. By or on the effective date of this Consent Order, (Respondent) shall notify EPA in writing of the name, title, and qualifications of the engineer or geologist, and of any contractors or subcontractors and their personnel to be used in carrying out the terms of this Consent Order.

VII. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, (Respondent) shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved Plans.

In addition, (Respondent) shall:

1. Follow the EPA guidance for sampling and analysis contained in the document entitled (Title).

2. Consult with EPA in planning for, and prior to, field sampling and laboratory analysis.

3. Inform the EPA Project Coordinator in advance which laboratories will be used by (Respondent) and ensure that EPA personnel and EPA-authorized representatives have reasonable access to the laboratories and personnel used for analyses.

4. Ensure that laboratories used by (Respondent) for analyses perform such analyses according to EPA methods (SW-846) Title) (date) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, (Respondent) shall submit all protocols to be used for analyses to EPA for approval within (Number) days prior to the commencement of analyses.

5. Ensure that laboratories used by (Respondent) for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis of a reasonable number of known samples provided by EPA to demonstrate the quality of the analytical data.

6. Use the EPA guidance to evaluate all data to be used in the (Plans) including what is collected prior to EPA approval of the (Plan) required by Section (Number) of this Consent Order. This evaluation shall be provided to EPA as part of the (Plan) required by Section (Number) of this Consent Order, and shall be updated as necessary.

VIII. PUBLIC COMMENT AND PARTICIPATION

[NOTE: Public involvement in the review of Administrative Orders on Consent is an important aspect of the corrective action process. If, however, prompt action is required to address an imminent threat to human health or the environment, the provision should be modified. A sample provision outlining the public comment process is provided below.]

[1. Following proposed modification or proposed approval by EPA of a Corrective Measure Study Final Report, EPA shall make both the RCRA Facility Investigation Final Report and the Corrective Measure Study Final Report and EPA's justification for selecting the proposed remedy available to the public for review and comment for at least (number) days.

2. Following the public review and comment period, EPA shall notify (Respondent) which alternative corrective measure is selected, if any. If the Corrective Measure proposed and tentatively selected by EPA after review of the Corrective Measure Study Final Report is not the corrective measure approved by EPA after consideration of public comments, EPA shall inform (Respondent) in writing of the reasons for such decision.]

3. Final agency action shall occur when (Respondent) is subject to a final order directing respondent to implement the measures in the Corrective Measure Study Final Report.

[IX. CORRECTIVE MEASURE IMPLEMENTATION]

[If (Respondent) has complied with the terms of this consent Order, after selection of the corrective measure, EPA shall provide a (number) day period for negotiation of a new administrative order on consent [or a judicial consent decree] for implementation of the corrective measure. If agreement is not reached during this period, EPA reserves all rights it has to implement the corrective measure or other remedial response and to take any other appropriate actions under RCRA, CERCLA or any other available legal authority.]

X. REPORTING

Beginning with the month following the effective date of this order, (Respondent) shall provide EPA with written progress reports for each month, by the tenth day of the following month. At a minimum, these progress reports shall: (1) describe the actions, progress, and status of projects which have been taken toward achieving compliance with this Consent Order; (2) describe all plans and activities completed during the past month, as well as the actions which are scheduled for the next month. (3) identify any requirements under this Order that were not completed as provided and any problem areas and anticipated problems areas in complying with this Consent Order; and (4) include the results of sampling and tests and other data generated pursuant to the Work Plan(s).

XI. ON-SITE AND OFF-SITE ACCESS

[NOTE: Provisions requiring the respondent to give EPA and its designated representatives access to the site and to relevant records must be included in the Order. Such provisions should also set forth, as deemed necessary, the Respondent's responsibilities with respect to gaining access to third party property. The following composite provision incorporates most of the relevant requirements.]

1. EPA and/or any EPA representative, including EPA contractors, are authorized to enter and freely move about all property at the Facility for the purposes of, inter alia: interviewing Facility personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of the Respondent in carrying out the terms of this Order; conducting such sampling and tests as EPA or its representative deem necessary; using a camera, sound recording, or other documentary type equipment; and verifying the reports and data submitted to EPA by the Respondent. The Respondent shall permit such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, that pertain to work undertaken pursuant to this paragraph, and shall comply with all approved health and safety plans.

2. To the extent that work required by the Work Plan must be done on property not owned or controlled by (Respondent), (Respondent) will use its best efforts to obtain site access agreements from the present owner(s) of such property within (number) days of approval of the Work Plan. Best efforts as used in this Section shall include, at a minimum, a certified letter from (Respondent) to the present owners of such property requesting access agreements to permit (Respondent) and EPA and its authorized representatives to access such property. Any such access agreement shall be incorporated by reference into this Order. In the event that agreements for site access are not obtained within (number) days of the effective date of this Consent Order, (Respondent) shall notify EPA regarding both the lack of and its failure to obtain such agreements within (number) days thereafter. In the event that EPA obtains access, (Respondent) shall undertake EPA approved work on such property. Nothing in this section limits or otherwise affects EPA's right of access and entry pursuant to applicable law, including RCRA and CERCLA.

XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

[NOTE: Site-specific sampling and analysis requirements must be included in the Order, as well as provisions requiring the respondent to give EPA and its designated representatives access to the site and relevant records. The following is a sample provision.]

1. (Respondent) shall make available to EPA all results of sampling, tests, or other data generated by or on its behalf with respect to the implementation of this Consent Order. (Respondent) shall submit these results in the progress reports described in Section (Number) of this Consent Order. Similarly, upon request, EPA will make available to (Respondent) the results of sampling or tests generated pursuant to this Order by EPA within (number) days after any such results or data pass EPA quality assurance review.

2. (Respondent) shall notify EPA at least (number) days before conducting any well drilling, installation of equipment, or sampling. At the request of EPA, (respondent) shall provide or allow EPA or its authorized representative to take split samples of all samples collected by (Respondent

pursuant to this Consent Order. Similarly, at the request of (Respondent), EPA shall allow (Respondent) or its authorized representatives to take split or duplicate samples of all samples collected by EPA under this Consent Order. EPA shall notify (Respondent) at least (Number) days before conducting any sampling under this Consent Order.

3. All information and data shall be available to the public except to the extent that it is confidential business information. Disputes over confidentiality shall be covered by 40 CFR Part 2. Environmental contamination data shall not be deemed confidential.

XIII. RECORD PRESERVATION

(Respondent) agrees that it shall preserve, during the pendency of this Consent Order and for a minimum of (Number) years after its termination, all records and documents in its possession or in the possession of its divisions, employees, agents or consultants or contractors which relate in any way to this Consent Order or to hazardous waste management and disposal at the Facility. At the conclusion of (Number) years (Respondent) shall then make such records available to EPA for inspection or EPA's retention or shall provide copies of any such records to EPA.

(Respondent) further agrees that within 5 days of the effective date of this Order or of retaining or employing an agent, consultant or contractor, whichever comes first, (Respondent) will enter into an agreement, to be confirmed in writing within 15 days, with its agents, consultants and/or contractors whereby its agents, consultants and/or contractors will be required to maintain and preserve during the pendency of this Order and for a minimum of (number) years after its termination, all records and documents within their respective possession which relate in any way to this Order or to hazardous waste management and disposal at the facility.

XIV. PROJECT COORDINATOR

1. On or before the effective date of this Consent Order, EPA and (Respondent) shall each designate a Project Coordinator. Each Project Coordinator shall be responsible for overseeing the implementation of this Consent Order. The EPA Project Coordinator will be EPA's designated respresentative. To the maximum extent possible, all communications between (Respondent) and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Order, shall be directed through the Project Coordinators.

2. The parties agree to provide at least (Number) days written notice prior to changing Project Coordinators.

3. The absence of the EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

XV. NOTIFICATION

Unless otherwise specified, reports, notices or other submissions required under this Consent Order shall be in writing and shall be sent to:

[EPA Project Coordinator]
US EPA, Region (Number)
Address

[Facility Project Officer]
Address

[XVI. REIMBURSEMENT OF OVERSIGHT COSTS]

[Beginning from the effective date of this Order, EPA shall submit to the Respondent (period of time) accounting and an explanation of all oversight costs incurred with respect to this Order during the previous year. Within (Number) calendar days of each such accounting and explanation, the Respondent shall remit a certified or cashiers check to the EPA for the EPA for the amount of such costs.

Payments to EPA shall be made to the order of the Treasurer of the United States of America, and shall be forwarded to the U.S. Environmental Protection Agency, [(Address) (Include appropriate post office box address)]

[XVII. DELAY IN PERFORMANCE/STIPULATED PENALITIES

[NOTE: This provision includes both stipulated and statutory penalties. Provisions covering stipulated penalties may vary in dollar amounts and time frame depending upon the circumstances. Different stipulated penalty amounts may be set for different types of requirements under the Order, with the amount related to the importance of the task. Stipulated amounts may, and usually should include escalators as the length of non-compliance time continues. Short grace periods may be negotiated into the provision. The following is a sample provision.]

1. Unless excused under Paragraph (number), "Force Majeure and Excusable Delay," for each day that same work product or task completion called for in the Work Plan is overdue, or for which (Respondent) fails to submit a report or document or otherwise fails to achieve the requirements of this Consent Order, (Respondent) shall pay the sums set forth below as stipulated penalties, except as provided in paragraph (number) of this section. Stipulated penalties shall accrue in the following amounts:

a. For failure to commence work as prescribed in this Consent Order and EPA approved plans and reports under this order: ($) per day for one to seven days of delay, and ($) per day for each of delay, or part thereof, thereafter;

b. For failure to submit any preliminary and final reports, at the time required pursuant to this Consent Order: ($) for the first one to seven days of delay, and ($) for each day of delay thereafter;

c. For failure to submit other deliverables required by this Consent Order: ($) for the first one to seven days, and ($) for each seven-day delay, or part thereof, thereafter;

d. For other failure to comply with provisions of this Consent Order after notice by EPA of noncompliance: ($) for the first one to seven days, and ($) for each seven-day delay, or part thereof,

2. Any stipulated penalties paid pursuant to this Consent Order shall be payable within (number) days after (Respondent's) receipt of written demand by EPA, shall be paid by certified or cashier's check made payable to the United States Treasury, and shall be remitted to:

Regional Waste Management Division Director
U.S. Environmental Protection Agency, Region (#)
Address

A letter describing the basis for the penalties shall accompany the check. Copies of the transmittal of payment shall be sent to the Office of Regional Counsel, US EPA, Region (number), Address.

3. The stipulated penalties set forth in this Section do not preclude EPA from pursuing any other remedies or sanctions which may be available to EPA by reason of (Respondent's) failure to comply with any of the requirements of this Consent Order, nor shall payment of said penalties relieve (Respondent) of the responsibility to comply with this Consent Order.

4. Should (Respondent) fail to comply with a time requirement of any task required by this Consent Order, the period of noncompliance shall terminate upon (Respondent's) performance of said requirement.

5. If (Respondent) disputes the basis for imposition of stipulated penalities, the issue shall be resolved under the Dispute Resolution procedures of Section (number) of this Consent Order.

XVIII. DISPUTE RESOLUTION

1. If (Respondent) disagrees, in whole or in part, with any EPA disapproval or other decision or directive made by EPA pursuant to this Consent Order, (Respondent) shall notify EPA in writing of its objections and the bases therefore with (number) calendar days of receipt of EPA's disapproval, decision or directive. EPA and (Respondent) shall then have an additional (number) calendar days from EPA's receipt of (Respondent's) objections to attempt to resolve the dispute. If agreement is reached, the resolution shall be reduced to writing, signed by representatives of each party and incorporated into this Consent Order.

If the parties are unable to reach agreement within this (Number) day period, EPA shall provide a written statement of its decision to (Respondent), which shall be incorporated into this Consent Order.

XIX. FORCE MAJEURE AND EXCUSABLE DELAY

[NOTE: Provisions excusing the respondent from compliance with the performance schedule upon occurrence of events beyond the respondent's control (force majeure) are common and may be included in the Order to facilitate negotiations. The following paragraph is an example of such a provision.]

1. (Respondent) shall perform the requirements under this Consent Order within the time limits set forth or approved or established herein, unless the performance is prevented or delayed solely by events which constitute a force majeure. A force majeure is defined as any event arising from causes not reasonably foreseeable and beyond the control of (Respondent) including its consultants and contractors, which could not be overcome by due diligence and which delays or prevents performance by a date required by this Consent Order. Such events do not include unanticipated or increased costs of performance, changed economic circumstances, or normal precipitation events.

2. (Respondent) must notify EPA in writing (number) days after it becomes aware of events which it knows or should know constitute a force majeure. Such notice shall estimate the anticipate length of delay, including necessary demobilization and remobilization, its cause, measures taken or to be taken to minimize the delay, and an estimated time table for implementation of these measures. Respondent shall adopt all reasonable measures to avoid and minimize the delay. Failure to comply with the notice provision of this section shall be grounds for EPA to deny (Respondent) an extension of time for performance.

3. If (Respondent) demonstrates to EPA that the delay has been or will be caused entirely by circumstances not reasonably foreseeable and beyond its control including its consultants and contractors, which could not have been overcome by due diligence, the time for performance for that element of the Work Plan shall be extended for a period equal to the delay resulting from such circumstances. This shall be accomplished through written amendment to this Consent Order pursuant to Section XXVI. Such an extension does not alter the schedule for performance or completion of other tasks required by the Work Plan unless these are also specifically altered by amendment of the Consent Order or underlying plan. In the event that EPA and (Respondent) cannot agree that any delay or failure has been or will be caused entirely by circumstances not reasonably foreseeable and beyond the control of (Respondent), which could not have been overcome by due diligence, or if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the Dispute Resolution provisions of Section (number) of this Consent Order.

XX. RESERVATION OF RIGHTS

[NOTE: To ensure abatement of the threats posed by site conditions, EPA's right to take action in the future or to require the Respondent to take appropriate future action should be preserved as much as possible. For example, the Respondent may satisfactorily perform the actions required of it by the Order, but those actions may prove ultimately to be insufficient to remedy the problem. To address such instances, the Agency must reserve its right to reinstitute legal action. The following is a sample provision.]

1. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by (Respondent) and to request that (Respondent) perform tasks in addition to thse stated in the Work Plan.

2. Compliance by (Respondent) with the terms of this Consent Order shall not relieve (Respondent) of its obligations to comply with RCRA or any other applicable State or federal law.

3. EPA reserves the right to take any enforcement action pursuant to CERCLA, RCRA, or any other available legal authority, including without limitation, the right to seek injunctive relief, including actions to compel implementation of corrective measures to compel compliance with this Order, for cost recovery, for monetary penalties, and for punitive damages.

4. EPA serves the right to perform any portion of the work consented to herein or any additional site characterization, feasibility study, and response/corrective actions as it deems necesary to protect public health or welfare or the environment. Absent an immediate hazard, EPA will not perform work consented to herein if respondent is performing said work in a timely and satisfactory manner. [EPA may exercise its authority under CERCLA to undertake removal actions or remedial actions at any time.] In any event, EPA reserves it right to seek reimbursement from (Respondent) for such additional costs incurred by the United States. Notwithstanding compliance with the terms of this Consent Order, (Respondent) is not released from liability, if any, for the costs of any response actions taken by EPA.

XXI. OTHER CLAIMS AND PARTIES

Nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation not a signatory to this Consent Order for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken from the Facility.

XXII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the substantive requirements of all applicable local, state, and federal laws and regulations.

XXIII. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

(Respondent) agrees to indemify and save and hold harmless the United States Government, its agencies, departments, agents, and employees, from any and all claims or causes of action arising from or on account of acts or omissions of (respondent) or its agents, independent contractors, receivers, trustees, and assigns in carrying out activities required by this Consent Order. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of (Respondent) or the United States under their various contracts.

[XXIV. FINANCIAL ASSURANCE]

[NOTE: To ensure that required corrective actions are successfully completed by the respondent, EPA may require the establishment of some form of financial assurance. If the respondent proves unable or unwilling to undertake the actions prescribed in the Order, the Agency will then have access to funds with which to undertake the required action. The financial assurance may take one or more of several forms depending on a number of factors, including the reliability and the financial security of the respondent. These forms of financial assurance may include a performance or surety bond, liability insurance, an escrow performance guarantee account, or a trust fund.]

XXV. SUBSEQUENT MODIFICATION

1. This Consent Order may be amended by mutual agreement of EPA and (Respondent) Such amendments shall be in writing, shall have as their effective date the date on which they are signed by both parties, and shall be incorporated into this Consent Order.

2. Any reports, plans, specifications, schedules, and attachments required by this Consent Order are, upon approval by EPA, incorporated into this Consent Order. Any non-compliance with such EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a failure to achieve the requirements of this Consent Order and shall subject (Respondent) to the penalty provisions included in Section (number) of this Consent Order and other sanctions.

3. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted to (Respondent) will be construed as relieving (Respondent) of its obligation to obtain written approval, if and when required ty this Consent Order.

XXVI. TERMINATION AND SATISFACTION

The provisions of this Consent Order shall be deemed satisfied upon (Respondent's) receipt of written notice from EPA that (Respondent) has demonstrated, to the satisfaction of EPA, that the terxs of this Consent Order, including any additional tasks which, subject to the limitations set forth herein, (Respondent) has agreed to undertake, have been satisfactorily completed. EPA shall issue such notice after receipt of notice by (Respondent) that it has completed the requirements of the Consent Order.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV - 4 1986

MEMORANDUM

SUBJECT: Draft Guidance on the Use of Stipulated Penalties in Hazardous Waste Consent Decrees

FROM: John S. Winder, Jr.
Assistant Enforcement Counsel, OECM-Waste

TO: Addressees

I have attached for your review and comment Draft Guidance on the Use of Stipulated Penalties in Hazardous Waste Consent Decrees. This document is designed to assist in the drafting of stipulated penalties provisions in EPA consent decrees for RCRA and CERCLA cases and to ensure the enforceability of those provisions. The comments which were submitted previously by the Office of Waste Programs Enforcement (OPWE) and the Department of Justice have been incorporated herein.

Please address your comments to Carolyn Tillman of my staff, Mail Code LE-134S, Room 3219L, FTS 475-8205, by Monday, November 24, 1986. After your comments have been incorporated, we will circulate a final draft for review.

Attachment

cc: Edward E. Reich, Associate Enforcement Counsel for Waste

Addressees:

Gene A. Lucero, Director, Office of Waste Programs Enforcement
John Cross, Chief, Guidance and Oversight Branch, Office of Waste Programs Enforcement
David T. Buente, Chief, Environmental Enforcement Section, U.S. Department of Justice
Nancy Firestone, Deputy Chief, Environmental Enforcement Section, U.S. Department of Justice
Hazardous Waste Branch Chiefs, Office of Regional Counsel, Regions I-X

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in Hazardous Waste Consent Decrees

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DRAFT

MEMORANDUM

SUBJECT: Guidance on the Use of Stipulated Penalties in Hazardous Waste Consent Decrees

FROM: Thomas L. Adams, Jr.
Assistant Administrator

TO: Offices of Regional Counsel, Regions I-X

INTRODUCTION

This document provides guidance on the use of stipulated penalties in hazardous waste consent decrees. [1]/ Stipulated penalties are fixed sums of money that a defendant agrees to pay for violating the terms of a decree. Since these monies are totally forfeited if a violation occurs, such penalties can be an effective enforcement tool for compelling compliance with a consent decree and minimizing future violations of and disputes over the terms of the decree.

This document supplements existing guidances and incorporates more recent experiences in negotiating consent decrees. The primary sources of the information contained herein are the "Guidance for Drafting Judicial Consent Decrees" (Courtney M. Price, October 19, 1983), "Drafting Consent Decrees in Hazardous Waste Imminent Hazard Cases" (Courtney M. Price,

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[1]/ This guidance does not apply to Administrative Orders on Consent since the relevant statutes currently provide high per diem penalties for violations of Administrative Orders.

Jack W. McGraw, May 1, 1985), "Division of Penalties with State and Local Governments" (Courtney M. Price, October 30, 1985), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and each of the EPA hazardous waste consent decrees filed to date. Based on the review of those guidance documents and a review and evaluation of each consent decree, this document has been prepared to assist in drafting the stipulated penalties section of future EPA hazardous waste consent decrees.

BACKGROUND INFORMATION

Since stipulated penalties can be effective in assuring timely compliance with the terms of a consent decree, it is important that this section of the decree be carefully drafted to protect the Agency's enforcement interests. To understand how stipulated penalties provisions have been drafted in the past, the consent decrees noted above were reviewed to evaluate their stipulated penalties provisions. Of the 58 hazardous waste consent decrees negotiated to date, 39 contained a section on stipulated penalties. The remaining 19 decrees can be characterized generally as agreements in which the defendant would pay civil penalties or response costs, and/or would conduct only limited remedial activities. The 39 decrees with stipulated penalties (see Attachment 1) required remedial work of a more long-term nature. The chart in Attachment 2 summarizes the stipulated penalties section of those decrees.

As the chart indicates, there is much variation in the content of the stipulated penalties section of these decrees. Some of the stipulated penalties provisions are fairly comprehensive, addressing a wide range of concerns, while others give little information beyond the amount of the penalty to be assessed. Since the stipulated penalties section should be clearly drafted to ensure ease of enforcement, the following guidelines should be used in drafting this section of the decree. While these recommendations should be followed in most cases, it is recognized that individual cases may vary, and one's bargaining position may ultimately dictate the character of such provisions.

RECOMMENDATIONS

A. Appropriate Use of Stipulated Penalties

1. In General

As a general rule, all types of consent decrees should include stipulated penalties if the decrees contain prospective obligations for the defendant. Consent decrees entered under SARA, however, are required to contain stipulated penalties. Section 121(e)(2) of SARA provides that:

> ...Each consent decree shall also contain stipulated penalties for violations of the decree in an amount not to exceed $25,000 per day, which may be enforced by either the President or the State. Such stipulated penalties shall not be construed to impair or affect the authority of the court to order compliance with the specific terms of any such decree. (Emphasis added).

Section 122(l) of SARA also p

violations of administrative orders and consent decrees:

> (l) CIVIL PENALTIES - A potentially responsible party which is a party to an administrative order or consent decree entered pursuant to an agreement under this section or section 120 (relating to Federal facilities) or which is a party to an agreement under section 120 and which fails or refuses to comply with any term or condition or the order, decree or other agreement shall be subject to a civil penalty in accordance with section 109.

In the context of a CERCLA consent decree with mandated stipulated penalties, both the stipulated penalties contained in the Consent Decree and the Section 122(l) penalties may be assessed for violation of the terms of a Consent Decree. In those instances where the stipulated penalty amounts contained in the consent decree are sufficiently high to effectively deter non-compliance with the Consent Decree */, however, it may be appropriate to waive 122(l) penalties. **/

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*/ See discussion § C.2., pp. 12-13, infra.

**/ It should be noted that the stipulated penalties language in Section 121 on its face applies only to CERCLA consent decrees. However, the analysis regarding waiver of Section 122(l) penalties also applies to CERCLA administrative orders that contain stipulated penalties. If a CERCLA administrative order does not contain stipulated penalties, Section 122(l) civil penalties will apply by operation of law.

Even consent decrees which primarily involve a "cash out" (i.e., where the defendant pays a fixed sum of money to absolve himself of his remedial obligations) may warrant the inclusion of stipulated penalties. For example, if a defendant agrees to pay his cash out share in installments, stipulated penalties should be used to penalize late payments. If a case arises in which the defendant must perform certain tasks in addition to cashing out (such as providing site access or security), stipulated penalties should be imposed to ensure that the defendant performs.

Stipulated penalties are applicable to noncompliance with a decree as a whole, or noncompliance with only specified requirements. Most commonly they are applicable to delays in performance; whether it is performance of any requirement of the decree, or only specified performances. The types of violations for which stipulated penalties apply will necessarily depend on the value the negotiator places on the activity to be performed.

Stipulated penalties are also applicable where the defendant makes a poor quality attempt at performance. If a consent decree requires the performance of a task and the Agency determines that the defendant's performance is inadequate, stipulated penalties may be assessed for failure to perform. It is recommended that Agency standards be used where applicable. In any event, the Agency should reserve the right to determine whether

the quality of the defendant's performance constitutes "compliance" with the standard; whether it is an Agency standard or some other standard agreed to by the parties during the negotiation process (such as "generally accepted engineering practices"). Furthermore, the burden of proof on such issues should rest with defendant.

2. When Penalties May/May Not Accrue

Usually stipulated penalties begin to accrue on the date in which complete performance of a particular task is due. The accrual of such penalties may be stayed, however, during designated periods or by the occurrence of certain events. The various reasons for not assessing stipulated penalties are noted below.

a. Force Majeure Event

One of the most common reasons for the nonaccrual of stipulated penalties is the occurrence of a force majeure event. A force majeure event is one which is beyond the control of the defendant (such as an act of God or an act of war).[2/] Since penalties generally do not accrue during this period, the definition of a force majeure event should be narrowly drawn and the burden placed on the defendant to show that a force

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2/ Twenty-one of the 39 consent decrees surveyed specifically stated that stipulated penalties would not accrue during the period of noncompliance caused by a force majeure event.

majeure event has occurred.[3]/

b. Grace Period

Many decrees provide for a fixed period immediately following notification of a violation in which the defendant has the opportunity to explain his noncompliance and/or correct it, and during which stipulated penalties will not accrue. The length of the grace periods noted to date have ranged from 3 to 30 days. It may be acceptable to include a limited grace period in the stipulated penalties provision to allow time for the correction of violations due to a force majeure event. However, the length of the grace period should be proportioned to fit the length of time reasonably calculated to correct the violation. In most cases, 7 days would be an acceptable grace period.

c. Dispute Resolution Period [4]/

Usually the obligation to perform a disputed activity is stayed when the defendant files a petition with the Court to

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[3]/ Some decrees may reference the staying of stipulated penalties due to a force majeure event in the "Force Majeure" section of the decree. However, it is recommended that the staying of penalties be addressed in the stipulated penalties section of the decree.

[4]/ Some decrees may reference the staying of stipulated penalties in the "Dispute Resolution" section. As noted in footnote 3 above, it is recommended that the staying of stipulated penalties during the dispute resolution period be addressed in the stipulated penalties section of the decree.

dispute a charge or resolve some disagreement. This often stays the assessment and payment of stipulated penalties at that point as well. Although this practice is discouraged, in the event of a stay, it should be clearly indicated that if the defendant loses the dispute, all penalties which accrued during the period of dispute resolution will be due.

If the dispute involves the selection of a remedy following the performance of an RI/FS by the defendants for a CERCLA cleanup action, a significant amount of time is often needed to settle such disputes. For those instances, the stipulated penalties section may be drafted in a manner that allows the Agency to waive the penalties accrued during the pendency of the dispute.

d. Period of Correction by Defendant

A typical stipulated penalties provision might indicate that "penalties will accrue until the violation is corrected by the defendant." Sometimes it is uncertain, however, whether such a statement means that penalties will cease to accrue on the day the defendant begins to correct the violation, or whether they continue to accrue through the last day of correction. Indeed, one of the decrees surveyed specifically provided that penalties cease to accrue upon initial demonstration by the defendant of compliance with the applicable requirements of the Decree.

It is preferable that stipulated penalties accrue through the final day of correction in order to foster the Agency's interest in timely compliance. It is necessary, therefore, to explicitly state this in the decree.

e. Missed Interim Deadlines

Three of the decrees surveyed provided that penalties for interim deadline violations would not be sought if the defendant met the final completion date. Since in many instances the final deadline is the most important, it may not be unreasonable to stay the penalties for violations of interim milestones. It should be clear to the defendant, however, that if the final deadline is missed, the penalties for interim deadline violations will be sought in addition to those which would accrue after the final deadline. The "Guidance for Drafting Judicial Consent Decrees," at 24, notes that interim deadline penalties can be collected up front and placed into an escrow account. This practice should be followed to encourage prompt compliance. The escrow agent should be authorized to turn account monies over to the Agency in the event that the final completion date is missed.

B. Appropriate Amount of Stipulated Penalties

1. In general

Since stipulated penalties are intended to assure compliance, they should necessarily be large enough to provide economic

incentives to the defendant to comply with the terms of the consent decree. The consent decrees surveyed contained stipulated penalties ranging from as low as $100 per day to as high as $5,000 per day. It was evident from the survey that no conclusions could be drawn regarding the specific amount which applied to specific types of violations. Nonetheless, in setting the amount, one should generally take into consideration the gravity of the violation, the financial condition of the defendant, the economic savings from noncompliance, the degree of harm or danger to the public or environment, the reliability of the defendant based on previous cooperation or experience, the potential for future or continuing violations, and the probable effectiveness of a particular size penalty. See, e.g., SARA § 109(a)(3).

As noted on page 3, supra, SARA provides for stipulated penalties as large as $25,000 per day. In addition, Section 122(l) provides that civil penalties may be assessed in accordance with Section 109 for failure to comply with a consent decree. Based on those two sections of the reauthorized Act, it is clear that Congress favors a strong penalty policy in this area. In particular, it is critical that the Agency set the penalty high enough to discourage noncompliance (i.e., refusal to do the work) based on purely economic considerations.

2. Fixed Amount vs. Sliding Scale

Each stipulated penalties provision should state a fixed amount per day to be imposed. This "sum certain" puts the defendant on notice of the potential extent of his obligation before a violation occurs.[5/] Although a sliding scale approach (i.e. "defendant shall pay up to $5000/day") was used in 9 of the consent decrees surveyed, this approach should be avoided since it makes the penalty subject to negotiation. That in turn destroys the economy of using stipulated penalties since the parties must then negotiate the ultimate amount.

3. Per Diem Increases in Size of Penalty

Although the sliding scale approach should not be utilized, a decree can provide that the per diem amount of the penalty will increase with each incremental increase in the period of noncompliance. For example, a fixed penalty of $5,000 per day might increase to $10,000 per day after the 15th day of noncompliance, and $15,000 per day after the 30th day. Fourteen of the consent decrees surveyed provided for such escalating penalties. Presumably escalating penalties will give the defendant added incentive to come into compliance, and it is recommended that they be used whenever possible.

5/ To the extent that EPA reserves its rights to seek penalties under SARA § 109 or civil contempt orders, however, the "sum certain" argument is really only an indication of the minimum amount for which a consent decree violator may be liable.

4. Sharing Penalties with the State

Statutory penalties may be shared with a State if the State has actively participated in the litigation, actively sought such penalties, and State law provides independent authority for the State to obtain civil penalties:

> The penalties should be divided in a proposed consent decree based on the level of participation and the penalty assessment authority of the state or locality. The division should reflect a fair apportionment based on the technical and legal contributions of the participants, within the limits of each participant's statutory entitlement to penalties.

"Division of Penalties with State and Local Governments" (Courtney M. Price, October, 30, 1985) at 3. Similarly, stipulated penalties may be shared with a State,[6]/ although the criteria for statutory penalties set out above should be used only as a guide in determining how to share stipulated penalties with a State. Since stipulated penalties are negotiated, the Agency should have greater flexibility in sharing them with a State.

C. Collection of Stipulated Penalties

1. In general

Since Agency policy encourages aggressive post-settlement enforcement, it is essential to the integrity of the enforcement program that stipulated penalties be collected whenever

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[6]/ Section 121 of SARA appears to support this position since it gives the State the authority to enforce the stipulated penalties section. See discussion at page 3, supra.

noncompliance occurs.[7] Subject to paragraph "2" below, every effort shall be made to collect stipulated penalties both to deter future noncompliance by defendants and to maintain the Agency's enforcement credibility. The Agency thus will not hesitate to initiate a judicial action to enforce the stipulated penalties provision of consent decrees.

2. Contempt Actions and Use of Other Remedies

If the defendant disagrees with the determination that a violation has occurred, the Agency's right to collect stipulated penalties is usually determined by the dispute resolution process. If the defendant loses in dispute resolution but refuses to pay, the Agency may collect stipulated penalties by filing a contempt action. See, United States v. City of Miami, 664 F.2d 435, 439 (5th Cir. 1981). Despite this remedy, a contempt suit to collect stipulated penalties is not the sole remedy for violations of a decree. There may be times when the Agency will prefer other or additional remedies, such as use of the court's equitable powers or its own right to

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[7] The need for improved post-settlement enforcement was recognized recently in a study by the United States General Accounting Office (GAO) on governmental oversight of cleanup efforts by responsible parties. That study indicates that in many of the settled cases examined pursuant thereto, provisions for the assessment of high penalties for noncompliance are not being enforced by the Agency. (See "Hazardous Waste--Responsible Party Clean Up Efforts Require Improved Oversight" (GAO, May 1986, pp. 29-30).)

collect higher penalties under applicable statutes. See, e.g., SARA § 109, RCRA § 3008. Thus, to preserve the Agency's rights, each section on stipulated penalties should state that these penalties are "in addition to, and not in lieu of" the Agency's right to other sanctions for violations of the decree.*/

3. Limitations Period for Demanding Payments

One of the decrees surveyed contained a limitations period for demanding the payment of stipulated penalties. The decree stated that if the plaintiff neither made written demand for stipulated penalties nor gave written notice of the intent to make such a demand within 120 days of the date it discovered or should have discovered the noncompliance, then the plaintiff would be deemed to have waived any claim for penalties based upon that noncompliance. The burden of proving a waiver was placed upon the defendant.

Hazardous waste consent decrees should not contain a limitations period for demanding stipulated penalties. The Agency should have the right to demand stipulated penalties for any noncompliance discovered at any time during the term of the decree. The burden of proving a waiver will be placed upon the defendant in any event, and the Agency should not have to defend its actions every time the defendant believes that a demand has been untimely made.

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*/ See, however, the discussion regarding SARA § 122(l) penalties at page 3A, supra.

4. Procedure for Collecting Penalties

A consent decree should not require that the Court be petitioned in order to collect penalties. Although many of the decrees provided that penalties were payable upon written demand, others required that the plaintiff first petition the Court for relief. This latter requirement is unnecessary and unduly burdensome.

Forfeiture is the best method of collecting penalties, and should be provided for in the decree. Under this procedure, upon notice of a violation the defendant will have a stated number of days to pay the penalty, petition the Court for a force majeure determination, or to move the issue into dipute resolution.

Each decree should also state that the invocation of the dispute resolution procedure by the defendant must be done "in good faith," and that the Agency will seek additional remedies if frivolous attempts to challenge penalty assessments occur. Moreover, the decree should state that the defendant bears the burden of establishing good faith.

5. To Whom Penalties Are Payable

The stipulated penalties section should indicate to whom monies are payable. This is particularly important for actions brought under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 et seq. (as amended by the Superfund Amendments and Reauthorization

Act of 1986), since the "Superfund" is partially replenished by monies paid under that statute. Although monies owed to the general Treasury are paid to the "Treasurer of the United States," it is recommended that stipulated penalties collected pursuant to CERCLA violations be made payable to the Superfund.[8] All penalties should be paid by certified check, contain the complete and correct address of the defendant, and reference the case name and civil action number.

D. Sample Stipulated Penalties Provisions

The following stipulated penalties provisions are offered as a guide in drafting this section of the decree:

___. STIPULATED PENALTIES

1. Defendant shall pay stipulated penalties to the United States [and/or the State of ____][9] for failure to comply with [Paragraphs_____ of] this Consent Decree. Compliance by Defendant shall include complete adherence to [EPA standards of work quality or the standards mutually agreed upon during negotia-

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[8] This recommendation is supported by the guidance memorandum on "Remittance of Fines and Civil Penalties" (Courtney M. Price, April 15, 1985) which indicates that "all EPA Superfund billings" should go into a lockbox bank specifically designated for Superfund monies. In addition, since Section 107(c)(3) of CERCLA directs that punitive damages go into the Superfund, it is arguable that CERCLA stipulated penalties should be deposited there as well.

The address for the CERCLA lockbox is:

EPA - Superfund
P.O. Box 371003M
Pittsburg, PA 15251

[9] Bracketed provisions are optional.

10ons] and to the specified time schedules and implementation schedules submitted by Defendant and approved by Plaintiff and this Court under this Decree. [If Defendant fails to meet interim deadlines, but meets the final completion date for the work to be performed herein, the penalties for missed interim deadlines may be excused. However, such penalties will be collected at the time of violation, pursuant to the procedures outlined in this section, and placed into an escrow account established by Defendant. The escrow agreement shall direct the escrow agent to deliver stipulated penalties to Plaintiff upon written statement by Plaintiff that the final completion date for all work has not been met].

2. Upon Plaintiff's determination that Defendant has failed to comply with the requirements of this Decree, Plaintiff shall give Defendant written notification of the same and describe the noncompliance. [The notification shall require Defendant to explain and correct the noncompliance within 7 days of receipt, or pay stipulated penalties]. Said notice shall also indicate the amount of penalties due.

3. [If the noncompliance is not corrected within 7 days], all penalties owed to the United States [or State] under this section shall be payble upon demand by EPA [or the appropriate State Agency] within 30 days of receipt of the notification of noncompliance. Such penalties shall be paid by certified check to the Treasurer of the United States [or Treasurer of the State, or the EPA Hazardous Substances Response Trust Fund] and mailed to [the appropriate Federal or State postal address].

4. All penalties begin to accrue on the day that complete performance is due, and continue to accrue through the final day of correction of the noncompliance.

5. Neither the filing of a petition to resolve a dispute nor the payment of penalties shall alter in any way Defendant's ultimate obligation to complete the performance required hereunder.

6. Defendant may dispute Plaintiff's right to the stated amount of penalties by filing a petition with the Court in accord with Section ___ (the "Dispute Resolution" section) herein, within 30 days of receipt of the notification of noncompliance. [Penalties shall accrue but will not be demanded during this period. If Defendant loses upon resolution, however, Plaintiff has the right to collect all penalties which accrued prior to and during the period of dispute.] Defendant bears the burden of proving that any dispute brought under this subsection is a

good faith dispute. If it is found that Defendant has not invoked the dispute resolution provisions in good faith, Plaintiff reserves the right to seek additional or other sanctions against Defendant.

7. [No penalties shall accrue for ___ days [grace period] for violations of this Decree caused by events beyond the control of Defendant as identified in Section ___ herein ("Force Majeure" section)]. Defendant has the burden of proving force majeure or compliance with this Decree.

8. If Defendant refuses to pay stipulated penalties, Plaintiff may institute contempt proceedings in the U.S. District Court for relief. However, nothing in this section shall be construed as prohibiting, altering, or in any way limiting the ability of Plaintiff to seek any other remedies or sanctions available by virtue of Defendant's violation of this Decree or of the statutes and regulations upon which it is based.

9. The following stipulated penalties shall be payable per violation per day to the United States [and/or State] for any noncompliance identified in subparagraph 1 above:

Amount/Day	Period of Noncompliance
$10,000	1st thru 14th day
$15,000	15th thru 30th day
$25,000	31st day and beyond

10. No payments made under this section shall be tax deductible.

11. This section shall remain in full force and effect for the term of this Decree.

Attachment 1

Hazardous Waste Consent Decrees Containing Stipulated Penalties

1. A & F Materials, Inc. (C.A. No. 83-3123)
2. Aerojet-General Corp. & Cordova Chem. Co. (1986)
3. Automated Ind. Disposal and Salvage Co., Inc. & Lipton Investment Service Co. (1980)
4. BASF Wyandotte Corp. & Fed. Marine Terminals, Inc. (C.A. 80-73699)
5. Berlin Farro Liquid Incineration, Inc. (1984)
6. Broderick Development Corp. (May 21, 1986)
7. Chemcentral/Detroit Corp. (C.A. No. 80-73730)
8. Chemical Recovery Systems, Inc. (No. C80-1858)
9. Chemical Waste Management, Inc., Oakbrook, Ill. (Docket Nos. TSCA-V-C-307, RCRA V-W-85R-019)
10. Denver, City and County of (84-JM-1507)
11. Diamond Shamrock Corp. (Docket No. V-W-3013-2, July 14, 1983)
12. Dusek, Franklin J., et al. (C.A. No. CAB-80-110)
13. Energy Systems Co. (ENSCO), 1981
14. Environmental Conservation and Chemical Corp. et al. (C.A. No. IP831419C)
15. Environmental Waste Removal, Inc. (C.A. No. 82-291)
16. Fike Chemicals, Inc. (C.A. No. 80-2497)
17. Gulf Coast Lead Co., (C.A. No. 80-1127, CIV-T-K)
18. Hillsborough, County of (Case No. 80-1128)
19. Lloyd L. Hodges, et al. (C.A. No. H-80-472)
20. Homestake Mining Co. (1983)
21. Hooker Chemicals & Plastics Corp., et al. (C.A. No. 79-988)

22. Ilco, Inc., et al. (C.A. No. CV85-H-823-5)

23. Melvyn Ingalls, et al. (C.A. No. 85-0282-GT (IEG))

24. Inmont Corp., et al. (1985)

25. Kin-Buc, Inc., et al. (C.A. No. 79.514)

26. Lancaster Metals Science Corp.

27. Alvin F. Laskin & Poplar Oil Co. (C.A. No. C79-7594)

28. Steve Martell, et al. (No. H-80473)

29. Metate Asbestos Corp., et al. (No. CIV-83-309)

30. Midwest Solvents Recovery, Inc., et al. (C.A. No. H-79-566)

31. Occidental Petroleum Corp., et al. (No. CIV S-79-989 MLS)

32. Petro-Processors of La. (C.A. No. 80-358-B)

33. Reilly Tar (1986)

34. Seymour Recycling Corp., et al. (C.A. No. IP-80-457-C)

35. Solvents Recovery Service of New England, Inc. (CA No. H-79-704 JAC)

36. Spectron, Inc. & Paul J. Mraz (C.A. File No. HM-80-1552)

37. Vertac Chemical Corp., et al. (No. Cr-C-80-110)

38. W. R. Grace Co. (C.A. No. 80-748-C)

39. Western Processing Co., Inc., et al. (No. C83-252M)

ATTACHMENT 2

STIPULATED PENALTIES PROVISIONS IN HAZARDOUS WASTE CONSENT DECREES
(in alphabetical order)

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
A&F Materials	$1000	Yes	Failure to meet sched. for phazes I and III as per Attachment; failure to notify OSC		Yes	
	$1000		Failure to meet monitoring reqmts of Phase IV of Attachment			
Aerojet (7-day grace period)	$2500 for days 8-30; $5000 thereafter	Yes	Failure to comply with time reqmts of section on Protection of Drink-Water Sources	No stip. pen. accrue if perf. is timely and in accord w/generally accepted scientific practices; If P neither makes written demand for pen. nor gives notice of intent to make such demand w/in 120 days of date P discovers or should have discovered noncompl., P deemed to have waived claim for pen. for that noncompl.	Yes	D has burden of proving P waived claim for pen.; disputes subject to disp. resol. proc.; pen. payable to EPA Haz. Subst. Resp. Trust Fund
(14-day grace period)	$1,000 for days 15-45; $2500 thereafter		Failure to comply with time reqmts for submission of RI/FS workplan/report and design report; initiation of selected or differing remedy; notifying Ps of changes to existing and currently planned facilities; submission of reports and monitoring plans for existing and currently planned facilities; Order to Ct regarding this Decree; notif. of intent to grant land			

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Auto-Ind.	$100		Failure to comply w/prov. of Decree			Pen. payable upon demand by EPA; U.S. may take into acc't magn. and dur. of viol., and any mitig. factors
BASF	$500 for days 1-30; $1000 thereafter	Yes	Failure to comply w/sched. for awarding contracts, completing final grading, seeding and mulching shallow-rooted vegetation, commencing and monitoring samling program, and final certif. that all work is completed	Force majeure; modification by Court; notification of nature, cause and antic. length of delay	Yes	Pay upon demand to U.S. Trsr and Atty Gen. of State
Berlin & Farro	$1000	Yes	Each day on which D fails to complete properly the perf. of work in Attachment	Force majeure, excluding increased costs; missed interim completion dates if final date met; timely written notif. of delays to OSC, SR, and Trus-Trustee	No	Disputes to be submitted to Ct for resol.; D has burden of proving force majeure
Broderick	$500		Failure to submit monthly progress report	Force majeure; modification by Ct	Yes	Pay to EPA Haz. Subst. Resp. Trust Fund; disputes subject to disp. resol. proc.; pen. payable w/in 30 days of ten demand by P; P has non-Ct-reviewable option to demand pen.
(3-day grace period)	$750		Failure to submit review and documentation of phase I activities per sched.			
	$750		Failure to submit quality assurance/control sampling and laboratory analysis plans per sched.			

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Broderick (cont.)	$750		Failure to implement EPA-approved sampling and quality assurance plan per sched.			
	$1000		Failure to begin field studies or lab analysis per sched.			
	$1000		Failure to submit phase 2 or 3 reports per sched.			
Chemcentral	Up to $500 for days 1-30; $1000 thereafter	Yes	Noncompl. with any sched. set forth in plans approved under this Consent Jgmt	Timely notif. of EPA and State of cause, nature and antic. length of delay	Yes	D has burden of proving EPA or State abused discretion in assessing pen.; pen. payable w/in 30 days upon demand by EPA or State
Chem. Recov. Sys.	Not to exceed $1500		Failure to comply w/prov. of Decree			Pen. payable upon demand by EPA and upon appropriate Motion and Order of Ct; in exercising discretion to have Ct impose pen., EPA shall take into acc't magn. and dur. of viol., and any other mitig. factors
CWM, Oakbrook, Ill.	$5000 for 1-time viol.; or $5000/wk for cont.		Failure to comply w/¶s H and I (implem. of initial and continuing groundwater programs; closure of ponds)		No, except spec. perf. or inj. relief for imminent and	EPA must notify D in writing of noncompl.

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
CWM, Oakbrook, Ill. (cont.)	viol. (not to exceed $5000 for 1st month) of cont. viol.)				subst. endangerment	
(15-day grace period)	$500		Failure to implement emergency procedures			
	$100		Failure to submit PCB status report			
Denver, City & Co. of	$3000		Failure to comply w/prohibition against pumping groundwater	D moves Ct for hearing to prove compl. or force majeure; D files petition w/in 7 days of receipt of demand for payment	Yes	Pay to EPA Haz. Subst. Resp. Trust Fund; liab. for pen. accrues thru termi- pen. payable w/30 days of receipt of written demand, unless D moves Ct for hearing (pen. then due w/30 days of jud. resol.)
(total pen. not to exceed $5000 per day)	$1000		Failure to comply w/schedules for groundwater treatment plan			
	$500		Failure to comply w/reporting and notice reqmts, and reqmts to pay money			
(7-day grace period)						
Diam. Shamrock	Up to $500		Delays in timely achievement of reqmts of this Order to give certain notices, submit RAP, implem. plan, interim and final reports, and copies of log sheets	Timely notit. of EPA and State describing nature, cause, and anti. length of delay; matters for which D is only secondarily liable; force majeure (excluding increased costs)	Yes	Disputes to be resolved via disp. resol. proc., pen. payable upon demand to U.S. Trsr

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Dusek	$100 for days 1-30; $300 for days 31-60; $500 thereafter		Failure to complete actions req'd by Decree w/in times specified		Yes	Payment of stip. pen. shall not excuse perf.
ENSCO (14-day grace period)	$1,000 for days 15-60; $2000 thereafter		Late completion of each of major subparts of Action Plan			
Envir. Cons. & Chem.	$1000		Failure to complete properly perf. of work in accord w/sched. in Attachment (incl. removal and disposal off-site of wastes and debris detailed in Attachment)	Missed interim dates if final completion date met; timely notif. of delays caused by force majeure (excluding increased costs)		Disputes to be submitted to Ct; D has burden of proving force majeure
Envir. Waste Removal	$200 for days 1-30; $350 for days 31-45; $500 for days 46-60; $1000 thereafter		Each day that D fails to meet reqmts of ¶s 3 and 4 or payment sched. in ¶ 9 (i.e., removal of entire outdoor waste pile at site, and transportation and disposal of same)	Force majeure (incl. notif. of nature, cause, and antic. length of delay; delays caused by unreas. risk to health or safety of people or envir.	Yes	Payable to U.S. Trsr

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Fike Chem. (30-day grace period)	$350		Viol. of each reqmt of Decree; Ds are late taking action req'd under Decree or meeting any sched. for remedial action	Force majeure		P may institite contempt proc. in U.S. Dist. Ct; D may petition Ct it believes P has breached; pen. payable to U.S. Trsr
Gulf Coast Lead	Not to exceed $100 for days 1-30; $250 for days 31-60; $500 thereafter		Failure to comply w/prov. of Decree as determined by Ct			Pen. payable upon demand by EPA to recogn. envir. fund or envir'ly beneficial project approved by EPA, P shall take into acc't magn. and dur. of viol. and any mitig. factors
Hillsboro, Co. of	$300		Failure to meet deadlines in Part IV-A (cap and cover reqmts)		Yes	Pen. payable promptly to U.S.
(30-day grace period	$500 for days 31-60; $1000 thereafter		Part IV-B (drainage ditch reqmts), or Part IV-F (County water supply)			
Hodges	Up to $500		Failure to comply with any prov. of Decree		Yes	Disputes to be submitted to Ct; burden of proving force majeure on D; pen. payable upond demand by EPA

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Homestake Mining	$1000 for days 1-10; $5000 thereafter		Viol. of any reqmt of this Agreement		Yes	
Hooker	Up to $5000		Unjustifiable failure to comply w/prov. of this Judgment	Force majeure; Order of Ct; failure of EPA/State to use best efforts to assist D in obtaining all authorizations which D unable to obtain and which prevent implem. of this Jgmt; notif. of nature, cause, and antic. length of delays	No	Pen. payable following Order of Ct as petitioned by P; in determining amt of pen. to assess., acc't shall be taken of economic savings to Ds, degree or seriousness of noncompl. (and other mitig. factors); Terms of this ¶ terminate 8 yrs. after effective date of this Jgmt
Ilco	$1000		Delay in completing fully and properly the perf. of work or otherwise violating terms of Decree	Force majeure (excluding increased costs)		Pay to Trsr., U.S.; Ds subject to Ct's contempt powers for any and all viol. of Decree; Ds have burden of proving force majeure or compl.
Ingalls, Melvyn	$100 for days 1-7; $200 for days 8-14;		Failure to make timely payments as specified		Yes	Pen. payable to U.S. Trsr by end of succeeding month; Upon payment, notice to be given to EPA and DOJ

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Ingalls, Melvyn (cont.)	$300 for days 15-21; $400 for days 22-28; $500 thereafter					
Immont Corp.	$500	Yes	Failure to comply w/any deadline	Force majeure; successful challenge to final Agency action; notification of nature, cause, and anticipated length of delay	Yes	Pay to U.S. Trsr and Trsr or State
Kin-Buc	$1000		Each day of noncompl. w/sched. for construction of cover and containment system on mound, as extended or altered by weather, Ct or EPA	Force majeure; acts by third parties		Pen. payable upon application to Ct
Lancaster	$1000		Failure to achieve tasks by dates specified in ¶ 1 and dates set forth in plan approved therein			Pay to U.S. Trsr only upon motion to Ct
Laskin & Poplar	$100		Each viol. of Part IV-B [CWA and NPDES viol.]	Force Majeure; initial demonstration by D of compl. w/applicable reqmts of Decree	Yes	Pay to U.S. Trsr w/in 30 days of demand by P; if D fails to comply w/applicable reqmt w/180 days, obligation to pay pen. shall cease 180 days after effective date of limitation
	$100		Each viol. of Part IV-C [TSCA PCB viol.]			
	$100		Each viol. of Part IV-F [Submission of quarterly progress reports]			

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Martell	$1000 for days 1-30; $1500 thereafter		Failure to comply w/any sched. set forth in plans approved pursuant to this Partial Consent Jgmt		Yes	D may petition Ct for relief; D has burden of proving P abused discretion in assessing pen.; pen. payable w/30 days of demand by EPA
Metate Asbestos Corp. (10-day grace period)	$500		Delays in completing properly the work; noncompl. w/maintenance prov. of Technical Appendix	Force majeure; delays caused by order of OSC		Pen. shall survive Decree
Midwest Solvent Recovery (7-day grace period)	$1000		Noncompl. w/major milestones set out in Exhibit; delays in meeting other sched. in Decree	Force majeure; modif. of Decree by Ct	Yes	Pen. payable w/in 14 days of demand by EPA
Occidental Petroleum	Up to $5000	State or U.S.	Unjustifiable failure to comply w/prov. of this Stip.	Force majeure; Order of Ct; notit. of nature, cause, and antic. length of delay; D's ability to obtain permits, etc.	No	Disputes to be submitted to Ct for resol.; in assessing pen., P may take into acc't economic savings to D, degree or seriousness of noncompl., dur., degree of endangerment to human health or envir., and any mitig. factors; pen. payable upon petition by P and Order of Ct

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Petro-Proc. of La.	Not to exceed $1000 for days 1-30; $5000 thereafter	Yes	Occurrence of any delay in completion of closure plan or supplemental plan ordered by or implemented pursuant to this Decree	Ct finds otherwise for good cause shown that no pen. should be paid	Yes	Pay to U.S. Trsr and Trsr of State w/in 30 days of Ct order
Reilly Tar (15-day grace	$500 for days 1-30; $1500 thereafter	Yes	Failure to make timely submittals under Decree	Filing of petition to dispute determination that submittal has not been made; missed interim milestones if final completion date met	Yes, incl. use of Ct's equitable and inherent powers	Payable w/in 30 days of receipt of written notif. to Haz. Subst. Resp. Trust Fund or Envir. Resp. Compl. Fund of Trsry of State; all payments accrue from date on which pert. was to have been made; all pen. cease to accrue upon completion of req'd pert.; filing of petition does not toll accrual of pen. from first day of viol., but does stay oblig. to make payments; Despite filing of petition, D still oblig. to pert.; D shall not assert as defense invalidity of these prov.; no payments tax deductible
	$750 for days 1-30; $1500 thereafter		All other failures to comply w/Decree			

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
Seymour Recycling Corp.	$1000		Failure to complete pert. of work in accord w/Exhibit	Force majeure (exclud. increased costs); notif. of nature, cause, and antic. length of delay		Disputes to be submitted to Ct for resol.
Solv. Recov. Serv. of N.E.	$100 for days 1-15; $500 for days 16-45; $1000 thereafter		Failure to comply w/time reqmts of Decree , incl. implem. sched. submitted by D	Force majeure; modification by Ct	Yes	Pay to U.S. Trsr
Spectron (30-day grace period)	No less than $200; no more than $500		Failure to comply w/each reqmt of Decree; delays in taking action req'd under Decree or under any sched. for remedial action	Force majeure		P may institute contempt proc. in U.S. Dist. Ct; D may petition Ct if believes P has breached Decree, Pen. payable w/in 15 days to U.S. Trsr upon written demand
Vertac Chem. Corp.	$500 for days 1-15; $1000 for days 15-45; $3,000 thereafter	Yes	Any failure to comply w/time reqmts of Decree, incl. any implem. sched. submitted by D	Force majeure	Yes	Payable to U.S. Trsr or State Dept of Poll. Control & Ecology upon Order of Ct

Decree	Amt/Day	Pen. Shared w/State	Violations to which stipulated penalties apply	Reason for no accrual of stip. penalties	Other Remedies Allowed	Miscellaneous
W. R. Grace	$2500		Delays in taking action req'd under Decree			In assessment of pen., magn. and dur. of delay and any other mitig. factors shall be taken into acc't
West. Proc. Co.	$1000		Delay in completing properly the perf. of work by 11/30/84, provided that treatment and discharge cont. until 4/1/85	Force majeure (excluding increased costs); notif. of nature, cause, and anticip. length of delay; secondary liability, except if Ct orders otherwise		D has burden of proving force majeure; Disputes not informally resolved are submitted to Ct; Despite pen.; D still oblig. to pert. all work

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 8 1984

MEMORANDUM

SUBJECT: Final RCRA Civil Penalty Policy

FROM: Courtney M. Price
Assistant Administrator for Enforcement
and Compliance Monitoring

Lee M. Thomas
Assistant Administrator for Solid Waste
and Emergency Response

TO: Addressees

Attached is the Final RCRA Civil Penalty Policy which is being issued jointly by our Offices.

In response to comments received from both Headquarters and Regional Offices on the January 31, 1984, Second Draft, the following changes have been made:

- the Potential for Harm section has been rewritten and new examples have been included to better explain the concepts of major, moderate and minor;
- the penalties listed in the matrix have been altered slightly in order to fill the gaps between each cell;
- the RCRA Civil Penalty Policy provides for the calculation of the economic benefit of non-compliance. The economic benefit formula included in the policy takes into account two types of costs, avoided and delayed. Definitions and examples of these terms have been included. The IRS interest rates to be used in the formula have been included for the years 1980-1984;
- the cut-off below which no economic benefit analysis needs to be conducted has been reduced from $10,000 to $2,500 because the lower figure is more appropriate for the RCRA program;

FINAL

RCRA CIVIL PENALTY POLICY

May 8, 1984

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RCRA CIVIL PENALTY POLICY

I. INTRODUCTION

To respond to the problem of improper management of hazardous waste, Congress amended the Solid Waste Disposal Act with the Resource Conservation and Recovery Act (RCRA) of 1976. Although the Act has several objectives, Congress' overriding purpose in enacting RCRA was to establish the statutory framework for a national system that would ensure the proper management of hazardous waste.

Section 3008(a) of RCRA, 42 U.S.C. §6928(a), provides that if any person is in violation of a requirement of Subtitle C, the Administrator of the Environmental Protection Agency (EPA) may, among other options, issue an order requiring compliance immediately or within a specified time period. Section 3008(c), 42 U.S.C. §6928(c), provides that any order issued may assess a penalty, taking into account:

- the seriousness of the violation, and
- any good faith efforts to comply with the applicable requirements.

Section 3008(g) further provides EPA with the authority to assess civil penalties of up to $25,000 per day of violation.

This document sets forth the Agency's policy for assessing administrative penalties under RCRA, 42 U.S.C. §6901 et seq.*/ The purpose of the policy is to assure that RCRA civil penalties are assessed in a fair and consistent manner; that penalties are appropriate for the gravity of the violation committed; that economic incentives for noncompliance with RCRA are eliminated; that persons are deterred from committing RCRA violations; and that compliance is achieved.

The policy provides internal guidelines to aid EPA compliance/enforcement personnel in assessing appropriate penalties. It also provides a mechanism whereby compliance/enforcement personnel may, within specified boundaries, exercise discretion in negotiating administrative consent agreements and orders, and otherwise modify the proposed penalty when special circumstances warrant it. The policy will be supplemented as necessary.

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*/ Because there is no RCRA judicial civil penalty policy, compliance/enforcement personnel may rely on this administrative civil penalty policy in assessing penalties in judicial cases.

This document does not discuss whether assessment of an administrative civil penalty is the correct enforcement response to a particular violation. Rather, this document focuses on determining what the proper civil penalty should be once a decision has been made that a civil penalty is the proper enforcement remedy to pursue. For guidance on when to assess administrative penalties, consult the following:

- Guidance on Developing Compliance Orders Under Section 3008 of RCRA, July 7, 1981;*/
- RCRA; Section 3005(e); Continued Operation of Hazardous Waste Facilities by Owners or Operators Who Have Failed to Achieve Interim Status, July 31, 1981;
- Guidance on Developing Compliance Orders Under Section 3008 of RCRA; Enforcement of Ground-Water Monitoring Requirements at Interim Status Facilities, January 22, 1982;*/
- Guidance on Developing Compliance Orders Under Section 3008 of RCRA; Enforcement of the Financial Responsibility Requirements Under Subpart H of 40 CFR Parts 264 and 265, October 6, 1982;*/
- Guidance on Developing Compliance Orders Under Section 3008 of RCRA; Failure to Submit and Submittal of Incomplete Part B Permit Applications, September 9, 1983.

The discussions of specific penalty assessments set out in the second and fifth guidances, above, are superseded by this document. The portions of these guidances which do not address specific penalty assessments remain operative.

The RCRA Civil Penalty Policy is immediately applicable and should be used to calculate penalties for all RCRA administrative actions instituted after the date of the policy, regardless of the date of violation.

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*/ These three guidances classify RCRA violations as either Class I, II, or III, and state that Section 3008 compliance orders should generally be issued to address Class I, Class II, and continued or flagrant Class III violations. The Agency is in the process of developing a RCRA enforcement response policy which could change the current scheme for classifying and responding to violations. Compliance/enforcement personnel should continue to rely on the existing guidance until the new enforcement response policy is issued.

The procedures set out in this document are intended solely for the guidance of government personnel. They are not intended and cannot be relied upon to create rights, substantive or procedural, enforceable by any party in litigation with the United States. The Agency reserves the right to act at variance with this policy and to change it at any time without public notice.

II. RELATIONSHIP TO AGENCY PENALTY POLICY

The RCRA Civil Penalty Policy sets forth a system of penalty assessment consistent with the established goals of the Agency's new civil penalty policy which was issued on February 16, 1984. These goals consist of:

- Deterrence;
- Fair and equitable treatment of the regulated community; and
- Swift resolution of environmental problems.

The RCRA penalty policy also adheres to the Agency policy's framework for assessing civil penalties by:

- Calculating a preliminary deterrence amount consisting of a gravity component;
- Determining any economic benefit of noncompliance; and
- Applying adjustment factors to account for differences between cases.

III. SUMMARY OF THE POLICY

The penalty calculation system consists of (1) determining a gravity-based penalty for a particular violation, (2) considering economic benefit of noncompliance where appropriate, and (3) adjusting the penalty for special circumstances. Two factors are considered in determining the gravity-based penalty:

- potential for harm; and
- extent of deviation from a statutory or regulatory requirement.

These two factors constitute the seriousness of a violation under RCRA, and have been incorporated into the following penalty matrix from which the gravity-based penalty will be chosen:

MATRIX

Extent of Deviation from Requirement

Potential for Harm	MAJOR	MODERATE	MINOR
MAJOR	$25,000 to 20,000	$19,999 to 15,000	$14,999 to 11,000
MODERATE	$10,999 to 8,000	$7,999 to 5,000	$4,999 to 3,000
MINOR	$2,999 to 1,500	$1,499 to 500	$499 to 100

Where a company has derived significant savings by its failure to comply with RCRA requirements, the amount of economic benefit from noncompliance gained by the violator will be calculated and added to the gravity-based penalty. A formula for computing economic benefit is included.

After determining the appropriate penalty based on gravity and, where appropriate, economic benefit, the penalty may be adjusted upwards or downwards to reflect particular circumstances surrounding the violation. The factors that should be considered are:

- Good faith efforts to comply/lack of good faith;
- Degree of willfulness and/or negligence;
- History of noncompliance;
- Ability to pay; or
- Other unique factors.

These factors (with the exception of factors which increase the penalty such as history of noncompliance) generally will be

considered after proposing the penalty in the complaint, i.e., during the settlement stage. However, the Regions have the discretion to apply the adjustment factors when determining the initial penalty, if the information supporting adjustment is available.

The policy also discusses the appropriate assessment of multiple and multi-day penalties.

A detailed discussion of the policy follows. In addition, this document includes a few hypothetical cases where the step-by-step assessment of penalties is illustrated. The steps included are choosing the correct penalty cell on the matrix, calculating the economic benefit of noncompliance, where appropriate, and adjusting the penalty assessment before and after issuance of the complaint.

IV. ADMINISTRATIVE RECORD

In order to support the penalty proposed in the complaint, compliance/enforcement personnel must include in the case file an explanation of how the proposed penalty amount was calculated. The case file must also include a justification of any adjustments made after issuance of the complaint. In ongoing cases, the assessment rationale would be exempt from the mandatory disclosure requirements of the Freedom of Information Act, 5 U.S.C. 552, because producing such records would interfere with enforcement proceedings, 40 CFR §2.118(a)(7). Nevertheless, the Agency may elect to release penalty information after a complaint has been issued. Once an enforcement action has been completed, the justification of the penalty assessment would no longer be exempt from disclosure.

A penalty computation worksheet to be included in the case file is attached. (See: Appendix.)

V. DETERMINATION OF GRAVITY-BASED PENALTY

RCRA Section 3008(c) states that the seriousness of the violation must be taken into account in assessing penalties. The gravity-based penalty is determined according to the seriousness of the violation. The seriousness of a violation is based on two factors which are used to assess the appropriate gravity-based penalty:

- potential for harm; and
- extent of deviation from a statutory or regulatory requirement.

A. Potential for Harm

The RCRA requirements were promulgated in order to prevent harm to human health and the environment. Thus, noncompliance with any RCRA requirement could result in a situation where there is a potential for harm. The potential for harm resulting from a violation may be determined by:

- the likelihood of exposure to hazardous waste posed by noncompliance, or
- the adverse effect noncompliance has on the statutory or regulatory purposes or procedures for implementing the RCRA program.

By answering questions like the following, compliance/enforcement personnel can determine the likelihood of exposure in a particular situation:

- What is the quantity of waste?
- Is human life or health potentially threatened by the violation?
- Are animals potentially threatened by the violation?
- Are any environmental media potentially threatened by the violation?

There may be violations where the likelihood of exposure resulting from the violation is small, difficult to quantify, or nonexistent, but which nevertheless may disrupt the RCRA program (e.g., failure to comply with financial requirements). This disruption may also present a potential for harm to human health or the environment, due to the adverse effect noncompliance can have on the statutory or regulatory purposes or procedures for implementing the RCRA program.

For each of the above considerations -- likelihood of exposure and adverse effect on implementing the RCRA program -- the emphasis is placed on the potential harm posed by a violation rather than on whether harm actually occurred. The presence or absence of direct harm in a noncompliance situation is something over which the violator may have no control. Such violators should not be rewarded by assessing lower penalties when the violations do not result in actual harm.

Compliance/enforcement personnel should evaluate whether the potential for harm is major, moderate, or minor in a particular

situation. The degree of potential harm represented by each category is defined as:

- MAJOR (1) violation poses a substantial likelihood of exposure to hazardous waste; and/or

  (2) the actions have or may have a substantial adverse effect on the statutory or regulatory purposes or procedures for implementing the RCRA program.

- MODERATE (1) the violation poses a significant likelihood of exposure to hazardous waste; and/or

  (2) the actions have or may have a significant adverse effect on the statutory or regulatory purposes or procedures for implementing the RCRA program.

- MINOR (1) the violation poses a relatively low likelihood of exposure to hazardous waste; and/or

  (2) the actions have or may have an adverse effect on the statutory or regulatory purposes or procedures for implementing the RCRA program.

The following examples illustrate the difference between major, moderate, and minor potential for harm.

Example 1 - Major Potential for Harm

40 CFR §265.143 requires that owners or operators of hazardous waste facilities establish financial assurance for closure of their facilities. The purpose of this requirement is to assure that funds will be available for proper closure of facilities. Under §265.143(a)(2), the wording of a trust agreement establishing financial assurance for closure must be identical to the wording specified in 40 CFR §264.151(a)(1). Failure to word the trust agreement as required may appear inconsequential. However, even a slight alteration of the language could change the legal effect of the financial instrument so that it would no longer satisfy the intent of the regulation. When the language of the agreement differs from the requirement such that funds would not be available to close the facility properly, the lack of identical wording would have a substantial adverse effect on the regulatory scheme. This violation would be assigned to the major potential for harm category.

Example 2 - Moderate Potential for Harm

Under 40 CFR §262.34, a generator may accumulate hazardous waste on-site for 90 days or less without having interim status or a permit provided that among other requirements, each container

or tank of waste is labeled or marked clearly with the words, "Hazardous Waste." In a situation where a generator is storing compatible waste, has labeled half of its containers, and has clearly identified its storage area as a hazardous waste storage area, there is some indication that the unlabeled containers hold hazardous waste. However, because there is a chance that the unlabeled containers could be removed from the storage area, and that without labels the Agency would not know if the waste had been stored for more than 90 days, this situation poses a significant likelihood of exposure to hazardous waste (although the likelihood is not as great as it would be if neither the storage area nor any of the containers were marked). The moderate potential for harm category would be appropriate in this case.

Example 3 - Minor Potential for Harm.

Owners or operators of hazardous waste facilities must, under 40 CFR §265.53, submit a copy of their contingency plans to all local police departments, fire departments, hospitals, and State and local emergency response teams that may be called upon to provide emergency services. If a facility has a complete contingency plan, including a description of arrangements agreed to by local entities to coordinate emergency services (§265.52), but failed to submit copies to all of the local entities, there is a potential for harm. However, because a complete plan exists and arrangements with all of the local entities have been agreed to, the likelihood of exposure and adverse effect on the implementation of RCRA would be relatively low. The minor potential for harm category would be appropriate in this situation.

B. Extent of Deviation from Requirement

The "extent of deviation" from RCRA or its regulatory requirements relates to the degree to which the violation renders inoperative the requirement violated. In any violative situation, a range of potential noncompliance with the subject requirement exists. In other words, a violator may be substantially in compliance with the provisions of the requirement or it may have totally disregarded the requirement (or a point in between). As with potential for harm, extent of deviation may be either major, moderate, or minor. In determining the extent of deviation, the following definitions should be used:

- MAJOR the violator deviates from the requirements of the regulation or statute to such an extent that there is substantial noncompliance.

- MODERATE the violator significantly deviates from the requirements of the regulation or statute but some of the requirements are implemented as intended.

- MINOR the violator deviates somewhat from the regulatory or statutory requirements but most of the requirements are met.

A few examples will help demonstrate how the evaluation procedure described above is used to select a category:

Example 1 - Closure Plan

40 CFR §265.112 requires that owners or operators of treatment, storage, and disposal facilities have a written closure plan. This plan must identify the steps necessary to completely or partially close the facility at any point during its intended operating life and to completely close the facility at the end of its intended operating life. Possible violations of the requirements of this regulation range from having no closure plan at all to having a plan which is somewhat inadequate (e.g., failure to include a schedule for final closure, while complying with the other requirements). These violations might be assigned to the "major" and "minor" categories respectively. A violation between these extremes might involve failure to modify a plan for increased decontamination activities as a result of a spill on-site.

Example 2 - Failure to Maintain Adequate Security

40 CFR §265.14 requires that owners or operators of treatment, storage and disposal facilities take reasonable care to keep unauthorized persons from entering the active portion of a facility where injury could occur. Generally, a physical barrier must be installed and any access routes conscientiously controlled.

The range of potential noncompliance with the security requirements is quite broad. In a particular situation, the violator may prove to have totally failed to supply any security systems. Total noncompliance with regulatory requirements such as this would result in classification into the major category. In contrast, the violation may consist of a small oversight such as failing to lock an access route on a single occasion. Obviously, the degree of noncompliance in the latter situation is less significant. With all other factors being equal, the less significant noncompliance should draw a smaller penalty assessment. In the matrix system this is achieved by choosing the minor category.

C. Penalty Assessment Matrix

Each of the above factors--potential for harm and extent of deviation from a requirement--forms one of the axes of the penalty assessment matrix. The matrix has nine cells, each containing a penalty range. The specific cell is chosen after determining which category (major, moderate, or minor) is appropriate for the potential for harm factor, and which category is appropriate for the extent of deviation factor. The complete matrix is illustrated below:

Extent of Deviation from Requirement

Potential for Harm	MAJOR	MODERATE	MINOR
MAJOR	$25,000 to 20,000	$19,999 to 15,000	$14,999 to 11,000
MODERATE	$10,999 to 8,000	$7,999 to 5,000	$4,999 to 3,000
MINOR	$2,999 to 1,500	$1,499 to 500	$499 to 100

The lowest cell (minor potential for harm/minor extent of deviation) contains a penalty range from $100 to $499. Provision for this low range of penalties has been made because the assessment of low penalties has proven to be an effective compliance tool. The highest cell (major potential for harm/major extent of deviation) is limited by the maximum statutory penalty allowance of $25,000 per day of violation.

The selection of the exact penalty amount within each cell is left to the discretion of compliance/enforcement personnel in any given case. Compliance/enforcement personnel should be careful to consider the seriousness of the violation only in selecting the penalty amount within the range. The reasons the violation was committed, the intent of the violator, and other factors related to the violator are not considered at this point; they will be considered at the adjustment stage.

VI. MULTIPLE AND MULTI-DAY PENALTIES

A. Assessing Multiple Penalties

In certain situations, EPA may find that a particular firm has violated several RCRA regulations. A separate penalty should be assessed for each violation that results from an independent act (or failure to act) by the violator and is substantially distinguishable from any other charge in the complaint for which a penalty is to be assessed. A given charge is independent of, and substantially distinguishable from, any other charge when it requires an element of proof not needed by the others. In many cases, violations of different sections of the regulations constitute independent and substantially distinguishable violations. For example, failure to implement a groundwater monitoring program, 40 CFR §265.90, and failure to have a written closure plan, 40 CFR §265.112, are violations which result from different sets of circumstances and which pose separate risks. In the case of a firm which has violated both of these sections of the regulations, a separate count should be charged for each violation. For penalty purposes, each of the violations should be assessed separately and the amounts totalled.

It is also possible that different violations of the same section of the regulations could constitute independent and substantially distinguishable violations. For example, in the case of a firm which has open containers of hazardous waste in its storage area, 40 CFR §265.173(a), and which also ruptured different hazardous waste containers while moving them on site, 40 CFR §265.173(b), there are two independent acts. The violations result from two sets of circumstances (improper storage and improper handling) and pose distinct risks. In this situation, two counts with two separate penalties would be appropriate. For penalty purposes, each of the violations should be assessed separately and the amounts totalled.

Multiple penalties also should be assessed where one company has violated the same requirement in substantially different locations. An example of this type of violation is failure to clean up discharged hazardous waste during transportation, 40 CFR §263.31. A transporter who did not clean up waste discharged in two separate locations during the same trip should be charged with two counts. In these situations, the separate locations present separate and distinct risks to public health and the environment. Thus, separate penalty assessments are justified.

In general, multiple penalties are not appropriate where the violations are not independent or substantially distinguishable. Where a charge derives from or merely restates another charge, a separate penalty is not warranted. If an owner/operator of a storage facility failed to specify in his waste analysis plan the parameters for which each hazardous waste will be analyzed, 40 CFR §265.13(b)(1), and failed to specify the frequency with which the initial analysis of the waste will be repeated, 40 CFR §265.13(b)(4), he has violated the requirement that he develop an adequate waste analysis plan. The violations result from the same factual event (failure to develop an adequate plan), and pose one risk (storing waste improperly due to inadequate analysis). In this situation, both sections violated should be cited in the complaint, but one penalty, rather than two, should be assessed. The fact that two separate sections were violated will be taken into account in choosing higher "potential for harm" and "extent of deviation" categories on the penalty matrix.

B. Assessing Multi-Day Violations

RCRA provides EPA with the authority to assess civil penalties of up to $25,000 per violation per day, with each day that non-compliance continues to be assessed as a separate violation. Multi-day penalties should generally be calculated in the case of continuing egregious violations. However, per day assessment may be appropriate in other cases.

In the case of continuing violations, the Agency has the authority to calculate penalties based on the number of days of violation since the effective date of the requirement and up to the date of coming into compliance. The gravity-based penalty derived from the penalty matrix should be multiplied by the number of days of violation.

VII. EFFECT OF ECONOMIC BENEFIT OF NONCOMPLIANCE

The new Agency civil penalty policy mandates the consideration of the economic benefit of noncompliance to a violator when penalties are assessed. In accordance with the goals of the Agency policy, the RCRA Civil Penalty Policy sets forth a system for calculating the economic benefit of noncompliance with RCRA requirements.

An "economic benefit component" should be calculated and added to the gravity-based penalty when a violation results in significant economic benefit to the violator. The following are examples of regulatory areas which should undergo an economic benefit analysis:

- Groundwater monitoring
- Financial requirements
- Closure/post-closure
- Waste determination
- Waste analysis
- Clean-up of discharge
- Part B submittals

For many RCRA requirements, the economic benefit of noncompliance may be difficult to quantify or relatively insignificant. Examples of these types of violations are failure to submit a report or failure to maintain records. In general, compliance/enforcement personnel need not calculate the benefit component where it appears that the amount of that component is likely to be less than $2,500. This figure is more appropriate for the RCRA program than the $10,000 cut-off in the Agency policy because of the amount of economic benefit associated with many RCRA violations.

It is generally the Agency's policy not to settle cases (i.e., the penalty amount) for an amount less than the economic benefit of noncompliance. However, the new Agency civil penalty policy does set out three general areas where settling the total penalty amount for less than the economic benefit may be appropriate. The RCRA policy has added a fourth exception for cases where ability to pay is a factor. The four exceptions are as follows:

- the economic benefit component consists of an insignificant amount (i.e., less than $2,500);
- there are compelling public concerns that would not be served by taking a case to trial;
- it is highly unlikely that EPA will be able to recover the economic benefit in litigation;
- the company has documented an inability to pay the total proposed penalty.

If a case is settled for less than the economic benefit component, a justification must be included in the case file.

A. Types of Economic Benefit

Compliance/enforcement personnel should examine two types of economic benefit from noncompliance in determining the economic benefit component:

- Benefit from delayed costs; and
- Benefit from avoided costs.

Delayed costs are expenditures which have been deferred by the violator's failure to comply with the requirements. The violator eventually will have to spend the money in order to achieve compliance. Delayed costs are the equivalent of capital costs. Examples of violations which result in savings from delayed costs are:

- Failure to install ground-water monitoring equipment;
- Failure to submit a Part B permit application; and
- Failure to develop a waste analysis plan.

Avoided costs are expenditures which are nullified by the violator's failure to comply. These costs will never be incurred. Avoided costs are the equivalent of operating and maintenance costs. Examples of violations which result in savings from avoided costs are:

- Failure to perform annual and semi-annual ground-water monitoring sampling and analysis;
- Failure to follow the approved closure plan in removing waste from a facility, where reremoval is not possible; and
- Failure to perform waste analysis before adding waste to tanks, waste piles, incinerators, etc.

B. Calculation of Economic Benefit

Because the savings that are derived from delayed costs differ from those derived from avoided costs, the economic benefit from delayed and avoided costs are calculated in a different manner. For avoided costs, the economic benefit equals the cost of complying with the requirement, adjusted to reflect income tax effects on the

company. For delayed costs, the economic benefit does not equal the cost of complying with the requirements, since the violator will eventually have to spend the money to achieve compliance. The economic benefit for delayed costs consists of the amount of interest on the unspent money that reasonably could have been earned by the violator during noncompliance. If noncompliance has continued for more than a year, compliance/enforcement personnel should calculate the economic benefit of both the delayed and avoided costs for each year.

The following formula is provided to help calculate the economic benefit component:

Economic Benefit = Avoided Costs (1-T) + (Delayed Costs x Interest Rate)

In the above formula, T represents the firm's marginal tax rate. In the absence of specific information regarding the violator's tax status, compliance/enforcement personnel should assume that the company's marginal tax rate is 46%, the Federal corporate tax rate for firms whose before-tax profits are greater than $100,000. Thus, compliance/enforcement personnel should assume that T = .46.

Compliance/enforcement personnel should calculate interest by using the interest rate charged by the Internal Revenue Service (IRS) for delinquent accounts. The IRS interest rates for 1980 through 1984 are as follows:

2/1/80	-	1/31/82	12%
2/1/82	-	12/31/82	20%
1/1/83	-	6/30/83	16%
7/1/83	-	6/30/84	11%

Interest rates for years other than those listed above are available from your local IRS office.

The economic benefit formula provides a reasonable estimate of the economic benefit of noncompliance. If a respondent believes that the economic benefit it derived from noncompliance differs from the estimated amount, it should present information documenting its actual savings to compliance/ enforcement personnel at the settlement stage.

See Section X of this document for hypothetical applications of the economic benefit formula. The Agency plans to develop additional guidance on calculating the economic benefit of noncompliance, including identifying sources of cost information

for various regulatory areas, and providing an Agency methodology for computing economic benefit. For this reason, the economic benefit formula set out in this document is for interim use only.

VIII. ADJUSTMENT FACTORS AND EFFECT OF SETTLEMENT

A. Adjustment Factors

As mentioned in Section V of this document, the seriousness of the violation is considered in determining the gravity-based penalty. The reasons the violation was committed, the intent of the violator, and other factors related to the violator are not considered in choosing the appropriate penalty from the matrix. However, any system for calculating penalties must have enough flexibility to make adjustments that reflect legitimate differences between similar violations. RCRA §3008(c) states that in assessing penalties, EPA must take into account any good faith efforts to comply with the applicable requirements. The new Agency civil penalty policy sets out several other adjustment factors to consider. These include the degree of willfulness and/or negligence, history of noncompliance, ability to pay, and other unique factors.

The adjustment factors can increase, decrease or have no effect on the penalty amount to be paid by the violator. Note, however, that no upward adjustment can result in a penalty greater than the statutory maximum of $25,000 per day of violation. Adjustment of a penalty may take place before issuing the proposed penalty in the complaint, or after assessment of the proposed penalty (as part of the settlement process). Most factors, in practice, will be considered at the settlement stage with the burden of proof for mitigation on the respondent. However, penalties may be adjusted before determining the proposed assessment if the necessary information is available. Compliance/enforcement personnel should use whatever information on the violator (and violation) is available at the time of initial assessment. Issuance of a complaint should not be delayed in order to collect additional adjustment information. The history of noncompliance factor should be used only to increase a penalty; the ability to pay factor should be used only to decrease a penalty. Justification for adjustments must be included in the case file.

In general, these adjustment factors will apply only to the gravity-based penalty derived from the matrix, and not to the economic benefit component if calculated. (See Section VII of this document for exceptions.)

Application of the adjustment factors is cumulative, i.e., more than one factor may apply in a case. For example, if the base penalty derived from the matrix is $9,500, and upward

adjustments of 10% will be made for both history of noncompliance and degree of willfulness and/or negligence, the total adjusted penalty would be $11,400 ($9,500 + 20%).

The following discussion of the factors to consider is consistent with the new Agency civil penalty policy. For the purposes of simplification, the percentage ranges for the adjustment factors in the Agency policy have been altered slightly for use in the RCRA Civil Penalty Policy.

At this stage of the RCRA program it is difficult to determine what types of non-monetary alternatives or alternative payments would foster the goals of the program. As compliance/enforcement personnel gain more experience in enforcing RCRA, use of these alternatives may prove to be advantageous to the public interest. Until such time, these alternatives, as set forth in the new Agency civil penalty policy, are not an option under the RCRA Civil Penalty Policy.

(1) Good faith efforts to comply/lack of good faith (Degree of cooperation/noncooperation)

Under §3008(a) of RCRA, good faith efforts to comply with the requirements must be considered in assessing a penalty. Good faith can be manifested by the violator promptly reporting its noncompliance. Assuming such self-reporting is not required by law, this behavior can result in mitigation of the penalty. Prompt correction of environmental problems also can constitute good faith. Lack of good faith, on the other hand, can result in an increased penalty. Compliance/enforcement personnel have discretion to make adjustments up or down by as much as 25% of the gravity-based penalty. Adjustments may be made in the 26%-40% range of the gravity-based penalty, but only in unusual circumstances. No downward adjustment should be made if the good faith efforts to comply primarily consist of coming into compliance.

(2) Degree of willfulness and/or negligence

Section 3008(d) of RCRA provides for criminal penalties for "knowing" violations. However, there may be instances of culpability which do not meet the criteria for criminal action. In cases where administrative civil penalties are sought for actions of this type, the penalty may be adjusted upward for willfulness and/or negligence. Conversely, although RCRA is a strict liability statute, there may be instances where penalty mitigation may be justified based on the lack of willfulness and/or negligence.

In assessing the degree of willfulness and/or negligence, the following factors should be considered, as well as any others deemed apropriate:

- how much control the violator had over the events constituting the violation;
- the forseeability of the events constituting the violation;
- whether the violator took reasonable precautions against the events constituting the violation;
- whether the violator knew or should have known of the hazards associated with the conduct;
- whether the violator knew of the legal requirement which was violated.

It should be noted that this last factor, lack of knowledge of the legal requirement, should never be used as a basis to reduce the penalty. To do so would encourage ignorance of the law. Rather, knowledge of the law should serve only to enhance the penalty.

The amount of control which the violator had over how quickly the violation was remedied also is relevant in certain circumstances. Specifically, if correction of the environmental problem was delayed by factors which the violator can clearly show were not reasonably foreseeable and out of his control, the penalty may be reduced.

Subject to the above guidance, compliance/enforcement personnel have discretion in all cases to make adjustments up or down by as much as 25% of the gravity-based penalty. Adjustments in the 26-40% range may be made, but only in unusual circumstances.

(3) History of noncompliance (upward adjustment only)

Where a party previously has violated RCRA or State hazardous waste law at the same or a different site, this is usually clear evidence that the party was not deterred by the previous enforcement response. Unless the previous violation was caused by factors entirely out of the control of the violator, this is an indication that the penalty should be adjusted upwards.

Some of the factors the compliance/enforcement personnel should consider are the following:

- how similar the previous violation was;
- how recent the previous violation was;
- the number of previous violations;
- violator's response to previous violation(s) in regard to correction of problem.

A violation generally should be considered "similar" if the Agency's or State's previous enforcement response should have alerted the party to a particular type of compliance problem. A prior violation of the same or a different RCRA or State requirement would constitute a similar violation.

For purposes of the section, a "prior violation" includes any act or omission for which a formal enforcement response has occurred (e.g., EPA or State notice of violation, warning letter, complaint, consent agreement, final order, or consent decree). It also includes any act or omission for which the violator has previously been given written notification, however informal, that the Agency believes a violation exists.

In the case of large corporations with many divisions or wholly-owned subsidiaries, it is sometimes difficult to determine whether a previous instance of noncompliance should trigger the adjustments described in this section. New ownership often raises similar problems. In making this determination, compliance/enforcement personnel should ascertain who in the organization had control and oversight responsibility for compliance with RCRA or other environmental laws. In those cases the violation will be considered part of the compliance history of that regulated party.

In general, compliance/enforcement personnel should begin with the assumption that if the same corporation was involved, the adjustments for history of noncompliance should apply. In addition, compliance/enforcement personnel should be wary of a party changing operators or shifting responsibility for compliance to different persons or entities as a way of avoiding increased penalties. The Agency may find a consistent pattern of noncompliance by many divisions or subsidiaries of a corporation even though the facilities are at different geographic locations. This often reflects, at best, a corporate-wide indifference to environmental protection. Consequently, the adjustment for history of noncompliance probably should apply unless the violator can demonstrate that the other violating corporate facilities are independent.

Subject to the above guidance, compliance/enforcement personnel have discretion to make upward adjustments by as much as 25% of the gravity-based penalty. Adjustments for this factor in the 26-40% range may be made, but only in unusual circumstances.

(4) Ability to pay (downward adjustment only)

The Agency generally will not request penalties that are clearly beyond the means of the violator. Therefore EPA should consider the ability of a violator to pay a penalty. At the same time, it is important that the regulated community not see the violation of environmental requirements as a way of aiding a financially troubled business. EPA reserves the option, in appropriate circumstances, to seek penalties that might put a company out of business. It is unlikely, for example, that EPA would reduce a penalty where a facility refuses to correct a serious violation. The same could be said for a violator with a long history of previous violations. That long history would demonstrate that less severe measures are ineffective.

The burden to demonstrate inability to pay rests on the respondent, as it does with any mitigating circumstances. Thus, a company's inability to pay usually will be considered at the settlement stage, and then only if the issue is raised by the respondent. If the respondent fails to provide sufficient information, then compliance/enforcement personnel should disregard this factor in adjusting the penalty. The National Enforcement Investigations Center (NEIC) has developed the capability to assist the Regions in determining a firm's ability to pay.

When it is determined that a violator cannot afford the penalty prescribed by this policy, or that payment of all or a portion of the penalty will preclude the violator from achieving compliance or from carrying out remedial measures which the Agency deems to be more important than the deterrence effect of the penalty (e.g., payment of penalty would preclude proper closure/post-closure), the following options may be considered:

- Consider a delayed payment schedule. Such a schedule might even be contingent upon an increase in sales or some other indicator of improved business.
- Consider an installment payment plan with interest.
- Consider straight penalty reductions as a last recourse.

The amount of any downward adjustment of the penalty is dependent on the individual financial facts of the case.

(5) Other unique factors

This policy allows an adjustment for unanticipated factors which may arise on a case-by-case basis. Compliance/ enforcement personnel have discretion to make adjustments by as much as 25% of

the gravity-based penalty for such reasons. Adjustments for these factors in the 26-40% range may be made, but only in unusual circumstances.

B. Effect of Settlement

The Consolidated Rules of Practice for the assessment of civil penalties incorporates the Agency policy of encouraging settlement of a proceeding at any time as long as the settlement is consistent with the provisions and objectives of RCRA and its regulations, 40 CFR §22.18(a). If the respondent believes that it is not liable or that the circumstances of its case justify mitigation of the penalty proposed in the complaint, the Rules of Practice allow it to request a settlement conference.

In many cases, the fact of a violation will be less of an issue than the amount of the penalty assessed. The burden always is on the violator to justify any mitigation of the assessed penalty. The mitigation, if any, of the penalty assessed in the complaint should follow the guidelines in the Adjustment Factors section of this document. The consent agreement must include a general statement of the reasons for mitigating the proposed penalty. Specific percentage reductions for individual factors need not be included.

IX. APPENDIX

PENALTY COMPUTATION WORKSHEET

Company Name: _____

Regulation Violated _____

Asessments for each violation should be determined on separate worksheets and totalled.

(If more space is needed, attach separate sheet.)

Part I - Seriousness of Violation Penalty

1. Potential for Harm: _____

2. Extent of Deviation: _____

3. Matrix Cell Range: _____

   Penalty Amount Chosen: _____

   Justification for Penalty Amount Chosen:

4. Per-Day Assessment: _____

Part II - Penalty Adjustments

	Percentage Change*	Dollar Amount
1. Good faith efforts to comply/lack of good faith:	_____	_____
2. Degree of willfulness and/or negligence:	_____	_____
3. History of noncompliance:	_____	_____
4. Other unique factors:	_____	_____

5. Justification for Adjustments:

* Percentage adjustments are applied to the dollar amount calculated on line 4, Part I.

PENALTY COMPUTATION WORKSHEET (cont.)

6. Adjusted Per-day Penalty (Line 4, Part I + Lines 1-4, Part II):	_____
7. Number of Days of Violation:	_____
8. Multi-day Penalty (Number of days x Line 6, Part II):	_____
9. Economic Benefit of Noncompliance:	_____
Justification:	
10. Total (Lines 8 + 9, Part II):	_____
11. Ability to Pay Adjustment:	
Justification for Adjustment:	_____
12. Total Penalty Amount (must not exceed $25,000 per day of violation):	_____

X. HYPOTHETICAL APPLICATIONS OF THE PENALTY POLICY

(1)(A) Violation: By notification dated August 15, 1980, Company A informed EPA that it conducts activities at its facility involving hazardous waste. In its notification, Company A indicated that it only generated hazardous waste. A 1983 inspection revealed that Company A was also storing hazardous waste, and had been since 1979. Company A had not filed a Part A Permit Application and was thus operating without a permit or interim status, in violation of §3005 of RCRA. In addition, Company A was in violation of §3010 of RCRA by failing to notify EPA that it was storing hazardous waste. Failure to notify and operating without a pemit or interim status constitute independent and substantially distinguishable violations. Each violation should be assessed separately and the amounts totalled. The inspectors indicated that Company A's storage area was secure and that, in general, the facility was well managed. However, there were a number of violations of the interim status standards. The complaint issued to Company A assessed penalties for the Part 265 violations as well as the statutory violations. This example will discuss the §3005 and §3010 violations only.

(B) Seriousness: (i) Failure to Notify: Potential for Harm. Moderate - EPA was prevented from knowing that hazardous waste was being stored at the facility. However, because Company A notified EPA that it was a generator, EPA did know that hazardous waste was handled at the facility. The violation may have a significant adverse effect on the statutory purposes or procedures for implementing the RCRA program. Extent of Deviation. Moderate - although Company A did not notify EPA that it stored hazardous waste, it did notify the Agency that is was a generator. Company A significantly deviated from the requirement, but part of the requirement was implemented as intended. (ii) Operating without a permit. Potential for Harm. Moderate - although Company A was operating without a permit or interim status, its facility generally was well managed. However, there were a number of Part 265 violations. This situation may pose a significant likelihood of exposure which may have a significant adverse effect on the statutory purposes for implementing the RCRA program. Extent of Deviation. Major - substantial noncompliance with the requirement because Company A did not notify EPA that it stored hazardous waste, and did not submit a Part A.

(C) Gravity-based Penalty: (i) Failure to notify. Moderate potential for harm and moderate extent of deviation lead one to the cell with the range of $5,000 to $7,999. The mid-point is $6,500. (ii) Operating without a permit. Moderate potential for harm and major extent of deviation lead one to the cell with the range of $8,000 to $10,999. The midpoint is $9,500. (iii) Total penalty: $6,500 + $9,500 = $16,000.

(D) Settlement adjustment: Company A raised and documented that it had cash flow problems. It did not convince EPA that the penalty should be mitigated. An installment plan was accepted by both parties as a means of payment. Penalty remained at $16,000.

(2)(A) Violation: Company B failed to prevent unknowing entry of persons onto the active portion of its surface impoundment facility. The fence surrounding the area had several holes. 40 CFR §265.14.

(B) Seriousness: Potential for Harm. Major - some children already have entered the area; potential for harm due to exposure to waste may be substantial because of the lack of adequate security around the site. Extent of Deviation. Moderate - there is a fence, but it has holes. Significant degree of deviation, but part of the requirement was implemented.

(C) Gravity-based Penalty: Major potential for harm and moderate extent of deviation yield the penalty range of $15,000 to $19,999. The midpoint is $17,500.

(D) Pre-complaint Adjustment: During the inspection of the facility, EPA discovered that the operator of Company B had been made aware of the above occurrence more than three months earlier, but had failed to repair the fence or increase security in that area. The penalty is adjusted upwards 25% for willfulness and/or negligence. $17,500 + $4,375 = $21,875. [Penalty calculation using the Penalty Computation Worksheet follows this hypothetical.]

(E) Settlement Adjustment: Company B gave evidence at settlement of labor problems with security officers and reordering and delivery delays for a new fence. Company B was very cooperative and stated that a new fence had been installed after issuance of the complaint and that

security would be provided for by another company in the near future. Even though the company was very cooperative, its actions were only those required under the regulations. No justification for mitigation for good faith efforts to comply exists. No change in $21,875 penalty.

PENALTY COMPUTATION WORKSHEET

Company Name: Company B

Regulation Violated 265.14

Asessments for each violation should be determined on separate worksheets and totalled.

(If more space is needed, attach separate sheet.)

Part I - Seriousness of Violation Penalty

1. Potential for Harm: Major
2. Extent of Deviation: Moderate
3. Matrix Cell Range: $15,000 - $19,999

   Penalty Amount Chosen: $17,500

   Justification for Penalty Amount Chosen: midpoint of range
4. Per-Day Assessment: $17,500

Part II - Penalty Adjustments

	Percentage Change*	Dollar Amount
1. Good faith efforts to comply/lack of good faith:	N/A	N/A
2. Degree of willfulness and/or negligence:	25%	$4,375
3. History of noncompliance:	N/A	N/A
4. Other unique factors:	N/A	N/A

5. Justification for Adjustments:

* Percentage adjustments are applied to the dollar amount calculated on line 4, Part I.

PENALTY COMPUTATION WORKSHEET (cont.)

6. Adjusted Per-day Penalty (Line 4, Part I + Lines 1-4, Part II):	$21,875
7. Number of Days of Violation:	N/A
8. Multi-day Penalty (Number of days x Line 6, Part II):	N/A
9. Economic Benefit of Noncompliance:	N/A
Justification:	
10. Total (Lines 8 + 9, Part II):	$21,875
11. Ability to Pay Adjustment:	
Justification for Adjustment:	N/A
12. Total Penalty Amount (must not exceed $25,000 per day of violation):	$21,875

(3)(A) Violation: A 1984 inspection of Company C's land disposal facility revealed that Company C had failed to implement a ground-water monitoring system by November 1981 as required under 40 CFR §265.90. The facility had taken no steps to implement a system: it failed to install monitoring wells (§265.91), and to obtain and analyze samples (§265.92); no outline of a ground-water quality assessment program had been prepared (§265.93); and no records were kept nor reports submitted to the Agency (§265.94). All of the violations arise from the same set of circumstances. Because Company C did not install wells, no sampling and analysis could occur. Without sampling and analysis, Company C did not have information with which to prepare a quality assessment program outline, keep records, or submit reports to the Agency. Therefore, the violations are not independent and substantially distinguishable in this situation. [See: Assessing Multiple Penalties]. A single penalty assessment is appropriate, with each section of the regulations that was violated cited in the complaint.

(B) Seriousness: Potential for Harm. Major - the violation could pose a substantial likelihood of exposure and could have a substantial adverse effect on the purposes for implementing the RCRA program. Extent of Deviation. Major - none of the requirements were implemented as intended.

(C) Gravity-based Penalty: Major potential for harm and major extent of deviation yield the cell with the penalty range of $20,000 to $25,000. The mid-point is $22,500.

(D) Economic Benefit of Noncompliance: Ground-water monitoring has been identified as an area for which an economic benefit component may be significant. The following estimates of the costs of complying with the ground-water monitoring requirements are taken from a January 1982 report prepared for EPA by Geraghty & Miller, Inc., entitled, Development of Ground-Water Monitoring Requirements and Costs for Current RCRA Regulatory Requirements, Contract No. 68-01-5838:

First Year Costs

Cost of ground-water quality assessment plan outline and ground-water sampling and analysis plan (COP)	$2,000
Cost of wells (COW), 1 upgradient and 3 downgradient	$9,000
Cost of sampling (COS)	$1,640

Cost of analysis (COA)	$11,360
Cost of report (COR), report for determining system needs, not report required under §265.94	$3,200
TOTAL	$27,200

Second Year Costs

Cost of sampling and cost of analysis (COS, COA), assuming no contamination found	$1,900

Assumptions: geology is unconsolidated material; hollow-stem auger drilling; PVC construction material; ground-water sampling by hand bailing; wells dug 50 ft. deep; estimated costs remained constant over time.

COP, COW, COR, and first year COS and COA are delayed costs. Company C eventually will make these expenditures in order to achieve compliance. Second year and subsequent COS and COA are avoided costs. Company C has permanently avoided incurring these costs.

Calculation of Economic Benefit Component

For each year of noncompliance (1981-1984), the economic benefit component should be calculated using the formula set out in Section VII:

Economic Benefit = Avoided Costs (1-T) + (Delayed Costs x Interest Rate)

1981: By November 1981, Company C was required to implement its ground-water monitoring system by installing wells, obtaining and analyzing samples at least quarterly, and preparing a quality assessment program outline.

Delayed costs = $27,200
Avoided costs = $0
IRS interest rate = 12%
Assume T = .46

Economic Benefit = $0 + ($27,200 x 12%)
= $3,264

1982: Company C still had not implemented its ground-water monitoring system. In addition, it had not obtained and analyzed samples at least annually or semi-annually, depending on the indicator parameter.

Delayed costs = $27,200
Avoided costs = $1,900
IRS interest rate = 20%
Assume T = .46

Economic Benefit = $1,900 (1-.46) + ($27,200 x 20%)
= $6,466

1983: Company C still had not implemented its ground-water monitoring system. In addition, it had not obtained and analyzed samples at least annually or semi-annually, depending on the indicator parameter.

Delayed costs = $27,200
Avoided costs = $1,900
IRS interest rate = 13.5% (the average of 16% and 11%)
Assume T = .46

Economic Benefit = $1,900 (1-.46) + ($27,200 x 13.5%)
= $4,698

Total Economic Benefit = $3,264 + $6,466 + $4,698
= $14,428

Penalty proposed in complaint = gravity-based penalty + economic benefit component
= $22,500 + $14,428
= $36,928

Because noncompliance continued over a three year period, the proposed penalty does not exceed $25,000 per day of violation.

(E) Settlement Adjustment: Company C did not request a settlement conference but did comply with the Compliance Order and paid the proposed penalty.

(4)(A) Violation: Pursuant to §3007(a) of RCRA, EPA sent a letter to Company D requesting that it furnish information relating to hazardous waste. Specifically, five separate records were requested. The letter required a response to EPA within 14 calendar days of Company D's receipt of the letter. One month after Company D received EPA's information request, it submitted three of the five documents requested. EPA sent a second letter requesting the two remaining documents. Company D failed to respond to the request.

(B) Seriousness: Potential for Harm. Moderate - Based on the nature of the information requested, EPA determined that Company D's failure to submit information relating to hazardous waste to EPA as requested may have a significant adverse effect on the purposes and procedures for implementing the RCRA program. Extent of Deviation. Moderate - Company D did submit some of the information requested. It significantly deviated from the requirement, but part of the requirement was implemented as intended.

(C) Gravity-based Penalty: Moderate - potential for harm and moderate extent of deviation yield the penalty range of $5,000 to $7,999. The midpoint is $6,500.

(D) Pre-Assessment Adjustments - On two previous occasions at different facilities, Company D failed to respond completely to §3007 requests for different information. In those cases, EPA issued administrative complaints with proposed penalties of $6,500 and $8,125 respectively. Both cases resulted in Consent Agreements and Final Orders which were entered into before EPA requested the information in the present case. The penalty is adjusted upwards 50% for history of noncompliance. $6,500 + $3,250 = $9,750. Compliance/enforcement personnel determined that the penalties assessed in the previous cases had failed to deter Company D from repeated noncompliance with RCRA. For this reason, a multi-day penalty of $9,750 per day from the date the information was due to EPA was assessed.

(E) Settlement Adjustment: Company D failed to convince EPA that any penalty mitigation was justified. Settlement negotiations broke down and the case went to an administrative hearing.

(5)(A) Violation: Company E's Part B Permit Application was called in by EPA in 1983. Company E, a land disposal facility, failed to submit its Part B by the date specified when the application was called-in. EPA issued a Notice of Deficiency requiring submission of a complete Part B within 30 days. EPA also issued a warning letter stating that failure to submit a complete Part B application is a violation of 40 CFR §270.10(a) which may result in the assessment of civil penalties and the initiation of procedures to terminate the facility's interim status. Company E sent EPA a one-page response several weeks after the date stipulated in the Notice of Deficiency. The response was seriously incomplete. Thus, Company E failed to submit a complete Part B in violation of 40 CFR §270.10(a).

(B) Seriousness: Potential for Harm. Moderate - inspections of Company E's facility have revealed a generally well-managed operation. However, failure to carry out the applicable requirements of 40 CFR §270.14-270.29 could pose a significant likelihood of exposure in this situation. The violation could have a significant adverse effect on the procedures for implementing the RCRA program. Extent of Deviation. Major - Part B application was seriously incomplete.

(C) Gravity-based Penalty: Moderate potential for harm and major extent of deviation lead one to the cell with the range of $8,000 to $10,999. The mid-point is $9,500.

(D) Economic Benefit of Noncompliance: Failure to submit or submittal of an incomplete Part B application has been identified as an area for which an economic benefit component may be significant. In a document prepared by EPA's Office of Solid Waste requesting clearance from the Office of Management and Budget to call in Part B applications, it was estimated that the cost of preparing a Part B for a land disposal facility was approximately $150,000. The document, entitled, FY 1984 Burden Hours for RCRA Land Disposal Permitting Standards is dated November 18, 1983.

The economic benefit component should be calculated using the formula set out in Section VII:

Economic
Benefit = Avoided Costs (1-T) + (Delayed Costs x Interest Rate)

Failure to submit a complete Part B is a delayed cost. Company E eventually will spend the money in order to achieve compliance. No avoided costs are associated with this violation. The economic benefit should be calculated for a one year period. The IRS interest rate for 1983 is 13.5% (the average of 16% and 11%).

Economic Benefit = $0 + ($150,000 x 13.5%)
= $20,250

Penalty proposed in complaint = gravity-based penalty + economic benefit component
= $9,500 + $20,250
= $29,750

Because noncompliance continued over a period of several months, the proposed penalty does not exceed $25,000 per day of violation.

(E) Settlement Adjustment: At the settlement conference, Company E raised and documented that it was in a poor financial state and would be unable to pay the full penalty. Company E also told the Agency that it intended to cease handling hazardous waste. Because of the company's inability to pay, and because of the Agency's desire that Company E put what money it has into proper closure and post-closure care at its facility, the penalty was reduced to $5,000. A Compliance Order was issued putting Company E on a schedule for closing its facility in accordance with its approved closure plan.

POSSIBLE RCRA INTERIM MEASURES

Must be consistent with Final Measures Plan

- CONTAINERS
- LANDFILL
- GROUND WATER
- TANKS
- PARTICULATE EMISSIONS
- SURFACE IMPOUNDMENTS
- WASTE PILE
- SURFACE WATER RELEASE
- GAS MIGRATION CONTROL
- OTHER

INTERIM MEASURES

CONTAINERS

- Overpack/Re-drum
- Construct Storage Area/Move to Storage Area
- Segregation
- Sampling and Analysis
- Treatment, Storage and/or Disposal
- Temporary Cover

TANKS

- Overflow/Secondary Containment
- Leak Detection/Repair/Partial or Complete Removal

SURFACE IMPOUNDMENTS

- Reduce Head
- Remove Free Liquids and or Highly Mobile Wastes
- Stabilize/Repair Side Walls, Dikes or Liner(s)
- Temporary Cover
- Run-off/Run-on Control (Diversion of Collection Devices)
- Sample and Analysis to Document the Concentration of Constituents Left in Place When a Surface Impoundment Handling Characteristic Wastes is Clean Closed
- Interim Ground-water Measures (See Ground-water Section)

LANDFILL

- Run-off/Run-on Control (Diversion or Collection Devices)
- Reduce Head on Liner and/or in Leachate Collection System
- Inspect Leachate Collection/Removal System or French Drain
- Repair Leachate Collection/Removal System or French Drain
- Temporary Cap
- Waste Removal (See Soils Section)
- Interim Ground-water Measures (See Ground-water Section)

WASTE PILE

- Run-off/Run-on Control (Diversion of Collection Devices)
- Temporary Cover
- Waste Removal (See Soils Section)
- Interim Ground-water Measures (See Ground-water Section)

SOILS

- Sampling/Analysis/Disposal
- Run-off/Run-on Control (Diversion or Collection Devices)
- Temporary Cap/Cover

GROUND WATER

- Delineation/Verification of Gross Contamination
- Sampling and Analysis
- Interceptor Trench/Sump/Subsurface Drain
- Pump and Treat/In-situ Treatment
- Temporary Cap/Cover

SURFACE WATER RELEASE (Point and Non-point)

- Overflow/Underflow Dams
- Filter Fences
- Run-off/run-on Control (Diversion or Collection Devices)
- Regrading/Revegetation
- Sample and Analyze Surface Waters and Sediments or Point Source Discharges

GAS MIGRATION CONTROL

- Barriers/Collection/Treatment/Monitoring

PARTICULATE EMISSIONS

- Truck Wash (Decontamination Unit)
- Re-vegetation
- Application of Dust Supressant

OTHER TYPES OF ACTIONS

- Fencing to Prevent Direct Contact
- Extend Contamination Studies to Off-site Areas if Permission is Obtained as Required Under Section §3004(v)
- Alternate Water Supply to Replace Contaminated Drinking Water
- Temporary Relocation of Exposed Population
- Temporary or Permanent Injunction
- Suspend or Revoke Authorization to Operate Under Interim Status

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C 20460

JAN 24 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Request for Comments on a Draft Corrective Action Interim Measures

FROM: Lloyd Guerci, Director
RCRA Enforcement Division, OWPE (WH-527)

Bruce Weddle, ~~Director~~
Permit & State Program Division, OSW (WH-563)

TO: RCRA Branch Chiefs, Regions I-X
Regional Counsels, Regions I-X

On December 10, 1985, the RCRA Enforcement Division transmitted to you a copy of a draft §3008(h) Corrective Action Model Order developed at Headquarters and asked for your comments by December 20, 1985. Today we are transmitting one of the companion documents which was also noted in the December 10 transmittal.

The document is tentatively titled Corrective Action Interim Measures and is designed to provide a review of response actions available under §3008(h) as well as permits to quickly address problems while other detailed investigations or analyses are ongoing. Interim measures should be designed and implemented as an initial remedial activity in a multi-phased order or as the action in the first of a series of orders which feed into an operating permit, post-closure permit or interim status closure plan.

You will note that this document does not address the questions of trigger levels for corrective action or levels of clean-up to be achieved. We solicit your comments on these two key subjects. To date we at Headquarters have seen a wide variety of proposed requirements in Corrective Action Orders and Referrals. Clean-up levels have ranged from background, to a specified percentage reduction in total volatile organics, to the establishment of ACLs, to no specified clean-up levels. Activities have ranged from sweeping contaminated floors or parking lots to excavation of solid waste management units. Several actions have called for soil sampling and sediment/surface water sampling from point source and non-point source discharges.

We request that staff from both enforcement and permitting develop a coordinated set of comments from the Regional program offices. To allow for an expedited turnaround for the final document, we are requesting that you submit your comments to each of us within two weeks. In the interim, Regions are encouraged to continue to develop both administrative orders and judicial referrals under the new corrective action authority and to proceed with corrective action activities, including preliminary assessments or site investigations.

attachments

cc: RCRA Section Chiefs

DRAFT

JAN 24 1986

RCRA §3008(h) CORRECTIVE ACTION

INTERIM MEASURES

STRATEGY

FOR THE INTEGRATION OF

INTERIM MEASURES

IN

CORRECTIVE ACTION ORDERS

Interim Measures Strategy

Background

Section 3008(h) gives EPA authority to issue Administrative Orders or seek judicial relief requiring corrective action or such other response measures deemed necessary to protect human health or the environment, based on information that a release has or is occurring into the environment from a facility. This authority provides for the broad applicability of corrective actions and response measures.

Extensive and time consuming investigations may be required to develop a comprehensive corrective action plan (RI equivalent) for a facility. During this period the release could continue unabated which would allow the spread of contamination or the continuance of conditions that may endanger or impact human health or the environment. Therefore, interim measures pursuant to corrective action orders or permits, should be considered and where appropriate directed.

Implementation Strategy

1. OWPE (HQ) will review existing CERCLA guidance and CERCLA case files to develop a comprehensive list of possible interim measures.

2. OWPE (HQ) will provide the Regions with the list of interim measures together with model order language as needed for each interim measure to assist in the development of corrective action orders.

3. Regions should consider interim measures for all corrective action orders and initiate them for facilities where a release that threatens human health or the environment has been identified. Implementation of interim measures should be consistent with priorities, as necessary to protect human health or the environment, based on information that a release has or is occurring at an interim status facility.

4. Regions should integrate interim measures where appropriate, as initial phase(s) of corrective action orders.

5. Interim measures are independent of the comprehensive corrective action plan. They may, in fact, add additional costs or work to the comprehensive corrective action. This should not be a justification for not implementing an interim measure. To decide what interim measure is appropriate, both technical judgement and potential threat evaluation should be considered.[1] If the release poses a minimal threat to human

[1] An example of hazardous constituent specific health effects is attached. Similar data sheets can be found for other constituents in "Chemical, Physical and Biological Properties of Compounds Present at Hazardous Waste Sites", September 1985.

health or the environment, a comprehensive and sometimes expensive interim measure (e.g. pump and treat) might not be necessary or appropriate. Interim measures should be consistent with and integrated into any long term remedy (e.g. an operating permit, post-closure permit or interim status closure) to the maximum extent possible.

Types of Interim Measures

Corrective action orders should incorporate actions (interim measures) necessary to protect human health or the environment. Interim measures are actions that should be taken to prevent releases or additional contamination, prevent or reduce the further spread of contamination, and reduce, abate or remove the exposure threat presented by releases. During a selection of an interim measure, Regions should consider the magnitude of the potential threat to human health or the environment. The Agency's authority to seek relief by ordering an owner/operator to perform specified activities is directly correlated to the protection of human health and the environment standard. Therefore, if the threat is minimal or the risk has yet to be determined, simple monitoring of ground water, surface water, soil or air may be the types of actions ordered. For example, if a release to ground water is minimal and the aquifer is not used by the nearby population, a program to pump and treat may not be appropriate. If the threat is greater or as more information becomes available through initial or additional sampling and analysis, more serious actions should be contemplated either by incorporating actions into a single "phased" order or by issuing separate orders.

Attached is a list of some possible interim measures. It was compiled from removal actions and past CERCLA remedial guidance.

DECISION CRITERIA

Decision Criteria

Regional staff must review the pertinent facts about the source and nature of the release or threat of release and based on the magnitude of the potential threat to human health and environment, decide if interim measures are appropriate.

To determine when a potential threat to human health or the environment exists as a result of a release, the enforcement official/ permit writer, should consider factors such as site location, type of release and its scope. The following questions may help the Regional staff in determining these factors.

1. What is the location (e.g., residential area, schools, hospitals, near vital ecology or protected natural resource)?

2. Is the release widespread and/or migrating rapidly?

   (a) What factors could decrease or intensify the extent of contamination?

   (b) How is it spread [illegible] direction? At what rate?

3. What type of wastes or constituents are present (e.g., volatile organics, metals, etc)?

   (a) What are the characteristics (ignitable, reactive, corrosive, biohazard, radioactive, etc.) of the waste?

   (b) What is the background level of each waste or constituent?

4. What are the estimated quantities released?

5. What are the known effects of human exposure (short- and long-term effects)?

6. Has human exposure actually occurred?

   (a) What kind (e.g., inhalation, ingestion, skin contact)?

   (b) What is or will be the exposure pathway (e.g., air, drinking water, food)?

   (c) Are there reports of illness, injury, death?

   (d) How many people are or will be affected?

7. Is human exposure imminent?

   (a) What kind (e.g., inhalation, ingestion, skin contact)?

   (b) What is or will be the exposure pathway (e.g., air, drinking water, food)?

   (c) When is it likely to occur?

8. What are the characteristics of the exposed population(s) (how many, infants, nursing home residents)?

9. Has there been an evironmental impact?

   (a) What evironmental attributes have been impacted(e.g., ground water, air, surface water)?

   (b) What are the known short-term and long-term effects on the evironment of the released waste or constituent?

   (c) What natural resource effects have occurred/been demonstrated (e.g., fish kills)?

   (d) What are the known ecological effects?

10. Is there a threat to the environment?

   (a) When is this threat likely to materialize (days, weeks, months)?

   (b) What are the projected effects?

11. If response is delayed, how will the situation deteriorate?

INTERIM MEASURES

INTERIM MEASURES

Containers

a) Overpack/re-drum
b) Construct storage area/move to storage area
c) Segregation
d) Sample/analyze and dispose
e) Excavation/disposal
f) Temporary cap

Surface Impoundments

a) Reduce head
b) Remove free liquids and/or highly mobile wastes
c) Stabilize/repair side walls/increase freeboard/geotextile
d) In-Situ solidification
e) Cover (control air release or overflow due to rain)
f) Interim ground water measures
g) Runoff/run on control (diversion or collection devices)
h) Document the concentration of constituents left in place [illegible] characteristic wastes is clean closed*

Landfill

a) Runoff/run on control (diversion or collection devices)
b) Reduce head on liner and/or in leachate collection system
c) Repair leachate collection/removal system or french drain
d) Install new leachate collection/removal system or french drain
e) Temporary cap/cover (asphalt, synthetic or clay)
f) Interim ground water measures
g) Excavation/disposal

Waste Pile

a) Runoff/run on control (diversion or collection devices)
b) Cover (polymeric membrane, geotextile or clay
c) Solidification
d) Interim ground water measures
e) Removal of the waste pile for proper storage
f) Excavation/disposal

* When this type of surface impoundment is clean closed, there may be constituents left in place. Some of these constituents may present a potential threat to human health or the environment (e.g. corrosive waste may contain heavy metals).

Ground Water

a) Sampling and analysis
b) Delineation of plume
c) Interceptor trench/ sump/french drain
d) Pump and treat/in-situ treatment
e) Cut-off walls (slurry or bentonite)
f) Initiate development of ACLs

Surface Water Release

a) Overflow/underflow dams
b) Filter fences
c) Runoff/run on control (diversion or collection devices)
d) Regrading/revegetation
e) Cover with geotextile
f) Sample and analyze surface waters and sediments

Tanks

a) Leak or cracks detection/ repair
b) Relining
c) Partial or complete removal
d) Pipeline removal or replacement
e) Secondary containment

Gas Migration Control

a) Pipe vents
b) Trench vents
c) Gas barriers
d) Gas collection system
e) Gas treatment system
f) Gas recovery

Particulate Emissions

a) Truck wash (decontamination unit)
b) Re-vegetation
c) Application of dust supressent

Other Types of Actions

a) Fencing to prevent direct contact
b) Alternate water supply to replace contaminated drinking water
c) Temporary relocation of people
d) Extent of contamination studies into off-site areas if permission is obtained as required under Section §3004(v)
e) Other actions necessary to protect human health or the environment

INTERIM MEASURES LANGUAGE

TO INCLUDE IN

CORRECTIVE ACTION ORDERS

CONTAINERS

(1) Within ___ days, submit a plan to EPA which details procedures for sampling and analysis of wastes in (every container or specified containers). Upon reciept of EPA's comments on the plan, Respondant shall incorporate those comments and implement the plan. The plan shall be based on the sampling and analytical techniques described in SW-846 (and other documents listed by EPA).

(2) Within __ days, examine every container to detect any deterioration or leakage. Overpack or redrum each leaking and each substantially [illegible] container that may leak to prevent further or [illegible] leakage.

(3) Within days, designate or construct a storage area that meets the standards of 40 CFR §264 and is large enough for all containers. The area must have an impervious base and be constructed to collect releases. Consolidate and place containers that do not require overpacking or redrumming and those that are redrummed or overpacked in a temporary on site storage area approved by EPA.

(4) Within __ days, place containers in a well ventilated covered structure with appropriate secondary containment in accordance with Part 264 Subpart I requirements.

(5) If the content of the containers is not known, within __ days, submit a plan to EPA to sample and analyze to determine the proper treatment, storage and/or disposal techniques.

(6) Within __ days, remove and dispose of significantly contaminated soils* (residue of spills or leaks from containers) largely at or near surface. (List specific areas). After removal of contaminated soil, the remaining soil shall be sampled and analyzed in accordance with a plan submitted to EPA by the Respondant within __ days.

* Significantly contaminated areas should be identified on a case by case basis by EPA.

SURFACE IMPOUNDMENTS

(1) Within __ days, reduce the head in the surface impoundment to a level of __ in and maintain that level. To reduce the head, pump materials to increase the freeboard to __ inches. Store or dispose of the pumped materials in a manner that complies with applicable standards of RCRA and if appropriate, the Clean Water Act.

(2) Within __ days, submit a plan to select a method for stabilization (solidification, fixation, reduction of free liquids etc.) of the waste. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(3) Within __ days, submit a plan to place a temporary cover over the surface impoundment to reduce infiltration of precipitation and control air releases. The plan should include the design of a cover and method of application that assures that precipitation runs off and does not allow ponding on the cover, the cover must have a permeability no greater than ___, and is compatible with the chemical and physical characteristics of the waste being covered, local climate and the other design characteristics of the unit including any berms, dikes or other appurtenances. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(4) Within __ days, submit a plan to document the levels of the concentrations of hazardous waste or constituents left in place when a surface impoundment handling characteristic wastes is clean closed.* Within __ days, incorporate EPA's comments into the plan and implement the revised plan.

* When this type of surface impoundment is clean closed, there may be constituents left in place. Some of these constituents may present a potential threat to human health or the environment (e.g. corrosive waste may contain heavy metals).

LANDFILLS AND WASTE PILES

(1) Within __ days, submit a plan to place a cap (temporary) over the landfill or waste pile to prevent surface water infiltration, control water and wind erosion or dispersion, and isolate and contain contaminated wastes and volatiles. The plan should include the design and method of application that assures that precipitation runs off and the cap has a permeability no greater than _____ and is compatible with the chemical and physical characteristics of the waste being covered, local climate and hydrogeology. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(2) Within ___ days, submit a plan to excavate material and designate or construct a storage area that meets the standards of 40 CFR §265 and large enough for all the excavated waste or transport to an approved RCRA facility, taking into consideration:

(a) density of solid waste in a landfill

(b) amount of solid waste in a landfill

(c) the settlement to the fill

(d) chemical composition and hazards presented by the waste

(e) the bearing capacity of the fill

(f) decomposition rate of the waste

(g) proper packaging of the waste

Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(3) Within __ days, submit a plan for the installation of devices to control surface runoff so that it does not contribute to leachate generation or erosion of covered materials. The plan should include the design of diversion and collection devices to effect run-on control. These devices can consist of, but not limited to: dikes and berms, ditches, diversions, waterways, bench terraces, chutes and downpipes. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(4) Within __ days, reduce the head on the liner and/or in the leachate collection system to a level of __ in and maintain that level. Store or dispose of removed leachate in a manner that complies with applicable standards of RCRA.

(5) Within __ days, inspect the leachate collection system and repair, replace, or upgrade if necessary. Record all data collected or observations made and maintain this record as part of the facility operating record. If the observations or data collected demonstrate that leachate collection system is not functioning to the degree necessary to meet the requirements of Part 265, submit the inspection record to EPA within __ days for review and comment and to revise Part B of the facility's permit application.

GROUND WATER

(1) Within __ days, submit a plan to determine the extent of the contamination and to delineate the plume. Activity can be directed towards sections of plume threatening sensitive areas (list areas). The plan will include sampling and analysis of the following parameters: (list parameters) Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(2) Within __ days, submit a plan for the installation of impermeable barriers to divert ground water flow away from a waste disposal area, away from a sensitive environmental area or populated area, or to contain contaminated ground water migrating from the waste area. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(3) Within __ days, submit a plan for the installation of a system to capture the plume of contaminants based on the hydrogeology of the site and the type and amount of contaminants present in the ground water. The plan should include methods to be used to pump the ground water in order to lower the water table so that:

    (a) contaminated ground water does not discharge to a receiving stream that is hydraulically connected;

(b) ground water is not in direct contact with the waste site;

(c) to prevent leaky aquifers from contaminating other aquifers.

Within __ days incorporate EPA's comments into th plan and implement the revised plan.

(4) Within __ days, submit a plan for the installation of a system to include enough number of extraction and injection wells that will allow water within the plume to be pumped, treated and reintrouduced into the aquifer. The plan should include a ground water treatment system to address the specific ground water contamination problems. Within __ days incorporate EPA's comments and implement the revised plan.

(5) Within __ days, submit a plan to establish interim concentration levels to monitor the impact of pumping, injection, slurry wall construction, etc. on the hydrogeology of the site for the purpose of establishing ACLs or MCLs. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

SURFACE WATER RELEASE

(1) Within __ days, submit a plan to select a grading technique to control infiltration, detain or promote runoff. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(2) Within __ days, submit a plan to install filter fences in order to prevent further spread of contamination to surface waters. Filter fences will be constructed of materials that will contain the contaminants in the water. Within __ days incorporate EPA's comments into the plan and implement the revised plan.

(3) Within __ days, submit a plan to establish a vegetative cover to stabilize the surface of the hazardous disposal site. The plan will address the following factors:

(a) cover soil characteristics (grain size, organic content, nutrient and Ph levels and water content

(b) local climate

(c) site hydrogeology

(d) species compatibility with other plants selected to be grown on the site, resistance to insect damage and disease, and suitability for future land use.

Within __ days, incorporate EPA's comments into the plan and implement the revised plan.

Owner/operator will maintain vegetation and repair/replant as necessary.

(4) Within __ days, submit a plan for the installation of diversion and collection devices. These devices can consist of, but but not limited to: dikes and berms, ditches, diversions, waterways, bench terraces, chutes and downpipes. Within __ days of reciept incorporate EPA's comments and implement the revised plan.

(5) Within __ days, submit a plan which details procedures for sampling analyzing surface waters or sediments which have received (point source or non-point source) discharges from units (list units). Within __ days of reciept, incorporate EPA's comments and implement the plan.

TANKS

(1) Increase inspection frequency or change inspection procedures to detect leaks or cracks and repair or replace them.

(2) Within __ days, inspect valves and pipes (especially joints and connectors) and repair or replace them.

(3) Within __ days, remove part of the waste to prevent overflow in the tank. Monitor liquid level, place a lap on the tank or install a larger or secondary tank to handle overflow as necessary.

(4) Within ___ days, submit a plan for a complete repair/removal/replacement of tanks that present structural failure (e.g. leaks/cracks). Within ___ days incorporate EPA's comments and implement the revised plan.

(5) Within __ days, submit a plan for the design, construction and installation of dikes or other drainage control systems to prevent further spread of contamination due to releases from the tank. Within __ days incorporate EPA's comments and implement the revised plan.

GAS MIGRATION CONTROL

Within __ days, submit a plan for the design and installation of a gas migration control system to control lateral and vertical migration of gases or vapors. The gas migration control system will include, but not limited to:

(1) pipe vents and/or;

(2) trench vents and/or;

(3) gas barriers and/or;

(4) gas collection system and/or;

(5) gas treatment system and/or;

(6) gas recovery

Within __ days incorporate EPA's comments into the plan and implement same.

PARTICULATE EMISSIONS

(1) Within __ days, develop and install decontamination units to provide for the effective cleaning of vehicles and personnel entering contaminated areas in order to prevent further spread of contamination.

(2) Within __ days, establish a short term vegetative cover to stabilize contaminate surfaces.

(3) Within __ days, apply a dust suppressant to prevent spread of contamination due to the wind. Water is the most common dust suppressant used. It is inappropriate to use collected leachate, used oil, or hazardous waste to control wind dispersion.

OTHER ACTIONS

(1) Within ___ days, submit a plan to collect and analyze samples to determine extent of contamination outside facility boundaries where permission is obtained as required by Section §3004(v).

(2) Within ___ days provide alternative water supplies to the affected community.

(3) Within ___ days install security fencing, warning signs or other measures to limit access to the site.

(5) Within ___ days develop a public awareness program to reduce or control concern and counter unfounded rumors.

Attachment from "Chemical, Physical and Biological Properties of Compounds Present at Hazardous Waste Sites", September 1985

TETRACHLOROETHYLENE

Summary

Tetrachloroethylene (PCE, perchloroethylene) induced liver tumors when administered orally to mice and was found to be mutagenic using a microbial assay system. Reproduction toxicity was observed in pregnant rats and mice exposed to high concentrations. Animals exposed by inhalation to tetrachloroethylene exhibited liver, kidney, and central nervous system damage.

CAS Number: 127-18-4

Chemical Formula: C_2Cl_4

IUPAC Name: Tetrachloroethene

Important Synonyms and Trade Names: Perchloroethylene, PCE

Chemical and Physical Properties

Molecular Weight: 165.83

Boiling Point: 121°C

Melting Point: -22.7°C

Specific Gravity: 1.63

Solubility in Water: 150 to 200 mg/liter at 20°C

Solubility in Organics: Soluble in alcohol, ether, and benzene

Log Octanol/Water Partition Coefficient: 2.88

Vapor Pressure: 14 mm Hg at 20°C

Transport and Fate

Tetrachloroethylene (PCE) rapidly volatiziles into the atmosphere where it reacts with hydroxyl radicals to produce HCl, CO, CO_2 and carboxylic acid. This is probably the most important transport and fate process for tetrachloroethylene in the environment. PCE will leach into the groundwater, especially in soils of low organic content. In soils with high levels of organics, PCE adsorbs to these materials and can

Clement Associates

be bioaccumulated to some degree. However, it is unclear if tetrachloroethylene bound to organic material can be degraded by microorganisms or must be desorbed to be destroyed. There is some evidence that higher organisms can metabolize PCE.

Health Effects

Tetrachloroethylene was found to produce liver cancer in male and female mice when administered orally by gavage (NCI 1977). Unpublished gavage studies in rats and mice performed by the National Toxicology Program (NTP) showed hepatocellular carcinomas in mice and a slight, statistically insignificant increase in a rare type of kidney tumor.[1] NTP is also conducting an inhalation carcinogenicity study. Elevated mutagenic activity was found in Salmonella strains treated with tetrachloroethylene. Delayed ossification of skull bones and sternebrae were reported in offspring of pregnant mice exposed to 2,000 mg/m^3 of tetrachloroethylene for 7 hours/day on days 6-15 of gestation. Increased fetal resorptions were observed after exposure of pregnant rats to tetrachloroethylene. Renal toxicity and hepatotoxicity have been noted following chronic inhalation exposure of rats to tetrachloroethylene levels of 1,356 mg/m^3. During the first 2 weeks of a subchronic inhalation study, exposure to concentrations of 1,622 ppm (10,867 mg/m^3) of tetrachloroethylene produced signs of central nervous system depression, and cholinergic stimulation was observed among rabbits, monkeys, rats, and guinea pigs.

Toxicity to Wildlife and Domestic Animals

Tetrachloroethylene is the most toxic of the chloroethylenes to aquatic organisms but is only moderately toxic relative to other types of compounds. The limited acute toxicity data indicate that the LC_{50} value for saltwater and freshwater species are similar, around 10,000 µg/liter; the trout was the most sensitive (LC_{50} = 4,800 µg/liter). Chronic values were 840 and 450 µg/liter for freshwater and saltwater species, respectively, and an acute-chronic ratio of 19 was calculated.

No information on the toxicity of tetrachloroethylene to terrestrial wildlife or domestic animals was available in the literature reviewed.

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[1] J. Mennear, NTP Chemical Manager; personal communication, 1984.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH). 1983. Registry of Toxic Effects of Chemical Substances. Data Base. Washington, D.C. October 1983

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA). 1979. Health Assessment Document for Tetrachloroethylene (Perchloroethylene). External Review Draft No. 1, April 1979

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA). 1979. Water-Related Environmental Fate of 129 Priority Pollutants. Washington, D.C. December 1979. EPA 440/4-79-029

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA). 1980. Ambient Water Quality Criteria for Tetrachloroethylene. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C. October 1980. EPA 440/5-80-073

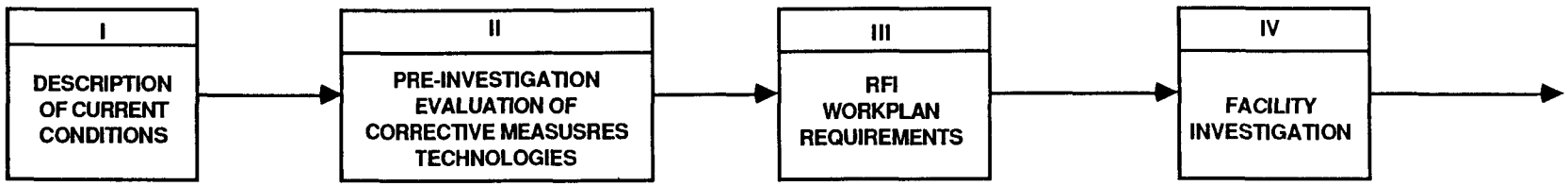
U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA). 1984. Health Effects Assessment for Tetrachloroethylene. Final Draft. Environmental Criteria and Assessment Office, Cincinnati, Ohio. September 1984. ECAO-CIN-H009

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA). 1985. Health Assessment Document for Chloroform. Office of Health and Environmental Assessment, Washington, D.C. September 1985. EPA 600/8-84/004F

VERSCHUEREN, K. 1977. Handbook of Environmental Data on Organic Chemicals. Van Nostrand Reinhold Co., New York. 659 pages

WEAST, R.E., ed. 1981. Handbook of Chemistry and Physics. 62nd ed. CRC Press, Cleveland, Ohio. 2,332 pages

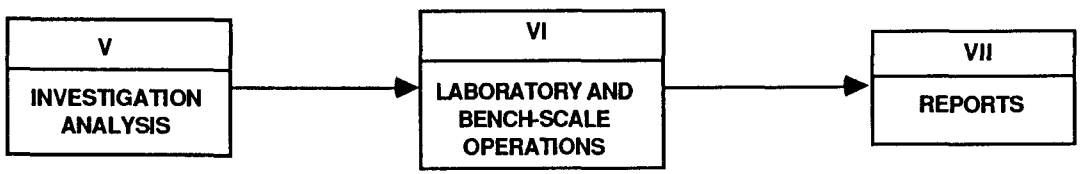
RCRA FACILITY INVESTIGATION (RFI) COMPONENTS *



- FACILITY BACKGROUND
- NATURE AND EXTENT OF CONTAMINATION
- IMPLEMENTATION AND INTERIM MEASURES

- PROJECT MANAGEMENT PLAN
- DATA COLLECTION QUALITY ASSURANCE PLAN
- DATA MANAGEMENT PLAN
- HEALTH AND SAFETY PLAN
- COMMUNITY RELATIONS PLAN

- ENVIRONMENTAL SETTING
- SOURCE CHARACTERIZATION
- CONTAMINATION CHARACTERIZATION
- POTENTIAL RECEPTOR IDENTIFICATION

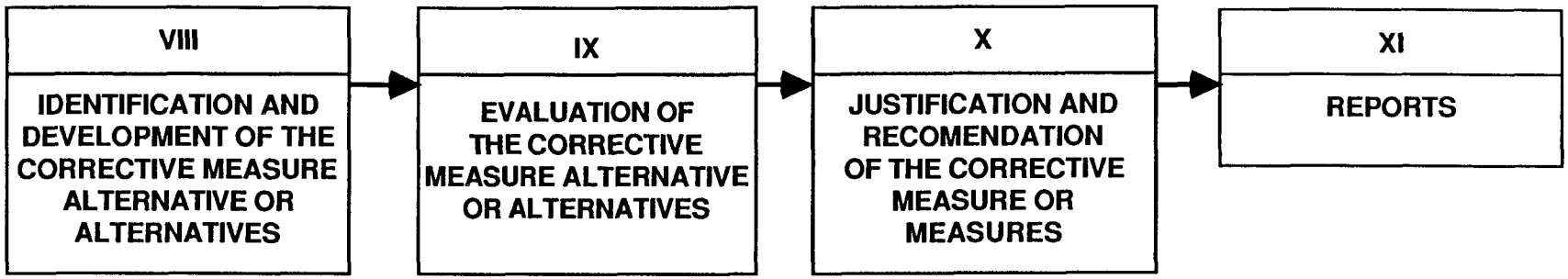


- DATA ANALYSIS
- PROTECTION STANDARDS

- PRELIMINARY AND WORKPLAN
- PROGRESS
- DRAFT AND FINAL

* As outlined in Corrective Action Plan. 11/14/86

CORRECTIVE MEASURES STUDY (CMS) COMPONENTS *



- DESCRIPTION OF CURRENT SITUATION
- ESTABLISHMENT OF CORRECTIVE ACTION OBJECTIVES
- SCREENING OF CORRECTIVE MEASURES TECHNOLOGY
- IDENTIFICATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

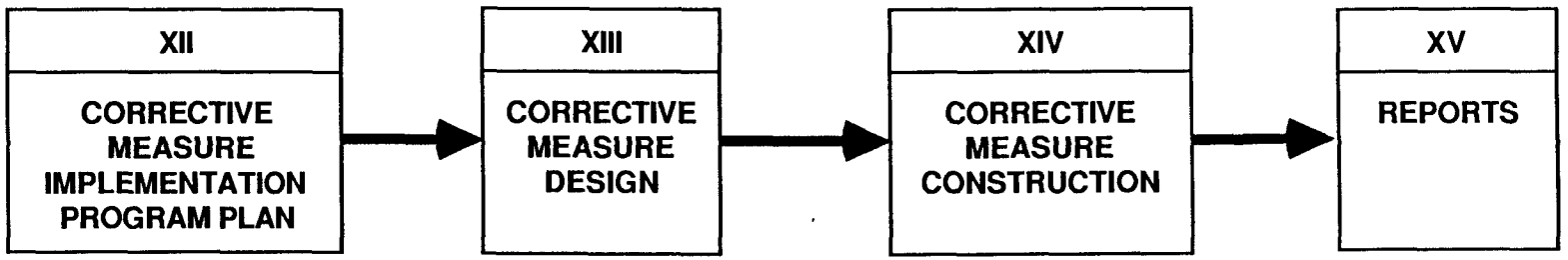
- TECHNICAL/ ENVIRONMENTAL/ HUMAN HEALTH/ INSTITUTIONAL
- COST ESTIMATE

- TECHNICAL
- ENVIRONMENTAL
- HUMAN HEALTH

- PROGRESS
- DRAFT
- FINAL

* As outlined in Corrective Action Plan. 11/14/86

CORRECTIVE MEASURES IMPLEMENTATION (CMI) COMPONENTS *



- PROGRAM MANAGEMENT PLAN
- COMMUNITY RELATIONS PLAN

- DESIGN PLANS AND SPECIFICATION
- OPERATION AND MAINTENANCE PLAN
- COST ESTIMATE
- CONSTRUCTION QUALITY ASSURANCE OBJECTIVES
- HEALTH AND SAFETY PLAN
- DESIGN PHASE

- RESPONSIBILITY AND AUTHORITY
- CONSTRUCTION QUALITY ASSURANCE PERSONNEL QUALIFICATIONS
- INSPECTION ACTIVITIES
- SAMPLING REQUIREMENTS
- DOCUMENTATION

- PROGRESS
- DRAFT
- FINAL

* As outlined in Corrective Action Plan. 11/14/86

United States
Environmental Protection
Agency

Office of
Solid Waste and
Emergency Response

EPA

DIRECTIVE NUMBER: 9902

TITLE: RCRA CORRECTIVE ACTION PLAN

APPROVAL DATE: November 14, 1986

EFFECTIVE DATE: November 14, 1986

ORIGINATING OFFICE: OWPE

☒ **FINAL**

☐ **DRAFT**

LEVEL OF DRAFT

- ☐ A — Signed by AA or DAA
- ☒ B — Signed by Office Director
- ☐ C — Review & Comment

REFERENCE (other documents):

SWER OSWER OSWER DIRECTIVE DIRECTIVE DI

United States Environmental Protection Agency
Washington, D.C.

EPA **OSWER Directive Initiation Request**

1. Directive Number: 9902.3

2. Originator Information

Name of Contact Person	Mail Code	Office	Telephone Number
Mark Gilbertson	WH-527	OWPE/RCRA Enf. Div.	382-4849

3. Title

RCRA Correction Action Plan

4. Summary of Directive *(include brief statement of purpose)* The RCRA Corrective Action Plan is intended to aid the Regions and States in determining and directing the specific work which must be performed as part of a complete corrective action program. It provides a technical framework for use during the development of Corrective Action Orders and corrective action permit requirements.

5. Keywords

RCRA, Corrective Action, RCRA Facility Investigation, Corrective Measure Study, Corrective Measure Interpretation

6a. Does this Directive Supersede Previous Directive(s)? ☐ Yes ☒ No What directive *(number, title)*

b. Does it Supplement Previous Directive(s)? ☐ Yes ☒ No What Directive *(number, title)*

7. Draft Level

☐ A — Signed by AA/DAA ☒ B — Signed by Office Director ☐ C — For Review & Comment ☐ In Development

This Request Meets OSWER Directives System Format

8. Signature of Lead Office Directives Coordinator	Date
Deborah K. Stroud	11-17-86
9. Name and Title of Approving Official	Date

OSWER OSWER OSWER
DIRECTIVE DIRECTIVE D

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 14 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

OSWER DIRECTIVE #9902

SUBJECT: Interim Final Corrective Action Plan

FROM: Gene A. Lucero, Director Gene A. Lucero
Office of Waste Programs Enforcement

Marcia Williams, Director Marcia Williams
Office of Solid Waste

TO: Addressees

Attached is the interim final guidance document entitled the Corrective Action Plan (CAP). The CAP will assist you in development of Corrective Action Orders (§ 3008(h)) and corrective action requirements in permit applications and permits (§ 3004(u)&(v)). The purpose of the CAP is to aid Regions and States in determining and directing the specific work the owner/operator or respondent must perform, as part of a complete corrective action program. The CAP should be used as a technical framework during the development of Corrective Action Orders and corrective action permit requirements. As specific, detailed guidance is issued by EPA Headquarters, the CAP will be modified to reflect and incorporate these documents.

The CAP provides a framework for the development of a site-specific schedule of compliance to be included in a permit or a compliance schedule in a Corrective Action Order. It does so by laying out scopes of work for the three essential phases of a complete corrective action program. These three phases and their objectives are as follows:

Phase I - RCRA Facility Investigation (RFI) - to evaluate thoroughly the nature and extent of the release of hazardous waste and hazardous constituents and to gather necessary data to support the Corrective Measure Study.

Phase II - Corrective Measures Study (CMS) - to develop and evaluate a corrective measure alternative or alternatives and to recommend the final corrective measure or measures.

Phase III - Corrective Measures Implementation (CMI) - to design, construct, operate, maintain and monitor the performance of the corrective measure or measures selected.

The CAP is consistent with existing guidance documents as well as those currently under development at Headquarters. These documents are listed below:

Existing:

- §3008(h) Policy Guidance on Interim Status Corrective Action Authority (10/85);
- Draft Interim Measure Guidance (12/85);
- Draft §3008(h) Model Order (12/85);
- Draft National RCRA Corrective Action Strategy (9/86); and
- RCRA Facility Assessment Guidance (10/86).

Under Development:

- RCRA Facility Investigation (RFI) Guidance - will provide the Owner/ Operator [Respondent] with various levels of investigation techniques to choose from in developing a site-specific work plan to fully characterize releases.
- Corrective Measure (CM) Guidance - will provide the Owner/ Operator [Respondent] with criteria and technical information for evaluating and selecting the measure or measures that will meet specific clean-up levels.

The CAP provides an overall model for a corrective action compliance schedule. The scopes of work contained in the CAP should not be considered "boilerplate", but rather as a "menu" of possible activities to be required on a site-specific basis. Only those tasks and reports necessary and appropriate to the specific situation should be required of the Owner/Operator [Respondent]. We also encourage the Regions to make available to the Owner/Operator [Respondent] existing model plans that are relevant to RCRA activities. For example, the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activites Operating Safety Guidelines" contains a model that can be used for the Health and Safety Plan outlined in the CAP.

A RCRA Facility Assessment (RFA) will have been conducted at the facilities that are to receive permits, and for some facilities which are issued §3008(h) Orders. The results of the RFA should be used as the basis for focusing the RCRA Facility Investigation (RFI) compliance schedules for individual sites, and should provide the necessary data for completion of the "background information" components of the CAP.

Finally, we feel it is necessary to stress the importance of site-specific technical detail in the development of Corrective Action Orders and corrective action permit requirements. Each facility has unique characteristics and circumstances affecting it that need to be incorporated into any requirements for corrective action. Without this up-front detail, many owner/operators or respondent will provide us with submittals which lack the technical detail necessary to perform a thorough corrective measure program. In addition to providing a detailed scope of work, the Agency should also propose a site-specific time-frame for completion of the work. Enforcement of permit conditions or requests for relief in an Order is always easier when very specific detail is included. Without a detailed schedule of compliance in a permit or a compliance schedule in a Corrective Action Order, we can expect untimeliness in submittals and actions.

It was also intended that the model scopes of work in the CAP foster timely, concise submissions by Owner/Operators. Therefore, when modifying these scopes of work with site-specific information, the scopes of work should only require that information which is necessary for the subject facility, thereby minimizing the number and length of Owner/Operator submitions and our review time. (In general, the average length of individual Owner/Operator submittals should not exceed 20 pages, excluding appendices.)

Please note that the CAP addresses comments by lead Regions. We would appreciate additional comments based upon your experiences in using the CAP. Should you have any questions with regard to this document, you may call Anna Buonocore (FTS 382-4829), Mark Gilbertson (FTS 382-4849) or Peter Ornstein (FTS 382-5618).

Attachment

ADDRESSEES:

Hazardous Waste Management Division Directors - Regions I-X
Hazardous Waste Branch Chiefs - Regions I-X
Enforcement Section Chiefs - Regions I-X
Permit Section Chiefs - Regions I-X
Regional Counsels - Regions I-X
Lloyd Guerci, OWPE
Steve Heare, OWPE
Sylvia Lowrance, OWPE
Frank Russo, OWPE
Peter Cook, OWPE
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George Dixon, OSW
Art Day, OSW

RCRA CORRECTIVE ACTION PLAN

INTERIM FINAL

November 1986

RCRA CORRECTIVE ACTION PLAN

° INTRODUCTION

° RCRA FACILITY INVESTIGATION

- Task I: Description of Current Conditions
- Task II: Pre-Investigation Evaluation of Corrective Measure Technologies
- Task III: RFI Workplan Requirements
- Task IV: Facility Investigation
- Task V: Investigation Analysis
- Task IV: Laboratory and Bench-Scale Studies
- Task VII: Reports

° CORRECTIVE MEASURE STUDY

- Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives
- Task IX: Evaluation of the Corrective Measure Alternative or Alternatives
- Task X: Justification and Recommendation of the Corrective Measure or Measures
- Task XI: Reports

° CORRECTIVE MEASURE IMPLEMENTATION

- Task XII: Corrective Measure Implementation Program Plan
- Task XIII: Corrective Measure Design
- Task XIV: Corrective Measure Construction
- Task XV: Reports

INTRODUCTION

The objective of a Corrective Action Program at a hazardous waste management facility is to evaluate the nature and extent of the release of hazardous waste or constituents; to evaluate facility characteristics; and to identify, develop, and implement the appropriate corrective measure or measures adequate to protect human health and the environment. The following bullets identify components necessary to assure a complete corrective action program. It should be recognized that the detail required in each of these steps will vary depending on the facilty and its complexity:

° Locate the source(s) of the release(s) of contaminants (e.g. regulated units, solid waste management units, and other source areas)

° Characterize the nature and extent of contamination both within the facility boundaries and migrating from the facility. This would include defining the pathways and methods of migration of the hazardous waste or constituents, including the media, extent, direction, speed, complicating factors inflencing movement, concentration profiles, etc.

° Identify areas and populations threatened by releases from the facility

° Determine short and long term, present and potential threats of releases from the facility on human health and/or the environment

° Identify and implement a interim measure or measures to abate the further spread of contaminants, control the source of contamination, or otherwise control the releases themselves

° Evaluate the overall integrity of containment structure and activities at the site intended for long-term containment

° Identify, develop, and implement a corrective measure or measures to prevent and remediate releases of hazardous waste or constituents from the facility

° Design a program to monitor the implementation, maintenance and performance of any interim or final corrective measure(s) to ensure that human health and the environment are being protected

The purpose of the Corrective Action Plan (CAP)is to aid Regions and States in determining and directing the specific work the owner/operator or respondent must perform, as part of a complete corrective action program. The Corrective Action Plan is a document specifically intended to assist Regions and States in the development of Corrective Action Orders (§ 3008(h)) and corrective action requirements in permit applications and permits (§ 3004(u)&(v)). It does so by laying out scopes of work for the three essential phases of a complete corrective action program which can be used to formulate facility-specific scopes of work for a order or

permit. These three phases and their objectives are as follows:

Phase I - RCRA Facility Investigation (RFI) - to evaluate thoroughly the nature and extent of the release of hazardous waste and hazardous constituents and to gather necessary data to support the Corrective Measure Study.

Phase II - Corrective Measures Study (CMS) - to develop and evaluate corrective measure alternative or alternatives and to recommend the final corrective measure or measures.

Phase III - Corrective Measures Implementation (CMI) - to design, construct, operate, maintain and monitor the performance of the corrective measure or measures selected.

Users of the CAP should understand that it is designed to identify actions that facility owner/operator or respondent must take as part of a corrective action program. It does not identify the steps that remain the responsibility of the regulatory agency. To clarify this interaction between the facility owner/operator or respondent, Figure 1 represents the flowchart of owner/operator or respondent submittals and Agency actions for the three phases of the CAP.

The CAP scopes of work should not be considered "boilerplate." The scopes of work in the CAP are models and must be modified, enhanced or sections deleted based on site-specific situations. Information generated from investigations such such as RCRA Facility Assessments (RFAs) should be used to tailor the scope of work to address facility-specific situations. The following are some examples where site-specifics require modification to the CAP model scopes of work.

° If the contamination problem at a facility is merely a small soil contamination problem, then the CAP should be scaled down accordingly.

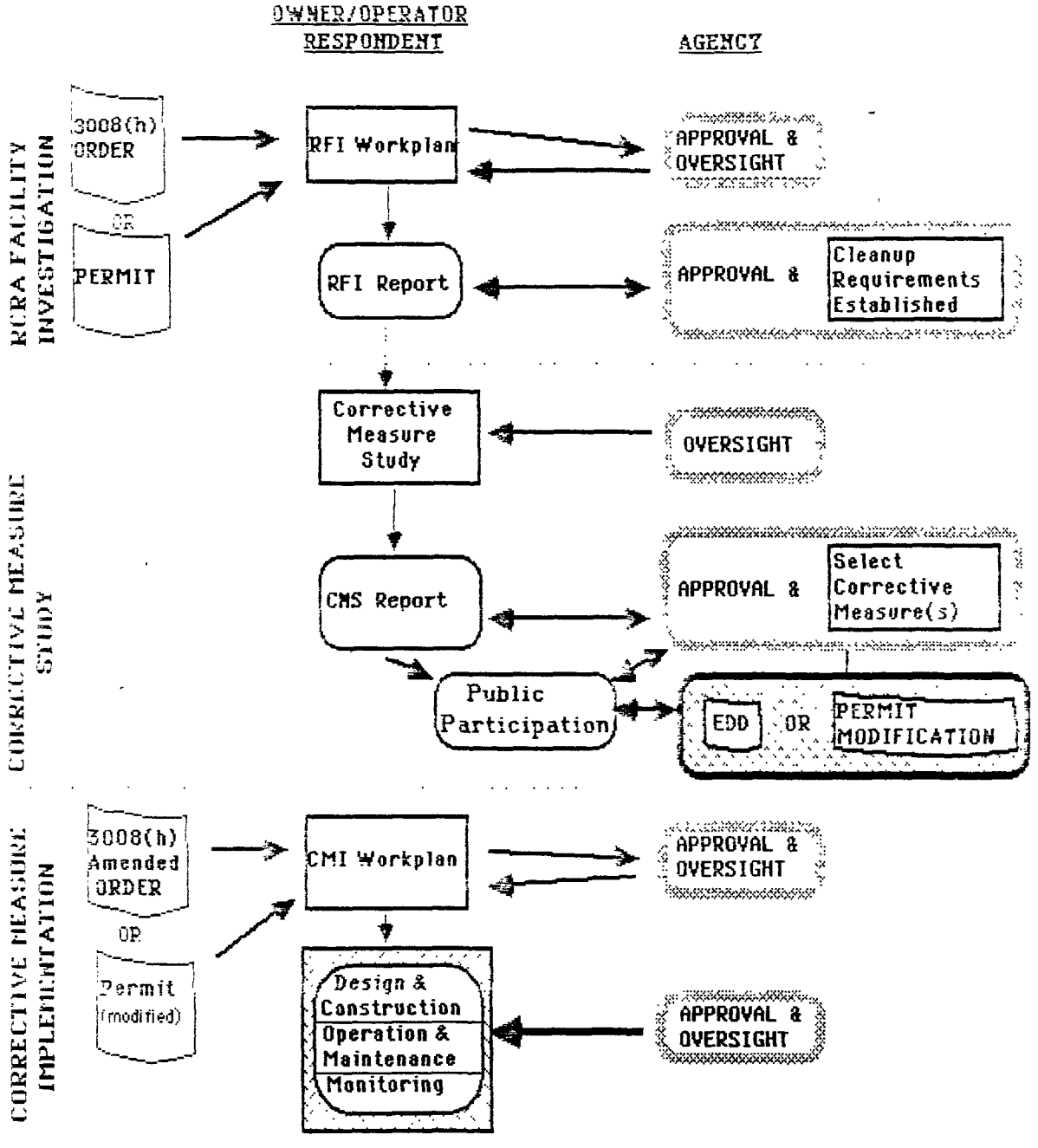
° In complicated contamination situations, the Health and Safety Plan and Community Relations Plans may need to be comprehensive. However, in simple contamination situations, these plans may be very brief.

° If site-specifics conditions require more detail than what has been scoped out in any particular section of the CAP, then the CAP should be enhanced accordingly.

° If there is sufficient information on a site to preclude an air release, then it would not be necessary to require the owner/operator or respondent to perform an air contamination characterization. The air contamination characterization work under the RFI (Task IV, C, 4) should be deleted.

Figure 1.

RCRA Corrective Action Plan



° If interim measures are underway, scheduled or contemplated at a facility, then the Interim Measures section under the RFI (Task I, C) should be modified to specifically reference the interim measures.

° If possible, the CAP should focus the owner/operator or respondent on specific solid waste management units and other areas of interest, as well as known waste management activity areas (i.e. waste recycling units, wastewater treatment tanks).

° If only one corrective measure alternative is appropriate for a given situation, and it would not be necessary to require the owner/operator or respondent to further investigate the possibility of other corrective measure alternatives, then the scopes of work (citations) would be modified to reflect this situation.

Finally, it is necessary to stress the importance of site-specific technical detail in the development of Corrective Action Orders and corrective action permit requirements. When the scope of work is specific to the facility, it is easier to enforce. Each facility has unique characteristics and circumstances affecting it that need to be incorporated into any requirements for corrective action. Without this many owner/operators or respondents will provide us with submittals which lack the necessary information to perform a corrective measure program. In addition to providing a adequate scope of work, the Agency should also propose a site-specific time-frame for completion of the work.

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)
AT
[SPECIFY FACILITY NAME]

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. The Owner/Operator [Respondent] shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation at [specify facility name].

[NOTE: This scope of work is intended to foster timely, concise submissions by Owner/Operators. To achieve this goal, it is important when using the model scope of work to consider facility specific conditions. This scope of work should be modified as necessary to require only that information necessary to complete the RCRA Facility Investigation.]

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis
- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports
- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Owner/Operator [Respondent] shall submit for U.S. EPA approval a report providing the background information pertinent to the facility, contamination and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. Facility Background

The Owner/Operator's [Respondent's] report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The Owner/Operator's [Respondent's] report shall include:

1. Map(s) depicting the following:

   a. General geographic location;

   b. Property lines, with the owners of all adjacent property clearly indicated;

   c. Topography and surface drainage (with a contour interval of [number] feet and a scale of 1 inch = 100 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas;

   d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;

   e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;

   f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;

   g. All known past and present product and waste underground tanks or piping;

   h. Surrounding land uses (residential, commercial, agricultural, recreational); and

   i. The location of all production and ground-water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

   All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the facility.

B. Nature and Extent of Contamination

The Owner/Operator [Respondent] shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Owner/Operator's [Respondent's] report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Owner/Operator [Respondent] shall identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);

   b. Quantities of solid and hazardous wastes;

   c. Hazardous waste or constituents, to the extent known; and

   d. Identification of areas where additional information is necessary.

2. The Owner/Operator [Respondent] shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

   a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;

   b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meterology, and air quality; and

   c. The potential impact(s) on human health and the environment, including demography, ground-water and surface-water use, and land use.

C. Implementation of Interim Measures

The Owner/Operator [Respondent's] report shall document interim measures which were or are being undertaken at the facility. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction and monitoring; and

4. Schedule for progress reports.

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the facility investigation, the Owner/Operator [Respondent] shall submit to EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (*e.g.*, compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

The Owner/Operator [Respondent] shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accomodate the facility specific situation. The RFI Workplan includes the following:

A. Project Management Plan

The Owner/Operator [Respondent] shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Data Collection Quality Assurance Plan

The Owner/Operator [Respondent] shall prepare a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

c. Description of the rational used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:

i) Environmental conditions at the time of sampling;

ii) Number of sampling points;

iii) Representativeness of selected media; and

iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

   i) RFI data generated by the Owner/Operator over some time period;

   ii) RFI data generated by an outside laboratory or consultant versus data generated by the Owner/Operator;

   iii) Data generated by separate consultants or laboratories; and

   iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include but not be limited to:

   i) Periodic assessment of measurement data accuracy, precision, and completeness;

   ii) Results of performance audits;

   iii) Results of system audits;

   iv) Significant quality assurance problems and recommended solutions; and

   v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Measures to be taken to prevent contamination if the sampling equipment and cross contamination between sampling points;

j. Documenting field sampling operations and procedures, including;

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate samples;

vi) Submission of field-biased blanks, where appropriate;

vii) Potential interferences present at the facility;

viii) Construction materials and techniques, associated with monitoring wells and piezometers;

ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

k. Selecting appropriate sample containers;

l. Sample preservation; and

m. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media are to be addresssed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurement and length of field measurements period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

[A performance audit will be conducted by U.S. EPA on the laboratories selected by the Owner/Operator [Respondent]. This audit must be completed and approved prior to the facility investigation.]

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. Data Management Plan

The Owner/Operator [Respondent] shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measured; and

f. Result of analysis (*e.g., concentration*).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Displays levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. Health and Safety Plan

The Owner/Operator [Respondent] shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;

b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;

c. List key personnel and alternates responsible for site safety, responses operations, and for protection of public health;

d. Delineate work area;

e. Describe levels of protection to be worn by personnel in work area;

f. Establish procedures to control site access;

g. Describe decontamination procedures for personnel and equipment;

h. Establish site emergency procedures;

i. Address emergency medical care for injuries and toxicological problems;

j. Describe requirements for an environmental surveillance program;

k. Specify any routine and special training required for responders; and

l. Establish procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. EPA Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations particularly in 29 CFR 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

E. Community Relations Plan

The Owner/Operator [Respondent] shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK IV: FACILITY INVESTIGATION

The Owner/Operator [Respondent] shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Owner/Operator [Respondent] shall collect information to supplement and verify existing information on the environmental setting at the facility. The Owner/Operator [Respondent] shall characterize the following:

1. Hydrogeology

The Owner/Operator [Respondent] shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility, including:

i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge.

v) Regional and facility specific ground-water flow patterns; and

vi) Characterize seasonal variations in the ground-water flow regime.

b. An analysis of any topographic features that might influence the ground-water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis).

c. Based on field data, test, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

   i) Hydraulic conductivity and porosity (total and effective);

   ii) Lithology, grain size, sorting, degree of cementation;

   iii) An interpretation of hydraulic interconnections between saturated zones; and

   iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral contect etc.).

d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

   i) Sand and gravel deposits in unconsolidated deposits;

   ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;

   iii) Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;

   iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and

   v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.

e. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

   i) Water-level contour and/or potentiometric maps;

   ii) Hydrologic cross sections showing vertical gradients;

iii) The flow system, including the vertical and horizontal components of flow; and

iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

f. A description of manmade influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Owner/Operator [Respondent] shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

a. SCS soil classification;
b. Surface soil distribution;
c. Soil profile, including ASTM classification of soils;
d. Transects of soil stratigraphy;
e. Hydraulic conductivity (saturated and unsaturated);
f. Relative permeability;
g. Bulk density;
h. Porosity;
i. Soil sorptive capacity;
j. Cation exchange capacity (CEC);
k. Soil organic content;
l. Soil pH;
m. Particle size distribution;
n. Depth of water table;
o. Moisture content;
p. Effect of stratification on unsaturated flow;
q. Infiltration
r. Evapotranspiration;
s. Storage capacity;
t. Vertical flow rate; and
u. Mineral content.

3. Surface Water and Sediment

The Owner/Operator [Respondent] shall conduct a program to characterize the surface - water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface-water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Owner/Operator [Respondent] shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description of topographic and manmade features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings.

B. Source Characterization

The Owner/Operator [Respondent] shall collect analytic data to completely characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;
b. Type of unit/disposal area;
c. Design features;
d. Operating practices (past and present);
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and
h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);
ii) Physical description (e.g., powder, oily sludge);
iii) Temperature;
iv) pH;
v) General chemical class (e.g., acid, base, solvent);
vi) Molecular weight;
vii) Density;
viii) Boiling point;
ix) Viscosity;
x) Solubility in water;
xi) Cohesiveness of the waste;
xii) Vapor pressure.
xiii) Flash point

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations.

C. Contamination Characterization

The Owner/Operator [Respondent] shall collect analytical data on ground-water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Owner/Operator [Respondent] shall address the following types of contamination at the facility:

1. Ground-water Contamination

The Owner/Operator [Respondent] shall conduct a Ground-water Investigation to characterize any plumes of contamination at the facility. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix VIII constituents in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Owner/Operator [Respondent] shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination.

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations.

3. Surface-Water and Sediment Contamination

The Owner/Operator [Respondent] shall conduct a surface-water investigation to characterize contamination in surface-water bodies resulting from contaminant releases at the facility.

The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immisicible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments; -

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.;

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations.

4. Air Contamination

The Owner/Operator [Respondent] shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Owner/Operator [Respondent] shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases mitigation;

b. The chemical composition of the gases being emitted;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Owner/Operator [Respondent] shall document the procedures used in making the above determinations.

D. Potential Receptors

The Owner/Operator [Respondent] shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

   b. Location of groundwater users including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining the facility:

   a. Domestic and municipal (e.g. potable and lawn/gardening watering);
   b. Recreational (e.g. swimming, fishing);
   c. Agricultural;
   d. Industrial; and
   e. Environmental (e.g. fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:
   a. Recreation;
   b. Hunting;
   c. Residential;
   d. Commercial;
   e. Zoning; and
   f. Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.

7. A description of any endangered or threatened species near the facility.

TASK V: INVESTIGATION ANALYSIS

The Owner/Operator [Respondent] shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

The Owner/Operator [Respondent] shall analyze all facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area.

B. Protection Standards [where applicable]

1. Ground-water Protection Standards

For regulated units the Owner/Operator [Respondent] shall provide information to support the Agency's selection/development of Ground-water Protection Standards for all of the Appendix VIII constituents found in the ground-water during the Facility Investigation (Task IV).

a. The Groundwater Protection Standards shall consist of:

i) for any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in that table (MCL) if the background level of the constituent is below the given in Table 1; or

ii) the background level of that constituent in the groundwater; or

iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by the Owner/Operator [Respondent] in accordance with U.S. EPA guidance. For any proposed ACL's the Owner/Operator [Respondent] shall include a justification based upon the criteria set forth in 40 CFR 264.94(b).

c. Within [insert number] days of receipt of any proposed ACL's. The U.S. EPA shall notify the Owner/Operator [Respondent] in writing of approval, disapproval or modifications, the U.S. EPA shall specify in writing the reason(s) for any disapproval or modification.

d. Within [insert number] days of receipt of the U.S. EPA's notification or disapproval of any proposed ACL, the Owner/Operator [Respondent] shall amend and submit revisions to the U.S. EPA.

2. Other Relevant Protection Standards

The Owner/Operator [Respondent] shall identify all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

TASK VI: LABORATORY AND BENCH-SCALE STUDIES

The Owner/Operator [Respondent] shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to facility conditions. The Owner/Operator [Respondent] shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Owner/Operator [Respondent] shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Owner/Operator [Respondent] shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Owner/Operator [Respondent] shall prepare a report summarizing the testing program and its results, both positive and negative.

TASK VII: REPORTS

A. Preliminary and Workplan

The Owner/Operator [Respondent] shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

B. Progress

The Owner/Operator [Respondent] shall at a minimum provide the EPA with signed, [monthly, bimonthly] progress reports containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

C. Draft and Final – Schedule for deliverables

Upon EPA approval, the Owner/Operator [Respondent] shall prepare a RCRA Facility Investigation Report to present Tasks IV-V. The RCRA Facility investigation Report shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report. Task VI shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted.

[number] copies of all reports, including the Task I report, Task II report, Task III workplan, Task VI report and both the Draft and Final RCRA Facility Investigation Reports (Task IV-V) shall be provided by the Owner/Operator [Respondent] to U.S. EPA.

[THE FOLLOWING FACILITY SUBMISSION SUMMARY MAY BE PLACED IN THE BODY OF THE ORDER OR PERMIT AND REMOVED FROM THE SCOPE OF WORK. NOT ALL OF THE ITEMS LISTED BELOW MAY BE REQUIRED AT EACH FACILITY.]

Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

Facility Submission	Due Date
Description of Current Situation (Task I)	[DATE]
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	[DATE]
RFI Workplan (Task III)	[DATE]
Draft RFI Report (Tasks IV and V)	[NUMBER] days after RFI Workplan Approval
Final RFI Report (Tasks IV and V)	[NUMBER] days after EPA comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task VI)	Concurrent with Final RFI Report
Progress Reports on Tasks I through VI	[MONTHLY, BI-MONTHLY]

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY
AT
[SPECIFY FACILITY NAME]

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at [specify facility name]. The Owner/Operator [Respondent] will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

[Note: This scope of work is intended to foster timely, concise submissions by Owner/Operators. To achieve this goal, it is important when using the model scope of work to consider facility specific conditions. This scope should be modified as necessary to require only that information necessary to complete the Corrective Measure Study.]

SCOPE

The Corrective Measure Study consists of four tasks:

Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives

A. Description of Current Situation
B. Establishment of Corrective Action Objectives
C. Screening of Corrective Measures Technologies
D. Identification of the Corrective Measure Alternative or Alternatives

Task IX: Evaluation of the Corrective Measure Alternative or Alternatives

A. Technical/Environmental/Human Health/Institutional
B. Cost Estimate

Task X: Justification and Recommendation of the Corrective Measure or Measures

A. Technical
B. Environmental
C. Human Health

Task XI: Reports

A. Progress
B. Draft
C. Final

TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II), the Owner/Operator [Respondent] shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Owner/Operator [Respondent] shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Owner/Operator [Respondent] shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have or are being implemented at the facility. The Owner/Operator [Respondent] shall also make a facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Owner/Operator [Respondent], in conjunction with the U.S. EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground water releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR 264.100.

C. Screening of Corrective Measure Technologies

The Owner/Operator [Respondent] shall review the results of the RCRA Facility Investigation and reassess the technologies specified in Task II and to identify additional technologies which are applicable at the facility. The Owner/Operator [Respondent] shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

   Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

   Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

   During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. Identification of the Corrective Measure Alternative or Alternatives

The Owner/Operator [Respondent] shall develop the Corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the preparation of the RFI Report. The Owner/Operator [Respondent] shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Owner/Operator [Respondent] shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Owner/Operator [Respondent] shall describe each corrective measure alternative that passes through the Initial Screening in Task VIII and evaluate each corrective measure alternative and it's components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Owner/Operator [Respondent] shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The [Owner/ Operator] Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Owner/Operator [Respondent] shall evaluate each alternative in the four following areas:

1. Technical;

The Owner/Operator [Respondent] shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

a. The Owner/Operator [Respondent] shall evaluate performance based on the effectiveness an useful life of the corrective measure:

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Owner/Operator [Respondent] shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Owner/Operator [Respondent] should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Owner/Operator [Respondent] shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

i) Constructability is determined by conditions both internal and external to the facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Owner/Operator [Respondent] shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. The Owner/Operator [Respondent] shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental;

The Owner/Operator [Respondent] shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health; and

The Owner/Operator [Respondent] shall assess each alternative in terms of the extent of which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional.

The Owner/Operator [Respondent] shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. Cost Estimate

The Owner/Operator [Respondent] shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.

      ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;

      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

      iv) Buildings and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

   b. Indirect capital costs include:

      i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

      ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

      iii) Startup and shakedown costs: Costs incurred during corrective measure startup; and

      iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Owner/Operator [Respondent] shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxillary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK X: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Owner/Operator [Respondent] shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks IX and X. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operating to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

TASK XI: REPORTS

The Owner/Operator [Respondent] shall prepare a Corrective Measure Study Report presenting the results of Task VIII through X and recommending a corrective measure alternative. [number] copies of the preliminary report shall be provided by the Owner/Operator [Respondent].

A. Progress

The Owner/Operator [Respondent] shall at a minimum provide the EPA with signed, [monthly, bimonthly] progress reports containing:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

B. Draft

The Report shall at a minimum include:

1. A description of the facility;

   a. Site topographic map & preliminary layouts.

2. A summary of the corrective measure or measures;

   a. Description of the corrective measure or measures and rationale for selection;

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements; and

   e. Long-term monitoring requirements.

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;

   a. Field studies (ground-water, surface water, soil, air); and

   b. Laboratory studies (bench scale, pick scale).

4. Design and Implementation Precautions;

   a. Special technical problems;

   b. Additional engineering data required;

   c. Permits and regulatory requirements;

   d. Access, easements, right-of-way;

   e. Health and safety requirements; and

   f. Community relations activities.

5. Cost Estimates and Schedules;

   a. Capital cost estimate;

   b. Operation and maintenance cost estimate; and

   c. Project schedule (design, construction, operation).

[number] copies of the draft shall be provided by the Owner/Operator [Respondent] to U.S. EPA.

C. Final

The Owner/Operator [Respondent] shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

[THE FOLLOWING FACILITY SUBMISSION SUMMARY MAY BE PLACED IN THE BODY OF THE ORDER OR PERMIT AND REMOVED FROM THE SCOPE OF WORK. NOT ALL OF THE ITEMS LISTED BELOW MAY BE REQUIRED AT EACH FACILITY.]

Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Draft CMS Report (Tasks VIII, IX, and X)	[NUMBER] days after submittal of the Final RFI
Final CMS Report (Tasks VIII, IX, and X)	[NUMBER] days after Public and EPA comment on the Draft CMS
Progress Reports on Tasks VIII, IX, and X	[MONTHLY, BI-MONTHLY]

SCOPE OF WORK FOR THE CORRECTIVE MEASURE IMPLEMENTATION
AT
[SPECIFY FACILITY NAME]

PURPOSE

The purpose of this Corrective Measure Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected to protect human health and the environment. The Owner/Operator [Respondent] will furnish all personnel, materials and services necessary for the implementation of the corrective measure or measures.

[Note: This scope of work is intended to foster timely, concise submissions by Owner/Operators. To achieve this goal, it is important when using the model scope of work to consider facility specific conditions. This scope should be modified as necessary to require only that information necessary to complete the Corrective Measure Implementation.]

SCOPE

The Corrective Measure Implementation program consists of four tasks;

Task XII: Corrective Measure Implementation Program Plan

- A. Program Management Plan
- B. Community Relations Plan

Task XIII: Corrective Measure Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Cost Estimate
- D. Project Schedule
- E. Construction Quality Assurance Objectives
- F. Health and Safety Plan
- G. Design Phases

Task XIV: Corrective Measure Construction

- A. Responsibility and Authority
- B. Construction Quality Assurance Personnel Qualifications
- C. Inspection Activities
- D. Sampling Requirements
- E. Documentation

Task XV: Reports

- A. Progress
- B. Draft
- C. Final

TASK XII: CORRECTIVE MEASURE IMPLEMENTATION PROGRAM PLAN

The Owner/Operator [Respondent] shall prepare a Corrective Measure Implementation Program Plan. This program will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The Program Plan includes the following:

A. Program Management Plan

The Owner/Operator [Respondent] shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of corrective measure(s). The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The Program Management Plan will also include a description of qualifications of key personnel directing the Corrective Measure Implementation Program, including contractor personnel.

B. Community Relations Plan

The Owner/Operator [Respondent] shall revise the Community Relations Plan to include any changes in the level of concern of information needs to the community during design and construction activities.

1. Specific activities which must be conducted during the design stage are the following:

   a. Revise the facility Community Relations Plan to reflect knowledge of citizen concerns and involvement at this stage of the process; and

   b. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

2. Specific activities to be conducted during the construction stage could be the following: Depending on citizen interest at a facility at this point in the corrective action process, community relations activities could range from group meetings to fact sheets on the technical status.

TASK XIII: CORRECTIVE MEASURE DESIGN

The Owner/Operator [Respondent] shall prepare final construction plans and specifications to implement the corrective measure(s) at the facility as defined in the Corrective Measure Study.

A. Design Plans and Specifications

The Owner/Operator [Respondent] shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including;

   a. Compliance with all applicable or relevant environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

   a. Use of currently accepted environmental control measures and technology;

   b. The constructability of the design; and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions;

4. Discussion of the possible sources of error and references to possible operation and maintenance problems;

5. Detailed drawings of the proposed design including;

   a. Qualitative flow sheets; and

   b. Quantitative flow sheets.

6. Tables listing equipment and specifications;

7. Tables giving material and energy balances;

8. Appendices including;

   a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);

   b. Derivation of equations essential to understanding the report; and

   c. Results of laboratory or field tests.

B. Operation and Maintenance Plan

The Owner/Operator [Respondent] shall prepare an Operation and Maintenance Plan to cover both implementation and long term maintenance of the corrective measure. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance (O&M);

   a. Description of tasks for operation;

   b. Description of tasks for maintenance;

   c. Description of prescribed treatment or operation conditions; and

   d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems;

   a. Description and analysis of potential operation problems;

   b. Sources of information regarding problems; and

   c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing;

   a. Description of monitoring tasks;

   b. Description of required laboratory tests and their interpretation;

   c. Required QA/QC; and

   d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M;

   a. Should systems fail, alternate procedures to prevent undue hazard; and

   b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan;

   a. Description of precautions, of necessary equipment, etc., for site personnel; and

   b. Safety tasks required in event of systems failure.

6. Description of equipment; and

   a. Equipment identification;

   b. Installation of monitoring components;

   c. Maintenance of site equipment; and

   d. Replacement schedule for equipment and installed components.

7. Records and reporting mechanisms required.

   a. Daily operating logs;

   b. Laboratory records;

   c. Records for operating costs;

   d. Mechanism for reporting emergencies;

   e. Personnel and maintenance records; and

   f. Monthly/annual reports to State agencies.

   An initial Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design Document submission and the Final Operation and Maintenance Plan with the Final Design Documents.

C. Cost Estimate

The Owner/Operator [Respondent] shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. An Initial Cost Estimate shall be submitted simultaneously with the Prefinal Design submission and the Final Cost Estimate with the Final Design Document.

D. Project Schedule

The Owner/Operator [Respondent] shall develop a Project Schedule for construction and implementation of the corrective measure or measures which identifies timing for initiation and completion of all critical path tasks. Owner/Operator [Respondent] shall specifically identify dates for completion of the project and major interim milestones. An Initial Project Schedule shall be submitted simultaneously with the Prefinal Design Document submission and the Final Project Schedule with the Final Design Document.

E. Construction Quality Assurance Objectives

The Owner/Operator [Respondent] shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

F. Health and Safety Plan

The Owner/Operator [Respondent] shall modify the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measure(s).

G. Design Phases

The design of the corrective measure(s) should include the phases outlined below.

1. Preliminary design

The Owner/Operator [Respondent] shall submit the Preliminary design when the design effort is approximately 30% complete. At this stage the Owner/Operator [Respondent] shall have field verified the existing conditions of the facility. The preliminary design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawings by the Owner/Operator [Respondent] shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. The Owner/Operator [Respondent] shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

2. Intermediate design

Complex project design may necessitate review of the design documents between the preliminary and the prefinal/final design. At the discretion of the Agency, a design review may be required at 60% completion of the project. The intermediate design submittal should include the same elements as the prefinal design.

3. Correlating plans and specifications

General correlation between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Owner/Operator [Respondent] shall:

a. Coordinate and cross-check the specifications and drawings; and

b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95% prefinal submittal to the Agency.

4. Equipment start-up and operator training

The Owner/Operator [Respondent] shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and operation of the treatment systems, and training covering appropriate operational procedures once the startup has been successfully accomplished.

5. Additional studies

Corrective Measure Implementation may require additional studies to supplement the available technical data. At the direction of the Agency for any such studies required, the Owner/Operator [Respondent] shall furnish all services, including field work as required, materials, supplies, plant, labor, equipment, investigations, studies and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, role of personnel involved and orientation of the site, etc. The interim report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

6. Prefinal and final design

The Owner/Operator [Respondent] shall submit the prefinal/Final design documents in two parts. The first submission shall be at 95% completion of design (i.e., prefinal). After approval of the prefinal submission, the Owner/Operator [Respondent] shall execute the required revisions and submit the final documents 100% complete with reproducible drawings and specifications.

The prefinal design submittal and shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Cost Estimate, Project Schedule, Quality Assurance Plan and Specifications for the Health and Safety Plan.

The final design submittal consist of the Final Design Plans and Specifications (100% complete), the Owner/Operator's [Respondent's] Final Construction Cost Estimate, the Final Operation and Maintenance Plan, Final Quality Assurance Plan, Final Project Schedule and Final Health and Safety Plan specifications. The quality of the design documents should be such that the Owner/Operator [Respondent] would be able to include them in a bid package and invite contractors to submit bids for the construction project.

TASK XIV: CORRECTIVE MEASURE CONSTRUCTION

Following EPA approval of the final design, the Owner/Operator [Respondent] shall develop and implement a construction quality assurance (COA) program to ensure, with a reasonable degree of certainty, that a completed corrective measure(s) meets or exceeds all design criteria, plans and specifications. The CQA plan is a facilityspecific document which must be submitted to the Agency for approval prior to the start of construction. At a minimum, the CQA plan should include the elements, which are summarized below. Upon EPA approval of the CQA plan the Owner/Operator [Resondent] shall construct and implement the corrective measures in accordance with the approved design, schedule and the CQA plan. The Owner/Operator [Respondent] shall also implement the elements of the approved Operation and Maintenance plan.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure shall be described fully in the CQA plan. The Owner/Operator [Respondent] must identify a COA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessay to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Owner/ Operator [Respondent] shall conduct the following activities:

1. Preconstruction inspection and meeting

The Owner/Operator [Respondent] shall conduct a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion Owner/Operator [Respondent] shall notify EPA for the purposes of conducting on prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the EPA approved corrective measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by the Owner/Operator [Respondent]. The Owner/Operator [Respondent] will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final inspection

Upon completion of any outstanding construction items, the Owner/Operator [Respondent] shall notify EPA for the purposes of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for COA activities shall be described in detail the COA plan. This should include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK XV: REPORTS

The Owner/Operator [Respondent] shall prepare plans, specifications, and reports as set forth in Tasks XII throuagh Task XV to document the design, construction, operation, maintenance, and monitoring of the corrective measure. The documentation shall include, but not be limited to the following:

A. Progress

The Owner/Operator [Respondent] shall at a minimum provide the EPA with signed, [monthly, bimonthly] progress reports during the design and construction phases and [semi-annual] progress reports for operation and maintenance activities containing:

1. An description and estimate of the percentage of the CMI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMI during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

B. Draft

1. The Owner/Operator [Respondent] shall submit a draft Corrective Measure Implementation Program Plan as outlined in Task XII;

2. The Owner/Operator [Respondent] shall submit draft Construction Plans and Specifications, Design Reports, Cost Estimates, Schedules, Operation and Maintenance plans, and Study Reports as outlined in Task XIII;

3. The Owner/Operator [Respondent] shall submit a draft Construction Quality Assurance Program Plan and Documentation as outlined in Task XIV, and

4. At the "completion" of the construction of the project, the Owner-/Operator [Respondent] shall submit a Corrective Measure Implementation Report to the Agency. The Report shall document that the project is consistent with the design specifications, and that the corrective measure is performing adequately. The Report shall include, but not be limited to the following elements:

   a. Synopsis of the corrective measure and certification of the design and construction;

   b. Explanation of any modifications to the plans and why these were necessary for the project;

   c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modification to these criteria;

   d. Results of facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria; and

   e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

   This report should include all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

C. Final

The Owner/Operator [Respondent] shall finalize the Corrective Measure Implementation Program Plan, Construction Plans and Specifications, Design Reports, Cost Estimates, Project Schedule, Operation and Maintenance Plan, Study Reports, Construction Quality Assurance Program Plan/Documentation and the Corrective Measure Implementation Report incorporating comments received on draft submissions.

[THE FOLLOWING FACILITY SUBMISSION SUMMARY MAY BE PLACED IN THE BODY OF THE ORDER OR PERMIT AND REMOVED FROM THE SCOPE OF WORK. NOT ALL OF THE ITEMS LISTED BELOW MAY BE REQUIRED AT EACH FACILITY].

Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Implementation Scope of Work is present below:

Facility Submission	Due Date
Draft Program Plans (Task XII)	[DATE]
Final Program Plans (Task XII)	[NUMBER] days after EPA comment on Draft Program Plans
Design Phases (Task XIII A)	
- Preliminary Design (30% completion)	[NUMBER] days after submittal of Final Program Plan
- Intermediate Design (60% completion)	[NUMBER] days after submittal of Final Program Plan
- Prefinal Design (95% completion)	[NUMBER] days after submittal of Final Program Plan
- Final Design (100% completion)	[NUMBER] days after submittal of Prefinal Design
(Task XIII B through G)	
- Draft Submittals	Concurrent with Prefinal Design
- Final Submittals	Concurrent with Final Design
Additional Studies: Interim Report (Task XIII F)	[DATE ESTABLISHED PRIOR TO FINAL DESIGN]
Additional Studies: Final Report (Task XIII F)	[NUMBER] days after EPA comment on Interim Report
Draft Construction Quality Assurance Plan (Task XIV)	Prior to construction
Final Construction Quality Assurance Plan (Task XIV)	[NUMBER] days after EPA comment on Draft Construction Quality Assurance Plan
Construction of Corrective Measure(s)	As approved in Final Design
Prefinal Inspection Report (Task XIV)	[NUMBER] days after Prefinal Inspection

Facility Submission	Due Date
Draft CMI Report (Task XV)	Upon completion of construction phase
Completion of Construction	As approved by EPA in the Corrective Measure Design
Final CMI Report (Task XV)	[NUMBER] days after EPA comment on Draft CMI Report
Progress Reports for Tasks XII through XIV	[MONTHLY, BI-MONTHLY]
Progress Reports During Operation and Maintenance	[SEMI-ANNUAL]

ANNOTATED BIBLIOGRAPHY
for the
CORRECTIVE ACTION PLAN**

Guidance on Remedial Investigations Under CERCLA; May 1985.

- Provides detailed guidance on the information that should be collected in performing a CERCLA Remedial Investigation. This document should be consulted in performing the investigation portion of the RFI/CMS since most of the RCRA Facility Investigation data needs are identical to these in CERCLA.

Guidance on Feasibility Studies Under CERCLA; April 1985.

- Provides a framework for developing, screening, and selecting a remedial action under CERCLA. Most of the techniques described are appropriate for the developing, screening, and selection of the RCRA Corrective Measures. However, the management and policy objectives presented in the document (i.e. fulfilling the requirements of the CERCLA National Contingency Plan) are not appropriate to RCRA and should be omitted from the Corrective Measure decisionmaking framework.

Chemical, Physical and Biological Properties of Compounds Present at Hazardous Waste Sites; EPA/OWPE; September 1985.

- Provides detailed technical information of the physical and toxicological properties of a wide range of chemicals. Such information should be included in the RCRA Facility Investigation and should be used in developing Corrective Measures.

Endangerment Assessment Handbook; EPA/OWPE; August 1985.

- Provides guidance on developing a CERCLA (or RCRA 7003) Endangerment Assessment. The information presented might be useful in assessing health and environmental effects in the RFI/CMS.

Methods for Chemical Analysis of Water and Waste; EPA-600/4-79-020; March 1979.

- Provides test procedures for monitoring waste discharge water supplies, and ambient waters.

Toxicology Handbook - Principles Related to Hazardous Waste Site Investigations; EPA/OWPE; August 1985.

- Discusses toxicological principles. Intended as an aid for non-toxicologists.

**NOTE: This is not a complete listing of the Agency guidance which may be relevant to the corrective action process. A number of documents are presently under development and have not been included.

Remedial Action at Waste Disposal Sites (Revised); EPA/625/6-85/006; 1985.

- Provides basic reference material on the design and implementation of remedial action. Although the document is geared towards the CERCLA RI/FS process, most of the material presented is directly applicable to the RCRA Corrective Action Plan.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods; SW-846; July 1982.

- Provides procedures that should be used to determine whether a waste is a hazardous waste as defined by 40 CFR Part 261.

Superfund Remedial Design and Remedial Action Guidance; February 1985.

- Provides guidance on developing remedial design and remedial actions at Superfund sites. Although procedurally focused on satisfying the NCP, the document provides useful managerial information for implementing RCRA Corrective Measures.

Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites; Draft; May 1986.

- Provides technical discussions of CERCLA remedial alternative screening and case studies which are largely applicable to the RFI/CMS. The guidance is intended to be consistent with EPA's Ground Water Protection Strategy and with RCRA.

Construction Ouality Assurance for Hazardous Waste Land Disposal Facilities; EPA/530-SW-85-031; July 1986.

- Public guidance on construction quality assurance for hazardous waste landfills, surface impoundmenets, and wastepiles.

RCRA Ground-Water Monitoring Technical Enforcement Guidance Document; Final; EPA/OWPE; September 1986.

- Provides guidance on data collection and well spacing and design for detection and assessment monitoring of Interim Status facilities. This guidance should be consulted in both the RCRA Facility Investigation and Corrective Measure stages of the RFI/CMS.

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Part IV

Department of Labor

Occupational Safety and Health Administration

29 CFR Part 1910

Hazardous Waste Operations and Emergency Response; Interim Final Rule

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

[Docket No. S-760]

Hazardous Waste Operations and Emergency Response

AGENCY: Occupational Safety and Health Administration; Labor.

ACTION: Interim final rule.

SUMMARY: This interim final rule amends the Occupational Safety and Health Administration (OSHA) standards for hazardous materials in Subpart H of 29 CFR Part 1910 by adding a new § 1910.120 containing employee protection requirements for workers engaged in hazardous waste operations including emergency response to hazardous substance incidents.

Coverage includes employees involved in responses covered by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (CERCLA or "Superfund" Act) [Pub. L. 96-510, 42 U.S.C. 9601 *et seq*, 94 Stat 2767] such as clean-up of hazardous waste sites, certain hazardous waste operations conducted under the Resource Conservation and Recovery Act of 1976 as amended (RCRA) [Pub. L. 94-580, 42 U.S.C. 6901 *et seq*, 90 Stat 2795], and emergency response to incidents involving the handling, processing and transportation of hazardous substances.

The issuance of this interim final rule is mandated by section 126(e) of the "Superfund Amendments and Reauthorization Act of 1986" (SARA) [Pub. L. 99-499]. The interim final rule will regulate employee safety and health at hazardous waste operations and during emergency response to hazardous substance incidents until a final standard, also mandated by section 126 of SARA, is issued by OSHA and becomes effective. The final OSHA standard also mandated by section 126 of SARA is the subject of a Notice of Proposed Rulemaking which will be published shortly.

DATES: Interim rule effective December 19, 1986; various start-up dates have been established in paragraph (p) of the standard. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 19, 1986.

FOR FURTHER INFORMATION CONTACT: Mr. James F. Foster, U.S. Department of Labor, Occupational Safety and Health Administration, Division of Consumer Affairs, Room S-4220, 200 Constitution Avenue, NW., Washington, DC 20210, 202-523-8151.

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SUPPLEMENTARY INFORMATION:

I. Background

On October 17, 1986, the President signed into law the "Superfund Amendments and Reauthorization Act of 1986" (SARA) [Pub. L. 99-499]. As part of SARA the Secretary of Labor ("Secretary") is directed to issue an interim final rule within 60 days after the date of enactment, which is to provide no less protection for workers engaged in covered operations than the protections contained in the Environmental Protection Agency's (EPA), "Health and Safety Requirements for Employees Engaged in Field Activities" manual (EPA Order 1440.2) dated 1981 and the existing OSHA standards under Subpart C of 29 CFR Part 1926. SARA also directs the Secretary to issue, within one year, a final standard under section 6(b) of the Occupational Safety and Health Act of 1970 for the health and safety of employees engaged in hazardous waste operations. SARA further indicates that certain specific areas of employee protection (i.e., medical surveillance, personal protective equipment, training, and others) contained in section 126(b) are relevant to protect employees engaged in hazardous waste operations.

The interim final rule issued today becomes effective immediately and will remain in effect until one year after issuance of the final OSHA standard, which will be proposed shortly. Congress has clearly directed in section 126(e) that these interim final rules become effective upon issuance and the standard provides this. Implementation is to commence immediately, however, various start-up dates are set forth in paragraph (p) of the standard which recognize that full implementation cannot be completed immediately for some provisions. In addition OSHA will, of course, recognize greater feasibility constraints in the first three months of the standard and take those constraints into account in enforcement.

This interim final rule has been adopted from the language of the EPA manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" (1981) and the language of OSHA's safety and health standards in Subpart C of 29 CFR Part 1926. The interim final rule also contains language taken from various documents issued either jointly or solely by the EPA, OSHA, the U.S. Coast Guard, and the National Institute for Occupational Safety and Health (NIOSH). OSHA has specifically used the joint OSHA/EPA/USCG/NIOSH document entitled, *"Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities"* (Preamble Reference 6), as an outline in preparing this interim rule. This four agency manual has been developed as a result of the collaborative efforts of professionals representing the four agencies. These professionals, who are knowledgeable in hazardous waste operations, worked with over 100 experts and organizations in the development of the criteria contained in this manual. The manual was published in October 1985 and is public information. The manual is a guidance document for managers responsible for occupational safety and health programs at inactive hazardous waste sites. The manual is intended for use by government officials at all levels and contractors involved with hazardous waste operations. The manual provides general guidance and is intended to be used as a preliminary basis for developing a specific health and safety program for hazardous waste operations. Further the major subject areas listed in SARA section 126(b) are nearly identical to these major chapters listed in the manual.

Congress indicated that reasonably comprehensive protection was intended for employees at hazardous waste operations, as discussed below, covering more than the minimum requirements specified in the EPA manual (EPA Order 1440.2) and Subpart C of 29 CFR Part 1926. In light of the short period of time Congress directed for issuance of this standard, OSHA's utilization of recognized sources of guidance which have been created by experts in the area and utilizing the resources of relevant agencies is appropriate.

In view of the brief period given for the issuance of this document, it may be necessary to issue minor corrections in the near future.

II. Summary and Explanation of the Standard

Paragraph (a)—Scope, Application, and Definitions

In paragraph (a)(1), *Scope*, OSHA has defined the scope of the standard to include:

(i) Hazardous substance response operations under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980

as amended (CERCLA) including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;

(ii) Major corrective actions taken in clean-up operations under the Resource Conservation and Recovery Act of 1976 as amended (RCRA);

(iii) Operations involving hazardous waste storage, disposal and treatment facilities regulated under 40 CFR Parts 264 and 265 pursuant to RCRA except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34;

(iv) Hazardous waste operations sites that have been designated for clean-up by state or local governmental authorities; and

(v) Emergency response operations for releases of or substantial threats of releases of hazardous substances and post-emergency response operations to such releases.

Thus this standard will cover hazardous waste clean-up operations at CERCLA sites, RCRA sites, emergency response sites and those sites designated by State or local governments. It will also cover other hazardous waste operations, such as storage, disposal or treatment of hazardous waste at RCRA facilities.

OSHA believes that Congress intended the interim rule to have a broad scope and application. This is indicated by the legislative intent as reflected in the language of SARA. The language of section 126(e) explicitly states that the Secretary "shall issue interim final regulations *under this section. . .*" (emphasis supplied). "Under this section" refers to the entire section 126 of SARA. And, as previously noted, section 126(a) mandates safety and health standards for the protection of employees engaged in hazardous waste operations. Thus, OSHA believes Congress intended the interim final rule to mirror section 126 and provide protective provisions to employees engaged in hazardous waste operations.

The argument is buttressed further by the fact that section 126(e) states that the interim final rule shall provide *no less* (emphasis added) protection for workers employed by contractors and emergency response workers than the protection contained in the Environmental Protection Agency Manual "Health and Safety Requirements for Employees Engaged in Field Activities" and exiting standards under Subpart C of 29 CFR Part 1926. The two sources cited in section 126(e) are not a limitation on the scope of the interim rule. Rather, this language establishes the minimum amount of protective provisions, with the broad parameters of employee protection delineated by the remainder of section 126.

This interpretation is reinforced because SARA is a freestanding statutory provision and not an amendment to CERCLA. The clear Congressional intent then is to provide protection to employees whenever they deal with hazardous wastes.

The hazards an employee faces at a RCRA, CERCLA, or emergency response site are the same hazards. The risk of exposure is to the same types of hazardous substances. The scope of the regulation fulfills the Congressional mandate: to effectively provide for employee health and safety at hazardous waste operations and emergency response incidents.

As indicated in the application provisions, different provisions of the standard apply to clean-up operations; regular hazardous waste operations and emergency response to take into account relevant differences.

Further the term "hazardous waste operation" is used in section 126(a) of SARA. "Hazardous waste" is also a term used in RCRA and there is no indication from SARA or its legislative history that RCRA facilities were to be excluded from coverage by this interim rule. This is a further reason why OSHA has included RCRA hazardous waste operations under the coverage of this interim final rule. However, small quantity generators; employers who have less than 90 days of hazardous waste accumulation; and solid waste disposal operations which do not involve hazardous waste are not covered by this interim final rule. Also, employees at hazardous waste sites who will not be exposed or do not have the potential to be exposed to hazardous substances are not covered by this interim final rule.

Emergency response employees who respond or will respond to incidents involving hazardous substances are covered by this interim final rule. Public employees of states that have agreements with OSHA under section 18 of the OSH Act must issue regulations at least as effective as these to protect public employees.

Municipal or other sanitary landfills that handle domestic wastes are not covered. Similar waste paper or scrap metal operations are generally not covered because of the type of wastes they handle. But they could be covered if they have clean-ups for or handle hazardous wastes meeting the scope provisions of the standard.

Operations with no exposure to on-site hazardous substances, i.e., road building for site access, construction of on-site or the setting up of temporary facilities in the clean zone or the closure of a RCRA site involving the building of a clay cap over hazard wastes, are considered to be construction activities covered by the standards in 29 CFR Part 1926.

The scope and application provisions carry out the intent of Congress and are consistent with good occupational safety and health policy. Employees performing clean-up operations under CERCLA, RCRA (corrective actions) and post emergency response, generally those employees likely to have the highest exposures to hazardous substances over a longer period, are covered by virtually all the provisions of the rule. Employees exposed to hazardous wastes in routine RCRA hazardous waste operations, who are regularly exposed to hazardous wastes but in a more controlled environment, are covered by the more limited requirements of paragraph (o) of the interim final rule. Emergency response workers, exposed usually for short periods to often unknown but possibly high levels of hazardous substances, have specific provisions directed towards this situation.

In paragraph (a)(2), *Application*, OSHA designates the requirements which apply to the specific work activities covered by this interim final rule. The requirements set forth in paragraph (1) of this section specifically apply to the work conducted by emergency response personnel, such as fire fighters, emergency medical system (EMS) employees and police, when they respond to hazardous substance incidents.

The requirements set forth in paragraph (o) of this section specifically apply to the hazardous waste operations at RCRA sites which are involved in disposal, treatment, storage and handling of hazardous waste. The exclusion of small quantity operators and less than 90-day accumulators excludes from coverage by the interim rule operators such as dry cleaners and gas stations which come within the purview of RCRA but are not hazardous waste operators in the normal meaning of the term. The approximately 4,000 RCRA sites where reasonably large quantities of hazardous wastes are regularly handled, treated and stored are covered by the rule. This reflects the legislative intent, meets the normal meaning of hazardous waste operations and covers the type of safety and health hazards that this regulation is designed to control.

Most of the requirements of the interim rule apply to clean-up activities of hazardous substances or hazardous wastes at CERCLA sites, corrective actions at RCRA sites, and clean-up operations of hazardous substances at emergency incidents after emergency response personnel have concluded their duties.

The employer must also comply with the standards in 29 CFR Parts 1910 and 1926, as well as with the requirements specifically covered in this interim rule. If there is a conflict or overlap, the more protective provisions are to apply. Since this interim rule does not cover all of the hazards present at hazardous waste operations, other OSHA standards in Parts 1910 and 1926 apply also. Other OSHA standards cover many other hazards, and OSHA wants to make clear that the other standards continue to apply. Also, hazardous waste operators who are not within the scope of this standard are covered by the Parts 1910 and 1926 standards.

In paragraph (a)(3), *Definitions*, OSHA has defined various terms used in this rulemaking. The definitions for hazardous substances and hazardous wastes have been taken from the U.S Environmental Protection Agency (EPA) and U.S. Department of Transportation (DOT) regulations. This has been done to assure consistency and compatibility between this interim rule and the rules and regulations of the EPA and DOT. The remaining definitions have been taken for the most part from SARA, the four agency manual (Reference 6) or existing OSHA standards.

The term "established permissible exposure limit" is defined to give direction as to the appropriate degree of protection needed to be achieved by personal protective equipment and other similar purposes.

Paragraph (b)—General Requirements

In paragraph (b), *General requirements*, OSHA sets forth for the most part a summary of requirements which are specified in detail in later paragraphs. The preamble discussion for later paragraphs sets forth the reasons for the various provisions. Many of these requirements are part of the minimum requirements which Congress directed OSHA to issue in section 126(e) of SARA. The EPA manual (EPA Order 1440.2) referenced in section 126(e) requires extensive training and medical surveillance programs. Subpart C of 29 CFR Part 1926, also referenced, requires, in addition, accident prevention programs (§ 1926.20(b)), use of appropriate personal protective equipment (§ 1926.28), sanitation and illumination requirements (§§ 1926.26 and 1926.27), provisions on safe handling of toxic substances (§ 1926.21 (b)(5)), precautions in confined spaces (§ 1926.21(b)(6)) and similar provisions. Congress also directed additional provisions for the proposed regulation, which are considered relevant for the interim regulation. These include engineering controls, maximum exposure limits and monitoring, handling requirements, decontamination procedures and emergency response. Based on this comprehensive statutory direction OSHA believes that the intent of Congress is to have employers implement a safety and health program that will address the recognized serious hazards to employees involved in hazardous waste operations. Therefore, OSHA has incorporated the more important elements of section 126(b), along with the mandatory provisions of section 126(e) of SARA, into this rule. Each general requirement in paragraph (b) calls for employer action and directs the employer to the specific paragraph of this rule that contains the duties in greater detail.

OSHA believes that these requirements are necessary to assure adequate employee protection to the known hazards faced by employees. The language used in these requirements has been adapted from the various documents listed in the Reference section of this preamble.

Three of the subparagraphs in paragraph (b) do not reference other paragraphs in the regulation. Paragraph (b)(1) requires the employer to develop a safety and health program for hazardous waste operations. Such programs are part of the requirements mandated by SARA for the interim rule. Thus, Subpart C of 29 CFR Part 1926 requires such a program in § 1926.20(b) and EPA Order 1440.2 requires training in "safety plan development" (pg. 5). OSHA's experience also establishes that a safety and health program is necessary to protect employees so that hazards are assessed and control programs are systematically laid out. Prior OSHA section 6(b) health standards require a compliance plan to set forth a health program to protect employees from the hazard.

Paragraph (b)(14) requires compliance with Subpart P of 29 CFR Part 1926 which covers excavation. OSHA considers that those provisions already apply, but they are singled out because they are particularly important to monitor since much excavation activity occurs on hazardous waste sites.

Paragraph (b)(15) requires employers to notify contractors and subcontractors of the hazards identified by the employer at hazardous waste operations. Sections 126(b)(2) and (e) of SARA indicate Congress's specific interest in protecting employees of contractors and in involving contractors in the safe operation of hazardous waste sites. This provision assists the contractor to become aware of the risks so that the contractor's employees may be better protected.

Paragraph (c)—Site Characterization and Analysis

For an effective safety and health program, which Congress clearly intends for employees, the employer needs to know the hazards faced by employees in order to develop and implement effective control measures. Site characterization provides the information needed to identify site hazards and to select employee protection methods. The more accurate, detailed, and comprehensive the information available about a site, the more the protective measures can be tailored to the actual hazards that the employees may encounter. Congress clearly intended that such a requirement be included. Subpart C of 29 CFR Part 1926 referenced in section 126(e) of SARA requires "frequent and regular inspections of the job site" (29 CFR 1926.20(b)(2)). Also section 126(b)(1) of SARA provides for site analysis. Also item #9 of the EPA manual (EPA Order 1440.2) addresses this practice.

Site characterization generally proceeds in three phases:

1. Prior to site entry, gather information away from the site, conduct reconnaissance from the site perimeter and conduct offsite characterization.

2. Conduct onsite surveys. During this phase, restrict site entry only to reconnaissance personnel.

3. Once the site has been determined safe for commencement of other activities, continue monitoring to provide an updated source of information about site conditions.

It is important to recognize that site characterization is a continuous process. At each phase of site characterization, information shall be obtained and evaluated to define the potential hazards of the site. This assessment shall be used to develop a safety and health plan for the next phase of work. In addition to the formal information gathering that takes place during the phases of site characterization described here, all site personnel should be constantly alert for new information about site conditions. Other requirements of this section have been adopted from reference 6.

Paragraph (d)—Site Control.

As part of the employers' site safety and health plan, this paragraph requires the employer to consider site control to minimize potential contamination of employees. Several items need to be considered, such as establishing work zones, so that employees know the hazards in different areas and will keep out of hazardous areas where the employees' presence is not required. Use of a buddy system and good site communications will assist in rescue of employees who become unconscious, trapped or otherwise seriously disabled on site.

Site control is especially important in emergency situations. Paragraph (d) describes the basic components of a program to control the activities and movements of employees and equipment at a hazardous waste site.

Several site control procedures can be implemented to reduce employee exposure to chemical, physical, biological, and safety hazards. The degrees of site control necessary depends on site characteristics, site size, and the surrounding community. The site control program should be established in the planning stages of a project and modified based on new information and site assessments developed during site characterization. The appropriate sequence for implementing these measures should be determined on a site-specific basis. In many cases, it will be necessary to implement several measures simultaneously.

The text used in this paragraph has been adapted from Reference 6. Item 9 of the EPA manual (Order 1440.2) indicates the need for this. In addition Subpart C of 29 CFR Part 1926 provides for regular inspection of job sites so hazards on the site can be controlled.

Paragraph (e)—Training.

The interim final rule includes specific provisions for initial and review training of employees before they are permitted to engage in hazardous waste operations that could expose them to safety and health hazards. Both the EPA manual and 29 CFR 1926.21 and 1926.22 referred to in section 126(e) of SARA have training and information requirements. The EPA manual has specific provisions for basic, intermediate and advanced training. It requires 40 hours training for employees managing uncontrolled hazardous waste sites, 24 hours for employees engaged in routine activities and 32 hours for intermediate activities. Additionally, section 126 generally has requirements for extensive training programs. The clear congressional intent of the interim final rule training provisions is to provide employees with the knowledge and skills necessary to perform hazardous waste clean-up operations with minimal risk to their safety and health.

The provisions for employees include a minimum of 40 hours of initial instruction off the site, and a minimum of 3 days of actual field experience under the direct supervision of a trained and experienced supervisor, at the time of job assignment. This amount of training is specifically directed by Congress for the interim final rule by its reference to the EPA manual which basically requires this amount of training for hazardous waste operators and Congress has specifically imposed these hour and day requirements under section 126(d) of SARA for the proposed final standard. There are slight differences between the EPA manual and section 126(c) of SARA. But they are sufficiently slight so that OSHA believes it appropriate to make the interim final rule consistent with what Congress directs for the proposed final rule so that employers need not make minor modifications to their training programs after two years.

In addition there are often many hazards at a waste site. The employee needs to be trained to recognize the hazards and appropriate work practices to minimize those hazards. The employee also needs to be well trained in the use of respirators and other forms of PPE. Without training those may not be used effectively and will not provide adequate protection. An extensive training program is necessary to achieve these objectives. The paragraph specifies these and the other items needed for effective training to avoid hazards.

Managers and supervisors directly responsible for hazardous waste site operations are to receive the same training as that of employees and at least eight additional hours of specialized training on managing hazardous waste operations. Since these people are responsible for directing others, it is necessary to enhance their ability to provide guidance and to make informed decisions. Both the EPA manual and section 126(e) of SARA direct eight hours of additional training for supervisors and managers.

The provisions also state that employees shall be retrained on an annual basis on relevant matters such as review of health hazards and use of personal protective equipment. Employees at hazardous waste operations face serious health and safety risks. Reminders are needed of this and of work practices to avoid hazards. Personal protective equipment provides much of their protection. If there is no retraining in the use, care and maintenance of said equipment, such equipment is unlikely to be utilized in a manner to provide adequate protection. The regulation provides for eight hours of annual retraining. The EPA manual for refresher training (item #10) requires this amount of training.

In all areas of training, whether it be for general site employees, on-site supervisors or for the use of specific equipment, the level of training provided needs to be consistent with the worker's job function and responsibilities. The training information should be presented clearly and, as a further safeguard, refresher training should be supplied to reemphasize the initial training and to update employees on any new policies or procedures.

A less detailed training provision is provided for employees working at routine operation on RCRA sites. Those sites will have more stable working conditions and the hazards will be better identified and more carefully controlled. Therefore OSHA believes not as extensive training is needed for those employees for the interim rule. OSHA specifies 24 hours for the required training based on the EPA manual which specifies this as the basic level of training for most routine field activities. OSHA in the proposal document will request comment whether this or a greater amount of training is appropriate for the permanent rule.

Paragraph (f)—Medical Surveillance

The interim final rule both includes specific provisions for baseline and periodic medical examinations. The EPA manual referred to in section 126(e) of SARA has requirements for both initial or baseline and periodic medical examinations. The examinations are to be provided to those routinely exposed to hazardous substances, to those whose duties are physically taxing and those who routinely wear respirators. In addition section 126(b) provides that routine medical examinations are to be provided to workers engaged in hazardous waste operations. Although the language is slightly different, the clear intent is to provide a comprehensive medical surveillance program for employees engaged in hazardous waste operations where it is medically prudent.

The paragraph states medical surveillance is to be provided to employees who have been or are expected to be exposed to hazardous substances or health hazards above established permissible exposure limits

for 30 or more days in a 12-month period or who wear respirators 30 days during the year. These are the employees who will be at greater health risk and employees who wear respirators need to be examined to determine whether they can safely do so as a routine matter. Some dividing line is needed, because employees who might be present on a hazardous waste site only a few days a year or working in areas such as offices or the periphery where exposures are low would not normally benefit from medical surveillance as their likely cumulative exposures to toxic chemicals would be very low probably not significantly higher than the general population. The EPA manual indicates some dividing line is appropriate because it directs medical surveillance only for employees "routinely" exposed

Wearing respirators for any part of each of 30 days will require medical surveillance because it indicates routine exposure to toxic chemicals. There is no requirement that there be 240 hours of respirator use before medical surveillance is required. Similarly being exposed over established safe levels to several chemicals each for less than 30 days but totalling more than 30 days per year requires medical surveillance. This indicates routine exposures to hazardous substances and also combinations of chemicals may cause synergistic effects creating greater health hazards than an individual chemical.

OSHA has based many of the details of medical surveillance on its experience in issuing health standards under section 6(b) of the OSH Act and as directed by section 6(b)(7) of the Act. Congress would be knowledgable that medical surveillance requirements in these standards represent OSHA's expert judgement of what is an appropriate medical surveillance program.

The appropriate medical tests and examinations depend on the substances an employee is exposed to and whether the employee wears a respirator. As employees on hazardous waste sites will be exposed to differing substances, the paragraph can not specifically state the required tests. Consequently the paragraph states that the employer provide to the physician information on exposures, respirator use, and duties on the site. The physician is then to determine the appropriate medical surveillance protocol in terms of specific tests and examinations. By the employer specifying duties the physician also can judge whether the employee can handle the arduousness of the work.

In situations where most of the employees on the site have similar exposures the protocol may be similar for all employees. Where different groups of employees on the site have substantially different exposures, several different protocols may be appropriate for the site's workers depending on exposures.

There are a number of sources for guidance on specific medical examination protocols. Chapter 5 of Reference 6 provides such guidance by groups of chemicals likely to be present on a site. It references other authorities. The manual should be supplied to the physician. It is also a basis for the medical surveillance program required by this paragraph. In addition, the EPA medical monitoring program guidelines referenced by the EPA manual provides guidance on specific protocols.

The paragraph requires an initial or baseline medical examination either prior to the start up date for employees who are currently working at hazardous waste sites or prior to initial assignment to an area where medical examinations will be required. The purpose is to take a detailed medical history and where possible develop a health baseline prior to any exposures so as to be able to evaluate changes which may be connected to hazardous substance exposures. In addition the initial examination will permit evaluation of whether the employee can appropriately wear respirators and whether the employee has preexisting conditions which would make exposure to hazardous substances inappropriate. An initial examination has been required by other OSHA health standards and is recommended in Reference 6.

The physician must be informed of what type of respirators and personal protective equipment an employee is likely to wear. The medical examination is to include appropriate tests to evaluate the employee's ability to wear respirators and PPE.

The physician will also specify the protocol of the periodic examinations. These may be different from the initial examination, for example, only an updated medical history would be required. The periodic examinations are required yearly. OSHA's experience in other health standards has been that this is an appropriate period and it is also recommended by Reference 6. EPA's medical monitoring program guidelines cross referenced in the EPA manual recommends baseline annual examination generally and a termination examination. It is reasonable to determine periodically whether exposures have brought medical changes and to identify conditions caused by chemicals at an early stage to permit more effective treatment. In some circumstances, the physician may advise more frequent examinations.

Examinations are also to be provided when the employee brings to the employer's attention signs or symptoms indicating possible overexposure to hazardous substances. The employee is to be trained in recognizing what symptoms may indicate substances to which the employee is exposed. Examples may be dizziness or rashes. Examinations are also required, when medically appropriate, during emergencies when exposure to higher levels is possible. For example, a urinary phenol test is appropriate for employees exposed to high levels of benzene in an emergency.

Finally, a medical examination is required for employees who have been required to have medical examinations upon termination of employment or reassignment to an area where medical examinations are not required. This is to detect conditions which have developed prior to departure and is recommended by the EPA program.

The medical examination is to be provided under the supervision of a licensed physician, i.e., the person must be qualified to make medical judgements. As provided by section 6(b)(7) of the OSH Act, the employer is to pay the cost of the examination. In addition provisions are included so that the employee is not discouraged from taking the examination. The exam is to be given at a reasonable time and place. If given during regular working hours the employee shall receive the employer's normal pay for that time. If the exam is given outside regular working hours, the employee shall be paid his regular wages for the time spent taking and waiting for the examination.

The physician shall make a report to the employer of medical conditions which may make the employee at increased risk to work at the site and any recommendations on limitations on use of respirators and other PPE as a result of the medical conditions. This will provide guidance for the safe employment of the employee at the site. The physician shall not reveal diagnoses or conditions unrelated to employment, but shall inform the employee directly of those conditions and any and all occupationally related conditions.

The medical paragraph requires that appropriate records be kept to assist in future evaluation of the employee's health. Secondarily, this information may assist in research on occupational related disease. Records should be kept pursuant to the provisions of 29 CFR 1910.20. Full consideration was given in

that standard to appropriate retention periods.

Paragraph (g)—Engineering Controls, Work Practices, and Personnel Protective Equipment

Anyone entering a hazardous waste site must be protected against potential hazards. The purpose of engineering controls, work practices, and PPE is to shield or isolate individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous waste site. Careful selection and use of adequate engineering controls, work practices and PPE should protect any employee from health and many other hazards including hazards to the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

Requirements of both Subpart C of 29 CFR Part 1926 and the EPA manual mandated to be included in the standard by Congress cover the provision and use of personal protective equipment. See for example, 29 CFR 1926.28 and items 7(a), 9(a)(7) and 9(b)(2) of the EPA manual. In addition existing OSHA regulations which apply to hazardous waste operations, in 29 CFR Part 1910, Subpart Z require exposures to various toxic and hazardous substances to be controlled with engineering controls if feasible, otherwise with PPE. These requirements apply now to employers and workers on Superfund sites pursuant to EPA regulations in 40 CFR Part 300. Finally, Congress specified in section 126(b) that there should be both PPE and engineering control provisions for the permanent final standard.

Paragraph (g)(1) basically carries over the existing requirements of Subpart Z. OSHA regulated toxic and hazardous substances are to be controlled to the permissible exposure limit if feasible. If not feasible they are to be controlled with PPE.

Paragraph (g)(2) provides that to achieve established permissible exposures limits for substances not regulated by OSHA, the employer may use an appropriate combination of engineering controls, work practices, and PPE. As these are interim regulations, preference for engineering controls where not already required would not be appropriate because of the limited time frame of this regulation and the frequent inability to install such controls in a short period. In addition it is OSHA's experience that this is an appropriate approach based on the emergency temporary standards it has issued which are also in effect for a limited period. OSHA will ask for comment in these areas in the proposal document.

Examples of engineering controls which may be feasible are pressurized cabs on materials handling equipment or pressurized control rooms in materials handling areas. However, in many cases personal protective equipment will be the only feasible means for providing protection to employees engaged in hazardous waste operations. The selection of personal protective equipment (PPE) must be based on the information obtained during the site characterization and analysis, as is required by paragraph (g)(3)(i) of this standard. Once an estimate of the types of hazards and their potential concentration has been obtained, the proper respirators and protective clothing can be selected based on the performance characteristics of the PPE relative to the site hazards and work conditions, as is required by paragraph (g)(3)(ii) of the standard. These requirements are derived from Reference 6 and are also supported by a NIOSH document, "Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide." These two document also support the requirements of paragraphs (g)(2)(iii) and (g)(2)(iv) which require positive pressure respirators with escape provisions to be used in IDLH atmospheres and totally-encapsulating chemical protective suits to be used where contact of the skin by the substance would be an IDLH situation.

Proper respirator selection, as required by this standard and 29 CFR 1910.134, involves providing a sufficient protection factor through the type of respirator used, respirator fitting, work site conditions, and respirator selection and use program. Proper protective clothing selection, as required by this standard, involves choosing protective clothing made of materials and construction which will prevent breakthrough of hazardous substances by permeation and penetration, or reduce the level of exposure to a safe level during the employee's duration of contact. Information on the performance characteristics of PPE is available in test reports and manufacturer's literature. Appendix B provides non-mandatory guidelines on classifying substance hazards as four levels (A, B, C, and D), and matching four levels of appropriate protection provided by different protective ensembles. These guidelines may be used as a basis for protective clothing selection, and the selection further refined when more information is obtained, as provided for in paragraph (g)(2)(v) of the standard. (In certain circumstances, this standard does specify the appropriate level of protection. See paragraph (c)(4)(iii)). Paragraph (g)(3)(vi) cross reference the existing requirements to select and use PPE pursuant to the requirements of 29 CFR 1910, Subpart I.

Paragraph (g)(4) requires totally-encapsulating suit materials used for Level A protection (the highest level of protection) to provide protection from the specific hazards which have been identified as requiring that level of protection. The purpose of this requirement is to be certain that the suit selected is comprised of materials which will provide the necessary protection, since no one material will provide protection from all hazards. Paragraphs (g)(4)(ii) and (g)(4)(iii) require totally-encapsulating suits to be capable of maintaining positive air pressure to help prevent inward leakage of hazardous substances, and to be capable of preventing inward gas leakage of more than 0.5 percent. These requirements, which are based on testing of totally-encapsulating suits, are included to establish a minimum level of suit performance so that their level of protection can be quantified for proper selection. The example test methods in Appendix A for totally-encapsulating chemical protective suits were taken from draft American Society for Testing and Materials committee documents.

Paragraph (g)(5) requires a PPE program to be established. This requirement is based upon reference 6, 29 CFR 1926.28, EPA manual items 4 and 7(g), and is included, since, in most cases, PPE will be the only protection feasible for employee protection, and because the amount of protection afforded by PPE is dependent upon so many factors, such as selection, fit, work duration and conditions, and decontamination. The PPE program is required to insure that the level of protection afforded by PPE is sufficient and continues to be sufficient for employee safety during hazardous waste operations.

Paragraph (h)—Monitoring

It is essential that employers be provided with accurate information on employee exposures in order to implement the correct PPE, engineering controls, and work practices. Airborne contaminants can present a significant threat to employee safety and health. Thus, identification and quantification of these contaminants through air monitoring is an essential component of a safety and health program at a hazardous waste site. Reliable measurements of airborne contaminants are useful for selecting personal protective equipment, determining

whether engineering controls can achieve permissible exposure limits and which controls to use, delineating areas where protection is needed, assessing the potential health effects of exposure, and determining the need for specific medical monitoring. As mentioned above, section 126(e) of SARA mandates the use of PPE by its direction that at a minimum the requirements of the EPA manual and Subpart C be followed. Those include requirements for use of PPE. But PPE cannot be effectively used unless monitoring has identified the type of PPE to be used. This is a further reason to include this provision in the interim final rule.

The language of this paragraph was adapted from reference 6.

Paragraph (i)—Informational Programs

In paragraph (i), *Informational Programs*, OSHA is requiring employers, as part of their safety and health program, to develop and implement a site specific safety and health plan for each hazardous waste operation site.

The site safety and health plan shall be developed by the employer, utilizing the other parts of the organizational plan and the employer's safety and health program. The site safety and health plan will address the anticipated safety and health hazards of each work operation or activity and the means to eliminate the hazards or to effectively control them to prevent injury or illness.

This site safety and health plan is to include: (1) The names of those responsible for assuring that safe and healthful practices and procedures are followed on the whole site; (2) risk analysis or systems analysis for specific work tasks or operations on the site; (3) employee training assignments both off site and on-the-job-training on site; (4) the list of required personal protective equipment needed for each work task and operation on site; (5) the employer's medical surveillance program for the site; (6) the methods for identification and characterization of safety and health hazards on the site including the monitoring procedures that will be done throughout the work on site; (7) site control measures including those for establishing work zones on the site; (8) the necessary decontamination procedures which are matched to the kinds of anticipated contaminants to be cleaned from employees and equipment; (9) the standard operating procedures to be used by employees on site; and (10) the contingency plan for emergencies and confined space entry procedures. Safety meetings and briefings and site inspections shall also be mentioned in the plan as well as the procedures to be followed in changing or modifying the plan.

The site safety and health plan is necessary to protect employee health. There are many hazards at a hazardous waste operation which need to be determined and addressed. The plan provides that this will be done in a systematic manner so that hazards will not be missed and so that needed protective action will not be overlooked. The approach used has be adapted from reference 6.

Paragraph (j)—Handling Drums and Containers

The handling of drums and containers at hazardous waste sites poses one of the greatest dangers to hazardous waste site employees. Hazards include detonations, fires, explosions, vapor generation, and physical injury resulting from moving heavy containers by hand and working around stacked drums, heavy equipment, and deteriorated drums. While these hazards are always present, proper work practices can minimize the risks to site personnel. Handling and storage of hazardous substances is addressed in item (a) of the EPA manual.

Containers are handled during characterization and removal of their contents and during other operations. Many of the hazards encountered during the handling of drums occur during the handling of containers. The relative size of a container when compared to the size of a drum is no indication of the degree of hazard posed by the container. They should be treated in accordance with the level of hazard posed by their contents not by their size. The language used in this paragraph was adapted from Reference 6.

Paragraph (k)—Decontamination

As part of the care of PPE required by this standard, decontamination is a necessary practice to properly protect those employees who may be exposed to hazardous substances. Decontamination provisions protect an employee from being exposed to hazardous substances which would otherwise be on the employee's PPE when it is removed. The standard requires that a decontamination plan be developed and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

As required by the standard, decontamination procedures and areas shall be developed to minimize hazardous exposures to employees whose equipment and PPE are being decontaminated, as well as to employees who are assisting in the decontamination of workers and equipment. These measures are required since without proper procedures and decontamination areas, employees may be unknowingly exposed to hazardous substances which have contacted, or otherwise adhered to equipment and clothing. The standard also requires that all employees, clothing, equipment and decontamination fluids and equipment be decontaminated or disposed of before leaving a contaminated area. These provisions are required so that contaminated persons and materials do not leave the "hot zone" and thereby expose other employees and persons to hazardous substances.

Decontamination methods and cleaning fluids must be matched to the particular hazardous substance at the site in order for the decontamination procedures to be effective in removing the hazards from PPE and other equipment. No one decontamination fluid will be effective for all hazardous substances. As required by the standard the decontamination program must be effective and it must be monitored by the site safety and health officer to maintain its effectiveness. These requirements are included so that employees are not exposed to hazardous substances by reusing PPE and other equipment which are still contaminated.

The language used in this paragraph was adapted from reference 6.

Paragraph (l)—Emergency Response

Section 126(e) of SARA specifically discusses protecting "emergency response workers," in addition in the EPA manual under items 4 and 9 and in 29 CFR 1926.23 and 1926.24 call for preparations and planning for emergencies. Congress made its intent clear that emergency planning and response is an important part of any employer's safety and health program and indicated that it is to be addressed in the interim final rule.

In paragraph (l)(1), *Emergency Response, General*, OSHA is requiring employers covered in paragraph (a)(2)(ii), who are involved in hazardous waste operations, as part of their on-site contingency planning to develop and implement an emergency response plan. These employers are to inform all their employees on the waste site about the emergency response plan. The plan is to be available for use prior to the start of work on the site. The plan will be a part of the site safety and health plan. The elements of the emergency response plan will include: (1) Recognition of emergencies; (2) methods or procedures for alerting employees on site; (3)

evacuation procedures and routes to places of refuge or safe distances away from the danger area; (4) means and methods for emergency medical treatment and first aid; (5) line of authority for employees; and (6) on-site decontamination procedures; site control means and methods for evaluating the plan.

Employers whose employees will be responding to hazardous substance emergency incidents from their regular work location or duty station, such as a fire department, fire brigade or emergency medical service, will also be required to have an emergency response plan. These employees which may be called upon to respond to hazardous substance emergency incidents involving a railroad tank car, motor carrier tank truck or to a plant location are considered off-site emergency response activities under this section. The emergency response plan is to include the incident command system required in paragraph (l)(3) of this section.

In paragraph (l)(2), *Hazardous waste operations, on-site emergency response,* OSHA is requiring the training of on-site emergency response personnel to have the same basic training as for the other employees involved in on-site hazardous waste operations plus the training needed to develop and retain the necessary skills for anticipated emergency response activities. Also, the procedures for handling hazardous substances on-site emergency incidents are to be oriented to the specific site and made a part of the emergency response plan.

The requirement of paragraphs (l)(3) and (l)(4) apply more broadly to all employers whose employees respond to off-site emergency incidents. In paragraph (l)(3), *Off-site emergency response,* OSHA is mandating that employers, such as fire departments, emergency medical and first-aid squads, fire brigades, etc., conduct monthly training sessions for their employees totalling 24 hours annually.

Note.—OSHA does not have jurisdiction over state and local government employees. OSHA state plan states must issue regulations as effective as these to cover state and local government employees in the state.

Training activities, such as breathing apparatus use, training, hose handling and preplanning may be used as training subjects for the monthly sessions provided hazardous substance incident operations are included in the presentation, discussion or drill. These training sessions and drills must involve at least 24 hours of training on an annual basis.

The incident command system shall be established by these employers for the incidents that will be under their control and shall be interfaced with the other organizations or agencies who may respond to such an incident. The National Transportation Safety Board, as a result of its investigation of hazardous materials incidents, has consistently recommended that better state and local emergency response planning be done to reduce the loss of life and property and that a system using a command post and on-scene commander be implemented. (See *Special Investigation Report. On-scene Coordination Among Agencies at Hazardous Materials Accidents,* NTSB-HZM-79-3, September 13, 1979; and *Multiple Vehicle Collisions and Fire, Caldecott Tunnel near Oakland, California,* NTSB/HAR-83/01, National Transportation Safety Board, Washington, DC, April 7, 1982, for further information.) Where available, state and local district emergency response plans shall be utilized in developing the incident command system and the emergency response plan to assure compatability with the other emergency responding agencies or employers.

In paragraph (l)(4), *Hazardous materials teams,* OSHA is requiring employers, who utilize specially trained teams involved in intimate contact with controlling or handling hazardous substances, to provide special training for the affected employees in such areas as care and use of chemical protective clothing, techniques and procedures for stopping or controlling leaking containers and decontamination of clothing and equipment for anticipated hazardous substance incidents. The employer is to make available to each team member a physical examination by a licensed physician and to implement a medical surveillance program in accordance with the requirements of paragraph (f) of this section.

In paragraph (l)(5), OSHA is requiring employers covered in paragraphs (a)(2)(i) and (ii) of this section, who will be involved in cleaning up hazardous waste after the emergency response activities are concluded, to comply with the same requirements that apply to others involved with hazardous waste clean-up operations. These hazardous waste clean-up operations will be typically done by special contractors and not by those agencies involved in responding to the initial emergency incident.

Paragraph (m)—Illumination

OSHA is required by SARA in section 126(e) to cover lighting of the worksite. In paragraph (m), *Illumination,* OSHA requires certain minimum illumination levels for work areas that are occupied by employees. Section 126(e) of SARA requires as a minimum the inclusion of the requirements of Subpart C of 29 CFR Part 1926. Section 1926.26 of that Subpart requires the amount of illumination set forth in this paragraph.

Paragraph (n)—Sanitation for Temporary Worksites

In paragraph (n), *Sanitation for temporary worksites,* OSHA sets minimum requirements for potable and non-potable water supplies, toilet facilities, and other areas related to sanitation at temporary workplaces. OSHA is mandated by SARA in section 126(e) to include sanitation requirements in the interim final rule since it requires the incorporation of provisions of Subpart C.

Paragraph (o)—Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA)

OSHA is providing a separate paragraph for operations conducted at worksites involving hazardous waste storage, disposal and treatment operating under the Resource Conservation and Recovery Act of 1976 (RCRA). This separate paragraph of requirements is appropriate because RCRA site operations, (not including major corrective actions and their associated hazards which are like CERCLA sites and are covered by the main part of the standard) generally are different from the operations and hazards found on a CERCLA clean-up site. For example, RCRA sites covered by this paragraph tend for the most part to be fixed on-going operations involving the receiving, processing, storage, treatment, and disposal of hazardous wastes or substance from outside sources. CERCLA sites on the other hand are temporary emergency clean-up operations involving often undefined and substantial quantities of hazardous substances.

Consequently hazards should be better controlled and more routine and stable for the RCRA sites covered by this paragraph and so less extensive requirements are appropriate.

Paragraph (p)—Start-up Dates

Section 126(e) of SARA directs that these interim final regulations take effect on issuance. Consequently, these regulations do become effective on issuance. However, completion of

implementation for some provisions is not feasible immediately. For these provisions, commencement of implementation must begin immediately, but completion of full compliance is required as soon as possible or feasible but in no case later than a specified date, which is no longer than three months.

It is OSHA's judgment that all provisions can be fully implemented by the periods specified. OSHA also believes that the immediate effectiveness provisions specifically apply to the mandatory requirements.

OSHA does not believe that Congress intended that work at current hazardous waste operations stop until implementation of all requirements can be feasibly completed. This paragraph so indicates. However, for new sites, these requirements can be completed in advance. It is not OSHA's intention that emergency actions necessary to protect the public safety and health be prevented because in a particular circumstance it is not feasible to carry out particular requirements of this standard in the time needed to respond to the emergency.

III. References

1 Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub L. 99–499

2 Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or "Superfund"), Pub L 96–510, December 11, 1980, 94 Stat 2767

3 Resource Conservation and Recovery Act of 1976 (RCRA), Pub L. 94–580, October 21, 1976, 90 Stat. 2795.

4 "Health and Safety Requirements for Employees Engaged in Field Activities", Environmental Protection Agency Order 1440.2, U S Environmental Protection Agency, July 12, 1981.

5 Subparts C and D of 29 CFR Part 1926.

6 "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", Occupational Safety and Health Administration, Environmental Protection Agency, U S Coast Guard, and National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No 85–115, October 1985.

IV. Regulatory Impact Analysis, Regulatory Flexibility Analysis and Environmental Impact Analysis

OSHA anticipates that this interim final standard will have a significant impact upon employers and their employees who work at CERCLA sites and at some RCRA sites; and who respond to emergency clean-ups of hazardous substance spills. OSHA has had little time since the enactment of SARA to collect information concerning these industries. As a result, the currently available information is insufficient for OSHA to use to estimate the potential benefits and costs that would occur as a consequence of compliance with this interim final rule. OSHA is collecting additional information to be used in conjunction with the information from the comments that will be received in response to publication of the proposed rule covering hazardous waste operations. This information will be sufficient for OSHA to provide a complete Regulatory Impact Analysis for the final rule that will govern hazardous waste operations.

Regulatory Flexibility Act Analysis. The requirements of the Regulatory Flexibility Act are not applicable to this interim final rule, under 5 U.S.C. 603(a), because notice and comment proposed rulemaking under the Administrative Procedures Act, or any other statute, is not required.

Environmental Impact Analysis. The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq*), as implemented by the regulations (40 CFR Part 1500) of the Council on Environmental Quality (CEQ), requires that federal agencies assess their regulatory actions to determine if there is a potential for a significant impact on the quality of the human environment and, if necessary, to prepare an environmental impact statement.

In accordance with these requirements and DOL NEPA Compliance Procedures (29 CFR Part 11, Subpart B, section 11.10(a)(4)), OSHA has determined that due to the compressed rulemaking schedule imposed by the Congress in issuing the interim regulation, no environmental impact statement will be prepared for this interim rule.

In similar situations, for example, when an emergency temporary standard (ETS) has been issued, the courts have held that NEPA does not require advance preparation of an environmental statement for an ETS (*Dry Color Manufacturing Association v. U S. Department of Labor;* 486 F. 2d 98, 107 (3rd Cir. 1973)). This interim final standard is similar in nature to an ETS issued for relatively brief periods for short notice pursuant to section 6(c) of the Occupational Safety and Health Act of 1970 and section 101(b) of the Federal Mine Safety and Health Act of 1977. The DOL NEPA regulations set forth in 29 CFR Part 11, Subpart B, section 11.10(a)(4), provide that in these situations the regulations set forth in 40 CFR Parts 1500 *et seq* may not be strictly observable.

OSHA, however, will assess the environmental effects of the proposed permanent regulation of hazardous waste sites. The possibility that increased training related to employee safety and health protection will also affect and reduce inadvertent environmental releases of hazardous substances at waste sites will be analyzed. The results of this study will be available for review and comment prior to the hearing on the proposed permanent standard and will be an appropriate issue for discussion at the public hearings scheduled for the proceeding.

In the interim, OSHA welcomes any comments on any environmental effects that might occur as a result of promulgation of a rule on hazardous waste sites.

V. International Trade

OSHA has preliminarily concluded that this interim final rule will not significantly affect international trade. The firms that will be primarily affected by this interim final rule deal with hazardous waste products and are not involved in international trade. In addition, the hazardous wastes to be handled under this interim final rule are primarily by, products from previously manufactured goods and consequently, any potential costs would not be borne by the goods that are currently being traded. Nevertheless, the information that OSHA is collecting and the information that will be supplied in response to the publication of the proposed rule covering Hazardous Waste Operations will be carefully reviewed and analyzed to establish the potential impacts of the final rule upon international trade.

VI. State Plan States

This **Federal Register** document adds an interim final rule (section 1910.120, "Hazardous Waste Operations and Emergency Response") to existing Subpart H of 29 CFR Part 1910, OSHA's general industry standards on hazardous materials. The 25 States with their own OSHA approved occupational safety and health plans must develop a comparable standard applicable to both the private and public (State and local government employees) sectors within six months of the publication date of this interim final rule or show OSHA why there is no need for action, e.g., because an existing state standard covering this area is already "at least as effective" as the new Federal standard. These states are Alaska, Arizona, California, Connecticut (for state and local government employees only), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York (for state and local government employees

only), North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. Until such time as a state standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate, in these states.

List of Subjects in 29 CFR Part 1910

Containers, Drums, Emergency response, Flammable and combustible liquids, Hazardous materials, Hazardous substances, Hazardous wastes, Incorporation by reference, Materials handling and storage, Personal protective equipment, Storage areas, Training, Waste disposal.

VII. Immediate Effectiveness and Absence of Notice and Comment

Section 126(e) of SARA specifically provides that the "Secretary of Labor shall issue interim final regulations under this section within 60 days . . ." after date of enactment. The express use of the phrase "interim final regulations," which in the rulemaking context commonly describes a rule issued without notice and comment, in connection with the extremely limited time frame provided by this section, makes clear that Congress intended this rule to be issued without the time-consuming process of notice and comment. The Agency, therefore, concludes that neither the notice and comment rulemaking provisions of the OSH Act nor those of the Administrative Procedures Act are applicable to the issuance of this interim final rule. The Agency also expressly finds that "good cause" exists under 5 U.S.C. 553(b)(B) for not providing notice and comment because notice and comment procedures, under these circumstances, would be impractical and contrary to the public interest.

Section 126(e) also expressly provides that "Such interim final regulations shall take effect upon issuance. . . ." OSHA finds this specific direction of law requires the Agency to issue this rule with an immediate effective date and, further, constitutes good cause not to delay the effective date of this rule until 30 days after publication under 5 U.S.C. 553(d).

Authority

This document has been prepared under the direction of John A. Pendergrass, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC. Pursuant to section 126(e) of the Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499), Sections 6 and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657), Sections 3 and 4 of the Administrative Procedures Act (5 U.S.C. 552(a), 553), and Secretary of Labor's Order 9-83 (48 FR 35736), 29 CFR Part 1910 is amended by adding a new § 1910.120, Hazardous Waste Operations, as set forth below, effective December 19, 1986.

Signed at Washington, DC this 16th day of December 1986.

John A. Pendergrass,

Assistant Secretary of Labor.

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

1. The Authority citation for Subpart H of Part 1910 is amended by adding the following:

Authority: * * * Section 1910.120 issued under the authority of section 126(e) of the Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499), Sections 6 and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657), sections 3 and 4 of the Administrative Procedure Act (5 U.S.C. 552(a), 533) and Secretary of Labor's Order 9-83 (48 FR 35736).

2. Part 1910 of Title 29 of the Code of Federal Regulations is amended by adding a new § 1910.120 to read as follows:

§ 1910.120 Hazardous waste operations and emergency response.

(a) *Scope, application, and definitions.*—(1) *Scope.* This section covers employers and employees engaged in the following operations:

(i) Hazardous substance response operations under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9601 *et seq*) (CERCLA), including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;

(ii) Major corrective actions taken in clean-up operations under the Resource Conservation and Recovery Act of 1976 as amended (42 U.S.C. 6901 *et seq*) (RCRA);

(iii) Operations involving hazardous waste storage, disposal and treatment facilities regulated under 40 CFR Parts 264 and 265 pursuant to RCRA, except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34;

(iv) Hazardous waste operations sites that have been designated for clean-up by state or local governmental authorities; and

(v) Emergency response operations for releases of or substantial threats of releases of hazardous substances and post-emergency response operations for such releases.

(2) *Application.* (i) All requirements of Part 1910 and Part 1926 of Title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste operations (whether covered by this section or not). In addition the provisions of this section apply to operations covered by this section. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply. 29 CFR 1910.5(c)(1) is not applicable.

(ii) All paragraphs of this section except paragraph (o) apply to hazardous substance response operations under CERCLA, major corrective actions taken in clean-up operations under RCRA, post-emergency response operations, and hazardous waste operations that have been designated for clean-up by state or local governmental authorities.

(iii) Only the requirements of paragraph (o) of this section apply to those operations involving hazardous waste storage, disposal, and treatment facilities regulated under 40 CFR Parts 264 and 265, except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34.

(iv) Paragraph (l) of this section applies to emergency response operations for releases of or substantial threats of releases of hazardous substances.

(3) *Definitions*—*"Buddy system"* means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to observe the activities of at least one other employee in the work group. The purpose of the buddy system is to provide quick assistance to those other employees in the event of an emergency.

"Decontamination" means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

"Emergency response" means response to any occurrence which results, or is likely to result, in a release of a hazardous substance due to an unforeseen event.

"Established permissible exposure limit" means the inhalation or dermal permissible exposure limit specified in 29 CFR Part 1910, Subpart Z, or if none is specified the exposure limits in "NIOSH Recommendations for Occupational Health Standards" dated September 1986 incorporated by reference, or if neither of the above is specified, the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1986-87" dated

1986 incorporated by reference, or if none of the above is specified, a limit based upon a published study or manufacturers' safety data sheet brought to the employer's attention. The two documents incorporated by reference are available for purchase from the following:

NIOSH, Publications Dissemination, Division of Standards Development and Technology Transfer, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH 45226, (513) 841-4287

American Conference of Governmental Industrial Hygienists, 6500 Glenway Ave., Building D-7, Cincinnati, OH, 45211-4438, (513) 661-7881

and are available for inspection and copying at the OSHA Docket Office, Docket No. S-760, Room N-3671, 200 Constitution Ave., NW., Washington, DC 20210.

"Hazardous substance" means any substance designated or listed under (i) through (iv) below, exposure to which results or may result in adverse effects on the health or safety of employees:

(i) any substance defined under section 101(14) of CERCLA,

(ii) any biological agent and other disease-causing agent as defined in section 104(a)(2) of CERCLA,

(iii) any substance listed by the U.S. Department of Transportation and regulated as hazardous materials under 49 CFR 172.101 and appendices, and

(iv) hazardous waste.

"Hazardous waste" means (i) a waste or combination of wastes as defined in 40 CFR 261.3, or (ii) those substances defined in 49 CFR 171.8.

Hazardous waste operation" means any operation involving employee exposure to hazardous wastes, hazardous substances, or any combination of hazardous wastes and hazardous substances that are conducted within the scope of this standard.

"Hazardous waste site" or *"site"* means any facility or location at which hazardous waste operations within the scope of this standard take place.

"Health hazard" means a chemical, mixture of chemicals or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Further definition of the terms used above can be found in Appendix A to 29 CFR 1910.1200.

"IDLH" or *"Immediately dangerous to life or health"* means any condition that poses an immediate threat to life, or which is likely to result in acute or immediate severe health effects. This includes oxygen deficiency conditions.

"Immediate severe health effects" means any acute clinical sign or symptom of a serious, exposure-related reaction manifested within 72 hours after exposure to a hazardous substance.

"Oxygen deficiency" means that concentration of oxygen by volume below which air supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

"Site safety and health officer" means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

(b) *General requirements*—(1) *Safety and health program.* Each employer shall develop and implement a safety and health program for its employees involved in hazardous waste operations. The program, as a minimum, shall incorporate the requirements of this section and be provided, as appropriate, to any subcontractor or its representative who will be involved with the hazardous waste operation. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for hazardous waste operations.

(2) *Site characterization and analysis.* Hazardous waste sites shall be evaluated in accordance with paragraph (c) of this section to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(3) *Site control.* Site control procedures shall be implemented in accordance with paragraph (d) of this section before clean-up work begins to control employee exposure to hazardous substances.

(4) *Training.* Initial or refresher or review training meeting the requirements of paragraph (e) of this section shall be provided to employees before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards.

(5) *Medical surveillance.* Medical surveillance shall be provided in accordance with paragraph (f) of this section for employees exposed or potentially exposed to hazardous substances or health hazards or who wear respirators.

(6) *Engineering controls, work practices and personal protective equipment.* Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with paragraph (g) of this section to protect employees from exposure to hazardous substances and health hazards.

(7) *Monitoring.* Monitoring shall be performed in accordance with paragraph (h) of this section to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed established permissible exposure limits for hazardous substances.

(8) *Informational program.* Employees, contractors, and subcontractors or their representative shall be informed of the degree and nature of safety and health hazards specific to the work site by using the safety and health plan outlined in paragraph (i) of this section.

(9) *Material handling.* Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with paragraph (j) of this section.

(10) *Decontamination.* Procedures for all phases of decontamination shall be developed and implemented in accordance with paragraph (k) of this section.

(11) *Emergency response.* Emergency response to hazardous waste operation incidents shall be conducted in accordance with paragraph (l) of this section.

(12) *Illumination.* Areas accessible to employees shall be lighted in accordance with the requirements of paragraph (m) of this section.

(13) *Sanitation.* Facilities for employee sanitation shall be provided in accordance with paragraph (n) of this section.

(14) *Site excavation.* Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped to prevent accidental collapse and conducted in accordance with Subpart P of 29 CFR Part 1926.

(15) *Contractors and sub-contractors.* An employer who retains contractor or

sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of any potential fire, explosion, health or other safety hazards of the hazardous waste operation that have been identified by the employer.

(c) *Site characterization and analysis.* (1) A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a trained person to aid in the selection of appropriate employee protection methods prior to site entry. During site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a trained person to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(2) All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(3) The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

(i) Location and approximate size of the site.

(ii) Description of the response activity and/or the job task to be performed.

(iii) Duration of the planned employee activity.

(iv) Site topography.

(v) Site accessibility by air and roads.

(vi) Pathways for hazardous substance dispersion.

(vii) Present status and capabilities of emergency response teams that would provide assistance to on-site employees at the time of an emergency.

(viii) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties.

(4) Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(i) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below established permissible exposure limits for known or suspected hazardous substances and health hazards and will provide protection against other known and suspected hazards identified during the preliminary site evaluation.

(ii) An escape self-contained breathing apparatus of at least five minutes duration shall be carried by employees or kept available at their immediate work station if positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble.

(iii) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site an ensemble of Level B PPE shall be provided as minimum protection and direct reading instruments shall be carried for identifying IDLH conditions. (See Appendix B for guidelines on Level B protective equipment.)

(iv) Once the hazards of the site have been positively identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section.

(5) The following monitoring shall be conducted during site entry when the site evaluation produces information which show the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

(i) Monitoring for hazardous levels of ionizing radiation.

(ii) Monitoring the air with appropriate test equipment for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances.)

(iii) Visually observe for signs of actual or potential IDLH or other dangerous conditions.

(6) Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified.

Note.—Risks to consider include, but are not limited to:

Exposures exceeding the appropriate Threshold Limit Values (TLVs), Permissible Exposure Limits (PELs), or Recommended Exposure Limits (RELs).

IDLH Concentrations.

Potential Skin Absorption and Irritation Sources.

Potential Eye Irritation Sources.

Explosion Sensitivity and Flammability Ranges.

(7) Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to all employees prior to the commencement of their work activities.

(8) An ongoing air monitoring program in accordance with paragraph (h) of this section shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(d) *Site control.* (1) A site control program for preventing contamination of employees shall be developed during the planning stages of a hazardous waste operation clean-up.

(2) The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy system"; site communications; the standard operating procedures or safe work practices; and, identification of nearest medical assistance.

(e) *Training.* (1) All employees (such as equipment operators and general laborers) exposed to hazardous substances, health hazards, or safety hazards shall be thoroughly trained in the following:

(i) Names of personnel and alternates responsible for site safety and health;

(ii) Safety, health and other hazards present on the site;

(iii) Use of PPE;

(iv) Work practices by which the employee can minimize risks from hazards;

(v) Safe use of engineering controls and equipment on the site;

(vi) Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards; and

(vii) Paragraphs (G) through (K) of the site safety and health plan set forth in paragraph (i)(2)(i) of this section.

(2) All employees shall at the time of job assignment receive a minimum of 40 hours of initial instruction off the site, and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training. The level of training provided shall be consistent with the employee's job function and responsibilities.

(3) On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations shall receive training as provided in paragraph (e)(1) and (e)(2) of this section and at least eight additional hours of specialized training on managing such operations at the time of job assignment.

(4) Trainers shall have received a level of training higher than and including the subject matter of the level of instruction that they are providing.

(5) Employees shall not participate in field activities until they have been trained to a level required by their job function and responsibility.

(6) Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1), (e)(2) and (e)(3) of this section shall be certified by their instructor as having completed the necessary training. Any person who has not been so certified or meets the requirements of paragraph (e)(1) of this section shall be prohibited from engaging in hazardous waste operations after March 16, 1987.

(7) Employees who are responsible for responding to hazardous emergency situations that may expose them to hazardous substances shall be trained in how to respond to expected emergencies.

(8) Employees specified in paragraph (e)(1) and managers specified in paragraph (e)(3) of this section shall receive eight hours of refresher training annually on the items specified in paragraph (e)(1) of this section and other relevant topics.

(9) Employers who can show by an employee's work experience and/or training that the employee has had initial training equivalent to that training required in paragraphs (e)(1), (e)(2), and (e)(3) of this section shall be considered as meeting the initial training requirements of those paragraphs. Equivalent training includes the training that existing employees might have already received from actual, on-site experience.

(f) *Medical surveillance*—(1) *Employees covered.* A medical surveillance program shall be instituted by the employer for:

(i) all employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limits for these substances, without regard to the use of respirators, for 30 days or more a year, or

(ii) all employees who wear a respirator for 30 days or more a year, or

(iii) HAZMAT employees specified in paragraph (1)(4) of this section while engaged in hazardous waste operations covered by this section.

(iv) The employer shall make medical examinations or consultations available to all employees who may have been exposed in an emergency situation to hazardous substances at concentrations above the permissible exposure limits.

(2) *Frequency of medical examinations and consultations.* Medical examinations and consultations shall also be made available by the employer to each employee covered under paragraph (f)(1) of this section on the following schedules:

(i) Prior to assignment or for employees covered on the effective date of this standard as specified in paragraph (p) of this section.

(ii) At least once every twelve months for each employee covered.

(iii) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.

(iv) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards

(v) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(3) *Content of medical examinations and consultations.* (i) Medical examinations required by paragraph (f)(2) of this section shall include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

(ii) The content of medical examinations or consultations made available to employees pursuant to paragraph (f) shall be determined by the examining physician.

(4) *Examination by a physician and costs.* All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(5) *Information provided to the physician.* The employer shall provide the following information to the examining physician:

(i) A copy of this standard and its appendices,

(ii) A description of the employee's duties as they relate to the employee's exposures,

(iii) The employee's exposure levels or anticipated exposure levels,

(iv) A description of any personal protective equipment used or to be used, and

(v) Information from previous medical examinations of the employee which is not readily available to the examining physician.

(6) *Physician's written opinion.* (i) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

(A) The results of the medical examination and tests.

(B) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health.

(C) The physician's recommended limitations upon the employees assigned work.

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposure.

(7) *Recordkeeping.* (i) An accurate record of the medical surveillance required by paragraph (f)(1) of this section shall be retained. This record shall be retained for the period specified and meet the criteria of 29 CFR 1910.20.

(ii) The record required in paragraph (f)(5)(i) of this section shall include at least the following information:

(A) The name and social security number of the employee;

(B) Physicians' written opinions;

(C) Any employee medical complaints related to exposure to hazardous substances;

(D) A copy of the information which shall be provided to the examining physician by the employer, with the exception of the standard and its appendices.

(iii) The employer shall ensure that this record is retained for the period specified in 29 CFR 1910.20.

(g) *Engineering controls, work practices, and personal protective equipment for employee protection*—(1) *Engineering controls, work practices and PPE.* (i) Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits of those hazardous substances regulated by 29 CFR Part 1910, Subpart Z, except to the extent that such controls and practices are not feasible.

Note.—Engineering controls which may be feasible are the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty

operations and locating employees upwind of possible hazards.

(ii) Whenever engineering controls and work practices are not feasible, PPE shall be used to protect employees to reduce exposure to below established permissible exposure limits.

(iii) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits.

(2) *Engineering controls, work practices, and personal protective equipment for substances not regulated in Subpart Z.* An appropriate combination of engineering controls, work practices, and personal protective equipment shall be established to reduce and maintain employee exposure to or below the established permissible exposure limit for hazardous substances not regulated by 29 CFR Part 1910, Subpart Z and health hazards.

(3) *Personal protective equipment selection.* (i) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(ii) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(iii) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used in IDLH conditions.

(iv) Totally-encapsulating chemical protective suits (Level A protection) shall be used in conditions where contact of the skin by the hazardous substance may result in an IDLH situation.

(v) The level of protection provided by PPE selection shall be increased when additional information or site conditions show that increased protection is necessary to reduce employee exposure below established permissible exposure limits for hazardous substance and health hazards. (See Appendix B for guidance on selecting PPE ensembles.)

Note.—The level of protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.

(vi) Personal protective equipment shall be selected and used to meet the requirements of 29 CFR Part 1910, Subpart I, and additional requirements specified in this section.

(4) *Totally-encapsulating chemical protective suits.* (i) Totally-encapsulating suit materials used for Level A protection shall protect employees from the particular hazards which are identified during site characterization and analysis.

(ii) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See Appendix A.)

(iii) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See Appendix A.)

(5) *Personal protective equipment (PPE) program.* A personal protective equipment program shall be established for hazardous waste operations. The PPE program shall address the following elements:

(i) Site hazards,
(ii) PPE selection,
(iii) PPE use,
(iv) Work mission duration,
(v) PPE maintenance and storage,
(vi) PPE decontamination,
(vii) PPE training and proper fitting,
(viii) PPE donning and doffing procedures,
(ix) PPE inspection,
(x) PPE in-use monitoring,
(xi) Evaluation of the effectiveness of the PPE program, and
(xii) Limitations during temperature extremes.

(h) *Monitoring.* (1) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances in order to determine the appropriate level of employee protection needed on site.

(2) As a first step, air monitoring shall be conducted to identify any IDLH and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials.

(3) As a minimum, periodic monitoring shall be conducted when:

(i) Work begins on a different portion of the site.

(ii) Contaminants other than those previously identified are being handled.

(iii) A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)

(iv) Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)

(4) High-risk employees, e.g., those closest to the source of contaminant generation, shall receive personal monitoring sufficient to characterize employee exposure.

(i) *Informational programs*—(1) *General.* As part of the safety and health program required in paragraph (b)(1) of this section, the employer shall develop and implement a site safety and health plan meeting the requirements of paragraph (i)(2) of this section for each hazardous waste operation.

(2) *Site safety and health plan.* The site safety and health plan, which shall be available on the site for inspection by employees, their designated representatives, and OSHA personnel, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.

(i) The site safety and health plan, as a minimum, shall address the following:

(A) Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer.

(B) A safety and health risk analysis for each site task and operation.

(C) Employee training assignments.

(D) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted.

(E) Medical surveillance requirements.

(F) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment to be used.

(G) Site control measures.

(H) Decontamination procedures.

(I) Site's standard operating procedures.

(J) A contingency plan meeting the requirements of paragraphs (1)(1) and (1)(2) of this section for safe and effective responses to emergencies including the necessary PPE and other equipment.

(K) Confined space entry procedures.

(ii) Pre-entry briefings shall be held prior to initiating any site activity and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that it is being followed.

(iii) Inspections shall be conducted by the site safety and health officer or, in the absence of that individual, another individual acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

(j) *Handling drums and containers*—(1) *General.* (i) Drums and containers used during the clean-up shall meet the

appropriate DOT, OSHA, and EPA regulations for the wastes that they contain.

(ii) Drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of inaccessible storage conditions shall be moved to an accessible location and inspected prior to further handling.

(iii) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(iv) Site operations shall be organized to minimize the amount of drum or container movement.

(v) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(vi) U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(vii) Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(viii) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(ix) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of drums or containers.

(x) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(xi) Fire extinguishing equipment meeting the requirements of 29 CFR Part 1910, Subpart L shall be on hand and ready for use to control small fires.

(2) *Opening drums and containers.* The following procedures shall be followed in areas where drums or containers are being opened:

(i) Where an airline respirator system is used, connections to the bank of air cylinders shall be protected from contamination and the entire system shall be protected from physical damage.

(ii) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(iii) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(iv) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(v) Material handling equipment and hand tools shall be of the type to prevent sources of ignition.

(vi) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(vii) Employees shall not stand upon or work from drums or containers.

(3) *Electrical material handling equipment.* Electrical material handling equipment used to transfer drums and containers shall:

(i) Be positioned and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers, or

(ii) Meet the requirements of 29 CFR 1910.307 and be of the appropriate electrical classification for the materials being handled.

(4) *Radioactive wastes.* Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) *Shock sensitive wastes.*

Caution: Shipping of shock sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Employers and their shippers should refer to 49 CFR 173.21 and 173.50.

As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(i) All non-essential employees shall be evacuated from the area of transfer.

(ii) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(iii) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(iv) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and the site safety officer or command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.

(v) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(vi) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

(6) *Laboratory waste packs.* In addition to the requirements of paragraph (j)(5) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):

(i) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according the hazards of the wastes.

(ii) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) *Sampling drums and containers.* Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) *Shipping and transport.* (i) Drums and containers shall be identified and classified prior to packaging for shipment.

(ii) Drum or container staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport.

(iii) Staging areas shall be provided with adequate access and egress routes.

(iv) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) *Tank and vault procedures.* (i) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(ii) Appropriate tank or vault entry procedures meeting paragraph

(i)(2)(i)(K) of this section shall be followed whenever employees must enter a tank or vault.

(k) *Decontamination.* (1) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(2) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(3) Decontamination shall be performed in areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) All employees leaving a contaminated area shall be appropriately decontaminated; all clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(5) Decontamination procedures shall be monitored by the site safety and health officer to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(6) All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(7) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

(8) Impermeable protective clothing which contacts or is likely to have contacted hazardous substances shall be decontaminated before being removed by the employee.

(9) Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(10) Unauthorized employees shall not remove protective clothing or equipment from change rooms.

(11) Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(12) Where the decontamination procedure indicates a need for showers and change rooms, they shall be provided and meet the requirements of 29 CFR 1910.141.

(l) *Emergency response*—(1) *General.* (i) An emergency response plan shall be developed and implemented to handle anticipated on-site emergencies prior to the commencement of hazardous waste operations. Emergency response activities to all other hazardous waste operations shall follow an emergency response plan meeting the requirements of this section.

(ii) *Elements of an emergency response plan.* The employer shall develop an emergency response plan for on-site and off-site emergencies which shall address, as a minimum, the following:

(A) Pre-emergency planning.

(B) Personnel roles, lines of authority, training, and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination.

(H) Emergency medical treatment and first aid.

(I) Emergency alerting and response procedures.

(J) Critique of response and follow-up.

(K) PPE and emergency equipment.

(2) *On-site emergency response*—(i) *Training.* Training for site emergency response shall be conducted in accordance with paragraph (e) of this section.

(ii) *Procedures for handling site emergency incidents.* (A) In addition to the elements for the emergency response plan required in paragraph (l)(1)(ii) above, the following elements shall be included for site emergency response plans:

(*1*) Site topography, layout, and prevailing weather conditions.

(*2*) Procedures for reporting incidents to local, state, and federal governmental agencies.

(B) The site emergency response plan shall be a separate section of the Site Safety and Health Plan.

(C) The site emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(D) The site emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(E) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(F) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an on-site emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

(G) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the on-site emergency response plan.

(3) *Off-site emergency response*—(i) *Training.* Training for handling emergency responses involving hazardous substances shall be conducted on a monthly basis and shall be at least 24 hours annually. The training shall include as a minimum recognition of hazards, selection, care, and use of personal protective equipment and safe operating procedures to be used at the incident scene.

(ii) *Procedures for handling off-site emergency incidents.* (A) The senior officer responding to an incident involving a hazardous substance or waste shall establish an Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS.

(B) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present.

(C) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in 29 CFR 1910.156(e) when worn while performing fire fighting operations beyond the incipient stage.

(D) Self-contained breathing apparatus shall be worn at all times during emergency operations involving exposure to hazardous substances or health hazards. After October 18, 1988 only positive pressure self-contained respirators shall be used.

(E) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(F) Back-up personnel shall be standing by with equipment ready to

provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also be standing by with medical equipment and transportation capability.

(G) The individual in charge of the ICS shall designate a safety officer, who is knowledgeable in fire fighting or rescue operations and hazardous substance handling procedures, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(H) When activities are judged by the safety officer to be unsafe and/or to involve an imminent danger condition, the safety officer shall have the authority to alter, suspend, or terminate those activities. The safety officer shall immediately inform the individual in charge of the ICS of any actions taken to correct these hazards at an emergency scene.

(I) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(4) *Hazardous materials teams (HAZMAT).* (i) Employees who are members of the HAZMAT team, employees designated by the employer to plug, patch or otherwise temporarily control or stop leaks from containers which hold hazardous substances or health hazards shall be given training in accordance with paragraph (l)(3) of this section that includes the care and use of chemical protective clothing and procedures to be followed when working on leaking drums, containers, tanks, or bulk transport vehicles.

(ii) Members of HAZMAT teams shall receive an annual physical examination by a licensed physician and be provided medical surveillance as required in paragraph (f) of this section.

(iii) Personal protective clothing and equipment to be used by HAZMAT team members shall meet the requirements of paragraph (g) of this section.

(iv) Approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet U.S. Department of Transportation and National Institute for Occupational Safety and Health criteria.

(5) *Post-emergency response operations.* Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards and materials contaminated with them such as contaminated soil or other elements of the natural environment, then such operations shall meet all the requirements of paragraphs (b) through (n) of this section.

(m) *Illumination.* Work areas shall be lighted to not less than the minimum illumination intensities listed in Table H-102.1 while any work is in progress:

TABLE H-102.1.—MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLES

Foot-candles	Area or operations
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors, warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading.
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms
30	First aid stations, infirmaries, and offices.

(n) *Sanitation at temporary workplaces*—(1) *Potable water.* (i) An adequate supply of potable water shall be provided on the site.

(ii) Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.

(iii) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(iv) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) *Nonpotable water.* (i) Outlets for nonpotable water, such as water for industrial or firefighting purposes shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(ii) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

(3) *Toilets facilities.* (i) Toilets shall be provided for employees according to Table H-102.2.

TABLE H-102.2.—TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One
More than 20, fewer than 200	One toilet seat and 1 urinal per 40 employees.
More than 200	One toilet seat and 1 urinal per 50 employees.

(ii) Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.

(iii) Hazardous waste sites, not provided with a sanitary sewer, shall be provided with the following toilet facilities unless prohibited by local codes:

(A) Privies;

(B) Chemical toilets;

(C) Recirculating toilets; or

(D) Combustion toilets.

(iv) The requirements of this paragraph for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(4) *Food handling.* All employees' food service facilities and operations shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

(5) *Temporary sleeping quarters.* When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

(6) *Washing facilities.* The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite, within controlled access work zones and shall be so equipped as to enable employees to remove hazardous substances.

(o) *Certain Operations Conducted under the Resource Conservation and Recovery Act of 1976 (RCRA).* Employers conducting operations specified in paragraph (g)(2)(iii) of this section shall:

(1) Implement a hazard communication program meeting the requirements of 29 CFR 1910.1200;

(2) Implement a medical surveillance program meeting the requirements of paragraph (f) of this section;

(3) Develop and implement a safety and health program for employees involved in hazardous waste operations. The program shall be designed to identify, evaluate and control safety and health hazards and provide for emergency response to their facilities for the purpose of employee protection;

(4) Develop and implement a decontamination procedure in accordance with paragraph (k) of this section, and

(5) Develop and implement a training program for employees involved with hazardous waste operations to enable each employee to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually.

(p) *Start-up dates*—(1) *Training and medical provisions.* Initial training and medical surveillance as specified by paragraph (e) and (f) of this section shall be commenced on the effective date of this standard, and be fully implemented as soon as possible but no later than March 16, 1987. Employees may continue in their work assignments until March 16, 1987 though training and medical examinations have not been completed so long as all feasible training and examinations have been completed.

(2) *Safety and health program.* The employer shall develop and implement a safety and health program as required by paragraph (b)(1) of this section as soon as is feasible and have it completed and implemented no later than March 16, 1987.

(3) *Engineering controls, work practices, and personal protective equipment.* (i) The engineering controls, work practices and personal protective equipment required by paragraph (g)(2) of this section shall be implemented as soon as feasible and implementation shall be completed no later than March 16, 1987.

(ii) The engineering controls, work practices and personal protective equipment required by paragraph (g)(1) of this section are existing requirements of other OSHA standards and continues to be required from the effective date of this standard.

(4) *Site safety and health plan.* The site safety and health plan required by paragraph (i)(2) of this section shall be completed as soon as feasible but no later than February 16, 1987.

(5) *Certain operations conducted under RCRA.* The requirements specified by paragraph (o) of this section shall be instituted by March 16, 1987.

(6) *Other requirements.* Requirements of this standard which do not have a separate start-up date and have not been required by other OSHA standards shall be carried out from the effective date of this standard.

(7) *New operations.* Operations covered by this section which are started after March 16, 1987, shall be in compliance with this section from the start of their operation.

Appendices to § 1910.120—Hazardous Waste Operations and Emergency Response

Note.—The following appendices serve as non-mandatory guidelines to assist employees and employers in complying with the appropriate requirements of this section.

Appendix A—Personal Protective Equipment Test Methods

This appendix sets forth the non-mandatory examples of tests which may be used to evaluate compliance with paragraphs 1910.120(g)(4) (ii) and (iii). Other tests and other challenge agents may be used to evaluate compliance.

A. Fully-Encapsulated Suit Pressure Test

1.0—Scope

1.1 This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a total-encapsulating chemical protective suit to be evaluated.

1.2 Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

2.0—Description of Terms

2.1 Totally-encapsulated chemical protective suit (TECP suit)—A full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

2.2 Protective clothing material—Any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

2.3 "Gas tight"—for the purpose of this practice the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

2.4 "Shall"—This term indicates a mandatory requirement.

2.5 "Should"—This term indicates a recommendation or that which is advised but not required.

2.6 "May"—This term is used to state a permissive use or an alternative method to a specific requirement.

3.0—Summary of Practice

3.1 The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pre-test suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the tests and is removed from service. After leak location and repair the test is repeated.

4.0—Required Supplies

4.1 Source of compressed air.

4.2 Test apparatus for suit testing including a pressure measurement device with a sensitivity of at least ¼ inch water gauge.

4.3 Vent valve closure plugs or sealing tape.

4.4 Soapy water solution and soft brush.

4.5 Stop watch or appropriate timing device.

5.0—Safety Precautions

5.1 Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

8.0—Test Procedure

6.1 Prior to each test, the tester shall perform a visual inspection of the suit. Check the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

6.1.1 Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or face piece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

6.1.2 Close all closure assemblies.

6.1.3 Prepare the suit for inflation by providing an improvised connection point or the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted with another component removed to permit a complete tests of the ensemble.

6.1.4 The pre-test expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer but in no case shall they be less than; A=3 inches water gauge and B=2 inches water gauge. The ending suit pressure (C) shall be no less than 80% (⅘) of the test pressure (B); i.e., the pressure drop shall not exceed 20% (⅕) of the test pressure (B).

6.1.5 Inflate the suit until the pressure inside is equal to pressure "A", the pre-test expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure "B", the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure "C," the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure (B−C) shall be defined as the suit pressure drop.

6.1.6 If the suit pressure drop is more than 20 percent (⅕) of the suit test pressure B during the three minute test period, the suit fails the test and shall be removed from service.

7.0—Retest Procedure

7.1 If the suit fails the test check for leaks by inflating the suit to pressure A and brushing or wiping the entire suit (including

seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

7.2 Retest the TECP suit as outlined in Test procedure 6.0.

8.0—Report

8.1 Each TECP suit tested by this practice shall have the following information recorded.

8.1.1 Unique identification number identifying brand name, date of purchase, material of construction, and unique fit features; e.g., special breathing apparatus.

8.1.2 The actual values for test pressures, A, B, and C shall be recorded along with the specific observation times. If the ending pressure (C) is less than 80% of the test pressure (B) the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

8.1.3 The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

8.1.4 Records shall be kept for each pressure test even if repairs are being made at the test location.

Caution

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

B. Fully-Encapsulated Suit Qualitative Leak Test

1.0—Scope

1.1 This practice semi-qualitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

1.2 Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method.

2.0—Description of Terms

2.1 Totally-encapsulated chemical protective suit (TECP suit)—A full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

2.2 Protective clothing material—Any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

2.3 "Gas tight"—for the purpose of this practice the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

2.4 "Shall"—This term indicates a mandatory requirement.

2.5 "Should"—This term indicates a recommendation or that which is advised but not required.

2.6 "May"—This term is used to state a permissive use or an alternative method to a specific requirement.

2.7 Intrusion Coefficient—A number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient the greater the protection provided by the TECP suit.

3.0—Summary of Recommended Practice

3.1 The volume of ammonia solution required to generate the test atmosphere is determined using the directions outlined in 6.1. The suit is donned by a person wearing the appropriate respiratory equipment (normally a self-contained breathing apparatus) and worn inside the enclosed test room. The ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured using a high range ammonia length of stain detector tube. When the ammonia reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-by person is required to observe the test individual during the test procedure, aid the person in donning and doffing the TECP suit and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric indicator strip of bromophenol blue is placed on the inside of the suit face piece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual should leave the test room immediately.

4.0—Required Supplies

4.1 A supply of concentrated ammonia (58 percent ammonium hydroxide by weight).

4.2 A supply of bromophenol/blue indicating paper, sensitive to 5–10 ppm ammonia or greater over a two-minute period of exposure.

4.3 A supply of high range (0.5–10 volume percent) and low range (5–700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

4.4 A plastic pan (PVC) at least 12" .14":1" and a half pint plastic container (PVC) with tightly closing lid.

4.5 Volumetric measuring device of at least 50 milliliters in volume with an accuracy of at least ±1 milliliters.

5.0—Safety Precautions

5.1 Concentrated ammonia is a corrosive volatile liquid requiring eye, skin, and respiratory protection.

5.2 Since the threshold limit value for ammonia is 25 ppm, only persons wearing the appropriate respirator protection shall be in the chamber. Normally only the person wearing the total-encapsulating suit will be inside the chamber. A stand-by person shall have a self-contained breathing apparatus, or equivalent breathing apparatus, available to enter the test area should the suited individual need assistance.

5.3 A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

5.4 The test room shall be large enough to allow the exercise protocol to be carried out and ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

5.5 Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

6.0—Test Procedure

6.1.1 Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of ammonia per cubic foot of test area volume to determine the approximate volume of ammonia required to generate 1000 ppm in the test area.

6.1.2 Measure this volume from the supply of concentrated ammonia and place it into a closed plastic container.

6.1.3 Place the jar, several high range ammonia detector tubes and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

6.2.1 In a non-contaminated atmosphere, open a presealed ammonia indicator strip and fasten one end of the strip to the inside of suit face shield lens where it can be seen by the wearer. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

6.2.2 If problems are encountered with this method of attachment the indicator strip can be attached to the outside of the respirator face piece being used during the test, assuming the face piece is worn within the TECP suit.

6.3 Don the respiratory protective device normally used with the suit; and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. DO NOT, however, plug off any venting valves.

6.4 Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

6.5 Open the container with the pre-measured volume of ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of ammonia.

6.6 After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

6.7 To test the integrity of the suit the following four minute exercise protocol should be followed:

6.7.1 Raising the arms above the head with at least 15 raising motions completed in one minute.

6.7.2 Walking in place for one minute with at least 15 raising motions of each leg in a one-minute period.

6.7.3 Touching the toes with a least 10 complete motions of the arms from above the head to touching of the toes in a one-minute period.

6.7.4 Deep knee bends with at least 10 complete standing and squatting motions in a one-minute period.

6.8 At any time during the test should the colorimetric indicating paper change colors the test should be stopped and section 6.10 and 6.12 initiated.

6.9 After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

6.10 Exit the test area.

6.11 The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

6.12 After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

6.13 The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the ammonia gas.

6.14 Any detectable ammonia in the suit interior (5 ppm NH_3 or more for the length of stain detector tube) indicates the suit fails the test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass fail criteria.

6.15 By following this practice an intrusion coefficient of approximately 200 or more can be measured with the suit in a completely operational condition.

7.0—Retest Procedures

7.1 If the suit fails this test check for leaks by following the pressure test in test A above.

7.2 Retest the TECP suit as outlined in the test procedure 6.0.

8.0—Report

8.1 Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

8.1.1 Unique identification number identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

8.1.2 General description of test room used for test.

8.1.3 Brand name and purchase date of ammonia detector strips.

8.1.4 Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

8.1.5 Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

8.2 The evaluation of the data shall be specified as "suit passed" or "suit failed" and the date of the test. Any detectable ammonia (5 ppm or greater for the length of stain detector tube) in the suit interior indicates the suit fails this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass fail criteria.

Caution

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

Appendix B—General Description and Discussion of the Levels of Protection and Protective Gear

This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE *materials* (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations, or the exposure after breakthrough must not pose a hazardous level.

Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, in relation to the employee's tasks must be considered. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and re-selection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

Part A. Personal protective equipment has been divided into four categories based on the degree of protection afforded and are as follows (See Part B of this appendix for further explanation of Levels A, B, C, and D hazards):

I. *Level A*—To be selected when the greatest level of skin, respiratory, and eye protection is required.

Level A equipment; used as appropriate

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA), or pressure-demand supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

2. Totally-encapsulating chemical-protective suit.

3. Coveralls.*

4. Long underwear.*

5. Gloves, outer, chemical-resistant.

6. Gloves, inner, chemical-resistant.

7. Boots, chemical-resistant, steel toe and shank.

8. Hard hat (under suit)*

9. Disposable protective suit, gloves and boots (Depending on suit construction, may be worn over totally-encapsulating suit).

10. Two-way radios (worn inside encapsulating suit).

*Optional, as applicable.

II. *Level B*—The highest level of respiratory protection is necessary but a lesser level of skin protection is needed.

Level B equipment; used as appropriate

1. Pressure-demand, full-facepiece self-contained breathing apparatus (SCBA), or pressure-demand supplied air respirator with escape SCBA (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*.
4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical-resistant steel toe and shank.
7. Boot-covers, outer, chemical-resistant (disposable)*.
8. Hard hat.
9. Two-way radios (worn inside encapsulating suit).
10. Face shield.*

*Optional, as applicable.

III. *Level C*—The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met.

Level C equipment; used as appropriate

1. Full-face or half-mask, air purifying, canisterequipped respirators (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*.
4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots (outer), chemical-resistant steel toe and shank*.
7. Boot-covers, outer, chemical-resistant (disposable)*.
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing).
11. Face shield*

*Optional, as applicable.

IV. *Level D*—A work uniform affording minimal protection: used for nuisance contamination only.

Level D equipment; used as appropriate

1. Coveralls.
2. Gloves*
3. Boots/shoes, chemical-resistant steel toe and shank.
4. Boots, outer, chemical-resistant (disposable)*.
5. Safety glasses or chemical splash goggles*.
6. Hard hat.
7. Escape mask*.
8. Face shield*.

*Optional, as applicable.

Part B. The types of hazards for which levels A, B, C, and D protection are appropriate are described below:

I. Level A—Level A protection should be used when:

1. The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin.
2. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible, or
3. Operations must be conducted in confined, poorly ventilated areas and the absence of conditions requiring Level A have not yet been determined.

II. Level B protection should be used when:

1. The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection.

Note.—This involves atmospheres with IDLH concentrations of specific substances that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

2. The atmosphere contains less than 19.5 percent oxygen, or
3. The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

III. Level C protection should be used when:

1. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin,
2. The types of air contaminants have been identified, concentrations measured, and a canister respirator is available that can remove the contaminants, and
3. All criteria for the use of air-purifying respirators are met.

IV. Level D protection should be used when:

1. The atmosphere contains no known hazard, and
2. Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note.—As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

Appendix C—Compliance Guidelines

1. *Occupational Safety and Health Program.* Each hazardous waste site clean-up effort will require a site specific occupational safety and health program headed by the site coordinator or the employer's representative. The program will be designed for the protection of employees at the site. The program will need to be developed before work begins on the site and implemented as work proceeds. The program is to facilitate coordination and communication among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees, who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator.

Each site safety and health program will need to include the following: (1) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health officer or manager and staff; (2) means or methods for the development of procedures for identifying and controlling workplace hazards at the site; (3) means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors; (4) the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner; (5) means to anticipate and prepare for emergency situations and; (6) information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

Accidents on the site should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site activities is also a feedback mechanism that needs to be used effectively to improve the program and may serve in part as an evaluative tool(s).

2. *Training.* The employer is encouraged to utilize those training programs that have been recognized by the National Institute of Environmental Health Sciences through its training grants program. These training and educational programs are being developed for the employees who work directly with hazardous substances. For further information about these programs contact: National Institute of Environmental Health Sciences, P.O. Box 12233, Research Triangle Park, NC 27709.

Training programs for emergency service organizations are available from the U.S. National Fire Academy, Emittsburg, MD and the various state fire training schools. The

International Society of Fire Service Instructors, Ashland, MA is another resource.

3. *Decontamination.* Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in Appendix D may be used for guidance in establishing an effective decontamination program.

4. Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These district and state plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. In addition, the CAER program of the Chemical Manufacturers' Association (CMA) is another helpful resource in formulating an effective emergency response plan. Also the current Emergency Response Guidebook from the U.S. Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook should be used as resources as well.

Appendix D—References to Appendix

The following references to the Appendix may be consulted for further information on the subject of this notice:

1. OSHA Instruction DFO CPL 2.70—January 29, 1986, *Special Emphasis Program: Hazardous Waste Sites.*

2. OSHA Instruction DFO CPL 2-2.37A—January 29, 1986, *Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*

3. OSHA Instruction DTS CPL 2.74—January 29, 1986, *Hazardous Waste Activity Form, OSHA 175.*

4. *Hazardous Waste Inspections Reference Manual,* U.S. Department of Labor, Occupational Safety and Health Administration, 1986.

5. Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency, *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies,* December 18, 1980.

6. *National Priorities List,* 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

7. *The Decontamination of Response Personnel,* Field Standard Operating Procedures (F.S.O.P.) 7; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

8. *Preparation of a Site Safety Plan,* Field Standard Operating Procedures (F.S.O.P.) 9; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

9. *Standard Operating Safety Guidelines;* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

10. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,* National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

11. *Protecting Health and Safety at Hazardous Waste Sites: An Overview,* U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

12. *Hazardous Waste Sites and Hazardous Substance Emergencies,* NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

13. *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide;* U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

14. *Fire Service Emergency Management Handbook,* Federal Emergency Management Agency, Washington, DC, January 1985.

15. *Emergency Response Guidebook,* U.S. Department of Transportation, Washington, DC, 1983.

[FR Doc. 86-28471 Filed 12-16-86; 12:57 am]

BILLING CODE 4510-26-M

KEY CORRECTIVE ACTION
TECHNICAL GUIDANCE DOCUMENTS

Activity	RCRA	CERCLA
Interim Measures	RCRA Sec. 3008(h) Corrective Action Interim Measures, draft, 1/86	
Investigations - Release/Problem Characterization	Corrective Action Plan, (CAP), interim final, 11/86	Guidance on Remedial Investigation Under CERCLA, final 6/85
	RCRA Facility Investigation (RFI) Guidance, draft final, 10/86	User's Guide to the Contract Laboratory Program final, 10/84
	Test Methods for Evaluating Solid Wastes/EPA/SW-846, final	Field Standard Operating Procedures (SOP) Manual, #s 4, 6, 7, 8, 9, final, 1985
	RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, final, 10/86	Data Quality Objectives (DQO) Development Workbook for Remedial Investigation/Feasibility Study Activities, draft, 7/86
	Alternative Concentration Limit (ACL) Guidance based on 264.94(b) Criteria draft, 12/86	Chemical, physical and Biological Properties of Compounds Present at Hazardous Waste Sites, draft, 10/85
		Endangerment Assessment Handbook, draft, 8/85

Activity	RCRA	CERCLA
Analysis and selection of Corrective Measures	Corrective Action Plan (CAP interim final, 11/86	Guidance of Feasibility Studies Under CERCLA, final 6/85 Superfund Public Health Evaluation Manual, final, 10/86 Guidance on Remedial Actions for Ground Water at Superfund Sites, draft, 12/85
Corrective Measures Implementation	Corrective Action Plan (CAP), interim final, 11/86 Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, final, 7/86	Superfund Remedial Design and Remedial Action (RD/RA) Guidance, 2/85

TECHNICAL GUIDANCE DOCUMENTS: INTERIM MEASURES

RCRA

- RCRA Sec. 3008(h) Corrective Action Interim Measures, draft, 1/86

CERCLA

TECHNICAL GUIDANCE DOCUMENTS: CORRECTIVE MEASURES IMPLEMENTATION

RCRA

- Corrective Action Plan (CAP) interim final, 11/86
- Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, final, 7/86

CERCLA

- Superfund Remedial Design and Remedial Action (RD/RA) Guidance, 2/85

TECHNICAL GUIDANCE DOCUMENTS: ANALYSIS AND SELECTION OF CORRECTIVE MEASURES

RCRA

- Corrective Action Plan (CAP) interim final, 11/86

CERCLA

- Guidance of Feasibility Studies Under CERCLA, final 6/85
- Superfund Public Health Evaluation Manual, final, October 1986
- Guidance on Remedial Actions for Ground Water at Superfund Sites, draft

TECHNICAL GUIDANCE DOCUMENTS: INVESTIGATIONS, RELEASE/PROBLEM CHARACTERIZATION

RCRA

- Corrective Action Plan, (CAP), Interim Final, 11/86
- RCRA Facility Investigation (RFI) Guidance, draft final, 10/86
- Test Methods for Evaluating Solid Wastes/EPA/SW-846, final
- RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, final, 10/86
- Alternative Concentration Limit (ACL) Guidance based on 264.94(b) Criteria draft, 12/86

CERCLA

- Guidance on Remedial Investigations Under CERCLA, final 6/85
- User's Guide to the Contract Laboratory Program final, 10/84
- Field Standard Operating Procedures (SOP) Manual, #s 4, 6, 7, 8, 9, final, 1985
- Data Quality Objectives (DQO) Development Workbook for Remedial Investigation/Feasibility Study Activities, draft, 7/86
- Chemical, Physical and Biological Properties of Compounds Present at Hazardous Waste Sites, draft, 10/85
- Endangerment Assessment Handbook, draft, 8/85

GUIDANCE DOCUMENTS RELATED TO CORRECTIVE ACTION**

RCRA Guidance Documents

Corrective Action Plan; Interim final, OWPE/OSW, November 1986

-- Provides Agency guidance for developing section 3008(h) corrective action orders and corrective action requirements in permit applications and permits in sections 3004(u) and (v). The Corrective Action Plan (CAP) provides a technical framework during corrective action orders and corrective action permit requirements. The CAP provides a model for developing site-specific compliance schedules for corrective action orders by laying out scopes of work for the three phases of a complete corrective action program: the RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI).

RCRA Section 3008(h) Corrective Action Interim Measures: draft, OWPE; January 1986

-- Reviews response actions available under section 3008(h) to quickly address immediate corrective action problems while other detailed analyses and investigations occur concurrently. Describes implementation strategy, decision criteria, and process-specific measures that can be taken. The strategy also provides interim measures language to include in corrective action orders.

Interim Measures Guidance; draft; OWPE; May 1986

-- Provides guidance to Regional/State staff on (1) how to identify situations requiring immediate response to mitigate a threat to human health and environment consistent with the long-term solution at the facility and (2) the actions the owner/operator must take.

Guidance on Facility Management Planning; draft; OSW; April 26, 1985

-- Provides guidance to the Regions and Statesin developing facility management plans and strategies. Provides guidance on initial facility screening, framework for a FMP, and a Facility Management Strategy.

RCRA Facility Investigation (RFI) Guidance; draft; OSW; October 1986

-- Provides detailed guidance to owner/operators for performing an RFI. This document identifies the critical steps, describes methods and addresses information requirements. It describes how to prepare an RFI plan; strategy for characterizing releases; QA/QC procedures; data presentation; health and safety; and media-specific investigation techniques.

**Note: This is not a complete listing of the Agency guidance which may be relevant to the corrective action process. A number of documents are presently under development and have not been included.

RCRA Facility Assessment (RFA) Guidance; OSW; October 1986

-- Provides guidance to Regional/State staff on how to conduct an RFA. It focuses on: identifying releases requiring further action; screening SWMUs for further investigation; collecting initial data on contamination levels; and media specific investigation techniques.

RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD); final; EPA/OWPE; September 1986

-- Provides guidance on data collection and well spacing and design for detection and assessment monitoring at Interim Status facilities. This guidance should be consulted in both the RCRA Facility Investigation and Corrective Measure stages of the RFI/CMS.

Construction Quality Assurance for Hazardous Waste Land Disposal Facilities; EPA/530-SW-85-031; July 1986

-- Public guidance on construction quality assurance for hazardous waste landfills, surface impoundments, and wastepiles.

Alternative Concentration Limit (ACL) Guidance; draft; OSW; December 1986

-- Provides guidance to owner/operators on how to develop the variance application for an Alternate Concentration Limit in ground water cleanups. It addresses data collection and analysis, exposure assessment and other issues that are necessary to support the variance application.

Preamble to Closure Conforming Changes Final Rule -- 40 CFR 265.228; draft; OSW; currently in OMB review

-- This rule amends the closure options for owner/operators of interim status surface impoundments. Formerly, owner/operators could close a surface impoundment as a storage unit and leave some waste in the unit if they could demonstrate that the constituents were no longer hazardous under Part 261. Under the conforming change, owner/operators of interim status surface impoundments must either clean close or close as a land disposal unit.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods; OSWER; SW-846; July 1982

-- Provides procedures that should be used to determine whether a waste is a hazardous waste as defined by 40 CFR Part 261.

Chemical, Physical and Biological Properties of Compounds Present at Hazardous Waste Sites; EPA/OWPE; September 1985

-- Provides detailed technical information on the physical and toxicological properties of a wide range of chemicals. Such information should be included in the RCRA Facility Investigation and should be used in developing Corrective Measures.

Methods for Chemical Analysis of Water and Waste, EPA/600/4-79-020; March 1979

-- Provides test procedures for monitoring waste discharge water supplies, and ambient waters.

Toxicology Handbook -- Principles Related to Hazardous Waste Site Investigations; EPA/OWPE; August 1985

-- Discusses toxicological principles. Intended as an aid for non-toxicologists.

Proposed Amendments for Landfill, Surface Impoundments and Waste Pile Closures (Hybrid Closure); draft; OSW; currently in OMB review

-- Will provide new standards for land disposal unit closure and may provide a model for source removal under corrective action. The proposed approach outlines the criteria which would enable owner/operators, under some narrowly defined conditions, to leave limited quantities of hazardous waste in the unit provided that such waste does not pose a threat to human health and the environment. This approach would also allow some owner/operators to obtain variances from the existing land disposal closure standards such as cover requirements.

Guidance on Public Involvement in the RCRA Permitting Program; draft; OSW; March 1986

-- Provides guidance on public involvement during permit modification. Corrective measure selection will probably require a major permit modification and necessitate public participation

National RCRA Corrective Action Strategy; draft; OWPE and OSW; October 1986

-- Outlines Agency's overall approach for implementing the new corrective action provisions 3004(u), 3004(v), and 3008(h). The document discusses the basic authorities for requiring corrective actions under permits and enforcement orders, processes that will be used to investigate facilities and select corrective measures, strategies for compelling owner/operators to take corrective action, and the role of the states.

Final Codification Rule; 50 Federal Register 28702, July 15, 1985

-- The rule amends existing hazardous waste regulations to reflect those statutory provisions of HSWA that have immediate or short-term effects on the regulated community. The rule also adds Part 280 to incorporate the interim requirements for underground storage tanks under new section 9003(g) of HSWA.

Proposed Codification Rule; 51 Federal Register 10706, March 28, 1986

-- This rule is a companion rule to the Final Codification Rule. It includes provisions to implement the statutory requirement for double-liners and corrective action beyond the facility property boundary.

RSI #3: Agency Interpretation of Section 3004(u): Corrective Action for Continuing Releases; draft; OSWER; January 1985

-- Provides statutory interpretation of the 3004(u) authority. It describes the types of information Regions/States should request from the owner/operator on SWMUs and potential releases at facilities subject to corrective action. The owner/operator response includes identification of SWMUs and their characteristics at RCRA facilities.

Interpretation of Section 3008(h) of the Solid Waste Disposal Act; OWPE; December 1985

-- This policy guidance discusses statutory authority, relationship to permitting authority, and appropriate guidance documents. It generally explains provisions of the statute.

Issuance of Administrative Orders Under Section 3013 of the Resource Conservation and Recovery Act; OSWER & OECM; September 1984

-- This memo provides guidance on the use of 3013 orders, the statutory authority to require owner/operators to perform certain studies and investigations. This memo addresses delegation of authority, criteria for issuing an order, determination of the appropriate respondent, elements of the order, review and discussion of the owner/operatoirs proposal, oversight, and enforcement. Model orders are attached as appendices.

Final Revised Guidance Memorandum on the Use and Issuance of Administrative Orders under Section 7003 of RCRA; final, OECM, September 1984

-- Memorandum provides guidance to assist Regional offices in developing and issuing Administrative Orders under RCRA section 7003. Memorandum describes the scope of section 7003, decision criteria for selecting an enforcement option, elements of an Administrative Order, Conference procedures, modification, revocation, or stay of the Order, negotiation of Orders, and delegation of authority. In addition, the memorandum provides a sample state notification letter.

CERCLA Guidance Documents

Guidance on Remedial Investigations Under CERCLA; OERR & OWPE; May 1985

-- Provides detailed guidance on the information that should be collected in performing a CERCLA Remedial Investigation. This document can be consulted in performing the investigation portion of the RFI/CMS since most of the RCRA Facility Investigation data needs are identical to those in CERCLA.

Superfund Exposure Assessment Manual; draft; _____; January 1986

-- Outlines a framework for a comprehensive, consistent, and appropriate assessment of human exposure to contaminants from uncontrolled hazardous waste sites. Provides an integrated methodology for assessing human population exposure based on the three major component analyses required for such assessment: (1) analysis of toxic contaminants released from a site, (2) determination of the environmental fate of such contaminants, and (3) evaluation of the nature and magnitude of human population exposure to toxic contaminants.

Site Inspection Sampling Strategy for Supporting HRS Scoring; under development; draft; OSWER; January 1986

-- This document guides the Site Inspection (SI) team in developing a sampling plan that leads to an appropriate HRS score for the site. The goal is to provide field staff with a framework of logic for developing a sampling plan which will provide the data and analysis needed to support the HRS.

Uncontrolled Hazardous Waste Site Ranking System: A User's Manual; 50 Federal Register 5910, February 12, 1985

-- This document describes the Hazardous Ranking System (HRS), the instrument for evaluating a site's relative potential to threaten human health and the environment. It also provides detailed instructions for using the HRS.

Field Standard Operating Procedures (FSOP)

-- Provides guidance in a cookbook format for various field activities. The procedures are described in the following manuals: FSOP #4 -- Site Entry (January 1985); FSOP #7 -- Decontamination of Response Personnel (January 1985); FSOP #8 -- Air Surveillance (January 1985); FSOP #6 -- Work Zones (April 1985); and FSOP #9 -- Site Safety Plan (April 1985).

Quality Assurance/Field Operations Methods Manual; _____; _____;

-- Provides Remedial Project Managers (RPMs), quality assurance officers, and States with a consolidated reference of all REM field procedures. This manual also promotes consistent field procedures among all ten EPA Regions.

Occupational Safety and Health Technical Assistance and Enforcement Guidelines for Superfund; _____; March 1984

-- Provides direction for OSHA field staff who may conduct enforcement activities or provide technical assistance at hazardous waste sites.

Guidance on Feasibility Studies Under CERCLA; OERR & OWPE; April 1985

-- Provides a framework for developing, screening, and selecting a remedial action under CERCLA. Most of the techniques described are appropriate for the development, screening, and selection of RCRA Corrective Measures. However, the management and policy objectives presented in the document (i.e., fulfilling the requirements of the CERCLA National Contingency Plan) are not appropriate to RCRA and should be omitted from the Corrective Measure decisionmaking framework.

Modeling Remedial Actions at Uncontrolled Hazardous Waste Sites; _____; _____;

-- Provides guidance on the selection and use of models for the purpose of evaluating the effectiveness of remedial actions at uncontrolled hazardous waste sites. Provides regulatory officials with guidelines for incorporating models into the remedial action planning at Federal and State Superfund sites.

Guidance Document for Cleanup of Surface Tank and Drum Sites; _____; May 1985

-- This manual provides guidance on carrying out concurrent remedial planning activities and accelerating project implementation for the cleanup of surface tanks and drums containing hazardous waste.

Guidance Document for Cleanup of Surface Impoundment Sites; _____; June 1986

-- Provides detailed guidance for conducting a limited remedial investigation and a limited feasibility study for the purpose of selecting appropriate remedial actions at NPL sites with one or more surface impoundments of hazardous waste.

Slurry Trench Construction for Pollution Migration Control; EPA/540/2-84/001; February 1984

-- Provides in-depth guidance on the use of slurry walls for the control of subsurface pollutants.

Leachate Plume Management; EPA/540/2-85/004; November 1986

-- Provides an overview of the fundamental concepts, procedures and technologies used in leachate plume management. Plume generation dynamics and delineation are discussed, plume control technologies are evaluated, and selection criteria for site applications are defined.

Mobile Treatment Technologies for Superfund Wastes, EPA/540/2-86/003(f); September 1986

- Provides background information on mobile units providing thermal, chemical, physical, or biological on-site treatment (including immobilization). Discusses planning considerations and data requirements in system use.

Policy on Flood Plains and Wetlands Assessment; _____; August 1985

-- Discusses situations that require preparation of a flood plains or wetlands assessment, and the factors that should be considered in preparing an assessment for CERCLA response actions.

Data Quality Objectives (DQO) Development Workbook for RI/FS Activities; draft; OERR; July 1986

-- Describes the four data quality levels used in sampling and analysis activities performed under CERCLA and the criteria used to determine which level is appropriate. The four levels range from field procedures to very rigorous laboratory protocols.

User's Guide to the Contract Laboratory Program; OERR; October 1984

-- Outlines requirements and analytical procedures for CLP protocols and procedures for sample handling under CERCLA.

Endangerment Assessment Handbook; EPA/OWPE; August 1985

-- Provides guidance on developing a CERCLA (or RCRA 7003) Endangerment Assessment. The information presented might be useful in assessing health and environmental effects in the RFI/CMS.

Superfund Public Health Evaluation Manual; OERR; October 1986

-- Provides guidance on methods for public health evaluations that are conducted as part of EPAs feasibility study process at CERCLA sites. The manual specifically supports chapter 5 of the Guidance for Feasibility Studies.

Superfund Remedial Design and Remedial Action Guidance; February 1985

-- Provides guidance on developing remedial design and remedial alternative screening and case studies which are largely applicable to the RFI/CMS. The guidance is intended to be consistent with EPA's Ground Water Protection Strategy and with RCRA.

Remedial Action at Waste Disposal Sites (Revised); EPA/625/6-85/006; 1985

-- Provides basic reference material on the design and implementation of remedial action. Although the document is geared towards the CERCLA RI/FS process, most of the material presented is directly applicable to the RCRA Corrective Action Plan.

Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, draft; OERR; October 1986

-- Focuses on key decisions in the development, evaluation, and selection of ground water remedial actions at Superfund sites. An emphasis is placed on policy issues and the decision making process for ground water remedial actions rather than technical issues.

Community Relations in Superfund: A Handbook; draft; OERR; October 1986

-- This document provides guidance for community relations in the Superfund Program. Its primary emphasis is to aid officials in planning and implementing community relations activities. It sets forth policy requirements for coordinating community relations activities at Supefund sites and additional techniques and guidance that can be used to enhance the basic requirements.

Federal-Lead Remedial Project Management Manual; draft; _____; _____

-- Assists EPA Remedial Project Managers (RPMs) in managing Federal-lead remedial response projects by describing procedures for and responsibilities of the RPM during the planning, design, construction, operation and close-out of remedial response projects.

State-Lead Remedial Project Management Manual; draft; _____; _____

-- Assists EPA Remedial Project Managers (RPMs) in managing State-lead remedial response projects. This manual describes the responsibilities of the RPM during the planning, design, construction, operation, and close-out of remedial response projects.

National Contingency Plan (NCP) 40 CFR Part 300

-- Provides the regulatory framework for implementing CERCLA. It outlines the responsibilities and coordination of implementing agencies. It describes regional and local plans and the response and remedial action process for oil and hazardous substances. The NCP was revised in 1985 to streamline the process and make other changes based on experience gained from implementation and to make CERCLA consistent with other pertinent Federal and State standards.

Discharge of Wastewater from CERCLA Sites into POTWs; joint memo from OERR and OWPE to Waste and Water Management Division Directors; _____

-- This memo addresses the concerns and issues unique to POTWs that must be evaluated prior to discharging CERCLA wastewater to a POTW.

Participation of Potentially Responsible Parties in Development of RIs and FSs; OWPE; March 1984

-- This document sets forth policies and procedures governing the participation of PRP's in the development of RI/FS under CERCLA,

including circumstances in which RI/FS may be conducted by PRPs; procedures for notifying PRPs when the Agency has identified target sites for the development of RI/FS; and principles governing PRP participation in Agency-financed RI/FS.

Preparation of Decision Documents for Approving Fund-Financed and PRP Remedial Actions Under CERCLA; OWPE; February 1985

-- Provides Regional offices with guidance for preparing decision documents required for the approval of fund-financed and PRP remedial actions (e.g., a Record of Decision (ROD) which documents the Agency's decision-making process and demonstrates that the requirements of CERCLA and the NCP have been met).

Remedial Action Costing Procedures Manual; _____; September 1985

-- Provides guidance for preparing detailed feasibility cost estimates of alternative remedial actions, and assists project managers and decision makers in developing and evaluating cost estimates for alternative remedial responses to uncontrolled releases of hazardous substances.

Removal Cost Management Manual; _____; January 1985

-- Provides procedures for on-site personnel in performing cost-management activities at Superfund removal sites.

ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF RESEARCH AND DEVELOPMENT

TECHNICAL ASSISTANCE DIRECTORY

Regional Services Staff (RD-674)
Office of Research Program Management
Environmental Protection Agency
Washington, DC 20460
May 1986

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT

Technical Assistance Directory

The Office of Research and Development conducts an Agency-wide integrated program of research and development relevant to pollution sources and control, transport and fate processes, health and ecological effects, measurement and monitoring, and risk assessment. The office rigorously disseminates its scientific and technical knowledge and upon request provides technical reviews, expert consultations, technical assistance and advice to environmental decision makers in the federal, state, and local governments.

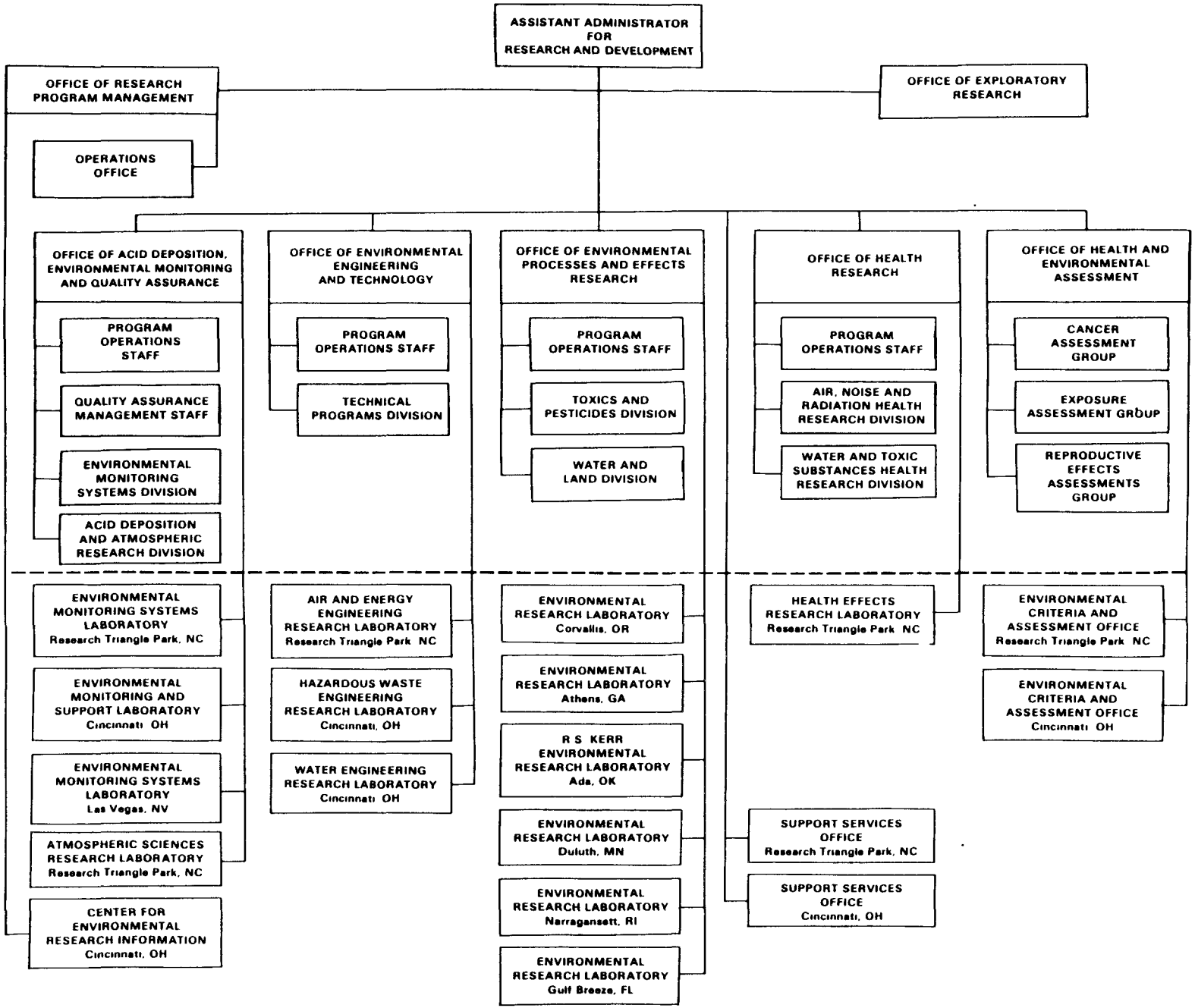
The ORD implements its activities through its Washington, DC headquarters' offices and seventeen associated laboratories and field locations (see organizational chart)

The programs, areas of expertise, and primary contacts in each of the major ORD field operations are conveyed in the following directory. These laboratory information sheets are made available in an effort to improve communication and technology transfer with our ORD client

In addition, information may be obtained from the following operations offices in Washington, DC. ORD publications may be requested from the Center for Environmental Research Information in Cincinnati, OH.

	Commercial	FTS
Office of Health Research	202-382-5900	8-382-5900
Office of Environmental Processes and Effects Research	202-382-5950	8-382-5950
Office of Acid Deposition, Environmental Monitoring and Quality Assurance	202-382-5767	8-382-5767
Office of Health and Environmental Assessment	202-382-7317	8-382-7317
Office of Research Program Management	202-382-7500	8-382-7500
Office of Environmental Engineering and Technology	202-382-2600	8-382-2600
Office of Exploratory Research	202-382-5750	8-382-5750
Center for Environmental Research Information	513-569-7562	8-684-7562

Clients are urged to contact the laboratories directly. If help or coordination is needed to properly access the laboratories' or headquarters' offices, directory assistance can be easily obtained by contacting the Regional Services Staff in Washington, DC on (CML) 202-382-7667 or (FTS) 8-382-7667.


ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT
OFFICE OF RESEARCH PROGRAM MANAGEMENT
OPERATIONS OFFICE
OFFICE OF EXPLORATORY RESEARCH
OFFICE OF ACID DEPOSITION, ENVIRONMENTAL MONITORING AND QUALITY ASSURANCE
PROGRAM OPERATIONS STAFF
QUALITY ASSURANCE MANAGEMENT STAFF
ENVIRONMENTAL MONITORING SYSTEMS DIVISION
ACID DEPOSITION AND ATMOSPHERIC RESEARCH DIVISION
OFFICE OF ENVIRONMENTAL ENGINEERING AND TECHNOLOGY
PROGRAM OPERATIONS STAFF
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OFFICE OF ENVIRONMENTAL PROCESSES AND EFFECTS RESEARCH
PROGRAM OPERATIONS STAFF
TOXICS AND PESTICIDES DIVISION
WATER AND LAND DIVISION
OFFICE OF HEALTH RESEARCH
PROGRAM OPERATIONS STAFF
AIR, NOISE AND RADIATION HEALTH RESEARCH DIVISION
WATER AND TOXIC SUBSTANCES HEALTH RESEARCH DIVISION
OFFICE OF HEALTH AND ENVIRONMENTAL ASSESSMENT
CANCER ASSESSMENT GROUP
EXPOSURE ASSESSMENT GROUP
REPRODUCTIVE EFFECTS ASSESSMENTS GROUP
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY Research Triangle Park, NC
ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY Cincinnati OH
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY Las Vegas, NV
ATMOSPHERIC SCIENCES RESEARCH LABORATORY Research Triangle Park, NC
CENTER FOR ENVIRONMENTAL RESEARCH INFORMATION Cincinnati, OH
AIR AND ENERGY ENGINEERING RESEARCH LABORATORY Research Triangle Park NC
HAZARDOUS WASTE ENGINEERING RESEARCH LABORATORY Cincinnati, OH
WATER ENGINEERING RESEARCH LABORATORY Cincinnati OH
ENVIRONMENTAL RESEARCH LABORATORY Corvallis, OR
ENVIRONMENTAL RESEARCH LABORATORY Athens, GA
R S KERR ENVIRONMENTAL RESEARCH LABORATORY Ada, OK
ENVIRONMENTAL RESEARCH LABORATORY Duluth, MN
ENVIRONMENTAL RESEARCH LABORATORY Narragansett, RI
ENVIRONMENTAL RESEARCH LABORATORY Gulf Breeze, FL
HEALTH EFFECTS RESEARCH LABORATORY Research Triangle Park NC
SUPPORT SERVICES OFFICE Research Triangle Park, NC
SUPPORT SERVICES OFFICE Cincinnati, OH
ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE Research Triangle Park NC
ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE Cincinnati OH

HAZARDOUS WASTE ENGINEERING RESEARCH LABORATORY

Thomas R. Hauser, Director

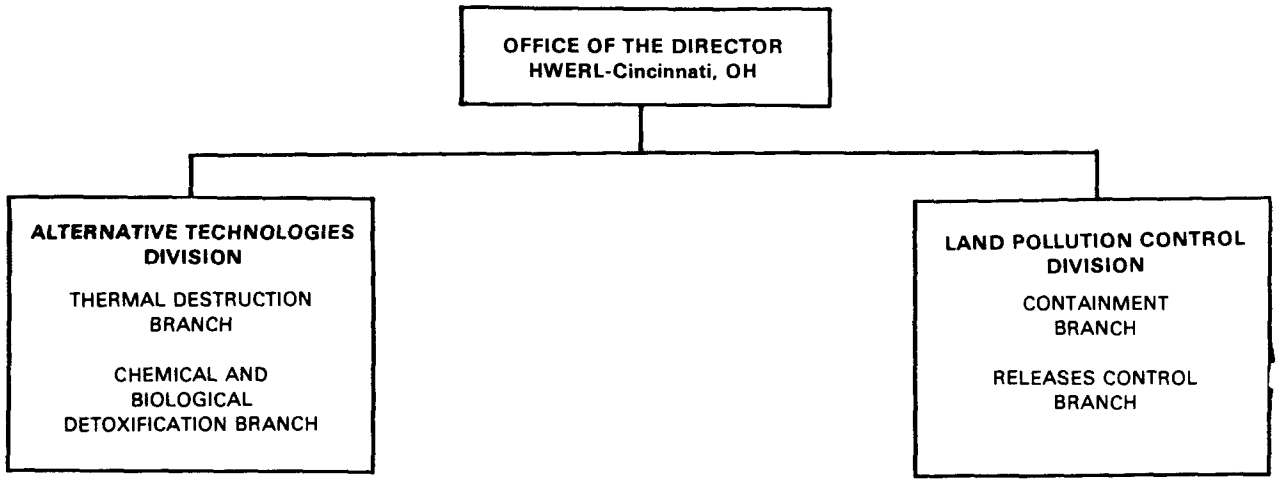
FTS: 684-7418
CML: 513-569-7418

26 W. St. Clair
Cincinnati, OH 45268

The Hazardous Waste Engineering Research Laboratory is responsible for the following major program areas:

HAZARDOUS WASTES Develops techniques for defining and characterizing solid and hazardous wastes, in order to provide reliable bases for regulatory and permitting decisions. Catalyzes advances in the state-of-the-art of solid and hazardous waste treatment and disposal, to encourage early commercialization of improved or lower cost control methods

HAZARDOUS SUBSTANCES (SUPERFUND): Develops techniques for defining and characterizing uncontrolled dump sites and releases of hazardous and other materials (e.g., spills) in order to provide reliable bases for regulatory decisions. Catalyzes advances in the state-of-the-art control of releases from underground storage tanks and containment and clean-up methods for uncontrolled dump sites and spills to encourage early commercialization of improved or lower cost control methods.



HWERL—CINCINNATI AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Thomas R Hauser	7418	Control technology
William A. Cawley	7896	Control technology
ALTERNATIVE TECHNOLOGIES DIVISION		
Clyde J Dial	7528	Control technology
Thermal Destruction Branch		
E Timothy Oppelt	7696	Incineration, treatment of hazardous waste
Donald A. Oberacker	7431	Conventional and "at sea" incineration, disposal of HW in boilers
Robert E. Mournighan	7430	Disposal of HW in kilns, Combustion Research facility
Myron Malanchuk	7881	Non-flame thermal destruction
Harry M. Freeman	7529	Innovative technologies, HW minimization, reuse
C C. Lee	7520	Plasma arc and HW treatment data base, engineering analyses
George Huffman	7881	Thermal destruction mechanisms
Benjamin L. Blaney	7519	Air emissions from treatment, storage and disposal facilities, solvent wastes
Robert A. Olexsey	7717	Hazardous waste treatment technology
Louis H Garcia	7881	Microspray burners
Laurel J Staley	7881	Turbulent flame-reactor and control temperature tower
Ronald J Turner	7775	Hazardous waste treatment, performance evaluations, organic wastes
Douglas W Grosse	2621	Pilot scale hazardous waste treatment, metal wastes
H Paul Warner	7293	Hazardous waste treatment residues, corrosive wastes
Chemical and Biological Detoxification Branch		
Albert J Klee	7493	Operations research and systems analysis
S Garry Howell	7756	Aqueous hazardous wastes, metals removal
Charles J Rogers	7757	In situ treatment of soils, chemical detoxificat Photochemical
Pasquale S Sferra	7774	In situ biological detoxification Vegetative
Brian A Westfall	7755	Pesticide disposal
Edward R Bates	7774	Oil shale
LAND POLLUTION CONTROL DIVISION		
Ronald D Hill	7861	Control technology, mining
Containment Branch		
Norbert B Schomaker	7871	Land disposal, RCRA facilities, municipal solid waste
Donald E Sanning	7875	Uncontrolled waste sites, containment technology, in situ treatment, thermal fusion (vitrification), dioxin
Carlton C Wiles	7795	Impoundments, encapsulation/overpacking, stabilization/fixation, stabilization process, underground mines
Robert E Landreth	7836	Landfill liners, landfill design and operation, pollutant control, flexible membrane liner, compatibility testing

	TELEPHONE*	AREA OF EXPERTISE
Mike H Roulier	7795	Clay liners, waste leaching, pollutant migration
Walter E Grube	7795	Soils chemistry, barriers (slurry walls), bottom sealing, soil liners
Robert Hartley	7838	Covers
Naomi Barkley	7854	Plume management, building and equipment, decontamination
Janet Houthoofd	7863	Waste storage freezing technology, freezing
Steve James	7877	Leachate control and treatment, fugitive dust control, toxic and flammable gases
Jon Herrmann	7839	Permeable treatment walls, electrokinetics
Herbert Pahren	7874	Grouting, grouts
Edward Opatken	7855	Thermoplastics, town gas works sites
Ronald Lewis	7856	Biodegradation
Paul de Percin	7797	Volatile emissions, all monitoring/modeling
Eugene Harris	7862	Mining sites
Douglas Ammon	7876	Remedial action modeling, remedial investigation/feasibility study process, remedial action costs
Mary Ann Curren	7837	Flexible membrane liners
Releases Control Branch Woodbridge Avenue Edison, NJ 08837-3679	201-321-6635**	
Ira Wilder	8-340-6635	Spills, Environmental emergency response unit
Frank Freestone	8-340-6632	Mobile treatment, on-site technology
John S Farlow	8-340-6634	Spills, floating spills, precipitation
Michael Gruenfeld	8-340-6625	Treatment chemistry
Richard Traver	8-340-6631	Flushing, delivery and recovery methods, underwater protective clothing, mobile in-situ containment/treatment system
John Brugger	8-340-6634	Sorption, EPA-developed on-site treatment/control technologies (mobile soil washer, mobile carbon regenerator, etc)
Anthony Tafuri	8-340-6604	Ion exchange, chemical treatment
James Yezzi	8-340-6703	Incineration technology
Mary Stinson	8-340-6683	Commercially developed on-site treatment technologies
Michael Royer	8-340-6633	Protective clothing and equipment, avoidance procedures, personal hazard detection

*FTS 684-xxxx, CML 513-569-xxxx
**Main Commercial Number for Edison, NJ, No FTS number

WATER ENGINEERING RESEARCH LABORATORY

F.T. Mayo, Director

FTS: 684-7951
CML: 513-569-7951

26 W. St. Clair
Cincinnati, OH 45268

The Water Engineering Research Laboratory is responsible for the following major program areas.

WATER QUALITY: Treatment levels for sludge prior to ocean dumping; treatment levels for wastewater discharged through ocean outfalls.

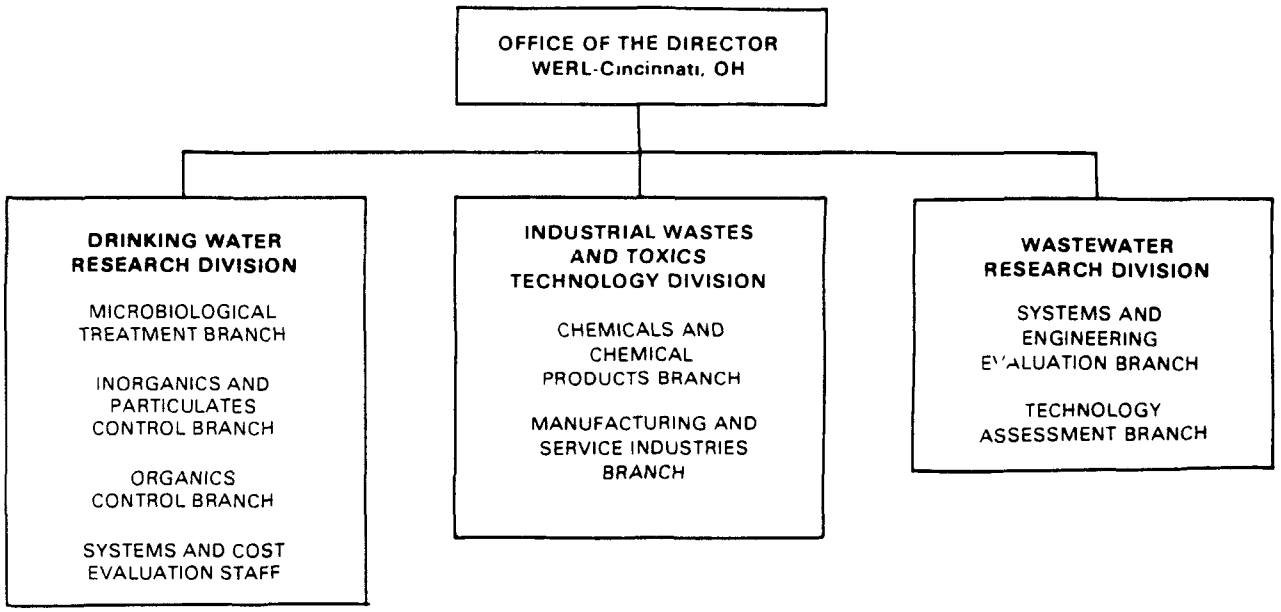
MUNICIPAL WASTEWATER: Innovative and alternative technology; small wastewater flows and information dissemination, sludge processing, conversion, and land application; plant operation, design and upgrading; evaluation of new wastewater treatment processes; toxic pollutant control at POTWs.

INDUSTRIAL WASTEWATER: Evaluation of wastewater treatment methods for water quality standards; development of toxicity reduction protocols and manuals for industries not yet addressed.

DRINKING WATER: Control and removal of physical and chemical contaminants, including organics, inorganics and particulates, prevention of water quality deterioration during storage and distribution; control and prevention of microbiological contaminants, improve water supply and treatment management practices

PESTICIDES: Develop and evaluate protective clothing and equipment for use in preventing pesticide exposure.

TOXICS. Alternatives to mitigate chemical release and exposure; develop predictive capabilities to assess PMNs for new chemicals; assess physical, chemical and biological techniques and devices for genetically engineered organisms, asbestos environmental control measures



WERL—CINCINNATI AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
F T Mayo	7951	Control technology
L W Lefke	7953	Control technology
DRINKING WATER RESEARCH DIVISION		
Robert M Clark	7201	Treatment and system costs
Edwin E Geldreich	7232	Microbiological treatment
Microbiological Treatment Branch		
Gary Logsdon	7345	Filtration and corrosion
John Hoff	7331	Disinfection
Don Reasoner	7234	Home treatment devices
Inorganics and Particulates Control Branch		
Tom Sorg	7370	Inorganics removal and corrosion
Marvin Gardels	7217	Corrosion
Organics Control Branch		
Alan Stevens	7342	Organic chemistry and treatment
Richard Miltner	7403	Organics control engineering
Systems and Cost Evaluation Staff		
Ben Lykins	7460	Cost evaluation, organics field evaluation
INDUSTRIAL WASTE TREATMENT AND TOXICS TECHNOLOGY DIVISION		
Alden G. Christianson	7406	Industrial processes and treatment
Chemicals and Chemical Products Branch		
Clyde Dempsey	7504	Industrial release and prevention
Ken Dostal	7503	Industrial treatment
Dave Watkins	7547	Chemical reactions, wastes
Manufacturing and Service Industries Branch		
Roger C. Wilmoth	7509	Asbestos, mining, industrial treatment
John Burckle	7506	Smelting, Biotech engineering processes
William Cain	7559	Asbestos
S. Jackson Hubbard	7507	Mining
WASTEWATER RESEARCH DIVISION		
John Convery	7601	Wastewater treatment
Lewis Rossman	7603	Optimization theory, water resources planning
Systems and Engineering Branch		
Carl A. Brunner	7655	Wastewater treatment
James Kreissl	7641	Small flows, I and A
Joe Farrell	7645	Municipal sludge treatment and disposal
Jim Ryan	7653	Land disposal (metal, crop, soil interaction)
Richard Brenner	7657	Biological treatment processes
Albert Venosa	7668	Disinfection, microbiology
Frank Evans	7610	Compliance achievement
Technology Assessment Branch		
Fred Bishop	7629	Toxics control, wastewater analysis
Walter Schuk	2828**	Instrumentation
Atal Eralp	2828**	Test and Evaluation Facility

*FTS. 684-xxxx, CML: 513-569-xxxx
**FTS 684-xxxx, CML 513-684-xxxx

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY

John C. Puzak, Acting Director

FTS: 629-2106
CML: 919-541-2106

(MD-75)
Research Triangle Park, NC
27711

The Environmental Monitoring Systems Laboratory is responsible for the following program areas.

METHODS DEVELOPMENT. Develop and improve monitoring systems for measuring air pollutants in ambient air and stationary sources

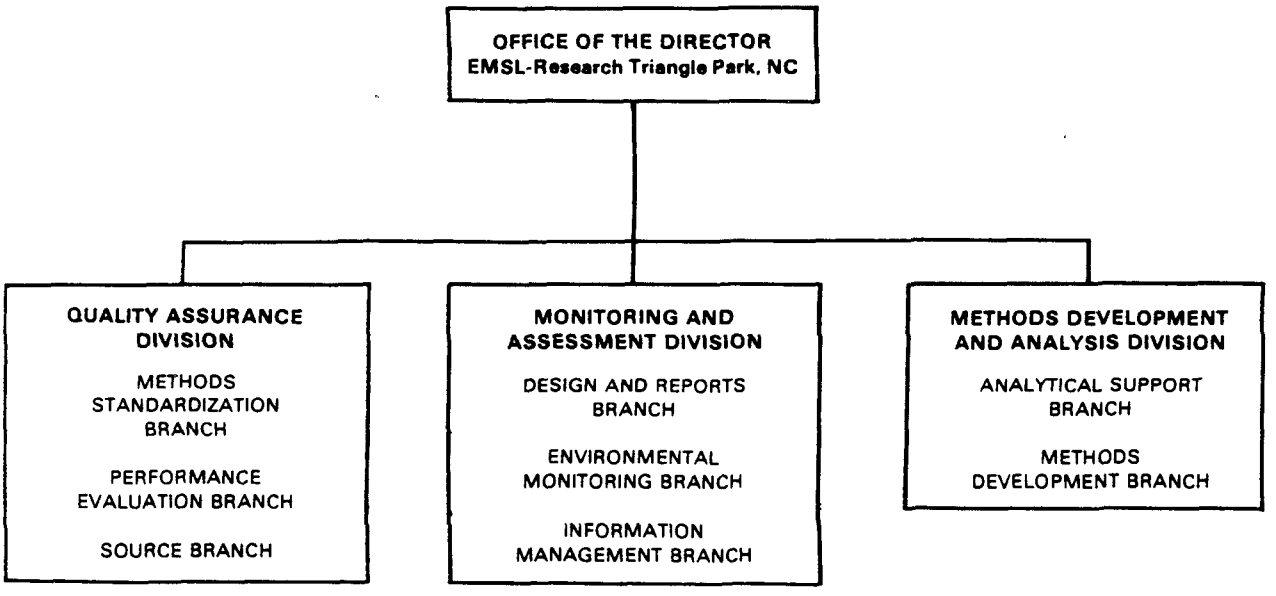
EQUIVALENCY PROGRAM: Implement the ambient air monitoring equivalency regulations

QUALITY ASSURANCE: Develop guidance documents for assuring the quality of air pollution measurements; standardize methods and work with NBS in developing primary standards.

PERSONAL EXPOSURE MONITORING. Develop methods for assessment of personal exposure to air pollutants in ambient air and indoor air; conduct special studies to identify air pollution problems and to evaluate exposure models.

ACID RAIN: Develop methods and quality assurance materials for measuring dry and wet deposition; operate pilot monitoring networks and serve as the data repository for national acid rain monitoring program.

TOXICS: Develop methods for measuring toxic air pollutants in ambient air and around toxic waste sites; conduct special air monitoring studies to assess the nature and amount of pollution.



EMSL—RTP AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
John C. Puzak	2106	Air pollution monitoring
Steven M. Bromberg	2919	Acid deposition, indoor air quality
QUALITY ASSURANCE DIVISION		
John B Clements	2188	Quality assurance
Darryl J von Lehmden	2415	QA handbook, traceability protocols
Methods Standardization Branch		
Larry J. Purdue	2665	Methods evaluation, standardization
Frank McElroy	2622	Equivalent methods
Michael Beard	2623	Asbestos
Performance Evaluation Branch		
William J. Mitchell	2769	Performance audits
Raymond C Rhodes	2574	QA statistics, quality control
Source Branch		
Rodney Midgett	2196	Source methods
Tom Logan	2580	Source monitoring and QA
MONITORING AND ASSESSMENT DIVISION		
Gerald G. Akland	2346	Exposure assessment statistics
David Mage	3184	Exposure assessment
Design and Reports Branch		
Charles E. Rodes	3079	Particle monitoring
Jack Suggs	2791	Statistics and design
Dave Holland	3126	Statistics and design
Terrence Fitz-Simons	2792	Statistics and design
Gary Evans	3124	Monitoring design
Environmental Monitoring Branch		
Thomas A Hartlage	3008	Air monitoring
Barry Martin	4386	Air monitoring
Information Management Branch		
Thomas C. Lawless	2291	Computer systems
METHODS DEVELOPMENT AND ANALYSIS DIVISION		
Robert E. Lee	2454	Methods development
Don Scott	7948	Chemometrics
Analytical Support Branch		
Joseph Walling	7954	Chemical analysis
Warren Loseke	2173	Inorganics analysis
Joe Bumgarner	2430	Organic analysis
Methods Development Branch		
Robert G. Lewis	3065	Methods development
Robert Harless	2248	Dioxin
Nancy Wilson	4723	Analytical methods development
William McClenny	3158	Monitoring methods development
James Mulik	3067	Ion chromatography
Richard Paur	3131	Ozone, acid rain methods

*FTS 629-xxxx, CML 919-541-xxxx

ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY

Robert L. Booth, Director

FTS: 684-7301
CML: 513-569-7301

26 W. St. Clair
Cincinnati, OH 45268

The EMSL—Cincinnati is responsible for the following major program areas.

WATER QUALITY: Standardized biomonitoring methods and effluent toxicity tests, quality assurance (QA) samples for ambient/non-point source monitoring programs.

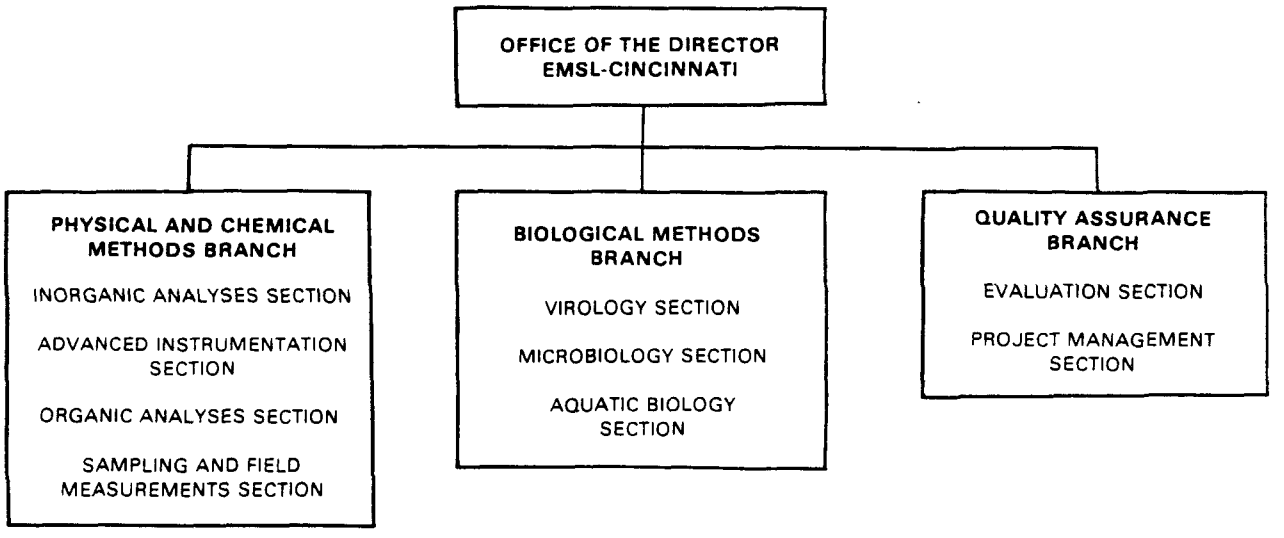
INDUSTRIAL WASTEWATER: Validated analytical test methods for National Pollutant Discharge Elimination System (NPDES) monitoring; performance evaluation (PE) studies for discharge monitoring reports.

DRINKING WATER: Official chemical and microbiological methods for meeting regulatory monitoring requirements of Safe Drinking Water Act (SDWA); certification of laboratories and distribution of QA materials.

TOXICS. Evaluation of analytical methods for key toxic organic materials and preparation of specialized QA materials.

SOLID WASTE. Evaluation and standardization of solid waste (SW)-846 methods and generic methods for the measurement of volatile and semi-volatile organic compounds, preparation and distribution of QA materials for Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and groundwater monitoring.

SUPERFUND: Development of analytical methods for the measurement of toxic materials in Superfund-type samples and QA materials for evaluation of contract laboratory program (CLP) laboratories



EMSL—CINCINNATI AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Robert Booth	7301	Methods and quality assurance (QA)
Thomas Clark	7301	Methods and QA
Terry Covert	7301	Alternate test procedures
Physical and Chemical Methods Branch		
James Lichtenberg	7306	Chemical methods
Inorganic Analyses Section		
Gerald McKee	7372	Inorganic chemistry
Theodore Martin	7312	Metals
Otis Evans	7307	Polargraphy tests
John Pfaff	7307	Laboratory certification
Advanced Instrumentation Section		
William Budde	7309	Advanced instrumentation
Ann Alford-Stevens	7330	Dioxin
James Eichelberger	7278	High resolution gas chromatograph/mass spectrometer
Organic Analyses Section		
James Longbottom	7308	Organic chemistry
Fred Kawahara	7313	Oil spills/petroleum chemistry
Sampling and Field Measurements Section		
Joseph Roesler	7286	Sampling/flow measurement
Biological Methods Branch		
Cornelius Weber	7337	Biological methods
Microbiology Section		
Robert Bordner	7319	Microbiology
Virology Section		
Robert Safferman	7334	Virology
Aquatic Biology Section		
William Horning	FTS: 778-8350 CML: 513-527-8350	Aquatic biology/toxicity tests
Quality Assurance Branch		
John Winter	7325	QA matters
Paul Britton	7325	Performance evaluation (PE) studies
Evaluation Section		
Harold Clements	7325	Quality control (QC)/PE samples
Project Management Section		
Edward Berg	7325	Methods standardization

*FTS: 684-xxxx, CML: 513-569-xxxx

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY

E.W. Bretthauer, Director

FTS: 545-2525
CML: 702-798-2525

P.O. Box 15027
Las Vegas, NV 89114

The Environmental Monitoring Systems Laboratory, Las Vegas, is responsible for the following major program areas:

OXIDANTS, GASES AND PARTICLES. Technical support and development for oxidant and GAP field studies, especially airborne lidar for oxidant transport and development studies; regional visibility impairment studies and visibility monitoring methods development.

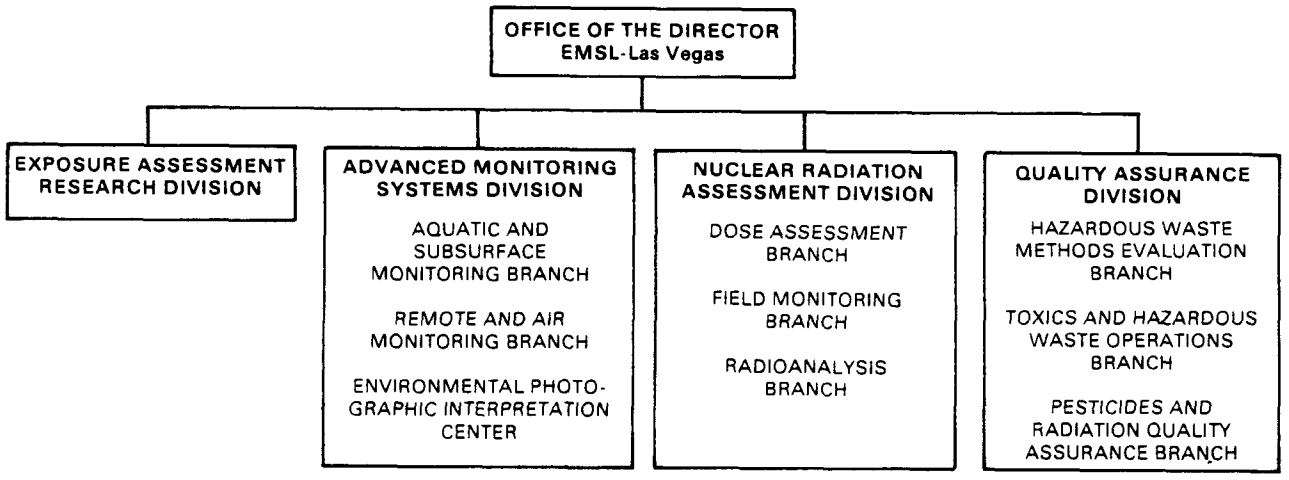
ACID DEPOSITION: Establishment of analytical methodologies, protocols and services for analyses of surface water and soil samples for assessing effects of acidic deposition; establishment of a comprehensive QA/QC program for the National Surface Water Survey and ensure data of known quality from the National Soil Survey.

WATER QUALITY, DRINKING WATER. Development and technical support applications of aerial and satellite remote sensing for water quality monitoring, site specific field evaluation of stream monitoring techniques.

HAZARDOUS WASTE, HAZARDOUS SUBSTANCES: Development and evaluation of geophysical and overhead remote sensing technology for subsurface and surface waste site characterization and for technical support for Superfund site assessments.

RADIATION QA, OFF-SITE RADIATION SAFETY Providing radionuclide standards and reference materials and assisting radiation labs in development and maintenance of a QA/QC program; conducting a comprehensive environmental monitoring and safety program in support of DOE nuclear weapons testing activities.

CHEMICAL TESTING AND ASSESSMENT, PESTICIDES: Development of QA guidelines and evaluation/development of methods for the analysis of xenobiotics in waste media; development of guidelines for the field testing (validation) of soil fate and transport models, development of monitoring and statistical methods to estimate human multi-media exposure.



EMSL—LAS VEGAS AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Robert N Snelling	2522	Environmental monitoring
Office of Program Management and Support		
Walter E Petrie	2564	Program management
James G Payne, Jr	2564	Program management, radiation safety, engineering
QUALITY ASSURANCE DIVISION		
Ronald K Mitchum	2103	Physical organic chemistry, spectroscopy
Ross K Robeson	2103	Program analyst, chemistry
David G. Easterly	2108	Chemistry, radiation QA
Toxics and Hazardous Waste Operations Branch		
J. Gareth Pearson	2383	Environmental biology QA
Hazardous Waste Methods Evaluation Branch		
Stephen Billets	2232	Physical analytical chemistry, spectroscopy
Pesticides and Radiation Quality Assurance Branch		
Radiation Quality Assurance Section		
Arthur N Jarvis	2134	Radiation QA
Pesticides Quality Assurance Section		
G. Wayne Sovocool	2212	Organic chemistry, spectroscopy
EXPOSURE ASSESSMENT RESEARCH DIVISION		
Eugene P. Meier	2201	Analytical environmental chemistry
James W Mullins	2207	Analytical radiochemistry
ADVANCED MONITORING SYSTEMS DIVISION		
Donald T. Wruble	2237	Environmental science
Robert E Crowe	2237	Water quality
Remote and Air Monitoring Branch		
Robert W. Landers, Jr.	2260	Remote sensing
Aquatic and Subsurface Monitoring Branch		
Leslie G. McMillion	2368	Ground water monitoring
Environmental Photographic Interpretation Center (Warrenton, VA)		
Vernard H. Webb	557-3110**	Remote sensing
NUCLEAR RADIATION ASSESSMENT DIVISION		
Office of the Director		
Charles F Costa	2305	Radiation safety
Allan E. Smith	2304	Radiation safety
John L. Connolly	2351	Radiation safety
Field Monitoring Branch		
John S. Coogan	2358	Radiation safety
Radioanalysis Branch		
Daryl L Thome	2158	Gamma spectrometry, mathematical statistics
Radiochemistry Section		
Robert W. Holloway	2325	Radiochemistry
Dose Assessment Branch		
Stuart C. Black	2556	Radiation biology and QA
Dosimetry Section		
Robert G. Patzer	2324	Human dosimetry
Data Analysis Section		
Frank Grossman	2331	Data validation

*FTS: 545-xxxx; CML: 702-798-xxxx

**FTS 557-xxxx; CML: 703-557-xxxx

ATMOSPHERIC SCIENCES RESEARCH LABORATORY

A.H. Ellison, Director

FTS: **629-2191**
CML: **919-541-2191**

(MD-59)
Research Triangle Park, NC
27711

The Atmospheric Sciences Research Laboratory is responsible for the following major program areas:

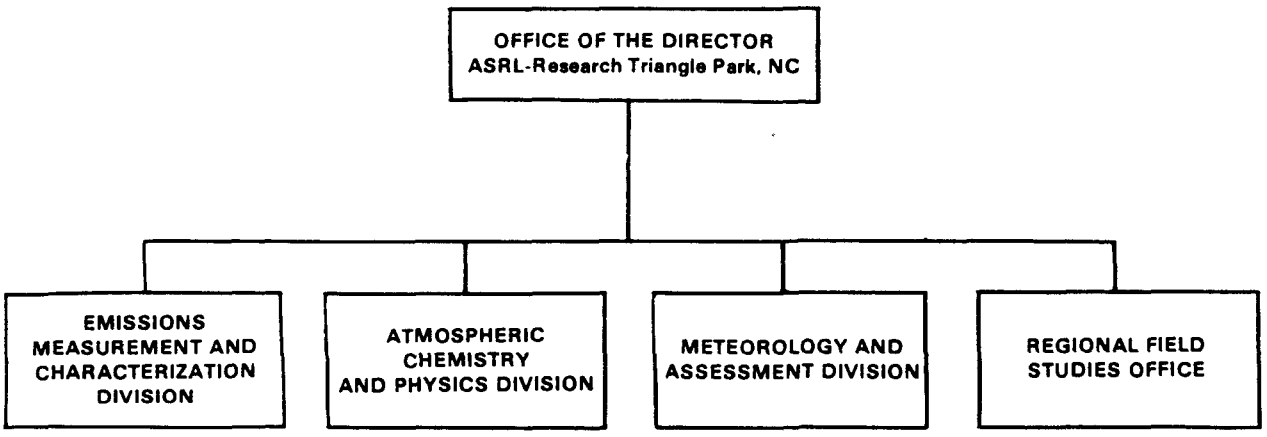
GAS AND PARTICLES. Urban, regional, complex terrain, and source apportionment air quality model development, evaluation and validation, materials damage and visibility studies, air quality model documentation (UNAMAP)

OXIDANTS Urban and regional atmospheric ozone model development, evaluation, and validation, laboratory photochemical studies.

ACID DEPOSITION Assess related atmospheric processes to model and to evaluate acid rain, acid deposition, and acid transport and transformation over urban and regional scales; materials damage function studies

MOBILE SOURCES Characterize the regulated and unregulated emissions from motor vehicles, assess the impact of mobile emissions on air quality

HAZARDOUS AIR POLLUTANTS Assess the sources, sinks, transport, formation, removal, reaction products, and ultimate fate of HAPs and HAPs precursors in the atmosphere



ASRL—RESEARCH TRIANGLE PARK AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Alfred H. Ellison	2191	Atmospheric processes
Jack H Shreffler	2191	Atmospheric processes
EMISSIONS MEASUREMENT AND CHARACTERIZATION DIVISION		
William E. Wilson	2551	Visibility, aerosol chemistry
Kenneth T. Knapp	3085	Stationary sources
Frank M Black	3037	Mobile sources
Fred H Haynie	2535	Material damage
ATMOSPHERIC CHEMISTRY AND PHYSICS DIVISION		
Basil Dimitriades	2706	Photochemistry, ozone
Joseph J. Bufalini	2442	Gas kinetics
Robert K Stevens	3156	Source apportionment
Jack Durham	2183	Acid deposition
METEOROLOGY AND ASSESSMENT DIVISION		
Francis A. Schiermeier	4541	Meteorological modeling
John F Clarke	3660	Model development
Peter L. Finkelstein	4551	Complex terrain modeling
D. Bruce Turner	4564	UNAMAP
James L. Dicke	5381	Regulatory use of models
William H. Snyder	2811	Wind tunnel
Joan H. Novak	4545	Data base management
REGIONAL FIELD STUDIES OFFICE		
William E. Wilson	2551	Visibility, aerosol chemistry

*FTS: 629-xxxx, CML: 919-541-xxxx

AIR AND ENERGY ENGINEERING RESEARCH LABORATORY

F.T. Princiotta, Director

FTS: 629-2821
CML: 919-541-2821

(MD-60)
Research Triangle Park, NC 27711

AEERL is responsible for studying energy and industrial pollution sources in the following major program areas:

OXIDANTS. Combustion modification and control of nitrogen oxides from utility boilers, industrial process equipment and boilers, reciprocating and turbine engines, commercial/residential combustion equipment, etc.; assessment of volatile organic compound sources (VOCs), and development of VOC control technologies

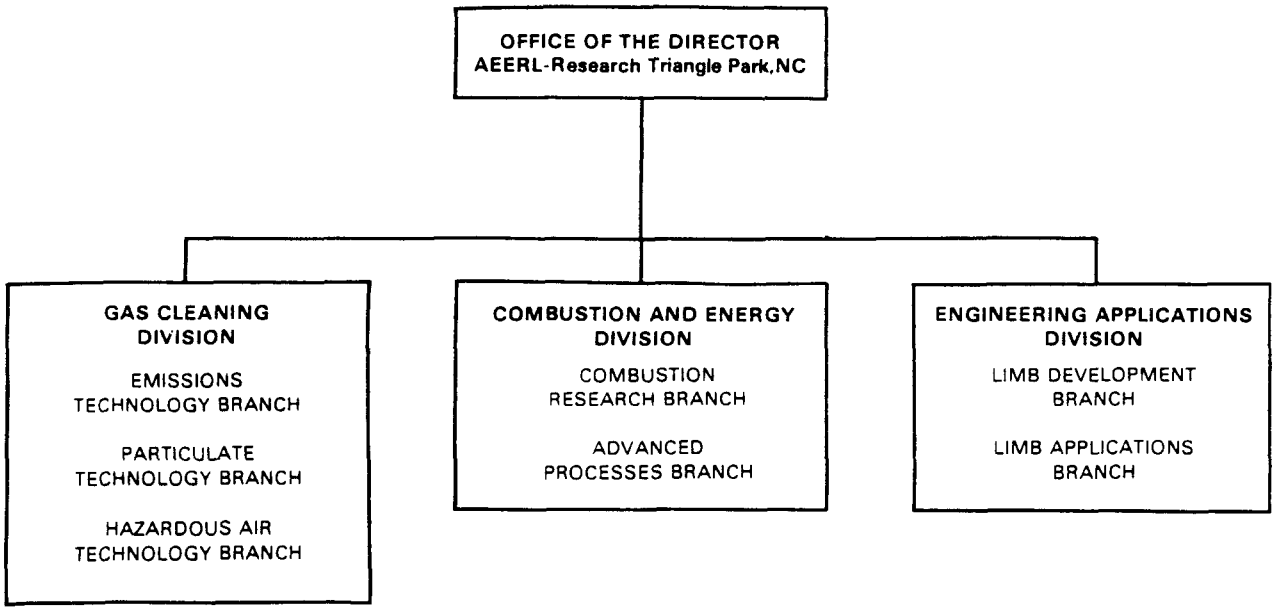
HAZARDOUS AIR POLLUTANTS Assessment and control of hazardous air pollutant (HAP) sources and of indoor air pollutants, development of improved wood stove designs, and source assessments and control technology developments for the EPA Integrated Air Cancer Project.

GASES AND INHALABLE PARTICULATES. Development of third-generation, low-cost, retrofittable technologies for the control of sulfur oxides and particulates in flue gases, organic acid enhancement of wet flue gas desulfurization, dry scrubbing and coal cleaning for sulfur oxide control, and other new low-cost SO_x control technologies (e.g., E-SO_x); electrostatic precipitation, fabric filtration and novel devices for the control of particulates.

HAZARDOUS WASTE. Provide fundamental combustion support to the Hazardous Waste Engineering Research Laboratory, including droplet atomization of liquid wastes, failure modes in a small pilot-scale rotary kiln, and small pilot-scale studies of fluidized-bed incineration, all using surrogate hazardous wastes

MULTIMEDIA Development of Limestone Injection Multistage Burner (LIMB) process, a retrofittable combustion modification technology for simultaneous removal of sulfur oxides and nitrogen oxides, expected to be important in the mitigation of acid rain precursors; assessment of advanced processes for energy production, such as synthetic fuels, and support of regional assessments of the impacts on the environment of initiating such processes.

ENERGY - ACID RAIN Participation in the National Acid Precipitation Assessment Program; assessment of control technologies suitable for mitigating acid rain precursors, development of predictive models and emissions inventories necessary to assess the extent of the national problem.



AEERL—RESEARCH TRIANGLE PARK AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Frank Princiotta	2821	Air and energy environmental assessment and control technology development
Alfred B Craig	2821	Air and energy environmental assessment and control technology development
GAS CLEANING DIVISION		
Bill Plyler	2918	Gas cleaning control technologies; hazardous air pollutant assessment and control technologies
Mike Maxwell	3091	Acid rain modeling, coal cleaning and inventories; SO_x control
Gene Tucker	2746	HAPS assessment and control; VOCs control technologies and painting and finishing operations
Norm Plaks	3084	Particulate and aerosol assessment and controls
COMBUSTION AND ENERGY DIVISION		
Bob Hangebrauck	4134	Combustion modification control technology and synthetic fuels research
Kelly Janes	2852	Coal gasification, direct/indirect liquefaction; synfuel plant
Bob Hall	2477	Combustion emission modeling and control
ENGINEERING APPLICATIONS DIVISION		
Jim Abbott	3443	Control technology for simultaneous removal of NO_x and SO_x, fundamental sorbent reactivity/kinetics
Blair Martin	7504	Control technology for simultaneous removal of NO_x and SO_x, low NO_x burners
Dick Stern	2973	Limestone Injection Multistage Burner (LIMB) demonstration
Dennis Drehmel	7505	LIMB; low NO_x burners; sulfur capture
Technical Support Office		
Jim Dorsey	2509	Sampling, monitoring, and analysis

*FTS: 629-xxxx, CML: 919-541-xxxx

ENVIRONMENTAL RESEARCH LABORATORY

T.A. Murphy, Director

FTS: 420-4601
CML: 503-757-4601

200 S.W.35th Street
Corvallis, OR 97333

MULTIMEDIA/ENERGY: Conduct research on impacts of acid precipitation, manage EPA's research on the effects of acid precipitation, including crops, drinking water, surface water and forests, define environmental impacts of energy development and atmospheric pollution in arctic and subarctic ecosystems and identify appropriate mitigation measures.

OXIDANTS. Conduct comprehensive research program on impact of air pollutants on natural and managed terrestrial ecosystems, especially agricultural crops and forests.

TOXICS: Develop methods to validate existing toxicology tests to assure their ability to predict effect on field populations, determine effects of toxic chemicals on aquatic and terrestrial ecosystems and functions; develop methods to predict ability of sediment-based contaminants to adversely impact aquatic systems, develop methods and data to assess effects of biotechnology products on terrestrial ecosystems.

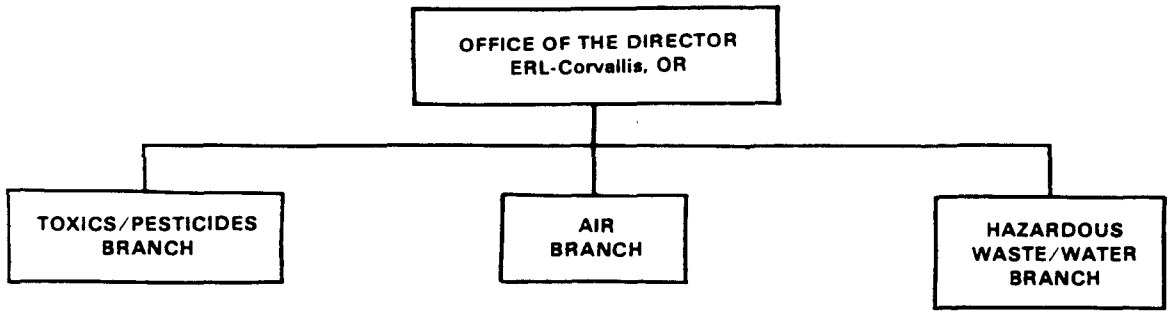
PESTICIDES: Develop or improve bioassay methodologies for determining the effects of microbiological pest control agents on or in non-target receptors or hosts; conduct field validation studies to determine if laboratory-derived methods and results reflect environmental responses under natural pesticide use conditions.

WATER QUALITY: Develop improved methods for assessing the biological effects of contaminated sediment on freshwater ecosystems and determine need for sediment criteria, develop procedures to assess biological integrity of freshwater ecosystems and define attainable uses given background contamination levels in the aquatic/terrestrial environs.

HAZARDOUS WASTE. Develop and evaluate a multimedia bioassay screening protocol to indicate the biological hazard associated with contaminated soils, water and sediments; determine the potential for dioxin accumulation in plants, fish and animals consumed by man to define potential biomagnification in food chain systems.

SUPERFUND: Provide field guides and reference manuals to describe major environmental processes and effects which will impact decisions regarding containment and cleanup of hazardous waste and provide technical assistance based on manual information.

SPECIAL FACILITIES: State-of-the-art computerized mapping, bird and mammal bioassay facilities, waterfowl ponds, aquatic bioassay facilities, experimental streams and ponds, plant growth chambers, greenhouses, outdoor terrestrial exposure chambers, terrestrial microcosm.



ERL—CORVALLIS AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Air Branch		
M. Robbins Church	4791	Limnology
William E. Hogsett	4632	Air pollution effects on vegetation
Robert T Lackey	4806	Acid rain effects, aquatic/terrestrial ecology
Eric P. Preston	4636	Forest ecology
David T Tingey	4621	Air pollution effects on vegetation
Parker J Wigington	4640	Hydrology
Hazardous Waste and Water Branch		
Clarence A. Callahan	4666**	Soil invertebrate ecology
Joseph C. Greene	4776	Aquatic toxicology
D Phillip Larsen	4666**	Lake/stream ecology
William E. Miller	4776	Chemistry/aquatic toxicology
Alan V Nebeker	4875	Aquatic toxicology
James M Omernik	4666**	Geography/cartography
Gerald S. Schuytema	4764	Invertebrate taxonomy/toxicology
Mostafa A. Shirazi	4666**	Systems ecology
Toxics and Pesticides Branch		
John L. Armstrong	4638	Molecular genetics
Richard S Bennett	4582	Wildlife ecology/toxicology
J Craig McFarlane	4670	Plant physiology
Paul T. Rygiewicz	4833	Plant ecology
Ramon J. Seidler	4661	Microbial ecology/biotechnology
Bill A. Williams	4679	Wildlife physiology/toxicology

*FTS: 420-xxxx, CML: 503-757-xxxx
**CML 503-753-6221

ENVIRONMENTAL RESEARCH LABORATORY

R.C. Russo, Director

FTS: 250-3134
CML: 404-546-3134

College Station Road
Athens, GA 30613

The Athens Environmental Research Laboratory conducts and manages fundamental and applied research to predict and assess the human and environmental exposures and risk associated with conventional and toxic pollutants in water and soil. Major program areas include:

WATER QUALITY: Develop and refine mathematical models for exposure assessment, pollutant fate, and wasteload allocation; define mechanisms controlling transport and transformation of organics and metals in surface water; develop water quality assessment models and basin planning management techniques including design and evaluation of Best Management Practices; develop knowledge-based expert systems for prediction of pollutant properties and behavior

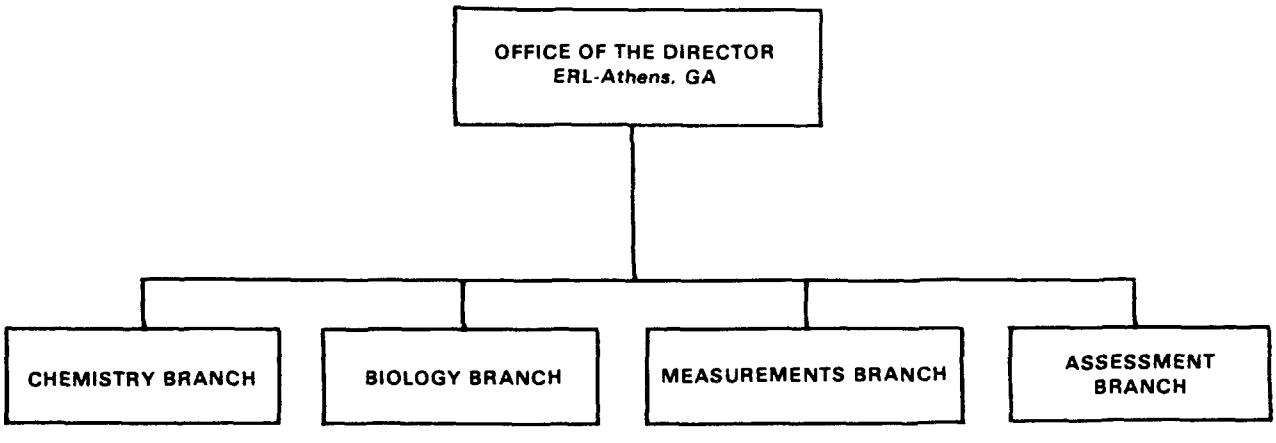
INDUSTRIAL WASTEWATER: Identify and measure chemical and biological properties of toxic pollutants in industrial and municipal effluent; apply computer identification techniques to gas chromatography-mass spectrometry, develop knowledge-based expert systems for pollutant identification.

TOXIC CHEMICAL TESTING AND ASSESSMENT: Develop mathematical expressions to describe chemical and biological processes, such as sunlight or microbial transformation of contaminants in water; develop risk assessment and ecological exposure analysis models, develop wasteload allocation models and exposure assessment models for pollutant runoff and leaching, perform microcosm research and data analysis for chemical fate and effects studies

PESTICIDES: Develop predictive models of pesticide migration through saturated and unsaturated soil zones to perform exposure and risk assessments for terrestrial and aquatic organisms, develop surface and ground water threat models from pollutant runoff and leaching, develop mathematical expressions to describe processes that transform toxic chemicals in water and sediment

HAZARDOUS WASTE: Develop ecological risk assessment methodology for hazardous waste management; develop multimedia environmental and human exposure assessment techniques for toxic organics and metals; describe organic and inorganic pollutant interactions in water, soil, and sediments.

SPECIAL FACILITIES/RESEARCH TOOLS: Center for Water Quality Modeling (distribution and maintenance of computer programs and training and assistance for users) and aquatic channel microcosms (indoor facilities for examining chemical pollutant fate and testing exposure analysis models)



ERL—ATHENS AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Rosemarie C Russo	3134	Ammonia/nitrite toxicity to aquatic organisms
George L Baughman	3430	Transformation of pollutants in water
Chemistry Branch		
Arthur W. Garrison	3145	Organic chemical analysis
Leo V Azarraga	3453	Molecular spectroscopy, metals speciation
George W. Bailey	3307	Pollutant colloid activity, soil chemistry
Samuel W Karickhoff	3149	Environmental process modeling
J MacArthur Long	3582	Asbestos analysis, electron microscopy
Robert V Moore	3770	Inorganic analysis, neutron activation
N Lee Wolfe	3429	Hydrolytic/redox reactions in water
Richard G Zepp	3428	Aquatic photochemistry
Biology Branch		
Harvey W Holm	3103	Environmental microbiology
Donald L. Brockway	3422	Aquatic biology, fish toxicology
Lawrence A Burns	3511	Exposure-effects modeling, ecology
Ray R. Lassiter	3501	Exposure-effects modeling, ecology
David L. Lewis	3358	Microbial ecology, biotransformation processes
Doris F Paris	3469	Microbial kinetics, structure-activity
John E. Rogers	3592	Microbial kinetics, biochemistry, ecology
Measurements Branch		
William T. Donaldson	3183	Organic ID, transformation rate measurement
James J. Ellington	3197	Comprehensive organic analysis
Heinz P Kollig	3447	Chemical kinetic constant measurement
John M. McGuire	3185	Mass spectrometry, organic identification
Frank E. Stancil	3447	Chemical kinetic constant measurement
William C. Steen	3188	Microbial kinetic constant measurement
Alfred D. Thruston, Jr.	3552	Liquid chromatography-mass spectrometry
Assessment Branch		
Robert R Swank, Jr.	3476	Industrial waste treatment, multimedia modeling
Robert B. Ambrose, Jr.	3476	Water quality and risk assessment modeling
Thomas O. Barnwell, Jr.	3175	Water quality modeling
David S. Brown	3310	Metals speciation, soil transformation processes
Robert F Carsel	3565	Pesticide and groundwater leaching modeling
Fred K. Fong	3138	Mass transport modeling
Lee A. Mulkey	3138	Hazardous waste management, pesticides, exposure
William R. Payne	3197	Pesticides analysis
Regional/State Contact		
Robert C. Ryans	3306	

*FTS 250-xxxx, CML. 404-546-xxxx

ROBERT S. KERR ENVIRONMENTAL RESEARCH LABORATORY

Clinton W. Hall, Director

FTS: 743-2426
CML: 405-332-8800

P.O. Box 1198
Ada, OK 74820

The Robert S Kerr Environmental Research Laboratory is responsible for the following major program areas

DRINKING WATER Determination of the fate, transport and transformation rates and mechanisms of pollutants in the subsurface environment for the protection of ground water from pollution by municipal, industrial and agricultural activities

HAZARDOUS WASTES Determination of the processes used in characterizing the subsurface and prediction of the effects of pollutants thereon in order to define the capabilities and limitations of natural processes to degrade and attenuate wastes in land treatment systems

RSKERL AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
PROCESSES AND SYSTEMS DIVISION		
Office of the Director		
Jack W Keeley	210	Aquifer restoration
Subsurface Processes Branch		
William J Dunlap	314	Contaminant sources
Dermott Bouchard	321	HPLC analysis
Don Clark	311	Inorganics chemistry
Bert Bledsoe	324	Trace metals analysis
Michael Henson	420	Anaerobic microbiology
Don Kampbell	332	GC/MS organics
Marvin Piwoni	262	Abiotic effects
John Wilson	259	Microcosms
Roger Cosby	320	Trace organics
Garmon Smith	316	GC/MS organics
Lynn Wood	304	Soils characterization
Dave Walters	261	Plants
Robert Smith	248	Biological analyses
Subsurface Systems Branch		
Carl Enfield	334	System models
Frank Beck	246	Soil science
Thomas Short	234	Process wastes
Fred Pfeffer	305	Waste characterization
John Matthews	233	Hazardous wastes biological processes
EXTRAMURAL ACTIVITIES AND ASSISTANCE DIVISION		
Office of the Director		
H. George Keeler	212	Land treatment
Extramural Activities and Assistance Branch		
James F. McNabb	216	Microbiology
R. Douglas Kreis	303	Ecology
Bobby D Newport	201	Ground water contamination from mining
Applications and Assistance Branch		
M. Richard Scalf	308	Waste management alternatives
Leon H Myers	202	Industrial wastes
Jerry Thornhill	310	Ground water investigations
Joe Keely	313	Prediction of contaminants
Lowell E Leach	333	Soil systems

*FTS 743-2(extension numbers), CML. 405-332-8800 (ask for extension)

ENVIRONMENTAL RESEARCH LABORATORY

Norbert A. Jaworski, Director FTS: 780-5550 CML: 218-720-5550 **6201 Congdon Boulevard Duluth, MN 55804**

MISSION Support the development of the scientific basis for policy, regulatory, and operational functions of the Environmental Protection Agency's water quality, toxic substances, hazardous wastes, pesticides, and energy programs ERL-Duluth conducts the following major programs of research, development, and technical assistance

Develop a sound chemical, physical, and biological understanding of toxicity principles, concepts, and logic necessary to determine concentrations of pesticides, toxic substances and hazardous wastes non-harmful to freshwater aquatic life, establish a data base for this knowledge, share this expertise and data resource with EPA program offices and other agencies and with other scientists.

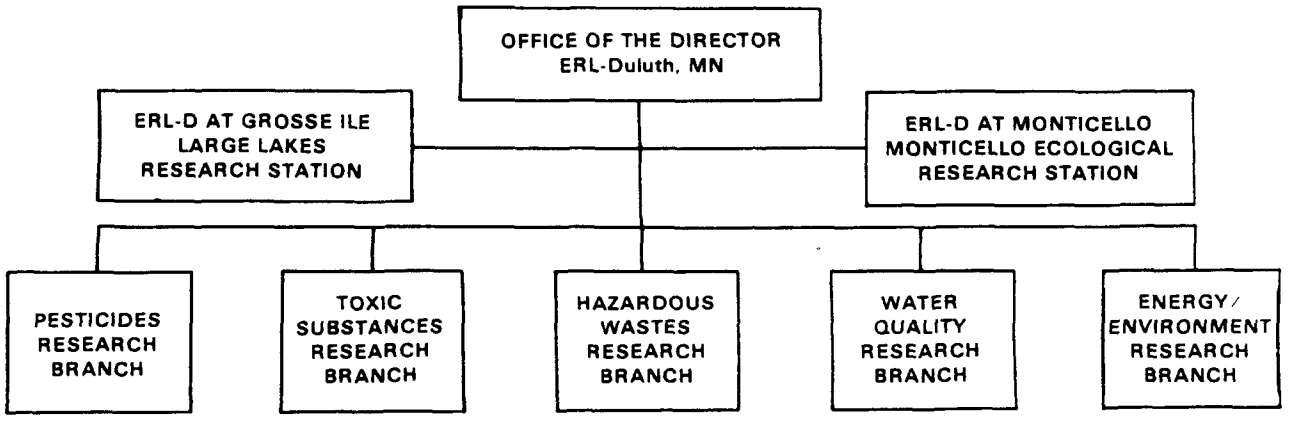
Develop, refine, and improve cost-effective aquatic laboratory tests for determining the adverse effects of single or multi-contaminant pollutants associated with toxic substances, pesticides, hazardous wastes, and energy development and use.

Develop common denominators, quantitative structure-activity relationships, toxicity wasteload allocation methods, and models that can be used to predict or assess the impact of chemical and physical pollutants on aquatic and aquatic-related organisms

Evaluate the ability of laboratory test methods and models to predict the fate and effects of contaminants under field conditions through use of ecological studies

Develop criteria for individual physical and chemical contaminants and complex mixtures for the protection of aquatic organisms and consumers of aquatic organisms, conduct related site-specific studies to support and assess agency use of the criteria.

Maintain exploratory surveillance for new and unrecognized types and quantities of xenobiotics in components of aquatic and aquatic-related ecosystems, develop analytical methods required for this exploratory surveillance.



ERL—DULUTH AREAS OF EXPERTISE

	TELEPHONE	AREA OF EXPERTISE
Office of the Director		
Norbert A Jaworski	780-5550	Phosphorus, eutrophication
Gilman D Veith	780-5572	Toxicity data bases, structure-activity, predictive toxicology
Water Quality Research Branch		
Nelson A. Thomas	780-5702	Phosphorus, toxicity testing-field response, complex effluents
Donald I Mount	780-5528	Toxicity reduction, ceriodaphnia testing
Robert A Drummond	780-5532	Biomonitoring
John G Eaton	780-5557	Bioaccumulation methods, acid rain-biological
Russell J. Erickson	780-5534	Complexing agents, metals, fish uptake and depuration
Armond E. Lemke	780-5563	Bioassay systems
Charles E. Stephan	780-5510	Water quality criteria documents, metals
Anthony R Carlson	780-5565	Site-specific water quality criteria
Ronald R. Garton	420-4743*	Metals, kinetics modeling
Jack H Gakstatter	420-4705*	Eutrophication
Pesticide Research Branch		
Richard E. Siefert	780-5552	Pesticide bioassays, fish and fish food taxonomy
Richard L. Anderson	780-5565	Invertebrates, toxicity testing, chemical/microbial pesticides
Alfred W Jarvinen	780-5561	Pesticide bioassays
Hazardous Wastes Research Branch		
Philip M. Cook	780-5523	Electron scope, particles bioassays, bioavailability, suspended solids, asbestos fiber data, sediments base
James M McKim	780-5567	Dose-response, comparative toxicology-modes of action
J. Howard McCormick	780-5514	Temperature, pH, stress and fish reproduction
Allan R. Batterman	780-5513	High hazard testing, electron scope
Energy/Environment Research Branch		
Kenneth E. Biesinger	780-5524	Polyelectrolites, daphnia culturing
Edward N Leonard	780-5556	Metals in tissue
Toxic Substances Research Branch		
Steven J. Broderius	780-5574	Acute testing, joint toxicity relationships
Douglas W. Kuehl	780-5559	Environmental chemistry, organics in tissue and water, planar chlorinated organics, LC/MS systems
J David Yount	780-5557	Ecosystems/watersheds, microcosms
Gary L. Phipps	780-5571	Acute bioassays
Large Lakes Research Station**		
William L. Richardson	226-7811	Waste load allocation, environmental modeling, eutrophication
David M. Dolan	226-7811	Toxic substances, statistics and modeling
Michael D. Mullin	226-7812	Metals, transport and fate of toxics
Monticello Ecological Research Station		
John W Arthur	787-3332	Outdoor channels
Steven F. Hedtke	787-3332	Field applicability, microcosms

*FTS 420-xxxx, CML: 503-757-xxxx
**FTS 226-xxxx, CML. 313-675-5000

ENVIRONMENTAL RESEARCH LABORATORY

William A. Brungs, Director

FTS: 838-5087
CML: 401-789-1071

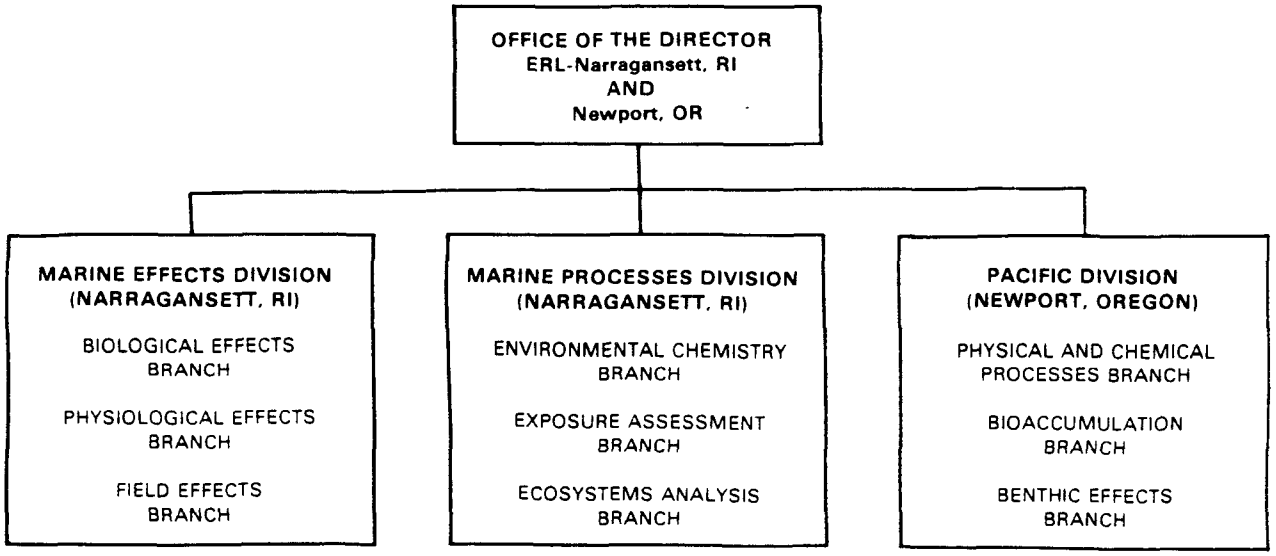
South Ferry Road
Narragansett, RI 02882

MISSION: Agency's center for marine, coastal, and estuarine water quality research, support primarily the EPA Office of Water, responding mainly to legislative requirements of the Clean Water Act, the Marine Protection, Research and Sanctuaries Act, and the Toxic Substances Control Act; provide the scientific base for marine hazard assessment and regulatory activities of that Office, provide technical assistance and investigations of an emergency nature, e g., spills of toxic materials, in evaluating environmental threats

PROGRAMMATIC AREAS. Estuarine and marine disposal and discharge of complex wastes, dredged materials, and other wastes; water use designation and quality criteria for estuarine and marine water and sediment; environmental assessment of ocean discharges.

EXPERTISE Toxicological testing using marine organisms, ecosystems analysis; physiological responses of organisms to contaminants, organic and inorganic analytical chemistry, biomonitoring, national and site-specific water quality criteria, physical transport and water quality modeling, contaminant bioavailability and bioaccumulation

SPECIAL FACILITIES. Wet Lab facilities available for biological testing using flowing seawater; capable of tempering of influent water, isolation of hazardous testing, and treatment of effluent water, maintains Field Station at the Hatfield Marine Science Center, Newport, Oregon.



ERL—NARRAGANSETT AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
D.J. Baumgartner		Transport processes, exposure assessment
A.D Beck		Nutritional requirements of marine organisms
V.J. Bierman		Ocean disposal, dumpsite designation, wasteload allocation, nutrient cycling
W.A Brungs		Aquatic life criteria, thermal effects, mixing zone designation
R.L. Garnas		Environmental and analytical chemistry, hazardous wastes
J.H Gentile		Hazard assessment, dredged materials, toxicity testing
D.J. Hansen		Aquatic life criteria, toxicity testing, sludge effects
R.W. Latimer		Environmental engineering
H. Lee		Bioaccumulation processes, bioavailability
J.F. Paul		Sediment transport, remote sensing, ocean disposal
K.T. Perez		Marine microcosms, surface microlayers
D.K. Phelps		Biomonitoring
S.C. Schimmel		Complex effluents, toxicity testing
R.C. Swartz		Benthic toxicity testing, community analysis

*FTS:838-5087 (for all contacts), CML:401-789-1071 (for all contacts)

ENVIRONMENTAL RESEARCH LABORATORY

Henry F. Enos, Director

FTS: 686-9011
CML: 904-932-5311

Sabine Island
Gulf Breeze, FL 32561

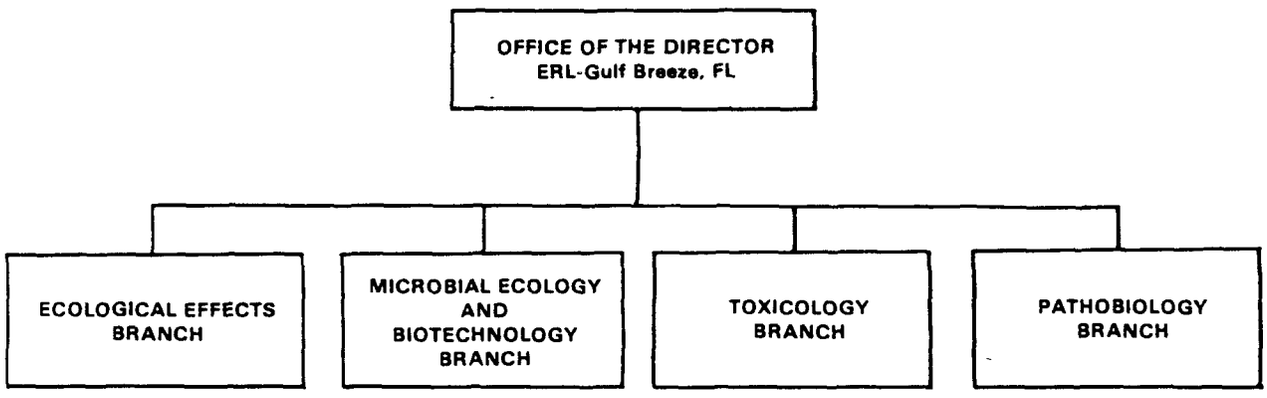
The Environmental Research Laboratory, Gulf Breeze, is responsible for developing scientific information used to formulate guidelines, standards, and strategies for management of hazardous materials in coastal, estuarine, and marine environments. The Laboratory's research and development efforts deal primarily with pesticides and toxic compounds regulated by EPA's Office of Pesticides and Toxic Substances. In addition, the impacts of the ocean disposal of drilling fluids and waste treatment effluents are investigated for the Office of Water. Research is organized into four branches.

TOXICOLOGY BRANCH: Development and testing of methods to determine lethal and sublethal effects of potentially harmful chemicals on estuarine and marine plants and animals; development of culture techniques for test organisms; and development of biological indicators for use in field investigations.

ECOLOGICAL EFFECTS BRANCH: Determination of chemical effects on ecological structure and function; conduct of field studies in order to estimate environmental responses in potentially impacted areas; and validating model systems for predicting resiliency of populations, communities, and ecosystems exposed to contaminants.

MICROBIAL ECOLOGY AND BIOTECHNOLOGY BRANCH: Describing microbiological interactions with pollutants, including biodegradation mechanisms and predictive techniques for biodegradation rates, sorption, transport, and products and potential risks associated with release of genetically engineered microorganisms (biotechnology) to the environment.

PATHOBIOLOGY BRANCH: Developing methods for evaluating risks of biological pesticidal agents to nontarget, aquatic species, and systems, including natural and genetically altered microbial pest control agents and biochemical control agents; developing aquatic species as indicators and models for evaluating risks of genotoxic agents to both aquatic animal and human health, and elucidating mechanisms in aquatic species whereby toxicants impair function, development, and cause disease in aquatic species, in order to better predict effects in populations at risk.



ERL—GULF BREEZE AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Henry F Enos		Pesticide chemistry and toxicology
Andrew J. McErlean		Pollution ecology
Thomas W. Duke		Pollution ecology
Frank G Wilkes		Aquatic ecology
Toxicology Branch		
Jack I Lowe		Marine toxicology
Gerald E Walsh		Marine ecology/toxicology
Douglas P. Middaugh		Fish culture/toxicology
James C. Moore		Analytical chemistry
Ecological Effects Branch		
Foster L. Mayer		Toxicology/aquatic ecology
James R. Clark		Aquatic ecology, toxicology
Marlin E. Tagatz		Zoology, botany
William P. Davis		Ichthyology, marine ecology
David E Weber		Plant pathology, ecology
Microbial Ecology and Biotechnology Branch		
Al W Bourquin		Microbial biochemistry
Parmely H. Pritchard		Microbial ecology/biodegradation
Leonard H. Mueller		Analytical chemistry
Paul Lefcourt		Environmental science
Tamar Barkay		Microbial ecology
Stephen M. Cuskey		Microbial genetics
Fred J. Genthner		Microbiology/plasmid biology
Pathobiology Branch		
John A Couch		Pathology, toxic mechanisms
Charles L. McKenney		Physiology
Wilhelm P. Schoor		Biochemistry
Lee Courtney		Electron microscopy
Stan Erickson		Cell culture

*FTS: 686-9011 (for all contacts), CML: 904-932-5311 (for all contacts)

HEALTH EFFECTS RESEARCH LABORATORY

F. Gordon Hueter, Director **FTS: 629-2281 (MD-51)**
CML: 919-541-2281 Research Triangle Park, NC 27711

The Health Effects Research Laboratory is responsible for the following

OXIDANTS Develop a data base for use in regulatory decision making on the health effects of O_3 and NO_2 exposure by conducting human clinical, epidemiologic and animal studies Models are also being developed to quantitatively extrapolate animal data to humans

HAZARDOUS AIR POLLUTANTS (HAP): Develop and validate techniques to evaluate the toxic effects of HAP's, produce dose-response data on the toxic effects of HAP's, and develop models which improve our ability to use toxicological data in risk assessments

MOBILE SOURCES Provide quality health effects data on the effects of exposure to CO and develop methods for obtaining dose response data for use in risk assessments for regulatory purposes

GASES AND PARTICLES. Develop a data base for use in regulatory decision making on the health effects of SO_2, particles and Pb by conducting human clinical, epidemiologic and animal studies. Models are also being developed to extrapolate animal data to humans and to provide information on the relationship between particle size and lung deposition in man.

WATER QUALITY Provide field tested methods in a manual that discusses protocols and interprets strengths and weaknesses on health effects biomonitoring techniques, develop health related indicator for shellfish growing waters in cooperation with NOAA and FDA and extend studies on the enterococcus indicator system for recreational water

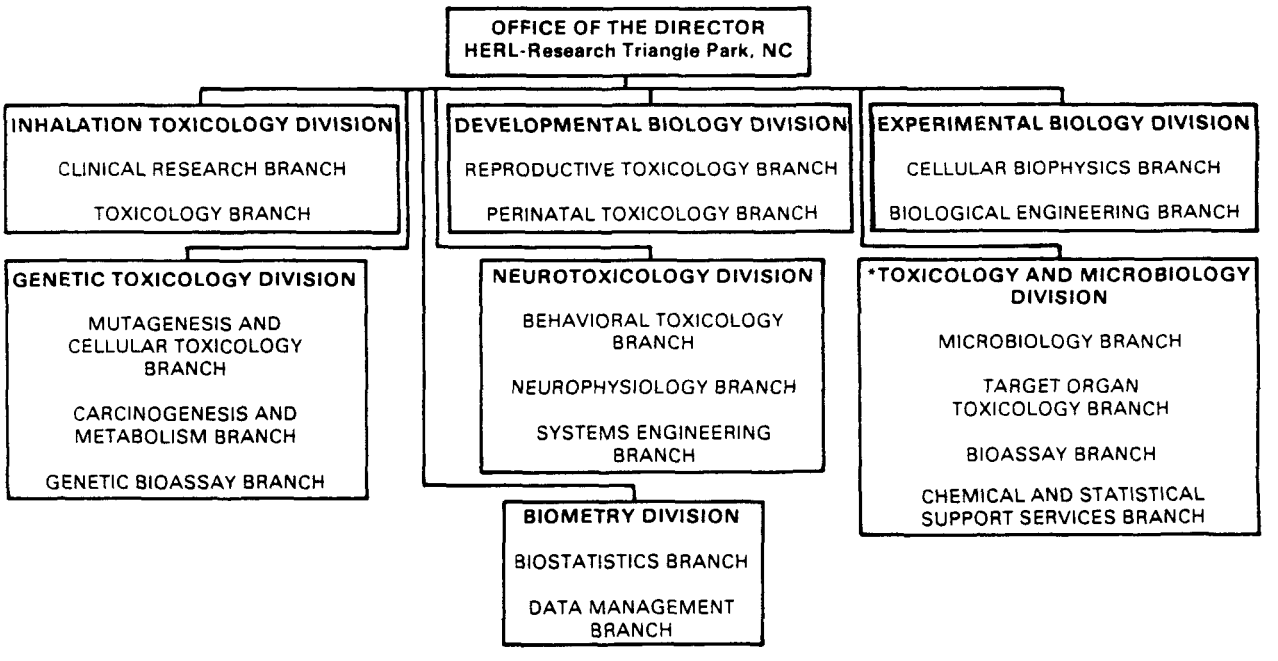
MUNICIPAL WASTEWATER Provide data and appraisal documents on health aspects of land application of municipal sludge as well as on the occurrence, survival and transport of enteric pathogens in sludge

DRINKING WATER: Provide health monitoring and engineering data for drinking water standards.

HAZARDOUS WASTE: Develop and evaluate short-term *in vivo* and *in vitro* bioassays for screening wastes for designation as hazardous.

PESTICIDES. Develop methodologies and generate data for the assessment of risks from pesticides; define environmental and health endpoints for future test methods

TOXIC CHEMICAL TESTING AND ASSESSMENT: Develop and validate test methods for identifying hazards under the Toxic Substances Control Act (TSCA).



*26 W. St. Clair, Cincinnati, OH 45268, FTS: 684-7401, CML. 513-569-7401

HERL—RESEARCH TRIANGLE PARK

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
F Gordon Hueter	2281	Environmental toxicology
Judith Graham	2283	Inhalation toxicology
DEVELOPMENTAL BIOLOGY DIVISION		
Neil Chernoff	4050	Developmental biology
Robert Kavlock	2327	Teratology
John Laskey	2782	Reproductive toxicology
BIOMETRY DIVISION		
William Nelson	2339	Statistics and data management
John Creason	2598	Biostatistics
VACANT	2567	Data management
Carl Hayes	7739	Epidemiology
EXPERIMENTAL BIOLOGY DIVISION		
Richard Phillips	2771	Non-ionizing radiation, electronic systems
Ronald Spiegel	7544	Engineering and electromagnetic research
Joe A. Elder	2541	Non-ionizing, radiofrequency, and microwave radiation
GENETIC TOXICOLOGY DIVISION		
Michael Waters	2537	Genetic toxicology
Stephen Nesnow	3847	Chemical carcinogenesis
Joellen Jungers	3849	Bacterial mutagenecity, carcinogenesis bioassays
Martha Moore	3933	Mammalian cell cytogenetics and mutagenicity
INHALATION TOXICOLOGY DIVISION		
Edward Massaro	2655	Biochemical and inhalation toxicology
Judith Graham	2531	Inhalation toxicology (animal)
John O'Neil	2601	Inhalation toxicology (human)
NEUROTOXICOLOGY DIVISION		
Lawrence Reiter	2671	Neurotoxicology
Robert MacPhail	2617	Behavioral toxicology and pharmacology
Robert Dyer	2617	Neurophysiology/electrophysiology
TOXICOLOGY AND MICROBIOLOGY DIVISION--CINCINNATI		
Elmer W. Akin	684-7218	Virology
Michael A. Pereira	684-7411	Biochemical toxicological methods
Frederick Kopfler	684-7451	Organic and analytical chemistry

*FTS. 629-xxxx, CML. 919-541-xxxx (for RTP); FTS: 684-xxxx, CML: 513-569-xxxx (for Cincinnati)

OFFICE OF HEALTH AND ENVIRONMENTAL ASSESSMENT

Peter W. Preuss, Director

FTS: 382-7317
CML: 202-382-7317

(RD-689)
Washington, DC 20460

The functions of the Office of Health and Environmental Assessment (OHEA) include performing scientific risk assessments to directly support the Agency's regulatory program offices, and providing oversight and guidelines to assure consistency and scientific quality in risk assessments performed throughout the Agency OHEA prepares a variety of documents in response to requests from EPA program offices in support of regulatory and enforcement decisions These documents include air and water criteria documents, health, risk, and exposure assessments; and guidance and methodology documents used in assessing the risk of exposure to hazardous pollutants OHEA also develops risk assessment guidelines, performs risk assessments, and provides technical assistance at the request of the program offices Furthermore, OHEA develops new risk assessment methodologies and suggests new research efforts that will better support future risk assessment procedures. OHEA consists of five units:

CARCINOGEN ASSESSMENT GROUP: Provides advice on the human health risks associated with exposure to suspected cancer-causing agents

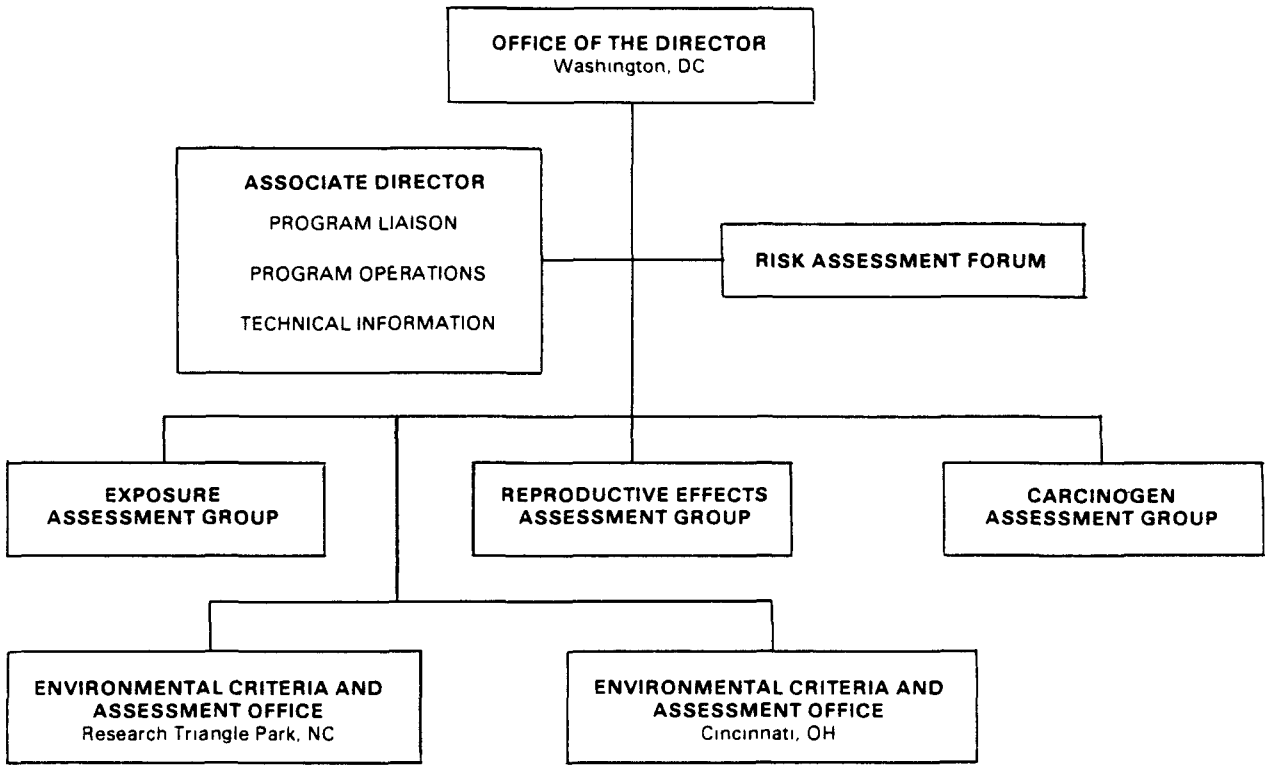
EXPOSURE ASSESSMENT GROUP Provides advice on the exposure characteristics and factors of agents that are suspected of causing detrimental health effects

REPRODUCTIVE EFFECTS ASSESSMENT GROUP Provides advice on the hazards associated with chemicals that are suspected of causing detrimental reproductive effects, including mutagenic and teratogenic effects, and sterility

ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE/ CINCINNATI Is responsible for the preparation of criteria and health and hazard assessment documents on water pollution and solid and hazardous wastes (See page 36)

ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE/ RESEARCH TRIANGLE PARK: Is repsonsible for the preparation of criteria and assessment documents primarily in the field of air pollution (See page 34)

Information on the availability of OHEA documents can be obtained from the Technical Information Staff (RD-689), 382-7345.



OHEA—WASHINGTON AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Peter W Preuss	7317	Health and environmental assessment
Dorothy Patton	6743**	Risk assessment forum
CARCINOGEN ASSESSMENT GROUP		
Charles H Ris	5898	Human health risks
EXPOSURE ASSESSMENT GROUP		
Charles H Nauman	8909	Exposure characteristics and factors
REPRODUCTIVE EFFECTS ASSESSMENT GROUP		
Lawrence Valcovic	7303	Reproductive effects

*FTS 382-xxxx, CML 202-382-xxxx (Washington)
**FTS 475-xxxx, CML 202-475-xxxx (Washington)

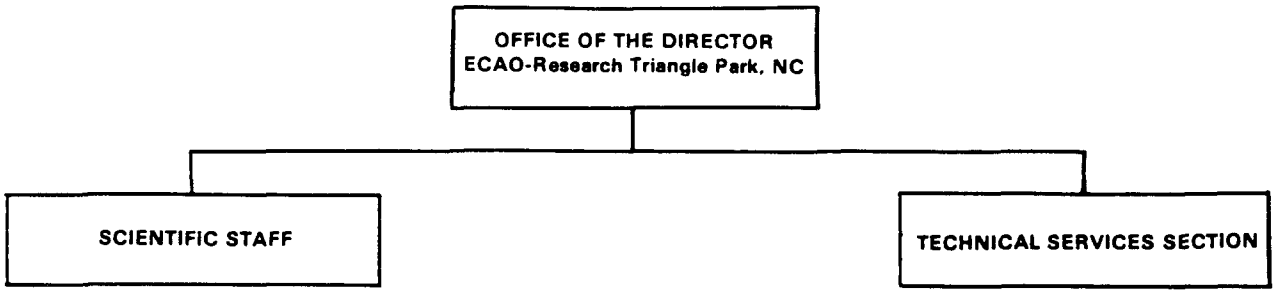
ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE

Lester D. Grant, Director

FTS: 629-4173
CML: 919-541-4173

(MD-52)
Research Triangle Park, NC
27711

MISSION: The Environmental Criteria and Assessment Office is responsible for developing the following types of documents: (1) revised or new criteria documents which serve as a basis for setting national ambient air quality standards for pollutants such as sulfur oxides, nitrogen oxides, ozone, and lead; (2) health assessment documents which deal with the health effects associated with a pollutant suspected of needing control; and (3) special reports as required to meet a specific need or as dictated by legislation.



ECAO—RESEARCH TRIANGLE PARK AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Lester D Grant	4173	Health effects
Michael A. Berry	4172	Environmental effects and legislation
Si Duk Lee	4159	Health effects
Donna W. Wicker	4171	Administration and contracts
Emily R. Lee	4169	Program and office operations
Barbara Kearney	4168	Program and office operations
SCIENTIFIC STAFF		
Michael A. Berry	4172	Environmental effects and legislation
Jasper H B. Garner	4153	Terrestrial effects
Beverly E. Tilton	4161	Ozone and hydrocarbons
Thomas B. McMullen	4150	Air quality data
Robert M. Bruce	4154	Hazardous pollutants
Mark M. Greenberg	4156	Hazardous pollutants
Donna J. Sivulka	4155	Heavy metals
Dennis J. Kotchmar	4158	Epidemiology and pulmonary effects
J. Michael Davis	4162	Neurobehavior
David E. Weil	4163	Lead
James A. Raub	4157	Carbon monoxide
Beverly M Comfort	4165	Pesticides
Norman E. Childs	2229	Radiation
Robert W. Elias	4167	Metals and particles
William G. Ewald	4164	Hazardous pollutants
Harriet M. Ammann	4930	Hazardous pollutants
Darcy L. Campbell	4477	Forest systems
Ruby F. Griffin	4114	Program and office operations
TECHNICAL SERVICES SECTION		
Frances P. Bradow	3797	Documentation procedures and material effects
Allen G. Hoyt	4645	Graphics
Douglas B. Fennell	3789	Environmental information
Diane H. Ray	3637	Projects and records
Richard N. Wilson	3797	Copy production

*FTS: 629-xxxx, CML: 919-541-xxxx

ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE

J.F. Stara, Director

FTS: 684-7531
CML: 513-569-7531

26 W. St. Clair
Cincinnati, OH 45268

The Environmental Criteria and Assessment Office is responsible for the following major program areas.

AIR QUALITY: Comprehensive health assessment documentation and summaries for contaminants in air including maintenance of court files and disposition of public comments; participation and running of workshops on specific contaminants.

DRINKING WATER: Comprehensive health assessment documentation and summaries for drinking water contaminants including maintenance of court files and disposition of public comments and development of risk assessment methodologies applicable to drinking water.

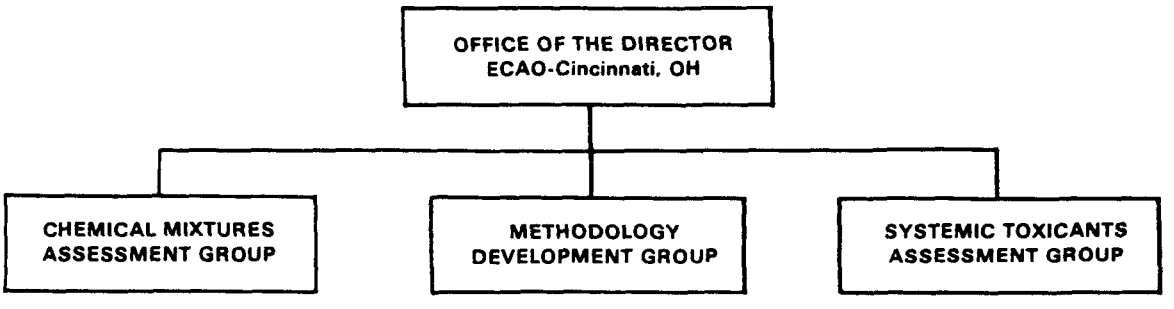
HAZARDOUS SUBSTANCES (NON-ENERGY): Chemical specific risk assessment addressing identification of reportable quantities for spill situations based on chronic toxicity; identification of health related goals and remedial action activities; risk characterization for uncontrolled hazardous waste sites performed.

HAZARDOUS WASTE. Development of health risk assessment documentation to support hazardous waste listing activities; quantitative specific chemical and complex mixture risk assessments to support program office activities related to RCRA reauthorization.

INTERMEDIA (NON-ENERGY): Development of health risk assessment guidelines and evaluation and development of methods for risk assessment of systemic toxicants and of chemical mixtures.

MUNICIPAL WASTEWATER: Design and development of methods for risk assessment of chemicals and pathogens in municipal sewage sludge to support technical regulations for sludge disposal methods.

WATER QUALITY: Comprehensive health assessment documentation; response to variance 301(g) requests; state and public technical assistance through EPA Regional offices.



ECAO—CINCINNATI AREAS OF EXPERTISE

	TELEPHONE*	AREA OF EXPERTISE
Office of the Director		
Jerry F. Stara	7531	Risk assessment
Steve Lutkenhoff	7531	Risk assessment
Debdas Mukerjee	7531	Cancer assessments
Judi Olsen	7575	Information transfer
CHEMICAL MIXTURES ASSESSMENT GROUP		
Chris DeRosa	7531	Superfund, solid waste programs
Helen Ball	7572	Contracts
Karen Blackburn	7531	Site assessment, health effects assessment
Harlal Choudhury	7531	Site assessment, land disposal bans
Frank Mink	7572	Solid waste listing activities
Lynn Papa	7572	Site assessment, land disposal bans
John Risher	7572	Confidential business information
METHODOLOGY DEVELOPMENT GROUP		
Linda Erdreich	7572	Health risk assessment methodology, epidemiology
Richard Hertzberg	7572	STARA database, biomathematical models
Jacqueline Patterson	7572	Information transfer, environmental policy
SYSTEMIC TOXICANTS ASSESSMENT GROUP		
Michael Dourson	7572	Acceptable daily intakes
Randy Bruins	7572	Sludge methodology
Larry Fradkin	7584	Pathogens of sludge
Annette Gatchett	7572	Environmental chemistry
Vlasta Molak	7531	Biotechnology
Bruce Peirano	7531	Hexachlorobenzene
Dave Reisman	7531	Air programs
Cindy Sonich-Mullin	7531	Drinking water program

*FTS: 684-xxxx, CML. 513-569-xxxx

TABLE 3-1 CATEGORIES AND POTENTIAL TREATMENT/DISPOSAL TECHNOLOGIES

TANK AND DRUM WASTE CATEGORIES	ON-SITE PREP ACTIVITIES			TREATMENT AND DISPOSAL									
	Bulking/ Consolidation	Absorbtion/ Solidification	Physical/Chemical Pretreatment	Solidification/ Chemical Fixation	Detonation	Physical/Chemical Treatment	Biological Treatment	Land Application	Seoure Landfill	Incineration/Thermal Reduction	Recycle/Reuse w/ Treatment	Recycle/Reuse w/o Treatment	Deepwell Injection
SLUDGE/SOLIDS													
• Organic Low Halogen	1	1	1	1	2	1	1	2	1	1	2	2	2
• Organic High Halogen	1	2	2	2	2	1	1	2	1	1	2	2	2
• Inorganic	1	1	1	1	2	1	2	2	1	2	2	2	2
• Flash point (<70° F)	2	2*	2	2	2	2	2	2	2	1	2	2	2
• Flash point (>70-140° F)	1	2	2	2	2	2	2	2	1*	1	2	2	2
• Flash point (> 140° F)	1	1	1	1	2	1	2	2	1	1	2	2	2
• PCB Contaminated Solid (< 50 ppm)	1	1	2	2	2	1	1	1*	1	1	2	2	2
• PCB Contaminatd Solid (> 50 - 500 ppm)	1	2	2	2	2	2	1	2	1*	1	2	2	2
• PCB Contaminated Solid (> 500 ppm)	1	2	2	2	2	2	1	2	1*	1	2	2	2
• Pesticide	1*	2	1	2	2	1	2	2	1	1	2	2	2
• Petroleum Residues	1	1	1	1	2	1	1	1	1	1	1	2	2
SPECIAL WASTES													
• Radioactive	*	*	*	*	*	*	*	*	*	*	*	*	*
• Strong Oxidizer	2	2	1	2	2	1	2	2	1	2	2	2	2
• Strong Reducer	1	2	1	2	2	1	2	2	1	2	2	2	2
• Lab Packs	2	2	2	2	1*	1	2	2	1	1	2	2	2
• Explosives	2	2	2	2	1	1	2	2	2	1	2	2	2

Phased waste shall be separated and handled as individual waste items
Mixed waste shall be classified under the more restrictive disposal category
1 • Reasonable Option
2 • Not Reasonable (Impractical, Technically Infeasable)
* • Further detailed analyses is warranted

TABLE 3-1 CATEGORIES AND POTENTIAL TREATMENT/DISPOSAL TECHNOLOGIES

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AQUEOUS WASTES													
• Acid pH < 2.0	1	2	1	2	2	1	2	2	2	2	1	1	1*
• Base pH > 12.0	1	2	1	2	2	1	2	2	2	2	1	1	1*
• Base with Sulfur	1	2	1	2	2	1	2	2	2	2	2	2	2*
• Base with Cyanide	1	2	1	2	2	1	2	2	2	2	2	2	2*
ORGANIC LIQUIDS													
• High Halogen content (>2%)	1	2	2	2	2	2	2	2	2	1	2	2	2*
• Organic liquids including Low Halogen content (0 - 2%)	1	2	2	2	2	1	2	2	2	1	1	2	2*
• Oils non-PCB contaminated	1	2	2	2	2	1	1	1	2	1	1	1	2
• PCB Contaminated liquid (50 - 500 ppm)	1	2	2	2	2	1	1	1	2	1	2	2	2
• PCB Contaminated Liquid (> 500 ppm)	1	2	2	2	2	1	2	2	2	1	2	2	2
CONTAMINATED WATER													
• 2 < pH < 12	1	2	1	2	2	1	2	2	2	2	2	2	1*
• Inorganic	1	2	1	2	2	1	2	2	2	2	2	2	1*
• Organic	1	2	1	2	2	1	1	1	2	2	2	2	1*
• PCB Contaminated Liquid (< 50 ppm)	1	2	2	2	2	1	2	2	2	1	2	2	2
• Pesticide	1	2	1	2	2	1	1	2	2	2	2	2	2

Phased waste shall be separated and handled as individual waste items
Mixed waste shall be classified under the more restrictive disposal category
1 • Reasonable Option
2 • Not Reasonable (Impractical, Technically Infeasable)
* • Further detailed analyses is warranted

United States
Environmental Protection
Agency

Hazardous Waste Engineering
Research Laboratory
Cincinnati OH 45268

EPA
July 1986

Research and Development

EPA

Treatment Technology Briefs

Alternatives to Hazardous Waste Landfills

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Introduction

Technologies other than landfill and containment need to be applied in the management of hazardous wastes. Acceptance of treatment technologies other than those currently being used is slow in coming. The Hazardous Solid Waste Act Amendments (HSWA) of 1984 modifying RCRA and the EPA policies of CERCLA cleanups using RCRA requirements at least as guidelines will require new approaches to the problem.

The treatment technology material included in this summary relates to technology which is available and applicable to hazardous waste disposal now. That is, further research is not required for application in the field. What remains is to apply the technology and derive the necessary design parameters and the costs for large-scale application. These derivations require, as a minimum, pilot-scale and more appropriately full-scale application at waste disposal sites and generator locations.

The selections of processes for presentation in this compendium is based on opinions resulting from technical evaluation. The purpose of making these briefs available is to remind the reader that processes and techniques are available and to encourage a search for additional information. Information in the briefs is not sufficient to permit direct evaluation of a process or technology. For evaluations involving specific sites or waste streams, the reader should consult sources that provide operational, effectiveness, and cost data.

Technology: Advanced Biological Methods

Brief Description: Two Processes—(1) Aerobic fluidized bed (suspended sand and oxygen), to provide large surface areas to improve microbial degradation of soluble solids. (2) Membrane aerobic reactor systems prevent loss of cell mass and thereby provide high concentrations of cells to destroy pollutants.

Applicability/Limitation: Process requires predeveloped microbes to be added to treatment systems. Natural microbes have been demonstrated to destroy pollutants in paint sludges.

Status/Availability: Biological systems are available.

Manufacturer: Dorr-Oliver

Users: General Motors

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Aerobic Biological Treatment

Brief Description: Microorganisms metabolize biodegradable organics in aqueous waste. This treatment includes conventional activated sludge processes as well as modifications such as sequencing batch reactors, and aerobic attached growth biological processes such as rotating biological contactors and trickling filters. Aerobic processes are capable of significantly reducing a wide range of organic toxic and hazardous compounds; however, only dilute aqueous wastes (<1%) are normally treatable. Recent developments with genetically engineered bacteria have been reported to be effective for biological treatment of specific hazardous waste which is relatively uniform in composition.

Applicability/Limitation: Used to treat aqueous wastes contaminated with low levels (BOD <10,000 mg/l) of non-halogenated organic and/or certain halogenated organics. The treatment requires consistent, stable operating conditions.

Design Criteria: There are numerous variations of the activated sludge process, however, fundamentally the principles of the unit operations are the same. The first step in the process involves aeration in an open tank, in which the organic biodegradable matter in the waste is degraded by microorganisms in the presence of oxygen. The hydraulic detention time of this unit operation is usually from 6 to 24 hours, although depending on the process mode, shorter or longer detection times may be incorporated. This is followed by a sludge-liquid separation step in a clarifier Organic loading rates can vary from 10 to 180 lbs of BOD applied per 1000 ft^3 depending on the MLSS concentration, the F/M ratio, and oxygen supply Variations of the conventional activated sludge system that incorporate pure oxygen or powdered activated carbon have reported excellent pollutant removals for typically difficult to treat waste

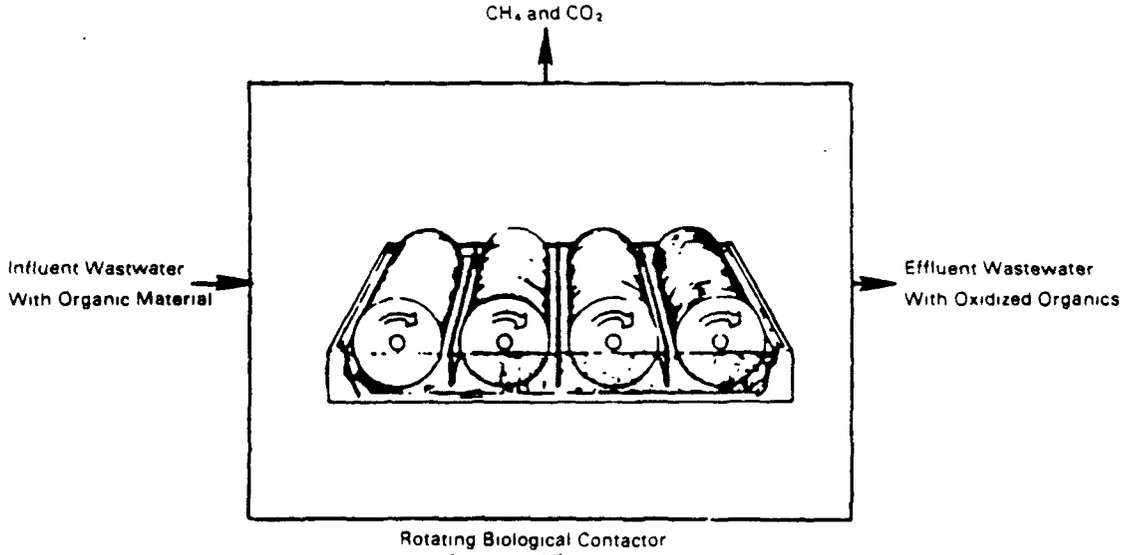
Status/Availability: Commercially available.

Manufacturer: Polybac Corporation, Mike Cawthray Detox, Inc , Evan K. Nyer (fixed film), (513) 433-7394 Ground Decontamination Systems, Joe Mahan, (201) 265-6727

Users: OH Materials, Joe Kirk, (219) 423-3526

EPA Contact: Ron Turner, (513) 569-7775

Schematic of rotating biological contactor.



Rotating Biological Contactor
(Courtest of Envirex)

Technology: Air Stripping

Brief Description: Air stripping is a mass transfer process in which volatile contaminants in water or soil are transferred to air. Design considerations—factors important in removal or organics from wastewater in air stripping are temperature, pressure, air-to-water ratio, and surface area available for mass transfer. A packed tower air stripper is shown on the next page. Practical tower diameters range from 1 to 12 ft with packing heights as high as 50 ft, air-to-water volumetric ratios may range from 10 to 1 up to 300 to 1. The resulting residuals are the contaminated off-gas and the "stripped" effluent.

Applicability/Limitation: Used to treat aqueous organic wastes with relatively high volatility, low water solubility (e.g., chlorinated hydrocarbons such as tetrachloroethylene, and aromatics such as toluene). Limitations include concentrations of VOCs less than 100 ppm, temperature dependence and the presence of suspended solids.

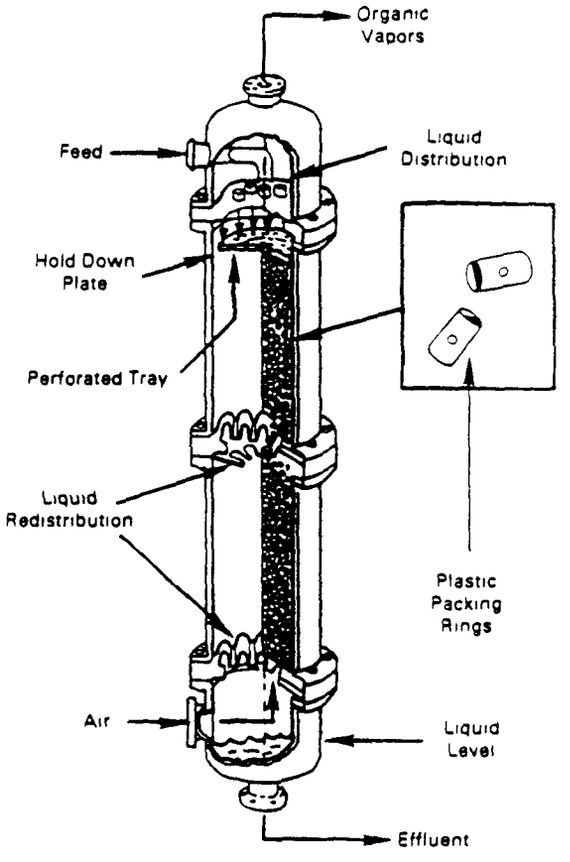
Status/Availability: Commercially available.

Manufacturer: See buyer's guides from trade journals.

Users: Superfund Sites: Triangle Chemical, McKin site and Verona Wellfield

EPA Contact: Ron Turner, (513) 569-7775

Schematic of air stripping.



Technology: Alkali Metal Dechlorination

Brief Description: Several chemical dechlorination processes are based on a method developed by the Goodyear Tire and Rubber Company in 1980. The original method uses sodium plus naphthalene in tetrahydrofuran (that is, sodium naphthalide) to strip chlorine atoms from PCBs resulting in polymerizing the biphenyl into inert condensible sludge. The reactor is blanketed with nitrogen and an excess of reagent to chlorine content is required. The Goodyear Company has not commercially developed the technology. However, several companies have modified the method by substituting their own proprietary reagent for the naphthalene. The equipment is mobile and can be transported on semitrailers.

Applicability/Limitation: Used to treat PCBs, chlorinated hydrocarbons, acids, thiols, chlorides and dioxins. Moisture content adversely affects rates of reactions.

Status/Availability: Commercially available

Manufacturer: American Mobile Purification, Peter Lawson-Johnson, (212) 267-7073
SunOhio, Doug Toman, (216) 452-0837
PPM, Inc., (404) 934-0902
Acurex, Jim Thompson, (415) 964-3200
Chemical Waste Management, Peter Daily, (312) 841-8360
Exceltech, Inc., John Sedwick, (415) 659-0404

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Alkali Metal/Polyethylene Glycol (PEG)

Brief Description: In 1978 the EPA sponsored research which led to the development of the first of a series of A/PEG reagents which were shown to effectively dechlorinate PCBs in oils. Essentially, these reagents were alkali metal polyethylene glycolates which react rapidly to dehalogenate haloorganic compounds of all types under ambient and high temperature conditions. In the A/PEG reagents, the alkali metal ion is held in solution by the large polyethylene glycolate anion. PCBs and other halogenated molecules are uniquely soluble in A/PEG reagents. These qualities combine to give a single-phase system in which the high concentration of anions readily displaces the halogen atoms on halogenated molecules. The reaction of halogenated aromatics with PEGs results in a substitution of the PEG for the chlorine atom to form a PEG ether The PEG ether, in turn, may then decompose to a phenol The biotoxicity of reaction by-products is under investigation.

Applicability/Limitation: Heat and excess reagent are required for the process to function effectively in soils containing more than seven percent moisture.

Status/Availability: Laboratory scale. Ready for field test.

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Alkaline Chlorination

Brief Description: In this process, chlorine gas (with caustic), chlorine dioxide, or hypochlorite (sodium or calcium) are routinely used to destroy cyanide which is converted to nitrogen gas and carbon dioxide gas

Applicability/Limitation. Used to treat free cyanides and complex cyanides although combinations with Fe or Ni will take a longer time Limitations include the exothermic heat of the reaeration, pH, non-selective competitions with other species and additional chlorine demands. Fairly close pH control (7 5 to 9.0) required to avoid toxic volatiles release Reduction efficiency about 99 6 percent

Status/Availability: Generally available

Manufacturer: See buyer's guides in trade journals

Users: Electroplating industry

EPA Contact. S Garry Howell, (513) 569-7756

Technology: Anaerobic Biological Treatments

Brief Description: The anaerobic biological treatment process encompasses the reduction of organic matter in an oxygen-free environment to methane and carbon dioxide. The most common anaerobic attached growth treatment process is the anaerobic filter. This process consists of a column filled with solid media. A number of proprietary anaerobic biotechnology processes are actively being marketed, each with distinct features, but all utilizing the fundamental anaerobic conversion to methane.

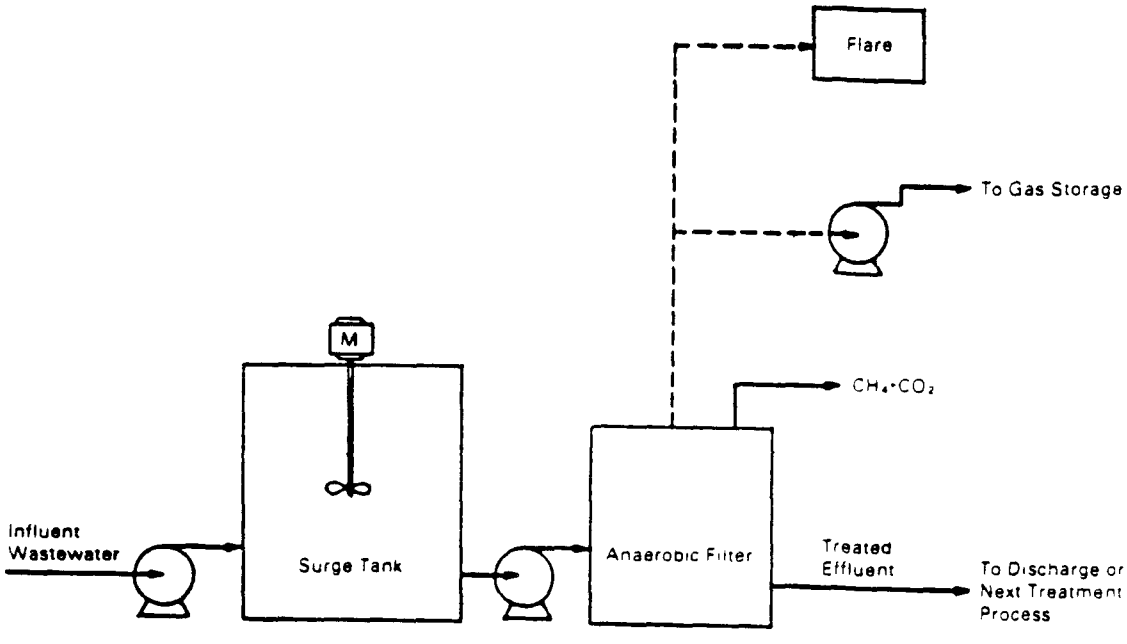
Applicability/Limitation: Used to treat aqueous wastes with low to moderate levels of organics. Anaerobic digestion can handle certain halogenated organics better than aerobic treatment. Stable, consistent operating conditions must be maintained. Anaerobic degradation can take place in native soils but when used as a controlled treatment process, an air tight reactor is required. Hazardous organic substances that have been found to be amenable to anaerobic treatment include acetaldehyde, acetic anhydride, acetone, acrylic acid, aniline, benzoic acid, butanol, cresol, ethyl acrylate, MEK, phenol and vinyl acetate.

Status/Availability: No mobile units are available. Current, state-of-the-art processes available.

Manufacturer: FMC, GDS and several other providers of selected microbes, nutrients, or systems designs.

EPA Contact: Ronald Lewis, (513) 569-7856

Schematic of anaerobic filter system



Technology: Asphalt-Based Stabilization/ Solidification (Thermoplastic Microencapsulation)

Brief Description: Involves the mixing of heated, dried wastes within either an asphalt bitumen, paraffin or polyethylene matrix resulting in a solid waste mass for landfill disposal. The advantages are waste volume reduction, low impermeability, elimination of free liquid, improved handling and good strength.

Applicability/Limitation: This method is applicable to hazardous wastes that are complex and difficult to treat. Wastes that should not be treated using this technology are: wastes with high water content; strongly oxidizing contaminants; anhydrous inorganic salts; tetraborates; iron and aluminum salts; and organics with low molecular weights and high vapor pressures (volatile). The disadvantages include expensive equipment, high processing cost and air pollution potential.

Status/Availability: Commercially available.

Manufacturer: Werner A. Pfleidler, Waldick, New Jersey
Aerojet Energy Conversion Company, Sacramento, California
Newport News Industrial Corporation, Newport News, Virginia

Users: _____

EPA Contact: Robert Landreth, (513) 569-7836

Technology: Blast Furnaces (Iron and Steel)

Brief Description: Blast furnace temperatures may reach up to 3400°F, and are generally above 3000°F. High heat content hazardous wastes can be used to supplement coke and other fuel requirements for blast furnace. A blast furnace produces molten iron from iron ore and other iron bearing feed materials. Iron ore, carbon (coke) and limestone feed to the top of the furnace and iron product and slag are removed in different layers from the bottom. HWF can be injected just above slag layer.

Applicability/Limitation: Composition (trace elements) of HWF must be controlled to avoid product quality problems. Waste oils were fired into blast furnace in HWERL test programs.

Status/Availability: Less than 80 blast furnaces currently operating in U.S.

Manufacturer: Several—Must be field constructed

Users: Cadence Chemicals, Mike Benoit, (219) 879-0371

EPA Contact: Robert Mournighan, (513) 569-7408

Technology: Carbon Adsorption

Brief Description: Removes dissolved organics from aqueous wastes, and organics from air streams due to the surface attachment between organic solutes and the large internal pore surface area of activated carbon grains. The residuals are spent carbon and regenerant (steam or solvent).

Applicability/Limitation: Used to treat single-phase aqueous organic wastes with high molecular weight and boiling point and *low solubility* and *polarity*, chlorinated hydrocarbons such as tetrachloroethylene, and aromatics such as phenol. Limitations are organic contaminant concentrations <10,000 ppm, suspended solids <50 ppm, dissolved inorganics and oil and grease <10 ppm.

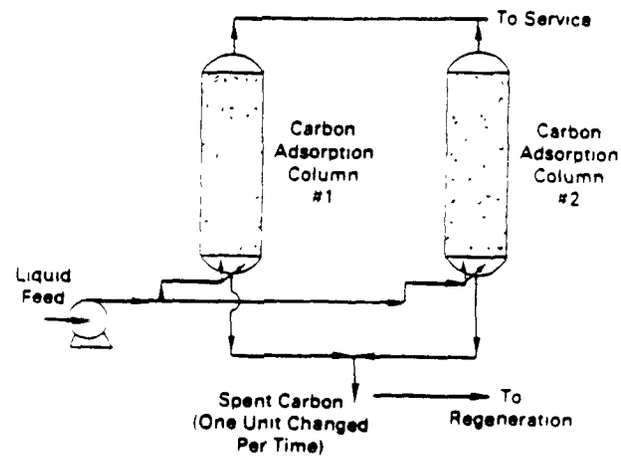
Status/Availability: EPA Environmental Emergency Response Unit—two transportable systems (50-gpm and 600-gpm units).

Manufacturer: Calgon Carbon Corporation, Dave Jordan, (201) 526-4646
Carbon Air Services, Inc., (612) 935-1844
Zimpro, Inc., (715) 359-7211
Chemical Waste Management, John Fink, (714) 940-7971

Users: IT Corporation, California

EPA Contact: Ron Turner, (513) 569-7775
Richard Traver, (201) 321-6677

Schematic of carbon adsorption.



Toxic Compounds Removed from Water Using the Carbon Adsorption System in the Hazardous Material Spills Treatment Trailer

Compound	Location of Incident	Quantity Treated (gallons)	Contact Time (minutes)	Influent Concentration (ppb)	Effluent Concentration (ppb)	Percent Removal
DNBP	Clarksburgh, New Jersey	2,000,000	26	8	< 002	99 98
PCB	Seattle, Washington	600,000	30-40	400	< 075	99 98*
Toxaphene	The Plains, Virginia	250,000	26	36	1	97 22
Chlordane	Strongstown, Pennsylvania	100,000	17	13	35	97 3
		3,000	240	1 430	43	99 99
Heptachlor	Strongstown, Pennsylvania	100,000	17	6 1	06	99 02
		3,000	240	80	1	99 87
Aldrin	Strongstown, Pennsylvania	100,000	17	8 5	19	97 76
		3,000	240	60 5	15	99 75
Dieldrin	Strongstown, Pennsylvania	100,000	17	11	< 01	99 99*
		3,000	240	60 5	< 01	99 99*
Kepone	Hopewell, Virginia	225,000	45 5	4 000	<1	99 98
Pentachlorophenol	Haverford, Pennsylvania	215,000	26	10,000	<1	99 98

Toxic Compounds Removed from Water Using the Carbon Adsorption System in the Hazardous Material Spills Treatment Trailer (Continued)

Compound	Location of Incident	Quantity Treated (gallons)	Contact Time (minutes)	Influent Concentration (ppb)	Effluent Concentration (ppb)	Percent Removal
Methylene Chloride	Oswego, New York	250,000	8 5	190	51	73 15
Carbon Tetrachloride	Oswego, New York	250,000	8 5	1 1	< 1	90 91*
Benzene	Oswego, New York	250,000	8 5	1	1	90
Toluene	Oswego, New York	250,000	8 5	120	3	99 75
Xylene	Oswego, New York	250,000	8 5	140	< 1	99 92*
Trichloroethane	Oswego, New York	250,000	8 5	12	< 1	99 17*
Trichloroethylene	Oswego, New York	250,000	8 5	21	3	98 57

Source Becker, D L , S C Wilson, 1978

Amenability of Typical Organic Compounds to Activated Carbon Adsorption

Compound	Molecular Weight	Aqueous Solubility (%)	Concentration mg/l Initial (C_o)	Concentration mg/l Final (C_f)	Adsorbability % compound/ % carbon	Adsorbability Percent Reduction
Alcohols						
Methanol	32 0	-	1 000	964	0 007	3 6
Ethanol	46 1	-	1 000	901	0 020	10 0
Propanol	60 1	-	1 000	811	0 038	18 9
Butanol	74 1	7 7	1 000	466	0 107	53 4
n-Amyl alcohol	88 2	1 7	1,000	282	0 155	71 8
n-Hexanol	102 2	0 58	1 000	45	0 191	95 5
Isopropanol	60 1	-	1 000	874	0 025	12 6
Allyl alcohol	58 1	-	1 010	789	0 024	21 9
Isobutanol	74 1	8 5	1 000	581	0 084	41 9
t-Butanol	74 1	-	1 000	705	0 059	29 5
2-Ethyl butanol	102 2	0 43	1 000	145	0 170	85 5
2-Ethyl hexanol	130 2	0 07	700	10	0 138	98 5
Aldehydes						
Formaldehyde	30 0	-	1 000	908	0 018	9 2
Acetaldehyde	44 1	-	1 000	881	0 022	11 9
Propionaldehyde	58 1	22	1 000	723	0 057	27 7
Butyraldehyde	72 1	7 1	1 000	472	0 106	52 8
Acrolein	56 1	20 6	1 000	694	0 061	30 6
Crotonaldehyde	70 1	15 5	1 000	544	0 092	45 6
Benzaldehyde	106 1	0 33	1 000	60	0 188	94 0
Paraldehyde	132 2	10 5	1 000	261	0 148	73 9
Amines						
Di-N-Propylamine	101 2	-	1 000	198	0 174	80 2
Butylamine	73 1	-	1 000	480	0 103	52 0
Di-N-Butylamine	129 3	-	1 000	130	0 174	87 0
Allylamine	57 1	-	1 000	686	0 063	31 4
Ethylenediamine	60 1	-	1 000	893	0 021	10 7
Diethylenetriamine	103 2	-	1 000	706	0 062	29 4
Monethanolamine	61 1	-	1 012	939	0 015	7 2
Diethanolamine	105 1	95 4	996	722	0 057	27 5
Triethanolamine	149 1	-	1 000	670	0 067	33 0
Monoisopropanolamine	75 1	-	1 000	800	0 040	20 0
Diisopropanolamine	133 2	87	1 000	543	0 091	45 7
Pyridines & Morpholines						
Pyridine	79 1	-	1 000	527	0 095	47 3
2-Methyl-5-ethyl pyridine	121 2	sl sol	1 000	107	0 179	89 3
N-Methyl morpholine	101 2	-	1 000	575	0 085	42 5
N-Ethyl morpholine	115 2	-	1 000	467	0 107	53 3

Amenability of Typical Organic Compounds to Activated Carbon Adsorption (Continued)

Compound	Molecular Weight	Aqueous Solubility (%)	Concentration mg. l Initial (C_o)	Concentration mg. l Final (C_f)	Adsorbability % compound / % carbon	Adsorbability Percent Reduction
Aromatics						
Benzene	78 1	0 07	416	21	0 080	95 0
Toluene	92 1	0 047	317	66	0 050	79 2
Ethyl benzene	106 2	0 02	115	18	0 019	84 3
Phenol	94	6 7	1 000	194	0 161	80 6
Hydroquinone	110 1	6 0	1 000	167	0 167	83 3
Aniline	93 1	3 4	1 000	251	0 150	74 9
Styrene	104 2	0 03	180	18	0 028	88 8
Nitrobenzene	123 1	0 19	1 023	44	0 196	95 6
Esters						
Methyl acetate	74 1	31 9	1 030	760	0 054	26 2
Ethyl acetate	88 1	8 7	1 000	495	0 100	50 5
Propylacetate	102 1	2	1 000	248	0 149	75 2
Butyl acetate	116 2	0 68	1 000	154	0 169	84 6
Primary amyl acetate	130 2	0 2	985	119	0 175	88 0
Isopropyl acetate	102 1	2 9	1 000	319	0 137	68 1
Isobutyl acetate	116 2	0 63	1 000	180	0 164	82 0
Vinyl acetate	86 1	2 8	1 000	357	0 129	64 3
Ethylene glycol monoethyl ether acetate	132 2	22 9	1 000	342	0 132	65 8
Ethyl acrylate	100 1	2 0	1 015	226	0 157	77 7
Butyl acrylate	128 2	0 2	1 000	43	0 193	95 9
Ethers						
Isopropyl ether	102 2	1 2	1 023	203	0 162	80 0
Butyl ether	130 2	0 03	197	nil	0 039	100 0
Dichloroisopropylene ether	171 1	0 17	1 008	nil	0 200	100 0
Glycols & Glycol Ethers						
Ethylene glycol	62 1	-	1 000	932	0 0136	6 8
Diethylene glycol	106 1	-	1 000	738	0 053	26 2
Triethylene glycol	150 2	-	1 000	477	0 105	52 3
Tetraethylene glycol	194 2	-	1 000	419	0 116	58 1
Propylene glycol	76 1	-	1 000	884	0 024	11 6
Dipropylene glycol	134 2	-	1 000	835	0 033	16 5
Hexylene glycol	118 2	-	1 000	386	0 122	61 4
Ethylene glycol monomethyl ether	76 1	-	1 024	886	0 028	13 5
Ethylene glycol monoethyl ether	90 1	-	1 022	705	0 063	31 0
Ethylene glycol monobutyl ether	118 2	-	1 000	441	0 112	55 9
Ethylene glycol monohexyl ether	146 2	0 99	975	126	0 170	87 1
Diethylene glycol monoethyl ether	134 2	-	1 010	570	0 087	43 6
Diethylene glycol monobutyl ether	162 2	-	1 000	173	0 166	82 7
Ethoxytriglycol	178 2	-	1 000	303	0 139	69 7
Halogenated						
Ethylene dichloride	99 0	0 81	1 000	189	0 163	81
Propylene dichloride	113 0	0 30	1 000	71	0 183	92 9
Ketones						
Acetone	58 1	-	1 000	782	0 043	21 8
Methylethyl ketone	72 1	26 8	1 000	532	0 094	46 8
Methyl propyl ketone	86 1	4 3	1 000	305	0 139	69 5
Methyl butyl ketone	100 2	v sl sol	988	191	0 159	80 7
Methyl isobutyl ketone	100 2	1 9	1 000	152	0 169	84 8
Methyl isoamyl ketone	114 2	0 54	986	146	0 169	85 2
Diisobutyl ketone	142 2	0 05	300	nil	0 060	100 0
Cyclohexanone	98 2	2 5	1 000	332	0 134	66 8
Acetophenone	120 1	0 55	1 000	28	0 194	97 2
Isophorone	138 2	1 2	1 000	34	0 193	96 6
Organic Acids						
Formic acid	46 0	-	1 000	765	0 047	23 5
Acetic acid	60 1	-	1 000	760	0 048	24 0
Propionic acid	74 1	-	1 000	674	0 065	32 6
Butyric acid	88 1	-	1 000	405	0 119	59 5
Valeric acid	102 1	2 4	1 000	203	0 159	79 7
Caproic acid	116 2	1 1	1 000	30	0 194	97 0
Acrylic acid	72 1	-	1 000	355	0 129	64 5
Benzoic acid	12 1	0 29	1 000	89	0 183	91 1
Oxides						
Propylene oxide	58 1	40 5	1 000	739	0 052	26
Styrene oxide	120 2	0 3	1 000	47	0 190	95 3

Technology: Catalytic Dehydrochlorination

Brief Description: Catalytic dehydrochlorination is based on the reaction of polychlorinated hydrocarbons with high-pressure hydrogen gas in the presence of a catalyst. The feed must be in either liquid or gaseous form with the inorganic and inert constituents removed. The choice of catalyst depends on the process requirements. The operating temperatures are 671° to 707°F under 30 to 50 atms pressure. The quantity of catalyst (usually 61 percent Ni on Kieselguher or 10 percent palladium in C for PCB compounds) is about 0.2 percent of pollutant weight.

Applicability/Limitation: In general, supported catalysts are quickly deactivated by impurities such as tars, sulfur compounds, etc. These processes are excessively costly and often require the use of hazardous chemicals.

Status/Availability: Laboratory scale.

Manufacturer: _____

Users: _____

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Centrifugation

Brief Description: Centrifugation is a physical separation process in which the components of a fluid mixture are separated mechanically, based on their density, by rapidly rotating the mass of fluid within a rigid vessel. Centripetal forces in centrifugation are similar to gravitational forces in sedimentation except that centripetal forces are thousands of times stronger than gravitational forces, depending on diameter and rotational speed of the centrifuge.

Applicability/Limitation: Dewatering, separating oil and water, clarification of viscous gums and resins, and recovery of metals. Centrifuges are generally better suited than vacuum filters for dewatering sticky or gelatinous sludges. Disc-type centrifuges can be used to separate a three-component mixture (i.e., oil, water, solids). Centrifuges cannot generally be used for clarification since they may fail to remove solids which are not large or dense particles. Recovery and removal efficiencies may be improved if filter paper or cloth are incorporated in the centrifuges.

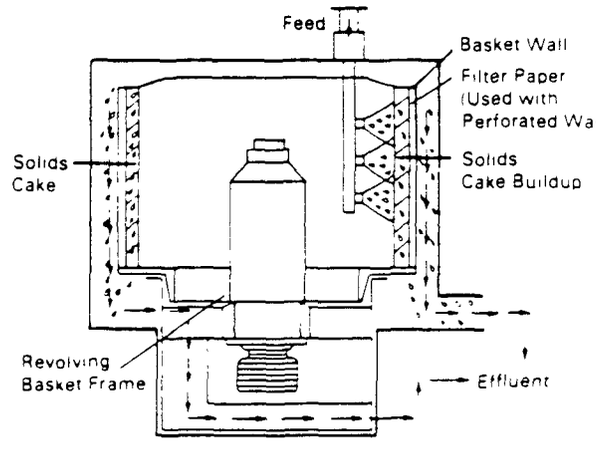
Status/Availability: Commercially available

Manufacturer: Western States Machine
Bird, Fletcher
Sharples
Dorr-Oliver

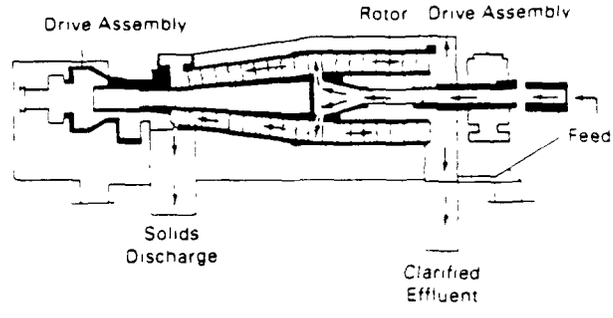
Users: Widespread

EPA Contact: S. Garry Howell, (513) 569-7756

Basket centrifuge.



Solid bowl centrifuge



Technology: Chemical Precipitation

Brief Description: Chemical precipitation facilities remove dissolved metals from aqueous wastes by chemically converting the metals into insoluble form Metals may be precipitated from solution as hydroxides, sulfides, carbonates or other salts. Hydroxide precipitation with lime is most common; however, sodium sulfide is sometimes used to achieve lower effluent metal concentrations This involves pH adjustment followed by sodium sulfide and flocculant aid additions. Solids separation is effected by standard flocculation coagulation techniques. The resulting residuals are metal sludge and the treated effluent with an elevated pH and, in the case of sulfide precipitation, excess sulfide.

Applicability/Limitation: This technology is used to treat aqueous wastes containing metals including zinc, arsenic, copper, manganese, mercury, cadmium, trivalent chromium, lead and nickel Selective precipitation of barium as barium sulfate and silver as silver chloride are other applications Limitations include optimum pH for the mix of metals present and chelating or complexing agents Organics are not removed. The resulting sludge may be hazardous by definition but often may be delisted by specific petition. Sulfide precipitation has been successfully used at a plating facility (as shown in the following table).

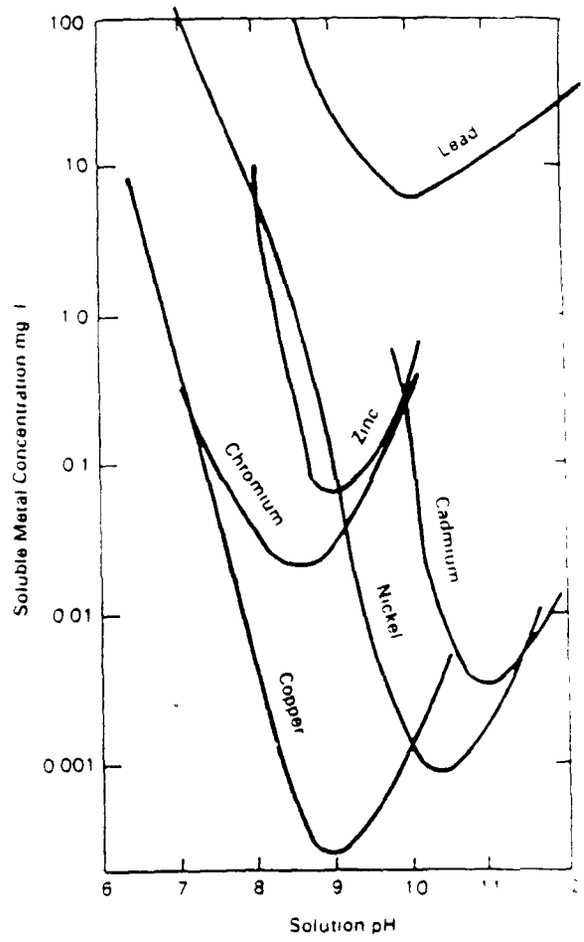
Status/Availability: Commercially available

Manufacturer: Mobile Systems—Rexnord CRIG, Richard Ostawski, (414) 643-2762
Ecolochem, Inc., Richard Smallwood, (800) 446-8004
Dravo Corporation, Ogden Clemons, (412) 777-5235

Users: Widespread

EPA Contact: S Garry Howell, (513) 569-7756

Solubilities of metal hydroxides as a function of pH



Treatment of Industrial Plating Wastewaters by Sulfide Precipitation and Settling

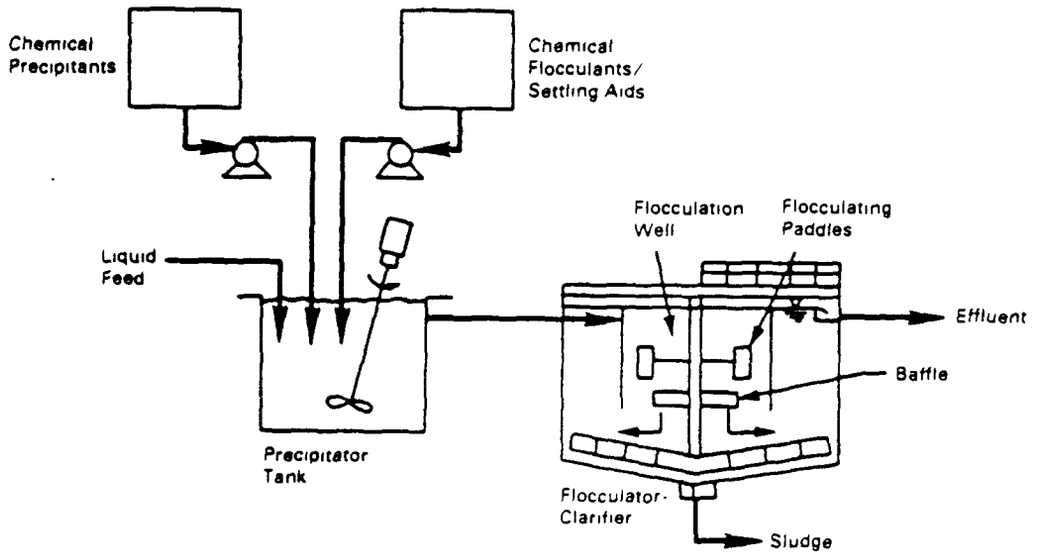
Initial conditions of wastewater

pH = 7 1 ± 0 1
Zn = 82.7 mg/l = 1 264 mM
Ni = 4 7 mg/l = 0 080 mM
Total Metals = 1 344 mM

Run No.	pH	t, min	S" Dosage	Residual Metal, mg/l		Removal Efficiency, %		
				Zn	Ni	Zn	Ni	Overall
35	10 0	10.0	1 15x	5 0	0 04	<93 95	99 15	<94 34
36	10 0	10.0	0	3 4	0 05	95 89	98 94	96 15
37	10.0	15.0	1 15x	4 4	0 11	94 68	97 66	94 94
38	10.0	15.0	0	>5 0	0 08	<93.95	98 30	<94 29
39	10.0	5.0	1 15x	0 76	0 15	99 08	96 81	99 03
40	10 0	5 0	0	3 6	0 09	95 65	98 09	95 87
41	10 0	10 0	1 0x	4 7	0 10	94 32	97 87	94 61
42	10 0	10 0	0 8x	>5 0	0 20	<93 95	95 74	<94 41
43	7 2	10 0	0 8x	>5 0	1 05	<93 95	77 66	93 06
44	7 4	10 0	1 15x	>5 0	>5 0	<93.95	0	88 44

Ref: Peters, 1984

Chemical precipitation and associated process steps.



Technology: Circulating Bed Combustor

Brief Description: The GA circulating bed combustor is designed to be an improvement over conventional fluidized beds. The system operates at higher velocities and with finer sorbents than fluidized bed systems. This permits a unit that is more compact and easier to feed. The unit also produces lower emissions and uses less sorbent materials than the fluidized bed systems. No off-gas scrubber is necessary in the circulating bed combustor and heat can be recovered as an added benefit.

The key to the high efficiency of the circulating bed combustor is the high turbulence that is achieved within the combustor. This feature allows efficient destruction of all types of halogenated hydrocarbons, including BCBs and other aromatics, at relatively low temperatures (less than 850°C). All acid gases are captured within the combustion chamber by injected limestone. Compounds containing high levels of phosphorus, sulfur, cyanide, etc., can be processed with emissions of NO_x, CO and acid gases. In addition to the turbulence a large combustion zone with uniform (and lower) temperature throughout also contributes to high efficiency. The circulating bed combustor also features longer residence times of the combustibles and sorbents in the combustion zone.

Applicability/Limitation: The system is capable of treating solids, sludges, slurries and liquids containing such compounds as chlorobenzenes, acetonitrile, carbon tetrachloride, trichloroethane, sodium fluoride, tributyl phosphate, aniline, malathion, sodium silicates and lead oxide.

The system is capable of handling feeds of liquids, sludges or solids. The process requires no atomizer or multiple feed ports for successful treatment. The high degree of turbulence and mixing ensures treatment of a wide variety of wastes. The wastes however must be homogenous in composition when fed to the combustor.

An additional benefit of the circulating bed incinerator is the possibility of heat recovery. Energy can be recovered either as steam or hot water. The system takes advantage of good heat transfer in the combustor rather than utilizing a separate waste heat boiler for heat recovery. This is possible because the combustion chamber is of "water wall" construction, therefore, cooling tubes need not be located in the direct path of hot gases.

Status/Availability: Ready for field-scale testing

Manufacturer: G. A. Technologies

Users:

EPA Contact: Donald Oberacker, (513) 569-7341

Technology: Distillation

Brief Description: Separates miscible organic liquids for solvent reclamation and waste volume reduction The resulting residuals are still bottoms and "slop" or intermediate distillate cuts. Two major types of distillation processes are batch distillation and continuous fractional distillation

Applicability/Limitation: Used to treat liquid organic wastes, primarily spent solvents, either halogenated such as, spent 1,1,1-trichloroethane degreasing solvent or non-halogenated compound such as methyl ethyl ketone solvent mixture from paint line clean-out. Liquids to be separated must have different volatilities The limitations are heat-sensitive suspended solids and azeotropes. Batch distillation in a heated still pot with condensation of the overhead vapors is easily controlled and flexible, but cannot achieve the high product purity of continuous fractional distillation Small packaged batch stills treating one drum per day or less are becoming popular for on-site recovery of solvents. Continuous fractional distillation is accomplished in tray columns or packed towers ranging up to 40 feet in diameter and 200 feet high Each is equipped with a reboiler, a condenser, and an accumulator The capacity of a unit is a function of the waste being processed, purity requirements, reflux ratio and heat input

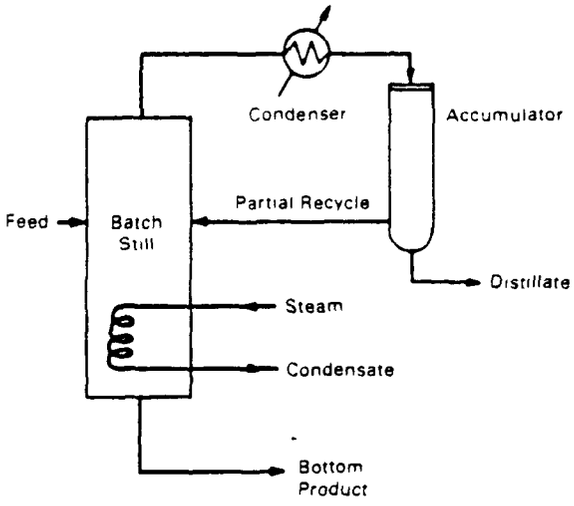
Status/Availability:

Manufacturer: Exceltech, Inc., John Sedwick, (415) 659-0404
Kipin Industries, Peter Kipin, (412) 495-6200
Mobile Solvent Reclaimers, Inc , Larry Lambing, (816) 271-4392

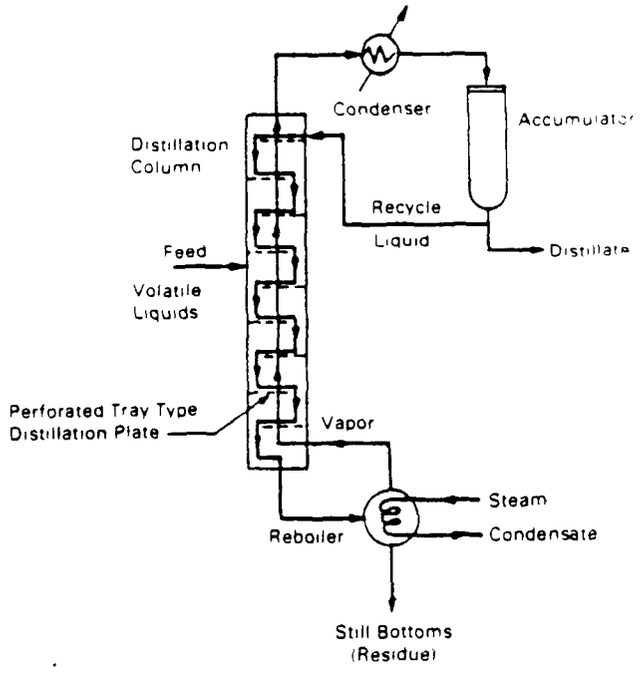
Users:

EPA Contact: Ron Turner, (513) 569-7775

Batch distillation.



Continuous fractional distillation



Technology: Electric Reactors

Brief Description: Use an electrically heated fluid wall reactor to pyrolyze waste contaminants from particles such as soils. Emissions and residuals include mostly N_2, H_2O and Cl_2 and/or HCl trapped in the scrubber ash components in the residue. The advantages are that it is transportable, has a high treatment efficiency, and emissions are low.

Applicability/Limitation: Used to treat organics, inorganics in solid, liquid or gas (solid or liquid may require pretreatment) and for PCB or dioxin contaminated soils It is limited to treating solids less than -35 U S mesh and liquids atomized to <1500 micron droplets.

Status/Availability: Commercial units are under construction, none in use

Manufacturer Thagard Research Corporation, Costa Mesa, California
J M Huber Construction, Jim Boyd (806) 274-5040

Users: Two units in Borger, Texas

EPA Contact: Harry Freeman, (513) 569-7529

Technology: Electrolytic Oxidation

Brief Description: In this process cathodes and anodes are immmersed in a tank containing a waste to be oxidized, and a direct electrical current is imposed on the system The process is particularly applicable to cyanide bearing waste The products of decomposition for cyanide waste are ammonia, urea, and carbon dioxide During the decomposition, metals present are plated out on a cathode

Applicability/Limitation: Used to treat high concentrations (up to 10 percent) of cyanide and to separate metals and allow their potential recovery Limitations include physical form (such as sludge or solids), non-selective competition with other species and long process time at up to 200°F

Status/Availability: Commercially available

Manufacturer: Stauffer Chemical Company

Users: _____

EPA Contact: S Garry Howell, (513) 569-7756

Technology: Evaporation

Brief Description Evaporation is the physical separation of a liquid from a dissolved or suspended solid by the application of energy to volatilize the liquid. In hazardous waste treatment, evaporation may be used to concentrate a hazardous material thus reducing the volume of waste requiring subsequent treatment or disposal

Applicability/Limitation: Evaporation can be applied to any mixture of liquids and non-volatile solids provided the liquid is volatile enough to evaporate under reasonable heating or vacuum conditions (Both the liquid and the solid should be stable under those conditions) If the liquid is water, evaporation can be carried out in a large pond with solar providing the energy Evaporation of aqueous wastes can also be done in closed process vessels with energy provided by steam and the resulting water vapor condensed for possible reuse Energy requirements are usually minimized by such techniques as vapor recompression or multiple-effect evaporators

Evaporation is applied to solvent wastes contaminated with nonvolatile impurities such as oil grease paint solids or polymeric resins Mechanically agitated or wiped thin film evaporators are used Solvent is evaporated and recovered for reuse. The residue is the bottom stream typically containing 30 to 50 percent solids

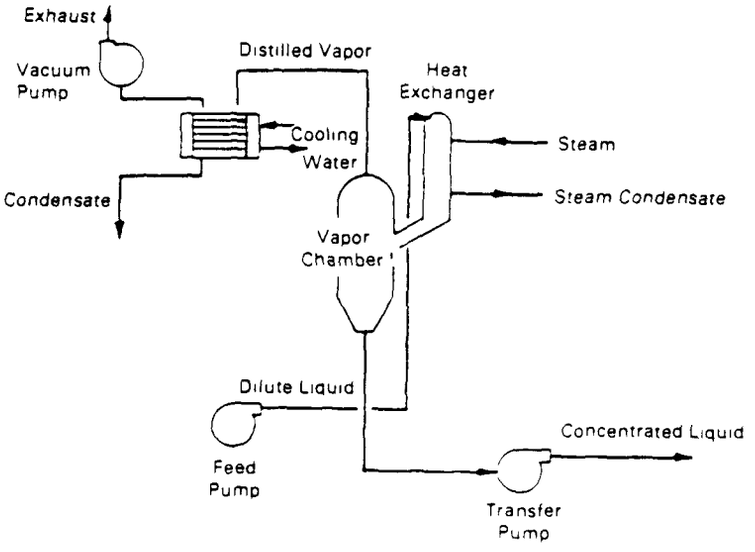
Status/Availability: Commercially available

Manufacturer Resources Convervation Company (Mobile Brine Concentration Systems), Bellevue Washington

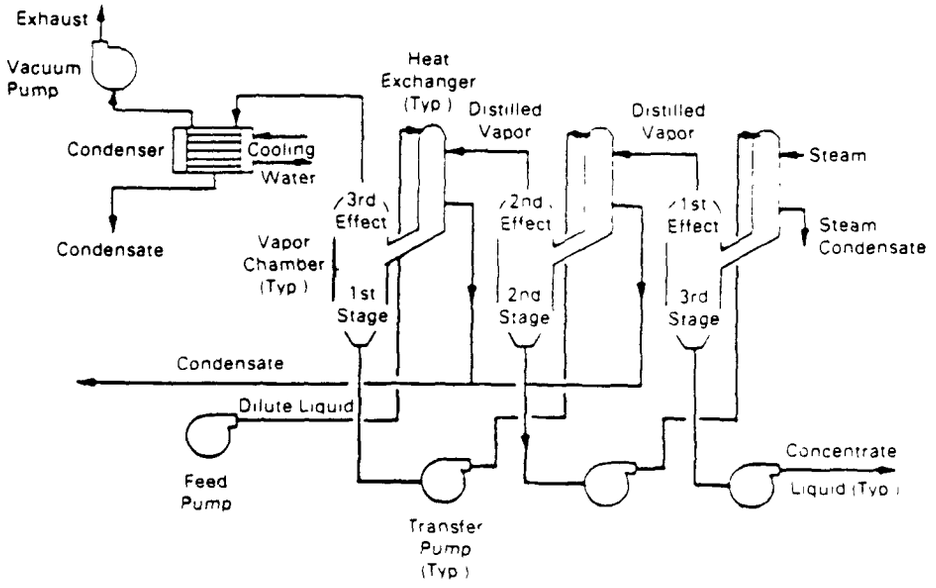
Users: _____

EPA Contact: Ron Turner, (513) 569-7775

Schematic of single and multiple effect evaporators



Typical Single Effect Evaporator—Falling Film Type



Typical Multi-Effect (Triple Effect) Evaporator—Falling Film Type

Technology: Extraction/Soil Flushing or Washing

Brief Description: Removes toxic/hazardous organics and inorganics from soil or sludge by extracting contaminants by partitioning. The site is flooded with the appropriate flushing solution and the elutriate is collected. The resulting waste-containing elutriate is treated

Applicability/Limitation: Used to remove both organics and inorganics if they are sufficiently soluble in a solvent Surfactants can be used for hydrophobic organics.

Status/Availability: Commercially available
EPA Mobile In-Situ/Containment Treatment Unit

Manufacturer: Critical Fluid Systems, Peter Dunlap, (617) 492-1631
IT Corporation, Dave Sikes, (415) 228-5100

Users: Volk Air National Guard Base Wisconsin (found not viable)
Lee s Farm Wisconsin, (312) 535-2318
Celtor Chemical Works
Hoopa Indian Reservation, Nick Morgan (916) 243 5831

EPA Contact Ron Turner, (513) 569-7775
Richard P Traver, (02) 321-6677

Technology: Filtration

Brief Description: Granular media filtration usually uses gravity to remove solids from a fluid by passage of the fluid through a bed of granular material. Several mechanisms are involved in the removal of suspended solids by granular media filtration. They include straining, physical adsorption and coagulation-flocculation. In vacuum and high-pressure filtration pressure (either negative or positive) is used to move water through the filter media and leaving the solids behind. These filters may be precoated with a filter aid such as a ground cellulose, diatomaceous earth, etc.

Applicability/Limitation: Filtration is used for the dewatering of sludges and slurries as a pretreatment for other processes. Filtration does *not* reduce the toxicity of the waste. Although sometimes powdered activated carbon may be used as a combination adsorbent and filter aid, it merely reduces the volume of waste to be treated. Filtration should not be used with sticky or gelatinous sludges, this is due to likelihood of filter media plugging. Granular media should be preceded by gravity separation if suspended solids are greater than 100 mg/l Design criteria—In granular bed filtration rates range from 2 gpm/sf for shallow beds of fine sand to over 15 gpm/sf for deep bed filters using coarse sand or multiple media beds. Vessels are from 2½ to 20 feet in diameter, with media depth of 1½ to over 15 feet.

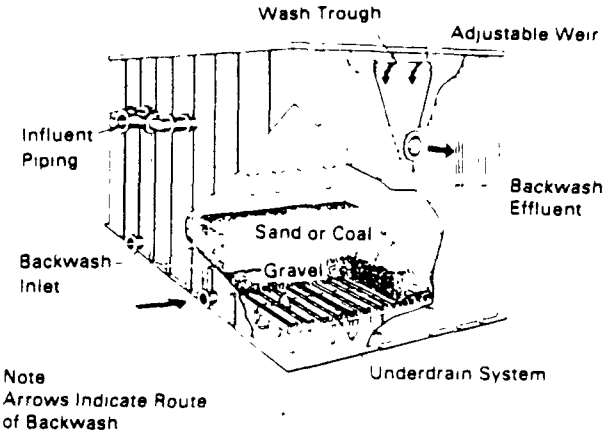
Status/Availability: Commercially available

Manufacturer: Granular Media Filters
Calgon Carbon Corporation, Dave Jordan, (201) 526-4646
Carbon Air Services, Inc., (612) 935-1844
Chemical Waste Management, John Fink, (714) 940-7971
Dorr-Oliver
Krauss-Maffei, (316) 945-5251
Komline Sanderson, (201) 234-1000
Bird Machine Co., (617) 668-0400
DR Sperry, Inc., (312) 892-4361

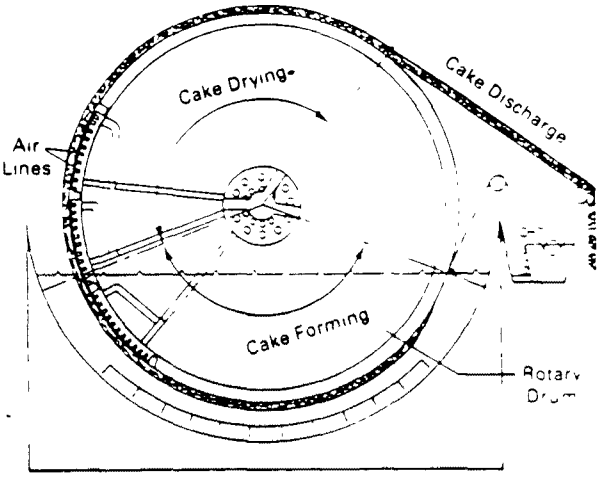
Users: Widely used.

EPA Contact: S Garry Howell, (513) 569-7756

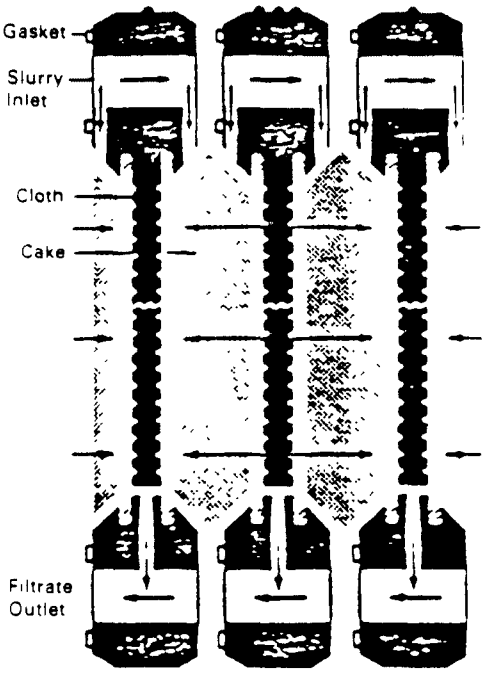
Packaged granular media gravity filter.



Vacuum filter.



Filter press unit



Technology: Fluidized Bed Incinerators

Brief Description: Utilize a very turbulent bed of inert granular material (usually sand) to improve the transfer of heat to the waste streams to be incinerated. Residues and emissions include acid gases trapped in the bed, low particulates, low nitrogen oxides and ash components (for low-ash wastes) Advantages of this technology include low temperature with no ash agglomeration, low gas emissions, low particulate emissions and a long residence time Operating temperatures range from 1300 to 2100°F, gas residence times are usually several seconds, and excess air rates are normally 40 percent Heat release rates range from 100,000 to 200,000 Btu/hr/ft^3

Applicability/Limitation: Not presently used for hazardous waste commercially Refractory wastes may not be destroyed.

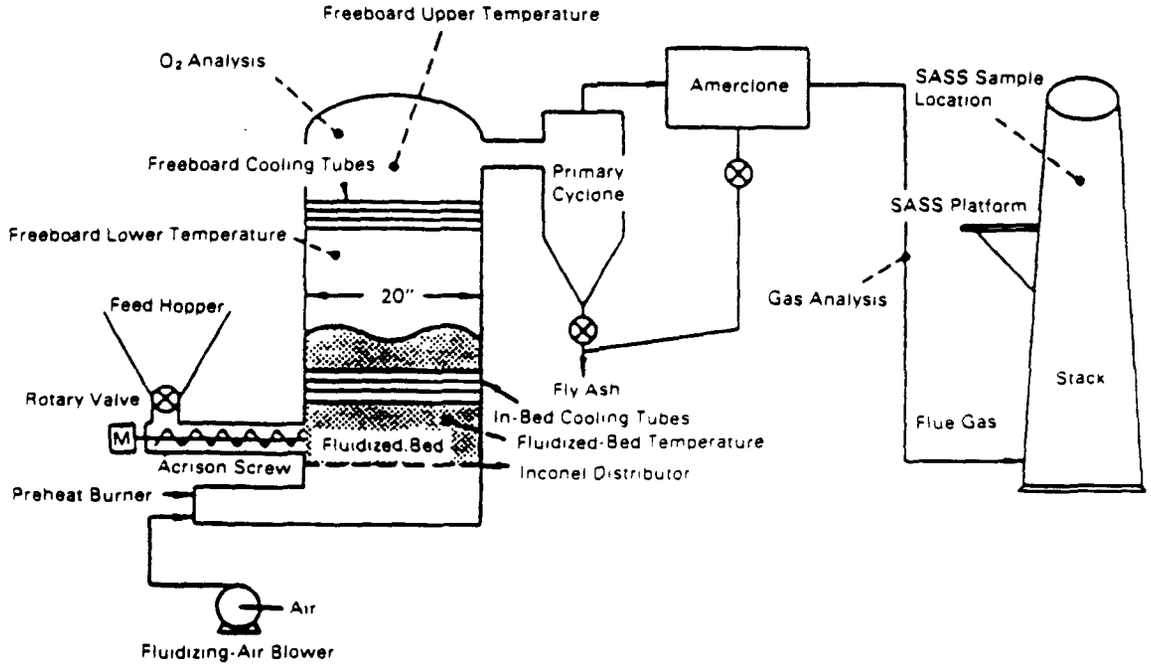
Status/Availability: Commercially available

Manufacturer: Battelle, Jack Conner, Columbus, Ohio
GA Technologies, William Rickman, (619) 455-3860
Dorr-Oliver
Waste-Tech Services, Inc , (208) 522-0850
(303) 987-1790 (mobile)

Users:

EPA Contact: Harry M Freeman, (513) 569-7529

Energy Resources Company's pilot-plant FBC facility.



Technology: Fly Ash or Lime-Based Pozzolan Stabilization/ Solidification

Brief Description: This technology involves the addition of large amounts of a siliceous material combined with a setting agent such as lime, cement or gypsum resulting in dewatering, stabilized, solidified product. Also can use thermoplastic (asphalt, polyethylene)

Applicability/Limitation: Used for sludges and contaminated soils including metals, waste oils and solvents Materials such as borates, sulfates and carbohydrates interfere with the process Long-term stability and resistance to leaching unknown in some cases

Status/Availability: Commercially available

Manufacturer: Different silicate processes available

Users: _____

EPA Contact: Carlton Wiles, (513) 569-7795

Technology: Fuel Blending

Brief Description: Method to reuse waste organics as fuel substitutes The objective is the controlled blending of segregated wastes of known characteristics into a fuel product whose chemical and physical characteristics meet the fuel specifications of the fuel user

Applicability/Limitation: Used to combine waste oils, solvents and organic sludges to produce a material with a fuel value usually greater than 10,000 Btu/lb. Limitations include chlorine and water content, the waste viscosity and the need for low solids In addition, the presence of certain hazardous constituents (such as PCBs) and the corrosivity of the waste can be limiting criteria for certain wastes

Status/Availability: In use for lime and cement manufacturing, process heating and blast furnace operation where permitted

Manufacturer: _____

Users: Solid Tek Systems, Inc , (404) 361-6181

EPA Contact: Ron Turner, (513) 569-7775

Technology: Granular Media Filtration

Brief Description: Granular media filtration uses gravity to remove solids from a fluid by passage of the fluid through a bed of granular material Several mechanisms are involved in the removal of suspended solids by granular media filtration They include straining, physical adsorption and coagulation-flocculation A granular media filter therefore can remove particles much smaller than the void size of the filter media Filters may be open top with gravity feed, or enclosed in a pressurized vessel The range of configurations available include many proprietary designs related primarily to improvements in the backwashing operation

Applicability/Limitation: Granular media filtration is typically used after gravity separation processes for additional removal of suspended solids and oils prior to the other treatment processes and as a polishing step for treated wastes to reduce suspended solids and associated contaminants to low levels Pretreatment by filtration is appropriate for membrane separation processes ion exchange, and carbon adsorption in order to prevent plugging or overloading of these processes Filtration of settled waste is often required to remove undissolved heavy metals which are present as suspended solids to ensure meeting effluent quality requirements Granular media filtration should be preceded by pretreatment processes if the suspended solid concentration exceeds about 100 mg/l Otherwise, premature plugging will occur

Status/Availability: Commercially available

Manufacturer: Calgon Carbon Corporation, Dave Jordan, (201) 526-4646
Carbon Air Services, Inc., (612) 935-1844
Chemical Waste Management, John Fink, (714) 940-7971

Users: _____

EPA Contact: S Garry Howell, (513) 569-7756

Technology: Hydrolysis

Brief Description: Enhances cleavage rates of organic molecules (breakdown to simpler, less-toxic compounds) by acceleration of acid or base-catalyzed hydrolysis rates through adjustment of soil/groundwater/sludge pH

Applicability/Limitation: Applicable in-situ treatment, e.g., pesticide spills. Acid hydrolysis not recommended for in-situ treatment because of potential mobilization of heavy metals Base-catalyzed hydrolysis attractive because of pH adjustment by lime, alkaline fly ash, or sodium carbonate

Status/Availability: Used at several sites

Manufacturer: Not applicable

Users:

EPA Contact: Donald Sanning, (513) 569-7875

Technology: Industrial Boilers

Brief Description: Hazardous waste is used as supplementary fuel to coal, oil or natural gas in fire tube and water tube industrial boilers. Hazardous waste fuel (HWF) (generally limited to liquid wastes) can be blended with primary fuel and fired into a boiler with primary fuel or it can be fired alone through other burners The heat release rate of boilers that have been tested with HWF ranges from 100 to 800 x 10^3 Btu/ft^3/hr

Applicability/Limitation: Chlorine and sulfur must be limited to HWF to minimize corrosion of boiler materials of construction and to avoid increases in HCl and sulfur oxide air emissions Solids hazardous wastes such as contaminated soils are not applicable for use as HWF in boilers Particularly useful for the disposal of hazardous wastes generated on site

Status/Availability: Only a small fraction of the nations 23,000 fossil fueled boilers are in use burning HWF

Manufacturer: Various manufacturers May be package units or field constructed

Users: Hazardous waste generators may use on site boilers to destroy combustible wastes

EPA Contact: Robert E Mournighan, (513) 569 7408

Technology: Industrial Kilns (Cement, Lime, Aggregate, Clay)

Brief Description: Rotary kilns constructed of steel casings lined with refractory brick Blended feed material is fed into the upper (higher) end of the kiln and fuel (coal, gas, oil, or hazardous waste) is fired at the lower end. Kiln temperatures are about 3000°F for lime kilns, and less than 2000°F for aggregate and clay drying kilns. Hazardous waste fuel usually fired into kiln with separate burner than primary fuel Waste blending may be necessary to obtain desired fuel characteristics.

Applicability/Limitation: Generally limited to liquid waste Chlorine and sulfur content of waste fuel must be controlled to prevent kiln operating and product quality problems Contaminated soils are not good candidates for treatment in industrial kilns

Status/Availability 280 cement and lime kilns but use of hazardous waste fuel not widespread At least 11 cement kilns now burn HWF as supplemental fuel

Manufacturer Various manufacturers Kilns are field constructed

Users Off-site HWF generators

EPA Contact Robert Mournighan, (513) 569-7408

Technology: Infrared Incineration Systems

Brief Description: The primary chamber consists of a rectangular cross section "box" of carbon steel lined with layers of lightweight ceramic fiber blanket. Infrared energy is provided by silicon carbide resistance heating elements. The material to be processed is conveyed through the furnace on a woven wire belt through the furnace. When the material reaches the discharge end of the furnace, it drops off of the belt into a hopper The residuals are the gaseous products of waste combustion, low particulates and solid residuals. The advantages include a quiescent combustion zone for low particulate emissions, reduced gaseous emissions since no fossil fuel is used, up to 50 percent turndown, the system allows a high degree of control and long residence times are achievable

Applicability/Limitation: Used to treat solids, sludges and contaminated soils The process is used primarily for solids or sludges, but liquid or gaseous injection systems are available

Status/Availability: Operational units at several locations, mobile units under construction, pilot-test unit available

Manufacturer: Shirco Infrared Systems, Jim Welsh, (214) 630-7511

EPA Contact: Harry M Freeman, (513) 569-7529

Technology: In-Situ Adsorption (Permeable Treatment Beds)

Brief Description: A trench, excavated down to a confining layer, is filled with adsorbent or chemical treatment material, such as activated carbon, diatomaceous earth, fly ash, zeolites, lime or sodium carbonate (to raise pH) Contaminated groundwater is treated as it percolates through the beds.

Applicability/Limitation: Beds must be sufficiently permeable to allow passage of ground water Bed pores may clog up, beds require renovation or replacement

Status/Availability: Not used in full scale yet

Manufacturer: _____

Users: _____

EPA Contact: Donald Sanning, (513) 569-7875

Technology: In-Situ Chemical Immobilization

Brief Description: Heavy metals are stabilized in the ground as insoluble precipitates (sulfides, phosphates, hydroxides, carbonates) or oxidized forms (e g., ferric hydroxide with Mn coprecipitate) Alternatively some reduced forms are more stable (Cr[III], Se[IV]). Certain organic monomers can be stabilized as polymers

Applicability/Limitation: Applies mostly to heavy metals The in-situ conditions must be maintained to avoid reversion of the stabilized form to a more mobile form (e g., sulfides can be oxidized to sulfates, remobilizing the heavy metals)

Status/Availability: EPA Mobile In-Situ Containment Treatment Unit

Manufacturer: Not applicable

Users: _____

EPA Contact: Donald Sanning, (513) 569-7875
Richard Traver, (201) 321-6677

Technology: In-Situ Thermal Destruction

Brief Description: Radio-frequency (RF) electrodes placed along the ground surface heat the shallow subsurface and generate superheated steam from ground water Organics are destroyed or mobilized by vaporization, thermal decomposition, or distillation.

Applicability/Limitation: High operating costs (electric power) Probably most applicable to volatile, low boiling point, or easily decomposed organic compounds.

Status/Availability: Not used on full scale yet

Manufacturer: Illinois Institute of Technology has done research

Users:

EPA Contact: Donald Sanning, (513) 569-7875

Technology: Ion Exchange

Brief Description: Removes toxic metal ions from solution to recover concentrated metal solutions for recycling by exchanging one ion, electrostatically attached to a solid resin material for a dissolved toxic ion The resulting residuals include spent resins and spent regenerants such as acid, caustic or brine

Applicability/Limitation: This technology is used to treat metal wastes including cations (Ni^{2+}, Cd^{2+}, Hg^{2+}) and anions (CrO_4^{2-}, SeO_4^{2-}, $HAsO_4^{2-}$) Limitations are selectively/competition, pH, and suspended solids. The oxidizing agent concentration should be greater than 50 meq/l for practical operation. Highly concentrated waste streams (>2500 mg/l contaminants) or high solid concentrations (>50 mg/l) should be avoided

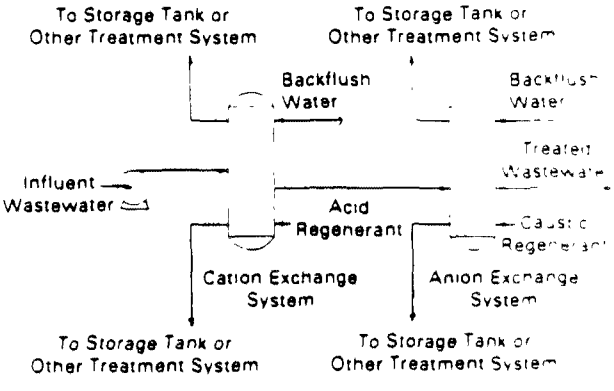
Status/Availability: Commercially available

Manufacturer: See buyer's guides from trade journals

Users: Used on full commercial scale for water treatment conditioners

EPA Contact: S Garry Howell, (513) 569-7756

Schematic of ion exchange



Technology: Liquid Injection Incineration

Brief Description: Waste material is introduced to the combustion chamber in various droplet sizes to mix with air and fuel, as needed Following combustion, the resulting gases are cooled and treated to remove particulates and to neutralize acid gases. Pretreatment such as blending, may be required for wastes to provide efficient mixing with the oxygen source. Operating temperatures range from 1200° to 1300°F and the gas residence time ranges from 0 1 to 2.0 seconds. Typical heat output ranges from 1 to 100 MMBtu/hr.

Applicability/Limitation: Can be applied to all pumpable organic wastes including wastes with high moisture content. Care must be taken in matching waste to specific nozzle designs. Wastes with high moisture content, high inorganic content or which contain heavy metals are restricted.

Status/Availability: Ensco has a mobile unit available, used with rotary kilns EPA Mobile Unit/ Incineration System is available.

Manufacturer: Several, see buyer's guide from trade journals.

Users: EPA Region VII, James Denny Farm, Missouri (dioxin destruction).

EPA Contact: Donald Oberacker, (513) 569-7431
Frank J Freestone, (201) 321-6632

Technology: Macroencapsulation/ Overpacking

Brief Description: Encapsulates large particles in an environmentally secure barrier using lime or cement pozzolan, thermoplastic or organic polymer. A matrix is formed from reactive components, but the waste not uniformly dispersed. The product containing the waste is in nodule form Product placement technique is very important.

Applicability/Limitation: Some processes are applicable to both organics and inorganics Advantages—The waste nodules are isolated, improved handling, low permeability, minimum treatment, good beaming strength Disadvantages—Presence of free liquid and the resultant product can be leachable

Status/Availability: _____

Manufacturer: _____

Users: _____

EPA Contact: Robert Landreth, (513) 569-7839

Technology: Molten Glass

Brief Description: Uses a pool of molten glass as the heat transfer mechanism to destroy organics and to capture ash and inorganics. The emissions include acid gas and particulates and all residue is contained in the glass. The advantages include significant volume reduction, most wastes are treatable, the residual is stabilized glass. Process is based on existing glassmaking technology

Applicability/Limitation: Used to treat any solid or liquid such as plastics, asphalt, PCB or pesticides. Sodium sulfates greater than 1 percent of the final glass may pose a problem It is inappropriate for soils or high ash waste and it requires additional treatment for off-gas.

Status/Availability: Commercially available for uses other than hazardous waste incinerators

Manufacturer: Penberthy Electromelt International Inc , (206) 762-4244
Battelle—Northwest, (509) 375-2927

Users: _____

EPA Contact: Harry M Freeman, (513) 569-7529

Technology: Molten Salt

Brief Description: Waste material is injected beneath a bed of molten sodium carbonate for incineration. Inorganics trapped in the salt include phosphorus, sulfur, arsenic and halogens. The salt acts as a gas scrubber so there are low concentrations or no acid gas emissions, the scrubber controls particulates and the salt/ash mixture makes up the solid residue. Reaction temperatures in the bed range from 1500 to 2000°F and residence times are typically 0.75 seconds.

Applicability/Limitation: Used to treat low ash, low water content solid or liquid wastes Limitations are that low ash, and low water content are required and molten salt can be corrosive. The neutralization of acid gases results in the formation of other salts that can change the fluidity of the bed and hence, require frequent replacement of bed material

Status/Availability: Pilot-scale units available

Manufacturer: Rockwell International, (213) 700-8200

Users:

EPA Contact: Harry M Freeman, (513) 569-7529

Technology: Multiple Hearth Incinerator

Brief Description: Sludge or granulated solid combustible waste feeds through the furnace roof where a rotating air-cooled central shaft with air-cooled rabble arms and teeth plows the waste across the top hearth to dropholes where it falls to the next successive hearth until the ash is discharged at the bottom.

Applicability/Limitation: Disposes of sludges, tars, solids, gases and liquid combustible wastes (through nozzles). Not recommended for hazardous wastes

Status/Availability: Commercially available

Manufacturer: See buyer's guide for trade journals

Users: Most widely used sewage sludge incineration method

EPA Contact: Donald Oberacker, (513) 569-7431

Technology: Neutralization

Brief Description: Renders acid or caustic wastes non-corrosive by pH adjustment The resulting residuals include insoluble salts, metal hydroxide sludge, and neutral effluent containing dissolved salts. The final desired pH is usually between 6 0 and 9 0

Applicability/Limitation: Used to treat corrosive wastes, both acids and bases. Limitations may include concentration, the physical form such as sludges or solids and the need for corrosion-resistant equipment.

Status/Availability: Commercially available

Manufacturer: Newpark Waste Treatment Systems, Inc , James Hobby, (419) 586-6683
Solid Tek Systems, Inc , (404) 361-6181
Ecolochem, Inc , Richard Smallwood, (800) 446-8004
CECOS, Ernest C Neal, (716) 873-4200

Users: Widespread

EPA Contact: S Garry Howell, (513) 569-7756

Technology: Oxidation by Hydrogen Peroxide (H_2O_2)

Brief Description: Addition of H_2O_2 to oxidize organic compounds. H_2O_2 can be used as a source of oxygen for biodegradation.

Applicability/Limitation: Non-specific reaction. May be exothermic/explosive or require addition of heat and/or catalysts. Probably not applicable for in-situ treatment; may be used for surface treatment of contaminated ground water/sludges.

Status/Availability: Common industrial unit process.

Manufacturer: Various, FMC sells hydrogen peroxide and nutrient for biodegradation specifically for petroleum treatment

Users: _____

EPA Contact: Ronald Lewis, (513) 569-7856

Technology: Oxidation by Hypochlorites

Brief Description: Addition of sodium or calcium hypochlorite (bleaching agents) to oxidize organic wastes.

Applicability/Limitation: May produce toxic chlorinated organic by-products. Must be done under controlled (not in-situ) conditions, i e , batch reactors. Non-specific reaction

Status/Availability: Used in industrial processes

Manufacturer: See buyer's guide in trade journals

Users: _____

EPA Contact: Donald Sanning, (513) 569-7875

Technology: Ozonation

Brief Description: Ozonation is a chemical oxidation process appropriate for aqueous streams which contain less than 1 0 percent oxidizable compounds.

Applicability/Limitation: Ozone can be used to pretreat wastes to breakdown refractory organics or as a polishing step after biological or other treatment processes to oxidize untreated organics Ozone is currently used for treatment of hazardous wastes to destroy cyanide and phenolic compounds The rapid oxidation of cyanides with ozone offers advantages over the slower alkaline chlorination method Limitations include the physical form (i e , sludges and soilds) and nonselective competition with other species.

Status/Availability: Commercially available

Manufacturer: See buyer's guides or trade journal

Users: Widespread

EPA Contact: S Garry Howell, (513) 569-7756
Donald Sanning, (513) 569-7875

Technology: Plasma Systems

Brief Description: This technology uses a plasma arc device to create extremely high temperatures (temperatures approach 10,000°C) for waste destruction in highly toxic liquids. Gaseous emissions (mostly H_2, CO), acid gases in the scrubber and ash components in scrubber water are the residuals. The system's advantages are that it can destroy refractory compounds, the equipment can be made portable and typically the process has a very short on/off cycle.

Applicability/Limitation: Used to treat liquid wastes containing organics, pesticides, PCBs, dioxins or halogenated organics. The process is limited to liquids and continuous operation has not been demonstrated.

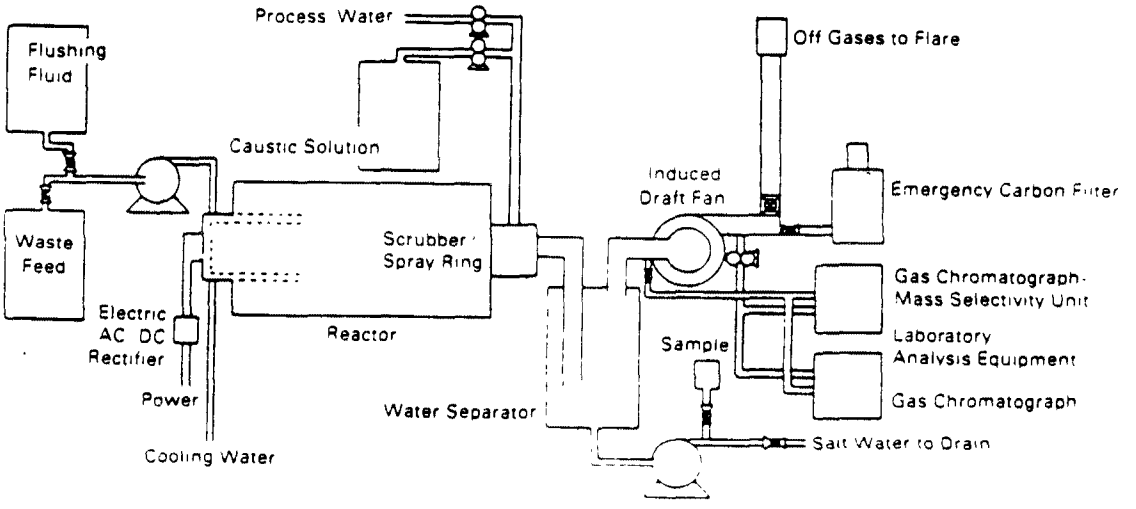
Status/Availability: Pilot-plant stage with demonstration in progress, mobile pilot plant available

Manufacturer: Pyrolysis Systems, Inc., Ed Fox, (416) 735-2401
Applied Energetics, Inc., John Dicks, (615) 455-0631
Westinghouse

Users: _____

EPA Contact: Harry M. Freeman, (513) 569-7529

Process schematic of the psi plasma pyrolysis unit.



Technology: Polymerization

Brief Description: Polymerization uses catalysts to convert a monomer or a low-order polymer of a particular compound to a larger chemical multiple of itself which has different properties for in-place stabilization

Applicability/Limitation: This technology treats organics including aromatics, aliphatics and oxygenated monomers such as styrene, vinyl chloride isoprene acrylonitrile, etc. Limited application to spills of these compounds

Status/Availability: Has been used at spills

Manufacturer: Not applicable

Users: _____

EPA Contact: Carlton Wiles, (513) 569-7795

Technology: Portland Cement Pozzolan Stabilization/Solidification

Brief Description: Mixes the waste with portland cement to incorporate the waste into the cement matrix. This improves handling and is inexpensive (plentiful raw materials).

Applicability/Limitation: Effective for metal cations, latex and solid plastic wastes. Large amounts of dissolved sulfate salts, or metallic anions such as arsenate and borates will hamper solidification. Organic matter, lignite, silt or clay will increase setting time.

Status/Availability: Commercially available.

Manufacturer: Aerojet Energy Conversion Company, Sacramento, California
ATCOR, Inc., Peekskill, New York
Chem-Nuclear Systems, Inc., Bellevue, Massachusetts
Delaware Custom Materials, Cleveland, Ohio
Energy, Inc., Idaho Falls, Idaho
General Electric Company, San Jose, California
Hittman Nuclear and Development Company, Columbia, Maryland
Stock Equipment Company, Cleveland, Ohio
Todd Research and Technical Division, Galveston, Texas
United Nuclear Industries, Richland, Washington
Westinghouse Electric Company, Pittsburgh, Pennsylvania

Users: _____

EPA Contact: Robert Landreth, (513) 569-7836

Technology: Pyrolysis Processes

Brief Description: Pyrolysis consists of heating material in the absence of air in order to thermally degrade to a volatile gaseous portion and residual solid comprised of fixed carbon and ash. There are two main ways to heat the material. One is by direct heating where the material is heated by direct contact with hot combustion products. The result of direct heating is an off-gas that is a combination of volatiles from the waste and burner flue products. Another method is indirect heating. This method keeps the burner flue products from mixing with the volatiles. Indirect heating is the necessary mode of heating if resource recovery is to be attempted, but it is also more complex and more expensive than direct heating. Indirect heating will probably prove economical only in very large units. Because of the drawbacks of indirect heating, Midland-Ross is concentrating on smaller units that can convert the waste to a preheated gaseous fuel and burn the fuel near the pyrolyzer. In this way direct heating imposes almost no penalty on overall fuel efficiency.

The pyrolysis equipment is designed to convert waste that is not suited for boiler fuel, into a gaseous fuel. The main objective of this system is to convert waste material from a disposal problem to a gaseous fuel source.

Applicability/Limitation: This technology is used to treat viscous liquids, sludges, solids, high ash materials, salts and metals and halogenated wastes. The limitations are that it requires a homogeneous waste input and metals and salts in the residue can be leachable.

Status/Availability: Commercially available batch and continuous.

Manufacturer: Midland-Ross Corporation, (419) 547-6444

Users: _____

EPA Contact: Harry M. Freeman, (513) 569-7529

Technology: Rotary Kiln Incineration

Brief Description: Wastes and auxiliary fuel are introduced to the high end of the kiln which is slightly inclined to horizontal. Wastes are oxidized, or combusted as they move through the kiln due to its rotation. Exhaust gases from the kiln pass to a secondary chamber, or afterburner for further oxidation. Ash residues are discharged and collected from the low end of the kiln. Exhaust gases may require acid gas and particulate removal, and the ashes may require solidification before landfilling.

Applicability/Limitation: Most types of solid, liquid and gaseous organic wastes can be treated with this technology. Wastes with high inorganic salt content and heavy metals as well as explosive wastes require special evaluation.

Status/Availability: Commercially available and in wide use.

Manufacturer: S. D. Myers, Inc., Joe Isle, (415) 794-6301
American Industrial Waste of ENCSO, Inc., (Mobile), (615) 383-1691
Exceltech, Inc., (415) 659-0404
International Waste Energy System, Dwight Brown (314) 389-7275
Winston Technology, Inc., (Mobile), (914) 273-6533
Industronics, Inc., (203) 289-1551
Volund USA, (312) 655-1490
Thermal
TR Systems
C & H Combustion
CE Raymond
Von Roll

Users: EPA-ORD, Denny Farm Site near McDonnell Missouri

EPA Contact: James Yezzi, (201) 321-6677

Technology: Soil Flushing/Soil Washing

Brief Description: Soil flushing is in-situ extraction of inorganic or organic compounds from soils by passing extractant solutions through the soils. These solutions may include water, surfactants, acids or bases (for inorganics), chelating agents, oxidizing and reducing agents. Soil washing consists of similar treatment, but the soil is excavated and treated at the surface in a soil washer.

Applicability/Limitation: Soil flushing/washing fluids must have good extraction coefficients, low volatility and toxicity, be safe and easy to handle, and most important, be recoverable/recyclable. Most promising for extraction of heavy metals, problems likely in dry or organic-rich soils. Care must be taken that the soil pores are not clogged. This can happen with certain surfactants tested for in-situ extraction.

Status/Availability: Limited full-scale testing.

Manufacturer: USEPA, Edison, New Jersey has mobile soil washer, other systems under development.

Users: Technology has been developed by oil industry (tertiary recovery) and mining (metal leaching).

EPA Contact Richard Traver (201) 321-6677

Technology: Sorption

Brief Description: Contaminants are bound up in pozzolan-type matrices by physical sorption or chemisorption yielding a stabilized material which is easier to handle. Liquid immobilization depends on added ingredients. This process results in high concentrations of contaminants at the surface of the material and contaminants may leach. The treated material is permeable.

Applicability/Limitation: For organics and inorganics. Advantages to this technology include plentiful raw materials, mixing technology known, improved handling, inexpensive additives, minimum pretreatment, bearing strength adequate for landfill. Disadvantages—large volume of additives, poor leachate control, placement sensitive, limited bearing strength, free water may be released under high pressure and there is temperature sensitivity.

Status/Availability: _____

Manufacturer: _____

Users: _____

EPA Contact: Robert Landreth, (513) 569-7836

Technology: Steam Stripping

Brief Description: Uses steam to remove organics from aqueous wastes. Steam stripping is essentially a continuous fractional distillation process carried out in a packed or tray tower. Clean steam rather than reboiled bottoms provides direct heat to the tower. The resulting residuals are contaminated steam condensate, recovered solvent, and "stripped" effluent.

Applicability/Limitation: Used to treat aqueous wastes contaminated with chlorinated hydrocarbons, aromatics such as xylenes, ketones such as acetone or MEK, alcohols such as methanol and high boiling point chlorinated aromatics such as penta-chlorophenol. Steam stripping will treat less volatile and more soluble wastes than air stripping and can handle a wide concentration range from less than 100 ppm to 10 percent organics.

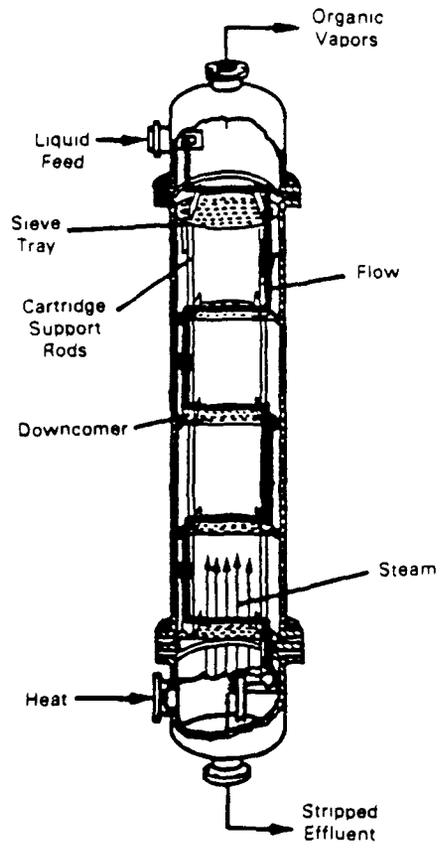
Status/Availability: USEPA has transportable unit.

Manufacturer: _____

Users: _____

EPA Contact: Ron Turner, (513) 569-7775

Steam stripping column—perforated tray type.



Source Pfaudler, Rochester New York

Technology: Sulfur Regeneration Units

Brief Description: Proprietary sulfuric acid regeneration unit is used to combust high sulfur refinery waste. Sulfur is recovered from the combustion gases using a double contact-double absorption sulfuric acid plant. The furnace operates above 1600°F, and has a long residence time (greater than 1 second).

Applicability/Limitation: Can destroy hazardous waste with high sulfur content Particularly appicable to high sulfur, high Btu refinery wastes

Status/Availability: Limited

Manufacturer: Stauffer Chemical proprietary process.

Users: Destroys on-site generated wastes

EPA Contact: Harry Freeman, (513) 569-7529

Technology: Supercritical Extraction

Brief Description: At a certain combination of temperature and pressure, fluids reach their critical point beyond which their solvent properties are greatly altered. These properties make extraction more rapid and efficient than processes using distillation and conventional solvent extraction methods. This technology has not been applied to PCBs. No cost or time estimates are available. Presently, the EPA has contracted Critical Fluid Systems, Inc., to investigate the use of supercritical carbon dioxide to extract hazardous organics from aqueous streams.

Applicability/Limitation: This technology is used to extract hazardous waste from the soil. It is limited at this time because it is new and it appears that the capital cost is high.

Status/Availability: Laboratory tests only

Manufacturer: _____

Users: _____

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Supercritical Water Oxidation

Brief Description: The supercritical water oxidation process is basically a high temperature, high pressure wet air oxidation. The unique properties of water above 500°C or 705°F (supercritical region) cause it to act as an excellent non-polar solvent for nearly all organic materials. Aqueous solutions or slurries (organic content >5 percent) are mixed with high-pressure oxygen (3200 to 3600 psi or >218 atms) to chemically oxidize wastes in less than one minute with >99.99 percent efficiency. The process is an emerging technology which may be less expensive than high-temperature incineration for destruction of organically contaminated aqueous wastes.

Two processing approaches have been evaluated: an above-ground pressure vessel reactor (MODAR) and the use of an 8,000 to 10,000-ft well reactor (Vertox). The SCW process is best suited for large volume (200 to 1000 gpm) dilute (1.0 to 10,000 mg/l COD) aqueous wastes that are of a volatile nature and that contain sufficient Btu's to sustain the process. In many applications, high Btu non-hazardous wastes can be mixed with low Btu hazardous wastes to provide the heat energy needed to make the process self sustaining. Emissions/residues include gaseous effluent (nitrogen and carbon dioxide), precipitation of inorganic salts and the liquid containing only soluble inorganic acids and salts. The advantages are rapid oxidation rates, complete oxidation of organics, efficient removal of inorganics and no off-gas processing is required.

Applicability/Limitation: Used to treat aqueous organic solution/slurry and mixed organic/inorganic waste. Sophisticated equipment and operations and long-term continuous operation have not been demonstrated, thereby limiting its use.

Status/Availability: Demonstration completed in 1985, commercial unit available in 1987

Manufacturer: Vertox Corporation, Dallas, Texas; MODAR, Inc., Natick, Texas (pilot scale)

Users: _____

EPA Contact: Harry M. Freeman, (513) 569-7529; Charles Rogers, (513) 569-7757

Technology: Ultraviolet Photolysis

Brief Description: Ultraviolet photolysis (UV) is a process that destroys or detoxifies hazardous chemicals in aqueous solutions utilizing UV irradiation. Natural photolysis of dioxins has been observed on soil surfaces although the degree of reaction is limited by the depth of penetration of the UV. Ultraviolet light has been used for degradation of dioxins in waste sludge. This process requires extraction of the dioxins into a clean transparent solvent. Reaction products are dechlorinated phenolic materials including ethoxylated phenol. Use of UV photolysis on a liquid dioxin waste required six extractions to reduce the dioxin content from 343 ppm to 0 2 ppm Photolysis of the extracted dioxin reduced dioxin level to less than 0.1 ppm after 20 hours. Overall destruction efficiency was 99.94 percent.

Applicability/Limitation: The inability of UV light to penetrate and destroy pollutants in soil or opaque solutions is a limitation of this approach. Photolysis can be enhanced by simultaneous introduction of ozone.

Status/Availability: Laboratory scale.

Manufacturer: SYNTEX

Users: _____

EPA Contact: Charles Rogers, (513) 569-7757

Technology: Vitrification

Brief Description: Large electrodes are inserted into soils containing significant levels of silicates. Graphite on the soil surface connects the electrodes. A high current of electricity passes through the electrodes and graphite. The heat causes a melt that gradually works downward through the soil Some contaminant organics are volatilized and escape from the soil surface and may be collected by a vacuum system Inorganics and some organics are trapped in the melt that as it cools becomes a form of obsidian or very strong glass.

Applicability/Limitation: Originally tested as a means of solidification/immobilization of low level radioactive metals. May also be useful for forming barrier walls (e g., equivalent to slurry wall construction). This later use needs testing and evaluation to determine how uniform the wall would be and stability of the material over a period of time

Status/Availability: _____

Manufacturer: Battelle Northwest has developed methods Currently negotiating for commercial license by others.

Users: _____

EPA Contact: Donald Sanning, (513) 569-7875

Technology: Wet Air Oxidation

Brief Description: Uses elevated temperature and pressure to oxidize organics. The oxidation products stay in liquid as do the inorganics. The off-gas low in nitrogen oxides, sulfur oxides and particulates. Off-gas treatment may be used for hydrocarbon emissions. The advantages are that it is thermally self-sustaining, accepts waste with organic concentrations range between biological treatment and incineration, detoxifies priority pollutants and the products of oxidation and stay in the liquid phase. Wet air oxidation is particularly well suited for treating organic compounds in aqueous waste streams that are too dilute (<15 percent organics) to treat economically by incineration. Oxidation of the organic compounds occurs when the aqueous solution is heated to about 300°C and 137 atm in the presence of compressed air. Typically, 80 percent of the organic substances will be completely oxidized. The system can accommodate some partially halogenated compounds, but highly chlorinated species such as PCBs, are too stable for complete destruction without the addition of catalysts.

Applicability/Limitation: Used to treat aqueous waste streams with less than 5 percent organics and with some pesticides, phenolics and organic sulfur, cyanide wastewaters. It is not recommended for aromatic halogenated organics. This technology is not economical for dilute or concentrated wastes and it is not appropriate for solids or viscous liquids

Status/Availability: Available at commercial scale

Manufacturer: Zimpro, Inc., William Copa (715) 359-7211
MODAR, Inc., (617) 655-7741
Vertech Treatment Systems, (303) 452-8800

Users: Casmalia Resources, 10-gpm demonstration unit.

EPA Contact: Harry M. Freeman, (513) 569-7529

Bibliography

1. Martin, Edward J., Oppelt, E. T., and Smith, B. P., Chemical, Physical, Biological Treatment of Hazardous Wastes, Paper to the 5th U.S./Japan Conference of Solid Wastes Management, Tokyo, Japan, Sept. 1982.

2. Oppelt, E. T., Pretreatment of Hazardous Wastes, Paper to the U.S./Spain Joint Seminar on the Treatment and Disposal of Hazardous Wastes, Madrid, Spain, May 1986.

3. Metcalf & Eddy, Inc., Engineers Briefing Technologies Applicable to Hazardous Waste, for USEPA, HWERL, Cincinnati, Ohio, May 1985.

4. Contributions by various participants of the RCRA/CERCLA Alternative Treatment Technology Seminar, CERI (Center for Environmental Research Information), USEPA, Cincinnati, Ohio, May 1986.

5. Turner, Ronald J., A Review of Treatment Alternatives for Wastes Containing Nonsolvent Halogenated Organics, USEPA, HWERL, Cincinnati, Ohio, 1986.

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OVERSIGHT DURING THE CORRECTIVE ACTION PROCESS TES IV CONTRACT

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OVERSIGHT ACTIVITIES
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- Metcalf & Eddy (M&E)
- Tetra Tech, Inc.
- ICAIR Life Systems
- Kellogg Corporation
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- Battelle Pacific Northwest Laboratories
- Development Planning and Research Associates, Inc.

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CONTRACTOR RESOURCES & CAPABILITIES

TECHNICAL EXPERTISE

- Engineers
  - Civil
  - Environmental
  - Process
  - Geotechnical
  - Chemical
  - Construction
- Hydrogeologists
  - Modelers
  - Fate and Transport
- Geologists/Geophysicists/Geochemists
- Air Quality Specialists
- Chemists
- Toxicologists
- Regulatory Specialists
- Health and Safety Coordinators
- QA/QC Specialists
- Nuclear Waste Health Physicists/Radiologists
- Sampling and Field Specialists

OVERSIGHT ACTIVITIES

RFA-RCRA FACILITY ASSESSMENT

- o Regulatory Specialists
- o Field technicians (for Sampling)
- o Environmental Engineers
- o Geologists
- o Hydrogeologists

RFI-RCRA FACILITY INVESTIGATION

- o Geologists/Hydrogeologists
- o Soil Scientists
- o Air Quality Specialists
- o Health and Safety Specialists
- o Engineers (Envir., Civil, Chem., Geotech.)
- o Biologists
- o Geochemists

CMS-CORRECTIVE MEASURE STUDY

- o Toxicologists
- o Engineers (Civil, Chem., Envir., Geotech., Process)
- o Hydrogeologists
- o Air Quality Specialists
- o Geochemists

CMI-CORRECTIVE MEASURE IMPLEMENTATION

- o Engineers (Construction, Chemical, Process)
- o Geologists/Hydrogeologists

OVERSIGHT ACTIVITIES

CONTRACTOR EXPERIENCE

- Completed over 100 RCRA Compliance Inspections
- Completed over 75 Field Investigations
- Provided Enforcement Support Services for RCRA Permitting and Corrective Action
- Completed Endangerment Assessments of Hazardous Releases at Regulated Facilities
- Provided Oversight of Removal Activities and Interim Measures Implementation
- Conducted Over 75 Remedial Investigation/Feasibility Studies

THE TES IV TEAM - CONTRACTOR RESOURCES AND CAPABILITIES DURING THE CORRECTIVE ACTION PROCESS

Jacobs Engineering Group Inc. is the prime contractor for the TES IV program. The contract was awarded in September 1986 to provide technical enforcement support to EPA Headquarters and Regions V-X. The total level of effort (LOE) available is 1,050,000 hours, approximately 33% of which is expected to be used for RCRA enforcement support.

RCRA support services provided under the TES IV contract includes: corrective action activities, inspection activities, sampling activities, record reviews, compliance evaluation inspections (CEI's), comprehensive monitoring evaluations (CME's), case development support, facility plan reviews, health & environmental assessments, special laboratory services, data management, policy and program support and training.

Specifically, in support of the corrective action process, the TES IV Team has demonstrated experience and technical depth in the following areas:

- o Assessment of facility (site) environmental conditions.
- o Identification and implementation of interim measures.
- o Review and evaluation of specific project work plans for technical completeness and adequacy.
- o Characterization of the hydrogeology and facility processes through sampling and geotechnical field activities.
- o Evaluation of populations at risk.
- o Analysis and evaluation of corrective measure technologies.

Attachment A provides an example scope of work for a RCRA Facility Investigation/Correction Measures Study, as issued under the TES contracts.

The Jacobs Team has been carefully selected to satisfy all of EPA's requirements for management, staffing and technical expertise under the Technical Enforcement Support Contract. Each team member has been selected based on their demonstrated technical experience with hazardous waste projects, including TES I and TES II, their offices and staff in place in Zone II and their ability to commit a major portion of their firm's resources to the program. The Jacobs Team consists of the following core and specialty firms:

<u>Prime Contractor</u>

- o Jacobs Engineering Group Inc.

Mission Subcontractors

- o Metcalf & Eddy (M&E)
- o Tetra Tech

Specialty Subcontractors

- o Battelle Pacific Northwest Laboratories (BNW)
- o Development, Planning and Research Associates, Inc. (DPRA)
- o Geo/Resource Consultants, Inc. (GRC)
- o ICAIR Life Systems
- o Kellogg Corporation

The team members are described below and a directory is also included with addresses and a principal contact for each firm.

Jacobs Engineering Group Inc.

Jacobs is an international consulting engineering and construction firm which has enjoyed a professional reputation of the highest order for more than 37 years. It has a technical staff of 1,600 professional and support personnel, more than 300 of whom are specialists in environmental engineering/hazardous waste management.

Jacobs has conducted surface water, ground water and air quality sampling and monitoring at many hazardous waste sites throughout the U.S. Jacobs has performed substantial site sampling/site inspection work for the EPA on the current TAT program and maintain field staffs fully trained in hazardous waste site activity.

Jacobs has also conducted many feasibility studies, including studies to identify and evaluate remedial actions and prepare conceptual designs for selected hazardous waste clean up alternatives. Studies have included in-depth record searches, field and laboratory studies, identification and evaluation of cost-effective alternatives, conceptual designs for selected remedial measures and preparation of final reports. Jacobs has also reviewed and analyzed plans and studies prepared by others to determine adequacy of data and site characterization.

Many Jacobs studies have involved endangerment assessments identifying, evaluating, quantifying and documenting the potential for endangerment to the public and to the environment. These have included toxicological screenings and in-depth assessments for a wide variety of chemicals.

As a major subcontractor on the TES II program, Jacobs has lead responsibility for TES work conducted in the Western U.S. Jacobs is thoroughly familiar with EPA's needs in all areas of the RCRA program.

Major Subcontractors

Metcalf & Eddy, Inc.

Metcalf & Eddy, Inc. is a Boston-based, environmental engineering consulting firm, with a staff of over 1,000 located in 15 U.S. cities and overseas. Eleven of these offices are in Zone II, comprising a total of nearly 300 staff in Zone II. Metcalf & Eddy manages over 1,600 projects and over 300 subcontracts each year.

Metcalf & Eddy has extensive direct experience in environmental programs related to each area of expertise required for the performance of this program. M&E has completed over 250 industrial/hazardous waste projects, including 30 projects in the area of uncontrolled hazardous waste site management involving field investigations/feasibility studies. Several of these included preparation of plans for and inspection of site clean up. Studies and designs for over 70 landfills and 75 incineration systems have also been successfully performed by M&E. Metcalf & Eddy staff have performed field sampling, hydrogeologic investigations, treatability testing, exposure and risk assessments and cost-effectiveness analysis of alternatives--all with strict adherence to appropriate health and safety and quality assurance procedures.

As a subcontractor to GCA Corporation on TES I, M&E provided enforcement support to EPA's Office of Waste Programs Enforcement on a variety of assignments, including development of data management systems used to support litigation efforts, remedial investigations, feasibility studies, review of responsible party plans, assistance in community relations and public participation programs and acting as expert witness in legal assignments under TES I. M&E is also conducting RI/FS projects in both Illinois and California under State Superfund contracts. M&E will provide technical support in all work areas, particulary in work assignments which are executed in Region V.

Tetra Tech, Inc.

Tetra Tech, Inc., founded in 1966, is an international environmental science and engineering consulting firm that provides its clients with a full range of services relating to water and energy. The firm's staff has provided multidisciplinary services throughout the world. Tetra Tech, Inc. has over 900 employees, including over 600 engineers, scientists, analysts and management staff.

Tetra Tech, Inc. provides hazardous waste management support services to private industry and to Federal, state and local governments. Most notable are the Technical Assistance Team (TAT) contract for EPA's Office of Emergency and Remedial Response and a Superfund remedial investigation under a state/EPA Cooperative Agreement at one of the nation's most complex site, Commencement Bay, WA and Hazardous Waste Site Remedial Investigation Analysis, Design and Implementation Services for the State of California. In addition to these programs, Tetra Tech, Inc. has conducted investigations at over 70 NPL sites for industry, military, local, state and Federal agencies.

Tetra Tech, Inc. brings considerable expertise to the team in the fields of geohydrology, pollutant transport, contaminant migration in soils and ground water; as well as an understanding of public concerns; and knowledge of the Federal regulatory framework in which hazardous waste investigations must be performed. Tetra Tech, Inc. has performed a wide range of ground water projects

for the Department of Defense, the U.S. Geological Survey, the U.S. EPA, Office of Water Research and Technology, Electric Power Research Institute and state and local agencies. The projects have included mathematical modeling, resource characterization, leachate analysis and prediction, field monitoring, well installation, pump tests, water use prediction, assessment of effects of waste disposal, containment design and review of current regulations. Tetra Tech, Inc. personnel have developed and applied mathematical models for the movement of pollutants in both the unsaturated and saturated zones.

Tetra Tech, Inc. has also conducted various field and ground water investigations and facility studies by combining its expertise in waste characterization and analysis, pilot plan and engineering/design/feasibility studies. Tetra Tech, Inc. will provide technical support in all work areas, particularly with respect to assignments in Regions VII and X.

Specialty Subcontractors

Battelle Pacific Northwest Laboratories (BNW)

Batelle, one of the world's largest contract research organizations, has conducted thousands of research projects in virtually all areas of the physical, life and social-behavioural sciences. Battelle has a staff of nearly 8,000 scientists, engineers, technicians and support personnel of which approximately 3,000 are located at the Pacific Northwest Laboratories. Research departments include: Atmospheric Sciences, Biology, Chemical Technology, Ecological Sciences, Energy Systems, Engineering Physics, Materials, Physical Sciences, Radiological Sciences and Water and Land Resources. Battelle has researched, developed, verified and conducted all the analytical studies specified in the Statement of Work and has, in many instances, functioned as the center of expertise and QA/QC auditor for these techniques for most analytical firms in the U.S. Battelle Pacific Northwest Laboratories will provide special laboratory services as required for this contract.

Developments Planning and Research Associates, Inc. (DPRA)

Development Planning and Research Associates provides research and consulting services in the areas of economics, data management, policy and regulatory analysis, marketing, feasibility analysis, resource allocation, environmental and energy economics, agriculture and international development. DPRA's corporate offices are located in Manhattan, KS; it also has an office in Washington, D.C. The 40 person staff holds graduate degrees in economics, agricultural economics, business administration, computer science, statistics, agronomy, chemistry, toxicology and library science. Other disciplines represented on the staff include, undergraduate degrees in mathematics, biology, plant science and accounting.

During the past five years, DPRA has supported EPA's Office of Solid Waste (OSW) and Office of Waste Programs Enforcement (OWPE) and their contractors with hazardous waste data base management and analysis. DPRA created the "OSW Hazardous Waste Database", which is designed to facilitate statistical analysis and inter-dataset analysis at a considerable savings in access costs.

DPRA has also conducted joint on-site inspections of 120 hazardous waste handlers with EPA. At the conclusion of the inspections, DPRA was responsible for computerizing the survey data, producing reports and summaries of the data collected, compiling complete documentation of the computerized data and the survey instrument and finally making the data available for integration with other waste handler information. DPRA will provide data management services to the TES Zone II contract.

Geo/Resource Consultants, Inc. (GRC)

Geo/Resource Consultants, Inc. is a minority-owned California corporation established in December 1976. The firm specializes in geology, geotechnical engineering, hazardous waste management, geophysics, seismology, hydrogeology and environmental studies. GRC holds 8(a) status from the Small Business Administration and is certified as a Minority Business Enterprise by the Environmental Protection Agency and other city, state and Federal agencies. Corporate headquarters is in San Francisco, CA with regional offices in Seattle, WA; Tucson, AZ; and Washington, D.C. GRC's expertise in hazardous waste projects consists of remedial action investigations in which the geological and hydrogeological regimes of contaminated sites are characterized, preparation of enforcement and regulatory documents, expert knowledge of RCRA/Superfund regulations, preliminary assessment of sites and development of closure/post-closure plans. GRC will provide technical support in geology, hydrogeology and geotechnical engineering, as well as, policy support.

ICAIR, Life Systems, Inc.

ICAIR specializes in expert witness services and risk assessment in the health sciences and environmental areas. The firm's role in this program will be to provide expert consultants/witness and technical assistance in endangerment assessments, public meetings and community relations, protocol development and review of testing data. ICAIR has been involved in cases such as Love Canal, Petro Processors, Conservation Chemical, ChemDyne, New Bedford Harbor, Solvents Recovery, Reilly Tar, Tampa Road and Rocky Mountain Arsenal, conducting risk assessments, coordinating peer review studies, and providing expert witness services. ICAIR specializes in providing health and environmental expertise through the largest, most comprehensive staff of well-qualified experts available anywhere in the United States. ICAIR's external staff roster includes more than 700 experts with advanced scientific, engineering or medical training in one or more of over 95 technical disciplines. Most of ICAIR's external staff will provide their services to the government only through ICAIR. ICAIR couples its external staff composed of university faculty, retired individuals, private consultants and private sector employees with an in-house scientific, engineering and management staff of more than 100 full-time employees.

Kellogg Corporation

Kellogg Corporation, headquartered in Denver, CO, is a firm of over 60 people that specializes in fact finding and document management in support of cost recovery negotiations, arbitration and litigation. Since 1970, Kellogg has completed over 1,500 assignments in 49 states and eight foreign countries. Kellogg has provided assistance in over 800 contract disputes involving $3.6 billion in claims on

projects valued at $105 billion. Kellogg's recent assignments in hazardous waste have been with Clean Sites, Inc. and public and private clients on both municipally and privately-owned hazardous waste sites.

Kellogg's experience provides a unique cost-effective approach to fact finding and data management which leads to efficient identification of potentially responsible parties (PRP's) and enforcement required to resolve issues. In addition to having people with relevant investigative skills, Kellogg has proprietary data management software programs specifically designed to facilitate PRP negotiations. Because of this expertise, Kellogg has been able to discover three to five times as many PRP's on several sites, as had been previously identified from the same document base. For example, in the Sheridan site, outside of Houston, 44 parties were originally identified. As a result of Kellogg's work on the publicly available documents, over 200 parties were identified. This includes a previously unidentified party which was found to be the third highest contributor to this site.

Kellogg will provide support in the areas of PRP searches, enforcement support services and cost recovery.

The following is a directory of the team members with RCRA experience and technical capabilities to support the corrective action program.

COMPANY	CONTACT	TELEPHONE
Program Management Office Jacobs Engineering Group Inc. 1042 National Press Building 529 14th Street, N.W. Washington, D.C. 20045	Jeffrey Van Houten	(202) 628-1903
Jacobs Engineering Group Inc. Region V 85 West Algonquin Road Arlington Heights, IL 60005	Dean Geers	(312) 806-9119
Jacobs Engineering Group Inc. Region VI 300 North Tower 700 North Pearl Dallas, TX 75201	Michael Warner	(214) 969-9366
Jacobs Engineering Group Inc. Region VII Suite 310 8700 Monrovia Lenexa, KS 66215-3537	Gary E. Parker	(913) 492-9218
Jacobs Engineering Group Inc. Region VIII Suite A-300 12600 West Colfax Avenue Lakewood, CO 80215	Donna Toeroek	(303) 232-7093
Jacobs Engineering Group Inc. Region IX 1340 Arnold Drive Martinez, CA 94553	Geoffrey W. Watkin	(415) 228-9700
Jacobs Engineering Group Inc. Region X Suite 700 IIIII 3rd Avenue Seattle, WA 98101	Lloyd Reed	(206) 622-0907
Jacobs Engineering Group Inc. P.O. Box 8717 Albuquerque, NM 87198-8717	Duane Truitt	(505) 262-1505

TES IV SUBCONTRACTORS

COMPANY	CONTACT	TELEPHONE
Metcalf & Eddy, Inc. Chemical Waste Management Div. 10 Harvard Mill Square Wakefield, MA 01888	Neville Chung	(617) 246-5200
Environmental Systems Engineering Tetra Tech, Inc. Suite 100 11820 Northrup Way Bellevue, WA 98005-1924	Tom Johnson	(206) 822-9596
Kellogg Corporation 26 West Dry Creek Circle Littleton, CO 80120	Marty Redding	(303) 794-1818
Life Systems, Inc. 24755 Highpoint Road Cleveland, OH 44122	Timothy Tyburski	(216) 464-3291
Battelle Pacific Northwest Laboratories P.O. Box 999 Richland, WA 99352	R. H. Lovely	(206) 525-3130
Development, Planning and Research Assoc., Inc. P.O. Box 727 200 Research Drive Manhattan, KS 66502	Richard Seltzer	(913) 539-3565
GEO/Resource Consultants, Inc. Waterside Mall 401 M Street, S.W. Washington, D.C. 20460	Mike Barclay	(202) 488-1487

Attachment A

EXAMPLE SCOPE OF WORK

RCRA FACILITY INVESTIGATION/
CORRECTIVE MEASURE STUDY

ENVIRONMENTAL PROTECTION AGENCY
Technical Enforcement Support at Hazardous Waste Sites

APPROPRIATION: ☐ CERCLA ☒ RCRA ☐ Other
Funding Acct. No. _____

TES NO. IV -
Contract No. 68-01-7331
Prime Contractor Name JACOBS

WORK ASSIGNMENT NO. 001
☒ Original
☐ Amendment No. _____
Priority: ☒ Normal ☐ Expedite*

SITE/FACILITY: FACILITY *XYZ* (or Project Name) | CITY (Site/Facility Location (City or County)) | ST (State) | 0 (Region/HQ)

NPL Site: ☐ Final or Proposed List ☐ No
Site Acct. #: _____ SCAP Activity Link: _____
RCRA Facility: ☒ Yes ☐ No Facility ID# _____

PURPOSE:
☒ Initiate New Work Assignment ☐ Work Plan Approval** ☐ Disapprove Work Plan (Contractor will immediately stop work)
☐ Work Plan Revision: (☐ SOW ☐ Cost/Hours) ☐ Closeout Work Assignment (All final deliverables received)

STATEMENT OF WORK SUMMARY (SOW) (Attach a *Detailed* SOW) (See Reporting Requirements):
Task Type Oversight of RCRA Facility Investigation Task No.: _____
(Must identify task type and number according to TES User's Guide to show activity is within the overall TES contract SOW)
Summary/Comments: The Region requires oversight support during the Facility's performance of a RFI/CMS. (See Attached)

BASE PERIOD	LOE	Cost/Fee
Previously Approved	0	
This Action	930	
Total	930	

OPTION PERIOD (Authorized only if contract option is exercised)	LOE	Cost/Fee
Previously Approved		
This Action		
Total		

TES II: Use Option Column
TES III & IV: Base period ends 9/30/87. Any work required after that date should appear in option column.

PERIOD OF PERFORMANCE
From: Effective date below
To: 9-30-87
(closeout date not to exceed September 30, 1987)

PERIOD OF PERFORMANCE
From: _____
To: _____ (Closeout date)

(Do not include clerical or Expert Witness hours in the LOE estimate. Expert Witness costs are considered "Other Direct Costs." Estimate the Expert Witness hours in the attached Scope of Work.)

No. of Pages to Follow _____ (Including SOW) Reference Info.: ☐ Attached ☐ Transmitted Separately ☐ Pickup From _____

REPORTING REQUIREMENTS: ☐ Briefing(s) ☐ Letter Report ☐ Draft Report ☐ Final Report*** ☐ Other
Deliverables are to be marked ENFORCEMENT CONFIDENTIAL: ☐ Yes ☐ No

Reporting requirements and deliverables may differ for each TES contract. Include in the SOW a schedule for deliverables. If the number of reports required for your deliverables differs from the contract's normal requirement, request that in your SOW.

INITIATOR: John Smith (Primary Contact) 1/5/87 (Date)
Street (Address) Phone no. (111) 222-3333 (FTS / Off-NET)

CONCURRENCE: Mary Doe (Regional Contact) 1/7/87 (Date)

APPROVAL: _____ (Project Officer (HQ TES P.O.)) _____ (Date)

_____ (Contracting Officer) _____ (Date (Effective Date))

CONTRACTOR ACKNOWLEDGEMENT OF RECEIPT:

_____ (Signature and Title) _____ (Date)

*Justification required in comment section. **Required within 45 days of effective date or work stops. ***30 day minimum required between draft and final report.

Revised: Dec. 1986

Sheet 1 White – Contracting Officer Copy (Washington D.C.) Sheet 2 Green – Project Office Copy (Washington D.C.), Sheet 3 Canary – Contractor Copy

I. INTRODUCTION AND BACKGROUND

The **FACILITY NAME** hazardous waste facility consists of approximately 100 acres of land and is located in **FACILITY LOCATION**.

The facility began accepting waste on or before February, 1970. Waste disposal activities have taken place in three separate areas:

1) Radioactive disposal area (until 1978)
2) Pre 1974 non-radioactive waste disposal area
3) 1974 to 1983 non-radioactive waste disposal area

The 1974 - 1983 disposal area was operated under both State permits and RCRA interim status. This portion of the facility accepted containerized liquid and solid hazardous wastes and up until 1979 PCB wastes for disposal in unlined trenches. No attempt was made to solidify the liquid wastes prior to disposal. This trench disposal operation covered approximately thirty acres with an average trench depth of about thirty feet.

Based upon ground-water monitoring reports submitted pursuant to the requirements of RCRA, hazardous wastes or hazardous waste constituents have been detected in the ground-water monitoring wells at the facility. There is no evidence to indicate that any private wells in the area have been affected by the facility. However, **FACILITY NAME** discontinued use of its own on-site drinking water well due to contamination. This well is approximately 1000 feet from the disposal areas. The total population served by ground water within a three mile radius of the facility is approximately 350.

II. ENFORCEMENT ACTION

On April 1, 1986, **NAME OF OWNER/OPERATOR** entered into a consent order with EPA under section 3008(h) of RCRA. This action requires the Respondent **NAME OF OWNER/OPERATOR** to conduct a RCRA Facility Investigation and Corrective Measure Study at the **FACILITY NAME**. A corrective action alternative will be selected by EPA and implemented by the Respondent. This Consent Order includes only the two non-radioactive waste disposal areas.

III. DESCRIPTION OF TASKS TO BE PERFORMED BY THE TES CONTRACTOR

Task 1. Assist EPA in the review of the RFI work plan to be submitted for approval by the Respondent on or before **DATE**.

Task 2. Represent EPA as the on-site project coordinator during the Respondent's performance of the RCRA Facility Investigation. This will include documentation and inspection of any work performed.

Task 3. Provide comments on the monthly reports submitted by the Respondent during the RCRA Facility Investigation.

Task 4. Assist EPA in the review of the draft and final RCRA Facility Investigation reports.

Task 5. Assist EPA in the review of the draft Corrective Measure Study Report.

IV. DELIVERABLES

1) Provide EPA with a written review of the work plan submitted by the respondent.

2) Provide EPA with weekly briefings of the progress of the field activities during the RFI. This should include any problems encountered and any recommendations for additional RFI work. It may be required to provide a written recommendation for any additional RFI work for review by EPA.

3) As necessary, during the RCRA Facility Investigation, provide EPA with a briefing, followed by a letter report, detailing any work halted by the Project Coordinator and the reasons for doing so. This briefing and report should also make recommendations for alternatives to the work which has been stopped.

4) During the RCRA Facility Investigation provide EPA with any comments or corrections to the Respondent's monthly report.

5) Provide EPA with a detailed review of any additional reports or plans submitted in accordance with the scope of work.

6) Provide EPA with a detailed review of the draft and final RCRA Facility Investigation Reports.

7) Provide EPA with a detailed review of the draft Corrective Measure Study Report.

V. SCHEDULE FOR TASK COMPLETION

1) RFI/CMS work plan review due within 20 working days of receipt.

2) Written reports detailing any halt of work by the EPA Project Coordinator are required within three working days of the cessation of work.

3) Provide EPA with comments on the Respondent's monthly progress reports within seven working days of receipt.

4) Provide EPA with a detailed review of any additional plans or reports required in the scope of work within fifteen working days of receipt.

5) Provide EPA with a detailed review of the draft RFI Report within fifteen working days of receipt.

6) Provide EPA with a detailed review of the final RFI Report within ten working days of receipt.

7) Provide EPA with a detailed review of the draft CMS Report within thirty working days of receipt.

VI. TRAVEL REQUIREMENTS

Travel will be required to and from the **FACILITY LOCATION** area over approximately 14 weeks to oversee the field activities. Also, budget two additional trips to this area for public hearings.

Travel to the regional office in **CITY, STATE** will be required for meetings with EPA, **NAME OF OWNER/OPERATOR**, and their contractors. Estimate approximately five (5) round trips.

VII. LEVEL OF EFFORT

1.	RFI/CMS work plan review	80 hours
2.	Oversight Activities (70 days x 8 hrs./day)	560 hours
3.	Additional plan review	40 hours
4.	Review of Respondent's draft and final reports	250 hours
	Total LOE	930 hours

RCRA CONSENT ORDER SUMMARY TABLE

Respondents/Date	Facility Description	Release Description	Mandated Activities	Special Provisions	Penalties
City of Janesville (WI) et al 9/30/86	Municipal and industrial landfill; ash beds, abandoned gravel and sand pits	GW: organics; municipal and private wells threatened	RFI; CMS; CMI	Reimburse EPA and Wisconsin DNR for recoverable costs under CERCLA Sec. 107.	
Eagle-Picher Industires, Inc., Colorado Springs, CO	Nickel-cadmium battery manufacturing facility; surface impoundments, drums	GW and soil contaminated with nickel, chromium, cadmium and arsenic	Interim measures: monitoring GW and implementing GW interception and collection system, if necessary; RFI; CMS; CMI	Financial assurance	Penalty not to exceed $25,000 for each day of non-compliance
Envirosafe Services of Idaho, Inc. Owyhee county, ID 10/31/85	Unlined disposal trenches; vacant missile silos and tunnel system	GW: organics; nearby wells for domestic and agricultural use	Interim Measures: removal and containment of waste; RFI; CMS; CMI		
Koppers Company, Inc. Carbondale, IL 6/4/86	Wood treatment plant; wastewater treatment facility: lagoons, sludge treatment, spray field	GW and soil contaminated with organic and creosote; SW contaminated with organics	RFI, CMS, CMI		$1,000 for first week plus $2,000 for each additional week per act of non-compliance
Martin Marietta Denver Aerospace, Waterton, Co 2/7/86	Weapons Manufacturer; disposal tanks, dumps, pits ponds, surface impoundments; incineration units	SW: organics, GW: organics, cyanide chromium; soils: heavy metals and cyanide	RFI, CMS, CMI	Reimburse EPA for recoverable costs under CERCLA Sec. 107	RFI, CMS: $1,000 for day 1-7, $1 000 per each additional day; other activities $1.000 day 4-7, $2,000 for each additional week
National Industrial Environmental Services, Inc., Furley, KS 5/31/85	Evaporation ponds, disposal trenchs, stormwater retention ponds	Release detected	Interim Measure: GW pump + treat, slurry wall or alternative if necessary; RFI; CMS	Financial assurance	$1 000/day to $5 000/day
The Boeing Company Portland, OR 7/21/86	Surface impoundment	GW: organics	Interim Measures: monitoring drinking water wells and providing alternative supply if necessary; RFI		
U.S. Ecology, Inc. Sheffield, IL 9/17/85	Landfill containing PCBs, cyanide, lead and chromium	GW: organics and chloroform	RFI, CMS, CMI	Financial assurance	$5 000/day for failure to submit deliverables

RESPONDENTS: City of Janesville;
Ashland Chemical Company;
Bunker Ramo Corporation's Borg Instrument Division;
General Motors Corporation;
Midwest Disposal Company;
Newell Company;
Parker Pen Company;
Pepsi Cola General Bottlers;
Riverside Plating Corporation;
Seneca Foods Corporation;
Shenex Chemical Company, Inc.;
SSI Technologies;
Sprackling Products;
Tecumseh Products Company/Layson Engineer; and
3M Company

AUTHORITIES: CERCLA Section 106(a) and RCRA Section 3008(h)
Consent Order (September 30, 1986)

FINDINGS OF FACT

Facility Description: This order addresses four sites that total approximately 65 acres and are located in the City of Janesville, Wisconsin. The City of Janesville is the present owner of the facility and is the respondent under RCRA [2]3008(h). Two of the four sites are abandoned sand and gravel pits and meet the definition of solid waste management units (SWMUs). The remaining two sites, the new Janesville Landfill and the Janesville Ash Beds (JAB) have been RCRA regulated since November 1980. The new Janesville Landfill is located in an extension of one of the abandoned sand and gravel pits and was licensed to accept municipal and industril solid wastes by the Wisconsin Department of Natural Resources (WDDR). The Janesville Ash Beds consist of five ash beds in which industrial liquids and sludges were disposed and allowed to evaporate or dry. WDDR licensed JAB in 1983 to accept hazardous waste. Materials within the ash beds have been removed but clean closure has not been certified. Both JAB and the new Janesville Landfill are in assessment ground-water monitoring. The RCRA Part A application identified F006, F007, F008, D008 wastes, and paint wastes were treated in JAB and disposed in the new Janesville Landfill. Characteristic waste D002 was also disposed in the landfill. The Agency proposed JAB and the abandoned sand and gravel pits on the National Priorities List (NPL) promulgated on September 21, 1984.

Release Determination: The order is based upon a ground water study that shows a release of the following organic compounds to the ground water: benzene, toluene, ethylbenzene, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, and 1,2-dichloroethane. The release of hazardous substances from the sites has contaminated the sand and gravel aquifer below the sites. Industrial, private and city wells are located in the aquifer associated with the sites. Janesville's municipal water supply originates from a number of wells in the area.

ORDER PROVISIONS

RFI: The order requires all of the respondents to conduct a comprehensive remedial investigation to characterize the sites and their actual or potential hazard to public health and the environment. Components of the remedial investigation include (1) characterizing the waste materials at the sites including leachate from the disposal sites; (2) determining the present and potential extent of ground-water contamination within the sand and gravel aquifer and within the bedrock aquifer, and evaluating the suitability of the sites for on-site containment systems; (3) determining the extent of contamination of surface and subsurface soils in and around the facility and sediments within the Rock River and the pond immediately south of the New Janesville landfill; and (4) determining the extent of contamination reaching the Rock River and the pond immediately south of the new Janesville landfill. The respondents will also conduct a program to determine the extent of release of contaminants to the air.

In addition to the site investigation, the respondents will identify preliminary remedial technologies to ensure that the site investigations provide sufficient detail and data to support the evaluation of alternatives during the feasibility study. Following the site investigations, the respondents will refine the preliminary options and recommend preliminary remedial technologies likely to apply to the site problem.

CMS: Based on the results of the RFI, the respondents will prepare and submit a draft feasibility study (RCR Corrective Measures Study or CNS) outlining remedial action alternatives to prevent or minimize the release of contaminants in the environment.

CMI: After selection of the remedial response or corrective action, EPA shall provide a sixty-day period for negotiation of a new administrative order on consent for implementation of the remedial response or corrective action.

Reimbursement of Costs: The respondents must reimburse EPA and WDNR for costs which EPA and WDNR concude are recoverable under Section 107 of CERCLA, and which have been incurred with respect to this consent order.

CONTACTS

Region V: Daniel J. Cozza
Remeidal Project Manager
CERCLA Eforcement Section

Headquarters: Cindy Byron
(202) 475-8728

RESPONDENT: Eagle-Picher Industries, Inc.
Colorado Springs, Colorado

AUTHORITIES: RCRA Section 3008(h)
Consent Order

FINDINGS OF FACT

Facility Description: Eagle-Picher is a nickel-cadmium battery manufacturing facility that generates, treats and stores hazardous waste. This facility includes two active surface impoundments, two inactive surface impoundments, and a drum storage area.

Release Determination: The consent order is based on the results of ground-water samples taken downgradient of the surface impoundments. Analyses of these samples show a release of nickel, chromium, cadmium and arsenic. In addition, soil samples show a release of nickel and cadmium. Eagle-Picher is hydraulically upgradient of wells which have the potential to draw ground water for domestic and/or agricultural purposes.

ORDER PROVISIONS

Interim Measures: The consent order requires Eagle-Picher to upgrade its ground-water monitoring well system and collect analytical data on the concentrations of cadmium, nickel and pH values in the soil and ground water. If the concentrations exceed the values contained in the consent order then Eagle-Picher must develop and implement an interim measures workplan. This workplan must propose a ground-water interception and collection system, and methodology and procedures for treatment of the contaminated ground water.

RFI: Eagle-Picher must conduct a comprehensive remedial investigation or RCRA Facility Investigation (RFI). This investigation will, at a minimum, specifically address the impact on ground water, surface water, and sediments/soils from the four surface impoundments, drum burial areas, spill areas, buried piping systems, tanks and sumps. The RFI will (1) determine the concentration, rate, and extent of contamination; (2) characterize the hydrology and geology of underlying aquifers and (3) characterize and define the impact of the site contamination on soils, surface water and ground water.

CMS: Based on the results of the RFI, Eagle-Picher shall prepare a corrective measures study (CMS) that identifies alternatives to remediate contamination. This study will also include an assessment by a professional engineer of the likely effectiveness and feasibility of each corrective measure alternative.

CMI: After submission of the CMS, EPA shall select the corrective measures to be implemented at the facility. Eagle-Picher must then submit a corrective

measures implementation workplan that includes an engineering design and a detailed schedule for implementation of the selected corrective measures.

Financial Assurance: After EPA approves the RFI/CMS workplan, Eagle-Picher must obtain a surety bond for performance of all work to be performed under this Consent Order.

Stipulated Penalities: EPA will assess a penalty not to exceed $25,000 for each day of non-compliance with this Consent Order.

CONTACTS

Region VIII: Marcella De Vargas
Waste Management Division
(303) 293-1506

Headquarters: Nancy Browne
(202) 475-9326

RESPONDENT: Envirosafe Services of Idaho, Inc.
Owyhee County, Idaho

AUTHORITIES: RCRA Section 3008(h)
Unilateral Order (October 31, 1985)

FINDINGS OF FACT

Facility Description: Envirosafe owns and operates a hazardous waste treatment, storage, and disposal facility. The facility has a number of solid waste management units, including at least 24 unlined disposal trenches, three missile launch silos extending 160 feet below the surface, and other underground silo structures, including a tunnel system. Prior to November 19, 1980, all but three of the trenches were filled with solid or hazardous waste. Many of the associated underground structures were also filled with liquid and solid hazardous waste.

Ground water beneath the site is located at a depth of approximately 200 feet. Each silo has a single ground-water monitoring well located 30 feet downgradient. Additional monitoring wells are in place 700 feet or more from the easternmost silo, in a 180 degree downgradient arc.

Release Determination: The order is based on a determination that hazardous constituents have been found outside the confines of the silos and their associated structures in both the soil and the ground water. The sampling data show that the following hazardous waste constituents have been found in the soil. For example, at Silo I, at 56-58 ft.: chloroform (166,000 ppb), 2-chlorophenol (137,000 ppb), 2,4-dichlorophenol (993,000 ppb), 2,4,5 trichlorophenol (1,010,000 ppb), 1,2,4 trichlorobenzene (80,000 ppb); and at 192-193 ft.: carbon tetrachloride (115 ppb), chlorobenzene (115 ppb), chloroform (143 ppb), methyl bromide (862 ppb), methylene chloride (201 ppb). The sampling data show that the following constituents are present in the ground water: For example, at Silo I: carbon tetrachloride (15.3 ppb), chloroform (86.9 ppb), methyl chloride (54.5 ppb), and methylene chloride (38.8 ppb).

All of the constituents identified above are listed in Appendix VIII and have toxic, carcinogenic, mutagenic or terotogenic effects on humans or other forms of life. Within a three-mile radius downgradient of the facility there are at least 14 wells which draw groundwater for agricultural and/or domestic purposes.

ORDER PROVISIONS

Interim Measures: The Order requires Envirosafe to immediately begin a monthly sampling and analysis program of the silo wells and the downgradient perimeter wells at the facility. Each sample must be analyzed for specific volative organics. If a volatile organic is found as the result of sampling in excess of 1 part per million (ppm), Envirosafe must immediately notify EPA and implement its Phase I Corrective Action plan which details procedures for removing and/or containing hazardous wastes or constituents.

RFI: The Consent Order gives Envirosafe 30 days to develop and implement a remedial investigation or RCRA Facility Investigation (RFI) plan for additional studies that will be necessary to develop a comprehensive corrective action plan. The plan must contain information about the nature and extent of contamination that constitutes releases and threatened releases. The plan must meet the following performance standards and objectives: site-specific health, safety and quality assurance performance standards; subsurface investigation performance standards, including monitoring well installation and construction, well development and hydraulic conductivity tests, well sampling, and an aquifer pump test; soil samples; and environmental sampling in general.

CMS: Upon completion of the RFI, Envirosafe must undertake a Corrective Measures Study (CMS) to develop feasible methods of achieving and maintaining background or ACLs for hazardous constituents found in ground water. The study must evaluate source control and on-site and off-site corrective actions for mitigating the contamination. The study must also categorize and analyze each discrete element.

CMI: The Order also includes a Phase II Corrective Action stage which requires Envirosafe to implement corrective action based on the results of the RFI and CMS. Envirosafe will submit quarterly reports detailing its progress in implementing the corrective action.

CONTACTS:

Region X: Kenneth D. Feigner
Chief, Waste Management Branch
Region X
(206) 442-2782

Headquarters: Charlotte White
(202) 475-6719

RESPONDENT: Koppers Company, Inc,
Carbondale, Illinois

AUTHORITIES: RCRA Section 3008(h)
Consent Order (June 4, 1986)

FINDINGS OF FACT

Facility Description: Koppers owns and operates a railroad tie and wood treatment plant. The plant covers approximately 136 acres and uses several different processes to treat wastewater generated from its wood preserving operations. Wastewater from the treatment process is piped through an oil/water separator to a biological wastewater treatment system consisting of four lagoons (treatment system lagoons), an activated-sludge treatment unit, and a spray irrigation field. The treatment system lagoons were constructed in the location of a former creosote-contaminated wastewater lagoon adjacent to a "swampy area". Sludge that results from the treatment of these wastewaters (K001) collects in the treatment system lagoons and spray irrigation field.

The Koppers facility also has numerous SWMUs including an "old lagoon area" that encompasses approximately four acres and kick-back areas that are contaminated as a result of spilled or leaking treatment agents and/or the dripping of these agents from treated wood. In addition, three to four years ago, Koppers excavated soil contaminated with creosote and other organic components and stored the contaminated soil on plastic sheets in a bermed area southeast of the spray field. This storage has continued to the present time.

Release Determination: The Consent Order is based on the results of ground-water monitoring data that indicate a release of hazardous waste constituents to the ground water from the treatment system lagoon area. These constituents include: pyrene, pentachlorophenol, acenaphthene, naphthalene, fluoranthene, chrysene, and anthracene. Contaminants from this area have moved off-site and reached Glade Creek, which passes near the eastern edge of the facility. During October 1981, two cattle died on the land east of the Koppers property. An autopsy revealed that they ingested creosote-contaminated material. Samples taken from Glade Creek in 1982 indicated a variety of polynuclear-aromatic hydrocarbons and pentacholorophenol.

Ground water and soil in the vicinity of the treatment plant are contaminated with creosote, pentachlorophenol and other organic compounds. This contamination may result from the kickback areas described above.

ORDER PROVISIONS

RFI: The Consent Order requires Koppers to perform a comprehensive remedial investigation or RCRA Facility Investigation (RFI) in accordance with a Statement of Work attached to the Consent Agreement. The RFI will include defining site geology and the occurrence of contamination; evaluating ground-water flow patterns and the extent and effects of ground-water contamination; and determining the extent and potential for air, surface water, and soil contamination. Before initiating the investigation, Koppers must review all available reports and data to assess what

existing data can be used in the RFI. This review will focus on site background, nature and extent of the contamination, previous and present sampling and analyses, and previous response actions. In addition, prior to starting any site investigations, Koppers will assess the site conditions to determine potential categories of source control (and/or off-site) corrective actions. EPA will review and screen the preliminary technologies so that the site investigations can be designed to answer questions raised during this site assessment and support the corrective measures study.

CMS: Either during or following the RFI, Koppers will assess the investigation results and recommend preliminary corrective action technologies. Based on the results of the RFI and consideration of the preliminary corrective action technologies, Koppers will prepare a Corrective Measures Study (CMS) that evaluates several alternatives for source control and off-site remedial actions in greater detail.

CMI: The Order requires Koppers to begin implementing the remedial action after review and approval by EPA.

Stipulated Penalties: $1,000 for the first week and $2,000 for each week thereafter for failure to submit a deliverable or comply with schedules required under the Consent Order.

CONTACTS

Region V: Kevin Pierard
Geologist, Unit 9, Indiana-Illinios Enforcement Unit
(312) 886-4466

Headquarters: Cindy Byron
(202) 475-8728

RESPONDENT: Martin Marietta Denver Aerospace
Waterton, Colorado

AUTHORITIES: CERCLA Section 106 and RCRA Section 3008(h)
Consent Order (February 7,1986)

FINDINGS OF FACT

Facility Description: The Denver Aerospace Waterton facility contains approximately 5200 acres and has been used for research, development and manufacture of aerospace components, defense systems, and related technologies since 1956. This facility treats, stores, and disposes F001, F002, U019, U044, and D007 hazardous wastes on-site in sumps, tanks, drums, pits, ponds, lagoons, surface impoundments, and incineration facilities.

Release Determination: The Order is based on the finding that hazardous constituents have been detected in surface water, ground water, and soil sediments. Analysis of surface water samples from Brush Creek, indicate the presence of trichlorethylene and trans-1, 2 dichlorethylene. These compounds, along with hexavalent chromium, cyanides, n-nitrosodimethylamine, and hydrazine, have also been detected in ground water samples taken at the facility. Onsite soil samples from the facility contained silver, cadmium and cyanides.

The potential sources of these releases include inactive evaporation ponds which are now covered with soil, and an inactive landfill used for the disposal of solid waste, including construction debris. Ground water and surface water pathways provide routes for the potential migration of contaminants toward the South Platte River. In addition, this facility is hydraulically upgradient from a water treatment plant which provides drinking water to the Denver metropolitan area.

Prior to issuance of this order, Martin Marietta constructed and installed an interim measure consisting of a well-point dewatering system. This system intercepts ground water in the area and transports the water to facilities where it is treated and released in order to mitigate contaminant migration.

ORDER PROVISIONS

RFI: Martin Marietta will submit to EPA a plan for a comprehensive RCRA Facility Investigation (RFI). The workplan will include determining (1) presence or absence of hazardous wastes or hazardous constituents; (2) the nature, extent, concentrations, and rate of movement of contaminants; (3) the extent and potential for migration of contaminants through each of the environmental media; and (4) the potential public health and environmental hazards resulting from the migration of contaminants.

The RFI will be conducted in three Phases. Phase I will focus on performance of a hydrogeologic and contamination study of the inactive site and the Rifle Range landfill and will include an investigation of the hydrogeology of the remaining portions of the study area and an investigation of other potential sources of contamination within the study area. Phase II includes the preparation and implementation of a field sampling and analytical plan and a QA/QC plan to confirm the existence of contamination in the additional areas identified for further study at the completion of Phase I. Phase III addresses the development of a workplan to investigate any newly discovered release or threatened release during the first two phases of this investigation.

CMS: Based on the results of the RFI, Martin Marietta shall prepare and submit a draft feasibility study (RCRA Corrective Measures Study or CMS) outlining remedial action alternatives to prevent or minimize the release of contaminants in the environment.

CMI: After selection of the remedial response or corrective action, EPA shall provide a sixty-day period for negotiation of a new administrative order on consent for implementation of the remedial response or corrective action.

Reimbursement of Costs: Martin Marietta must reimburse EPA for costs which EPA concludes are recoverable under Section 107 of CERCLA, and which have been incurred with respect to this consent order.

Stipulated Penalties: EPA will assess $1000 for the first 1-7 days of delay and $1000 for each additional day thereafter for failure to submit the RFI Phase I, II or III reports or CMS at approved times. For delays of other deliverables, EPA may assess $1000 for the first 4-7 days and $2000 for each 7-day delay thereafter.

CONTACTS

Region VIII: James Littlejohn
Remedial Project Manager, Enforcement Section
(303) 293-1518

Headquarters: Nancy Browne
(202) 475-9326

RESPONDENT: National Industrial Environmental Services, Inc. (NIES)
Furley, Kansas

AUTHORITIES: RCRA Section 3008(h)
Consent Order (May 31, 1985)

FINDINGS OF FACT

Facility Description: This consent agreement addresses the following units: evaporation ponds, disposal trenches and a stormwater retention pond.

Release Determination: EPA has determined that there has been a release and that the corrective action order is necessary to prevent future migration of ground-water contamination from the site.

ORDER PROVISIONS:

RFI/CMS: The Order requires NIES to take corrective action immediately and to conduct studies necessary to establish ACLs concurrently with the corrective actions.

The Consent Order requires NIES to reduce the average concentration of total volatile organic compounds (VOCs) in the ground water onsite and offsite by at least 25 percent in the year following initial establishment of A level and B level aquifer extraction well pumping programs. NIES must conduct ground-water monitoring to evaluate the success of this pumping program. During this time NIES is to develop alternate concentration levels (ACLs) for contaminants known to be present in the ground water and released from the facility, and to establish final levels of contaminant reduction and methods and schedules to achieve this reduction based on the ACLs. If the ACLs are not approved and finalized by the second year of ground-water extraction, NIES must reduce the average concentration of VOCs onsite and offsite by at least 50 and 35 percent, respectively. If during either the first or second year the average concentration of VOCs in the B level aquifer monitoring wells has not decreased by the above relevant percentage, then NIES is to commence construction of a slurry wall system, or submit an alternate reduction plan and schedule which, upon approval by EPA, would be implemented immediately.

Once the ACLs, either individually or collectively, have been approved by EPA, those ACLs, plans and schedules would become effective, replacing the negotiated requirements based on the percentage of VOC reduction. Within 15 months of approval of all ACLs, NIES must document its performance in achieving these levels and, if necessary, submit a plan including revised methods and schedules to expeditiously achieve the outstanding ACLs. The Consent Order corrective action program terminates when the ACLs have been attained and maintained for three consecutive years.

The Order requires NIES to decommission existing evaporation ponds and a stormwater retention pond. NIES is required to establish an amibient air monitoring network to describe all aspects of the dewatering activities which may have potential to cause air emissions of hazardous substances. NIES is also required to install and operate a monitoring station to gather meteorological data (e.g., temperature and precipitation, wind speed, wind direction). If, after completion of sludge removal and evaporation pond decommissioning activites, no emissions are detected during a 10-day post-activity period, NIES can terminate the air monitoring program. If continued emissions are present, NIES shall continue monitoring and submit a revised monitoring plan to address the situation.

The Consent Order also requires NIES to plug existing boreholes, wells and any other cross-connections that may exist between the A and B level aquifers.

Financial Assurance: Within one month after the Order becomes effective, NIES shall provide financial assurance for all provisions which do or may require expenditures. The financial assurance mechanisms can separate one construction cost from another, and may separate capital and operating and maintenance expenditures.

Stipulated Penalties: EPA may assess a range of penalties from $1,000 to $5,000 per day for failure to respond within the specified time to requirements in the Order.

CONTACTS

Region VII: David Tripp
Regional Counsel, Office of Regional Counsel
(913) 236-2808

Headquarters: Nancy Parkinson
(202) 382-2307

RESPONDENT: The Boeing Company
Portland, Oregon

AUTHORITIES: RCRA Section 3008(h)
Consent Order (July 21, 1986)

FINDINGS OF FACT

Facility Description: Boeing owns and operates a hazardous waste treatment, storage, and disposal facility. This Order addresses corrective action at a leaking surface impoundment. Boeing has identified MEK, TCA, and the following waste streams as those used at the Boeing plant: F001, F002, F005, and F006.

Release Determination: The Order is based on the results of ground water monitoring data which show TCE and TCA levels that exceed recommended levels in the ground water in the vicinity of the surface impoundment. On May 1, 1986, Boeing submitted results of groundwater sampling from five monitoring wells near the surface impoundment. The samples contained the following hazardous constituents in the following ranges: total organic halogen (TOX) (1200-2200 ug/1), total organic carbon (TOC) (2300-5400 ug/1), methyl-ethyl-ketone (MEK) (BD -79 ug/1), trichloroethylene (TCE) (1110-2260 ug/1), and 1,1,1 trichloroethane (TCA) (124-250 ug/1). On April 23, 1986, Boeing sampled selected wells on the property for volatile organic constituents. The results of the sampling include: TCA (ND- trace), TCE (2 -37 ug/1), tetrachloroethylene (PCE) (trace -5 ug/1), trans- 1,2 dichloroethylene (t- DCE) (7 -39 ug/1), and 1,1, dichloroethylene (DCE) (ND- 3 ug/1).

There are approximately 67 domestic, 31 irrigation, 36 municipal, and 11 industrial wells within a 3-mile radius of the Boeing facility. At least one potable water well has already been affected, and other drinking water sources are endangered.

ORDER PROVISIONS

Interim Measures: Boeing must implement interim measures which consist of sampling all active drinking water wells within 1/2 mile of the boundaries of the Boeing property, as well as all active drinking water wells within one mile of the property, and within a 180 degree arc centered on the downgradient ground-water flow direction. Boeing must arrange and pay for the analysis of all samples.

If the results of the sampling show that a well is contaminated above pre-determined action levels, or if a contaminant is not listed and is in concentrations above the recognized public health advisory level, and the contamination likely emanated from the Boeing facility, then Boeing must notify the affected well owner within three working days after such determination, and must offer to provide bottled water.

If the level of a contaminant will cause other health concerns apart from drinking the water, Boeing must develop and implement other initial corrective actions to minimize health risks.

RFI: Boeing must undertake the RFI in two phases. Phase I will include (1) an assessment of the rate and extent of air, surface water, soil and ground-water contamination; (2) development of a model of the aquifers affected by the release and a conservative prediction of the potential effect of hazardous constituent movement on downgradient well users; (3) an evaluation of the affect of pumping by nearby well users on hazardous constituent movement; (4) revision and update of the Exposure Information Report for the double lined surface impoundment; (5) characterization of each source of contamination and assessment of the need for source control measures; and (6) supplementation of the assessment report to include the entire Boeing property and all of the hazardous constituents detected earlier.

The Phase II investigation will begin if at any time during the effective period of the Order it is determined in Phase I, that the Boeing Plant is the likely source of off-site ground-water contamination. The investigation will include (1) an expansion of the ground-water model developed in Phase I to include both a model of the water bearing zones off the Boeing property affected by the release and a conservative prediction of the potential effect of hazardous constituent movement on downgradient well users; (2) an assessment of the rate and extent of air, surface water, soil, and ground-water contamination; and (3) an evaluation of the effect of ground-water pumping by well users in the vicinity of any plume(s) released from the Boeing property.

CONTACTS

Region X: Charles E. Findley
Director, Hazardous Waste Division
(206) 442-1906

Headquarters: Charlotte White
(202) 475-9316

RESPONDENT: US Ecology, Inc.
Sheffield, Illinois

AUTHORITIES: RCRA Section 3008(h)
Consent Order (September 17, 1985)

FINDINGS OF FACT

Facility Description: US Ecology operated as a hazardous waste landfill until January 1983 when it ceased receiving hazardous wastes. According to facility records, US Ecology received and buried a variety of hazardous wastes or hazardous constituents at the 45-acre facility, including PCBs, solid and liquid cyanide compounds, and paint sludges containing lead and chromium pigments.

Release Determination: The Order is based upon ground-water monitoring reports that show a release of hazardous wastes and/or constituents to the ground water. These constituents include: acetone, benzene, methylene chloride, trichloroethylene, chloroform, and carbon disulfide.

ORDER PROVISIONS

RFI: The Order requires US Ecology to conduct a comprehensive remedial investigation or RCRA Facility Investigation (RFI). The specific goals of the RFI include: identifying the location of existing contaminant plumes; describing contaminants being released and the rate and extent of their movement; evaluating ground-water movement for the entire area of the site; locating the source of current releases of contaminants; and defining the method of migration of contaminants through existing containment facilities. Based on this information, US Ecology will evaluate the site's overall integrity for long-term containment and the long-term impacts of releases (present and potential) from the facility.

The investigation will focus on ground-water contamination, but must also address air, soil and surface water contamination. In addition, US Ecology will investigate the relationship between surface water and ground water at the site.

CMS: Based on the results of the RFI, US Ecology will develop and evaluate corrective action alternatives. The Order requires the facility to evaluate each alternative in terms of reliability, implementability, operation and maintenance requirements, environmental effects, and safety requirements.

CMI: The Order requires US Ecology to implement the CMS.

Financial Assurance: US Ecology must establish an escrow account in the amount of $75,000 for payment of any stipulated penalties. This account will remain in effect for the duration of the RFI and CMS. In addition, the facility must provide EPA with an irrevocable standby Letter of Credit for $750,000. This Letter of Credit will guarantee performance and payment of the RFI and CMS. US Ecology must establish an additional Letter of Credit for $1,750,000 to guarantee the performance and payment of any corrective action. EPA may draw on the Letter of Credit in the event US Ecology fails to properly comply with the terms and conditions of the Consent Order.

Reimbursement of Costs: US Ecology must also reimburse EPA for costs incurred prior to the effective date of the Order (not to exceed $25,000), RFI and CMS oversight costs (not to exceed $30,000 per year for a maximum of two years), and oversight of corrective action implementation (not to exceed $100,000).

Stipulated Penalties: For each day US Ecology fails to submit deliverables required under the scope of work, EPA may assess penalties of $5,000 per day.

CONTACTS

Region V: Kevin Pierard
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SUPERFUND
Records Of Decision
Update

From: Hazardous Site Control Division
To: EPA Regional Offices

August 30, 1985
Vol. 1, No. 5

REMEDIAL RECORDS OF DECISION*
FY 1985

Region	Site/State	Candidate for Delegation	Threat or Problem	Issues	Regional Contact	Headquarters Contact
I May slip to 1986	Baird & Maguire Inc MA	no	Pesticides in soils & GW	Dioxin, ACL	Bob Shatten 223-1722	Steve Hooper 475-6689
	Beacon Heights L/F, CT	yes 4/12	LF leachate in GW	Treating GW in fractured bedrock	Rich Cavagnero 223-1947	Steve Hooper 475-6689
	Cannon Engr-Plymouth, MA	yes 7/31	Surface tanks & soils	--	Greg Roscoe 223-5911	Bill Kaschak 382-2348
ROD signed 7/11/85	Charles George L/F MA	yes 3/8	LF leachate in GW	RCRA capping	Rich Leighton 223-1946	Bill Kaschak 382-2348
	Groveland Wells, MA	yes 7/31	Solvents in GW	ACL, use of PRP RI/FS	Jim Cinello 223-1946	Steve Hooper 475-6689
	Hocomonco Pond, MA	yes 6/17	Creosote in soil GW	ACL	Jim Cinello 223-1946	Steve Hooper 475-6689
ROD signed 7/22/85	McKin Company, ME	yes 4/12	Volatiles in GW, soil contamination	Pumping & treating GW	Dave Webster 223-4909	Jim Spatareila 382-7995
	Nyanza Chemical MA (1st Operable Unit)	yes 4/12	Metal sludges	ACL/onsite RCRA facility	Rich Cavagnero 223-1947	Bill Kaschak 382-2348
	Picillo Farm Site RI (1st Operable Unit) (2nd Operable Unit)	yes 4/12 yes 6/17	Organics in soil & GW	ACL	John Randall 223-1928	Jim Spatarella S Ross 382-7995
II	Bog Creek Farm NJ	yes	Volatiles	Seriousness of health threat — potential for inplace treatment	Eric Swartz 264-1253	John Kingscott 382-7996
	Burnt Fly Bog, NJ	no	Lead/PCBs in soil/ sediment	Very tight schedule	Sue Kaufman 264-8098	Bob Quinn 382-2350 Jim Spatarella 382-7995
	Gems Landfill, NJ	yes 7/31	GW contact with landfill	GW cleanup — feasibility of RCRA cap	Ed Putnam 264-1873	John Kingscott 382-7996
	Glen Ridge Radiation NJ	no	Low-level radiation	Offsite disposal location	Doug Johnson 264-8475	John Kingscott 382-7996
	Goose Farm NJ	yes 6/17	GW & soil contamination by VOCs/ exotics	Heavy PRP involvement	Don Lynch 264-8216	Bob Quinn 382-2350 Jim Spatarella 382-7995
	Helen Kramer L/F NJ	yes 7/31	GW contact with LF	--	Ed Putnam 264-1873	John Kingscott 382-7996

* **Enforcement lead sites are not included on this list.**

Region	Site/State	Candidate for Delegation	Threat or Problem	Issues	Regional Contact	Headquarters Contact
	Lipari Landfill, NJ	yes 7/31	Leachate from LF	Leachate collection & disposal	Sal Badalamenti 264-1873	John Kingscott 382-7996
	Marathon Battery, NY	possible	Cd contamination of wetlands, cove & river	Wetlands env threat limited public health threat	Joel Singerman 264-9589	Bob Quinn 382-2350 Jim Soatarella 382-7995
	Olean Well Field, NJ	yes 6/17	TCE contamination of GW	No source data	Pam Tames 264-2646	Bob Quinn 382-2350 Jim Soatarella 382-7995
	Sinclair Refinery, NJ	yes	VOCs etc in soil GW	Solit site	Joel Singerman 264-9589	Bob Quinn 382-2350 Jim Soatarella 382-7995
	Swope Oil, NJ	yes 6/17	PCBs in soil	GW contamination of local wells	Don Lynch 264-8216	John Kingscott 382-7996
	Wide Beach, NY	yes 7/31	PCBs in soil	Consistency with removal action	Joel Singerman 264-9589	Bob Quinn 382-2350 Jim Soatarella 382-7995
	York Oil, NY	yes 7/31	PCBs in soil	Tight schedule	Bob Howe 264-1375	Bob Quinn 382-2350 Jim Soatarella 382-7995
III	Douglasville, PA	yes 4/12	Waste oil located in flood plain	Active facility is source of contamination	Bill Hagel 597-3161	Linda Boornazian 382-7997
	Drake Chemical, PA	yes 6/17	Contaminated buildings lagoons & GW	Flood plain adjacent facility RA coordination GW cleanup goals	Bill Hagel 597-3161	Linda Boornazian 382-7997
	Harvey-Knott, DE	yes 6/17	GW contamination drum disposal	Wetland assessment PCBs	Joe Dugandzic 597-9023	Lisa Woodson 475-8246
ROD signed 3/22/85	Heleva Landfill PA	yes 3/8	Contaminated GW	Source in GW 2 yr treatment included in remedy	Bill Hagel 597-3161	Lisa Woodson 475-8246
ROD signed 3/22/85	Lackawanna, PA	yes 3/8	Pits with contaminated leachate	Municipal/ industrial closure of pits subsidence	Walt Graham 597-9387	Linda Boornazian 382-7997
ROD signed 8/2/85	Lansdowne Radiation, PA	yes 6/17	House contaminated with radioactive materials	Relocation	Walt Graham 597-9387	Linda Boornazian 382-7997
ROD signed 6/28/85	McAdoo Associates, PA	no	Soils contamination	Fund balancing partial removal vs capping due to subsidence threat	Dom Digulio 597-3435	Linda Boornazian 382-7997
	Moyers Landfill PA	yes 6/17	LF with contaminated leachate	Gas collection for 20 years wanted by PRP	Stephanie del Re 597-0517	Linda Boornazian 382-7997
	Sand Gravel & Stone, MD	yes 6/17	Soil contamination shallow GW contamination	Complex hydrogeological system	Roy Shrock 597-0913	Lisa Woodson 475-8246
ROD signed 6/28/85	Taylor Borough, PA	yes 4/12	Drum disposal on top of LF minimal soil contamination	Soils around drum disposal subsidence threat GW discharges into mine pool	Joe Dugandzic 597-9023	Lisa Woodson 475-8246
	Tybouts Corner, DE	yes	Large LF GW contamination alternate water supply provided	GW cleanup levels institutional controls	Roy Shrock 597-0913	Linda Boornazian 382-7997
	Tysons Disposal, PA	no	Lagoons, soil and shallow GW contamination	Extent of excavation deferral of offsite/wetland area and deep aquifer	Joe Dugandzic 597-9023	Lisa Woodson 475-8246
IV	American Creosote, FL	yes 7/31	Lagoon areas onsite and offsite soil and GW contamination	Limits of excavation state regulation on onsite landfill	Jim Barksdale 257-2643	Lisa Woodson 475-8246

Region	Site/State	Candidate for Delegation	Threat or Problem	Issues	Regional Contact	Headquarters Contact
	Davie Landfill, FL	yes 6/17	Sludge lagoon threatens GW	Disposal in existing onsite landfill without double liner	Jim Orban 257-2643	Ed Barth 382-7998 Debbie Swichkow 382-2453
	Miami Drum/ Biscayne Aquifer, FL	no	Regional GW contamination	Plume is no longer identified with any site The aquifer is contaminated	Jim Orban 257-2643	Lisa Woodson 475-8246
ROD signed 3/29/85	Varsol Spill, FL	yes 3/8	Source dissipated	Petroleum fraction	Jim Orban 257-2643	Linda Boornazian 382-7997
EDO ROD signed 3/29/85	Whitehouse Waste Oil FL	yes 3/8	Soils GW w/ organics and metals	Length of GW treatment suitability for onsite closure	Jack Snider 257-2930	Ed Barth 382-7998
V	Acme Solvent IL (1st Operable Unit)	yes 4/12	Alternative water supply contaminated soils & GW (metals organics PCBs)	Soil cleanup level (delisting methodology)	Paul Bitter Dave Favero 886-4742	Kitty Taimi 382-2449 Ed Barth 382-7998
Moved to FY 86	Arcanum Iron OH	yes 7/31	Soil GW contamination with lead & acid	--	Allen Wojtas 886-6941	Carol Lindsay 475-6704
ROD signed 3/13/85	Byron Salvage IL (1st Operable Unit)	yes 3/8	Buried wastes, drums	--	Doug Yeskis 886-9296	Kitty Taimi 382-2449 Ed Barth 382-7998
	Cemetary MI (1st Operable Unit)	yes 7/31	Buried drums	Cleanup levels	Tom Thomas 886-1434	Kitty Taimi 382-2449 Ed Barth 382-7998
	Charlevoix Municipal, MI	yes 4/12	GW contamination limited to threat (IRM to provide alternate water supply)	--	Jack Kratzmeyer 353-6449	Carol Lindsay 475-6704
Moved to FY 86	Fields Brook OH (1st Operable Unit)	yes 7/31	Stream sediments contaminated with PCBs organics heavy metals	Disposal facility for PCBs High enforcement	Allen Wojtas 886-6941	Carol Lindsay 475-6704
ROD signed 6/12/85	Kummer L F MN (1st Operable Unit)	yes 4/12	Water supply	--	Allen Wojtas 886-6941	Kitty Taimi 382-2449 Ed Barth 382-7998
Moved to FY 86	Laskin/Poplar Oil OH	yes 6/17 7 31	PCB contaminated soils ponds GW	PCBs High enforcement	Jay Plucinski 353-6316	Carol Lindsay 475-6704
	LeHillier MN (1st Operable Unit)	yes 6/17	GW contamination with TCE	--	Fred Bartman 353-6083	Carol Lindsay 475-6704
ROD signed 8/2/85	Main St IN (1st Operable Unit)	yes 7 31	Public water supply contaminated w/ solvents	--	Mike Strimbu 353-6417	Carol Lindsay 475-6704
ROD signed 8/7/85	Morris Arsenic MN	yes 6/17	No threat deletion candidate	--	Gene Wang 353-6341	Carol Lindsay 475 6704
	New Lyme, OH	yes 6/17	Landfill contaminated soil leachate & GW	--	Mary Tyson 886-3006	Carol Lindsay 475-6704
	Northernaire, MI (1st Operable Unit)	yes 6/17	Contaminated soils	--	Mary Elaine Gustafson 886-6144	Kitty Taimi 382-2449 Ed Barth 382-7998
ROD signed 8/7/85	Old Mill OH	yes 4/12	Contaminated soil and GW	ACL length of time to treat GW	Mary Tyson 886-3006	Carol Lindsay 475-6704
ROD signed 8/12/85	Schmalz Dump WI (1st Operable Unit)	yes 6/17	PCB contamination of soil pond sediments	PCBs	Margaret Guerriero 886-0399	Carol Lindsay 475-6704
ROD signed 8/12/85	Verona Wellfield, MI (2nd Operable Unit)	yes 6/17	Contaminated soil	--	Jack Kratzmeyer 353-6449	Carol Lindsay 475-6704
	Wauconda Sand, IL (1st Operable Unit)	yes 7/31	Contaminated leachate	--	Cindy Nolan 886-0440	Carol Lindsay 475-6704
VI	Bayou Bonfouca LA	yes 4/12	Creosote waste piles LF/drums	Soil cleanup level	Don Porter 729-9712	Randy Kaltreider 382-2448

Region	Site/State	Candidate for Delegation	Threat or Problem	Issues	Regional Contact	Headquarters Contact
Moved to FY 86	Cecil Lindsey, AR	yes 6/17	Low level organics in soil	No action vs limited action	Joe Cravens 729-9737	Randy Kaltreider 382-2448
Moved to FY 86	Cleve Reber, LA	yes 4/12	LF/drums with organics	Extent of removal, if any, GW cleanup	Steve Gilrein 729-2737	Randy Kaltreider 382-2448
ROD signed 3/15/85	MOTCO, TX	yes 3/8	Lagoons containing PCBs, organics, and heavy metals	Incineration of PCBs, extent of soil/sludge removal	Don Porter 729-9712	Randy Kaltreider 382-2448
ROD signed 6/11/85	Triangle Chemical, TX	yes 4/12	Soils with arsenic, metals	ACL	Don Williams 729-9713	Ed Barth 382-7998
VII ROD signed 7/10/85	Ellisville Sites, MO (Rosaire & Callahan)	yes 4/12	Drums & contaminated soils	Offsite disposal	Bob Feild 758-3931	John Kingscott 382-7996
VIII Moved to FY 86	Denver Radium Site, CO	yes 6/25	Radioactive contamination (soils & structures)	Acceptable disposal facility	John Brink 564-1525	Randy Kaltreider 382-2448
ROD signed 8/7/85	Milltown, MT (Supplemental)	yes	Arsenic-contaminated water supply	Extent of contamination	Jim Knoy 585-5414	Beth Hall 382-2451 Blake Velde 475-6703
	Woodbury Chemical, CO	yes 3/8	Soils with pesticides	Extent of soil removal treatment vs onsite closure	Walt Sandza 564-1531	Randy Kaltreider 382-2448
IX	Celtor Chemical, CA	yes 6/17	Heavy metals in soil	Soil cleanup level	Nick Morgan 454-8918	Steve Hooper 475-6689
	Del Norte, CA	yes 6/17	Pesticides in soil, GW	ACL	Michele Dermer 454-8144	Steve Hooper 475-6689
ROD signed 5/9/85	Jibboom Junkyard, CA	yes 3/8	PCBs, metals in soil	Extent of soil excavation	Nick Morgan 454-8918	Steve Hooper 475-6689
X Moved to FY 86	Ponders Corner WA	yes 7/31	TCE in soil GW	ACL	Carol Thompson 399-2709	Steve Hooper 475-6689
ROD signed 5/3/85	Tacoma Well 12A, WA	no	Organic solvents in soil GW	ACL, extent of soil excavation	Phil Wong 399-7216	Steve Hooper 475-6689
	United Chrome, OR	yes	Hex-chromium in soil GW	ACL	John Meyer 399-1271	Steve Hooper 475-6689

SUPERFUND
Records Of Decision
Update

From: Hazardous Site Control Division
To: EPA Regional Offices

November 26, 1985
Vol. 1, No. 8

ROD SUMMARIES

VARSOL SPILL, REGION IV, FLORIDA
(Approved 3/29/85)

Description:
- Commercial operations at the Miami International Airport resulted in discharges of hydrocarbons, petroleum-fraction solvents, and jetfuel into surface waters and the Biscayne Aquifer.

Decision:
- No source control action specific to this site; area-wide responses and ground water remedies addressed in Biscayne Aquifer ROD.

Issues:
- RI showed no trace of solvent at site; other chemicals have biodegraded or dissipated and become part of overall contamination of Biscayne Aquifer.
- CERCLA does not address jetfuel spills.
- Private parties have recovered some spilled jetfuel.

Contacts:
- Region IV: Jim Orban
  FTS 257-2643

Headquarters: Lisa Woodson
FTS 475-8246

BISCAYNE AQUIFER, REGION IV, FLORIDA
(Approved 9/16/85)

Description:
- Three NPC sites and an unsewered industrial area to the North contributed to overall contamination in the Biscayne Aquifer. Sites include a drum recycling facility, a municipal landfill, and an international airport. As a result, three well fields serving more than 600,000 people have been contaminated. Biscayne Aquifer is close to the surface and has high transmissivity.

Decision:
- Add air stripping capacity to existing well-head treatment facilities at two wellfields

Issues:
- Area-wide groundwater contamination from numerous sources. Remedial measures ensure safe municipal supply but do not address existing contamination.
- Local authorities will pay for further treatment to remove additional chemicals and color and to increase available water supply. EPA supports these actions.
- Area-wide waste management plan recommended for entire study area.

Contacts:
- Region IV: Jim Orban
  FTS 257-2930
- Headquarters: Lisa Woodson
  FTS 475-8246

LEHILLIER/MANKATO, REGION V, MINNESOTA
(Approved 9/25/85)

Description:
- Natural and man-made depressions became ad hoc waste disposal sites between 1925 and 1960. In 1981, TCE was found in an aquifer serving the LeHillier community.

Decision:
- Manage migration and reduce source by extracting ground water using a system of existing and newly constructed wells and partially treating by air stripping.
- Extend LeHillier water distribution system to include all affected receptors.

Issues:
- Target levels for ground water restoration equate to a risk level of 10^{-6} TCE. Ground water treatment should take less than 5 years if contaminant source no longer exists and will take 5 to 10 years otherwise.

- Ground water treatment prevents migration of contaminants to water supply of adjacent town.

Contacts:
- Region V: Fred Bartman FTS 353-6883
- Headquarters: Carol Lindsay FTS 475-6704

DOUGLASSVILLE DISPOSAL SITE, REGION III, PENNSYLVANIA
(Approved 9/27/85)

Description:
- Waste oil reprocessing and recycling facility has been in operation since 1941. The site has drums of wastes and contaminated soils and sediments. VOCs were found in facility drinking water. In 1970 and 1972, storms washed millions of gallons of waste downstream from an abandoned lagoon.

Decision:
- Remove drums.
- Remove contaminated soils and sediments from drainage ditch and consolidate in the sludge disposal area. Cap filled sludge lagoon and facility disposal area.
- Install levees and dikes to protect site from 100-year flood event.
- Defer decision on ground water treatment.

Issues:
- Site is in 100-year floodplain of state scenic river.
- Active facility onsite.

Contacts:
- Region III: Bill Hagel FTS 597-3161
- Headquarters: Lisa Woodson FTS 475-8246

VERONA WELL FIELD, REGION V, MICHIGAN
(Approved 8/12/85)

Description:
- Three known sources have contaminated the Verona Well Field with VOCs. The well field supplies water for 35,000 residents of Battle Creek, Michigan, and for commercial and industrial users, including two major food processors. In 1984, incerceptor wells and air stripping facilities were constructed at the well field as an interim remedial measure to ensure a clean water supply to the community.

Decision:
- Contain and collect contaminated ground water in vicinity of one source. Pump to existing well field air stripper for treatment.
- Increase volatilization of VOCs from soils at that source using air extraction wells.

Issues:
- Enhanced volatilization using air extension wells is an alternative technology for dealing with soils contaminated with VOCs.

Contacts:
- Region V: Jack Kratzmeyer FTS 353-6449
- Headquarters: Carol Lindsay FTS 475-6704

SINCLAIR REFINERY SITE, REGION II, NEW YORK
(Approved 9/30/85)

Description:
- VOCs and other contaminants were found in the landfill associated with an oil refinery and in ground water. Flooding and migration of the Genesee River has eroded parts of the landfill.

Decision:
- Remove and dispose of drums offsite; excavate smaller landfill and consolidate with larger landfill; fill and cap landfill with RCRA clay cap.
- Channelize portion of river

Issues:
- Waste from the refinery portion of the site eventually may be incorporated into the landfill. An RI/FS for the refinery portion is under way.

Contacts:
- Region II: Joel Singerman FTS 264-9589
- Headquarters: Bob Quinn FTS 382-2350

WIDE BEACH DEVELOPMENT SITE, REGION II, NEW YORK
(Approved 9/30/85)

Description:
- A small recreational community on Lake Erie used waste oil for dust control. The waste oil was found to contain PCBs.

Decision:
- Excavate contaminated soil from roadways, drainage ditches, driveways, yards, and wetlands.
- Dispose of contaminated asphalt; reuse uncontaminated asphalt as fill
- Chemically treat contaminated soils; use treated soil as fill in excavated areas and repave roads and driveways.
- Treat perched water in sewer trenches.
- Continue sampling to define extent of contamination

Issues:
- Chemical detoxification of PCBs was found to be an effective alternative to land disposal or incineration

Contacts:
- Region II: Joel Singerman FTS 264-9589
- Headquarters: Bob Quinn FTS 382-2350

BEACON HEIGHTS LANDFILL, REGION I, CONNECTICUT
(Approved 9/23/85)

Description:
- This 30-acre privately operated landfill received

municipal refuse, rubber, plastics, industrial chemicals, and sludges. The ground water, which provides water for several residential wells, is contaminated.

Decision:
- Excavate discrete portion of site with minor wastes; consolidate wastes; cap site.
- Install leachate control system around landfill; collect leachate and treat offsite.
- Extend public water supply.
- Decision on ground water has been deferred.

Contacts:
- Region I: Rich Cavagnero FTS 223-1947, or Steve Farrick FTS 223-1718
- Headquarters: Steve Hooper FTS 475-6689

BAYOU BONFOUCA, REGION VI, LOUISIANA
(Approved 8/15/85)

Description:
- Abandoned creosote treating facility is within 100-year floodplain of adjacent bayou. Creosote contamination found in soils onsite, in ground water, and on the bottom of the bayou.

Decision:
- Excavate and dispose of creosote and highly contaminated soil offsite; dispose of contaminated water offsite through deep-well injection.
- Study extent of and remedies for contamination in sediment, ground water, and surface water.

Contacts:
- Region VI: Don Porter FTS 729-9712
- Headquarters: Randy Kaltreider FTS 382-2448

CELTOR CHEMICAL, REGION IX, CALIFORNIA
(Approved 9/30/85)

Description:
- The site was occupied by a processor of mining ores. Tailings left onsite have been washed downstream during floods and have leached heavy metals into surface waters. One large tailings pile was removed as an interim measure.

Decision:
- Excavate contaminated soils to risk-based levels for metals; dispose of contaminated soils offsite.

Contacts:
- Region IX: Nick Morgan FTS 454-8918
- Headquarters: Steve Hooper FTS 475-6689

GOOSE FARM, REGION II, NEW JERSEY
(Approved 9/27/85)

Description:
- Polysulfide rubber and solid rocket fuel propellants were buried in a pit dug in fine sand. Ground water and soils are contaminated. Interim activities have included offsite disposal of wastes and soil and plume containment

Decision:
- Flush remaining contaminated soil. Collect ground water, treat it, and re-inject treated water into ground.
- Continue testing to determine need for capping and extent of PCB contamination.

Issues:
- Heavy involvement of PRPs.

Contacts:
- Region II: Don Lynch FTS 264-8216
- Headquarters: Bob Quinn FTS 382-2350

OLEAN WELL FIELD, REGION II, NEW YORK
(Approved 9/24/85)

Description:
- The well field that supplies drinking water for the City and Town of Olean was found to contain TCE. Immediate actions included monitoring private wells and installing 11 carbon absorption units. Little data were available on the source of contamination.

Decision:
- Construct two air stripping systems to treat water from three municipal wells.
- Extend City water system to replace contaminated wells, inspect industrial sewers, recommend institutional controls on well water extraction, further define source and evaluate control methods.

Contacts:
- Region II: Pam Tames FTS 264-2646
- Headquarters: Bob Quinn FTS 382-2350

WOODBURY CHEMICAL SITE, REGION VIII, COLORADO
(Approved 7/19/85)

Description:
- Fire destroyed a pesticides plant in 1965. Contaminated rubble and debris were put on an adjacent lot. Pesticides metals, and other organic compounds are found both on- and offsite in soils and sediments.

Decision:
- Offsite incineration of material with total pesticide concentration in excess of 100 ppm and offsite disposal of soil containing 3-100 ppm total pesticides.

Contacts:
- Region VIII: Walt Sandza FTS 564-1531
- Headquarters: Randy Kaltreider FTS 382-2448

WESTERN PROCESSING, REGION X, WASHINGTON
(Approved 9/25/85)

Description:
- An industrial disposal company received wastes from local industries since the mid-1960s. Approximately 90 of the 126 priority pollutants have been found in soils, in ground water, and in surface water. Interim measures have included removal, site stabilization, reuse of wastes, and limited stormwater controls and treatment.

Decision:
- Excavate highly contaminated soil and some buried wastes.
- Provide interim soil cover to prevent human contact, but allow flushing.
- Pretreat extracted ground water for discharge into sewer system.
- Excavate, clean, and maintain all utility lines; plug or divert if necessary.
- Excavate contaminated sediment from creek.
- Monitor site closely and expand treatment if necessary.

Issues:
- Further actions at site will be determined after analyzing effectiveness of current remedies.
- Involvement of approximately 190 PRPs.
- Possible in-situ soil solidification pilot site.

Contacts:
- Region X: Judy Schwartz
  FTS 399-2684
- Headquarters: Steve Hooper
  FTS 475-6689

HARVEY AND KNOTT DRUM SITE, REGION III, DELAWARE
(Approved 9/30/85)

Description:
- Wastes accepted at this onsite disposal facility were from sanitary, municipal, and industrial sources and consisted of sludges, paint pigments, and solids. Wastes were burned, allowed to seep into the soil, or buried. Contaminants, including PCBs and VOCs, have been found in soils and sediments. VOC contamination was also found in ground water.

Decision:
- Treat water from onsite pond; remove and dispose of sediments, sludges, wastes, and drums.
- Install ground water collection and treatment system and use treated ground water to flush onsite soils. Operate system for 5 years and assess level of effectiveness.

Issues:
- Site closure decision will be deferred until effectiveness of soil flushing can be assessed.
- Extraction/treatment/flushing system is an alternative to excavation and disposal.
- Extensive wetland area surrounding site.

Contacts:
- Region III: Joe Dugandzic
  FTS 597-9023
- Headquarters: Lisa Woodson
  FTS 475-8246

HOCOMONCO POND, REGION I, MASSACHUSETTS
(Approved 9/30/85)

Description:
- Wood products were treated with creosote onsite. Wastes were stored in a lagoon and two depressions. Creosote compounds have contaminated local soils, ground water, and sediments in the local pond.

Decision:
- Excavate and dewater sediments from the pond and soils from the depressions. Place in an onsite facility built to RCRA standards.
- Relocate the open-jointed storm drain that runs through the former lagoon area.
- Cap both the onsite facility and the former lagoon area with one contiguous RCRA cap.

Contacts:
- Region I: Bruce Marshall
  FTS 223-0906
- Headquarters: Steve Hooper
  FTS 475-6689

NEW LYME, REGION V, OHIO
(Approved 9/27/85)

Description:
- This 40-acre landfill accepted industrial wastes not allowed by State of Ohio license. Cyanide wastes may be buried at the site. Soil, ground water, and sediment are contaminated. Contaminated leachate is apparent at seeps throughout the site. The site is surrounded on three sides by wetlands.

Decision:
- Install RCRA cap over landfill.
- Dewater landfill and extract and contain ground water indefinitely; treat ground water and contaminated leachate using biological precipitation and activated carbon techniques; consolidate contaminated sediment onsite under cap.
- Construct gas controls monitor ground water

Contacts:
- Region V: Mary Tyson
  FTS 886-3006
- Headquarters: Carol Lindsay
  FTS 475-6704

SWOPE OIL COMPANY, REGION II, NEW JERSEY
(Approved 9/27/85)

Description:
- This chemical reclamation and production facility was in operation from 1965 to 1979. PCBs and other chemicals were found in soils. A surface aquifer is contaminated in part from the site. A municipal well located 100 feet away in the lower aquifer has been closed.

Decision:
- Remove and dispose tanks and buildings offsite; treat or dispose of tank contents.
- Dispose of PCB-contaminated soils and buried sludge offsite; cap site.
- Study nature and extent of ground water contamination and feasibility of remedial alternatives.

Contacts:
- Region II: Don Lynch
  FTS 264-8216
- Headquarters: John Kingscott
  FTS 382-7996

CEMETERY DUMP, REGION V, MICHIGAN
(Approved 9/11/85)

Description:
- This abandoned gravel pit was used for burial of approximately 250 drums of hazardous wastes, including PCBs. Four residences were subsequently constructed onsite. Aquifer underlies the site, and supplies water for area-wide domestic wells.

Decision:
- Excavate and dispose of drums offsite. Soils to be addressed in ROD amendment.

Contacts:
- Region V: Tom Thomas
  FTS 886-1434
- Headquarters: Kitty Taimi
  FTS 382-2449
  Ed Barth
  FTS-382-7998

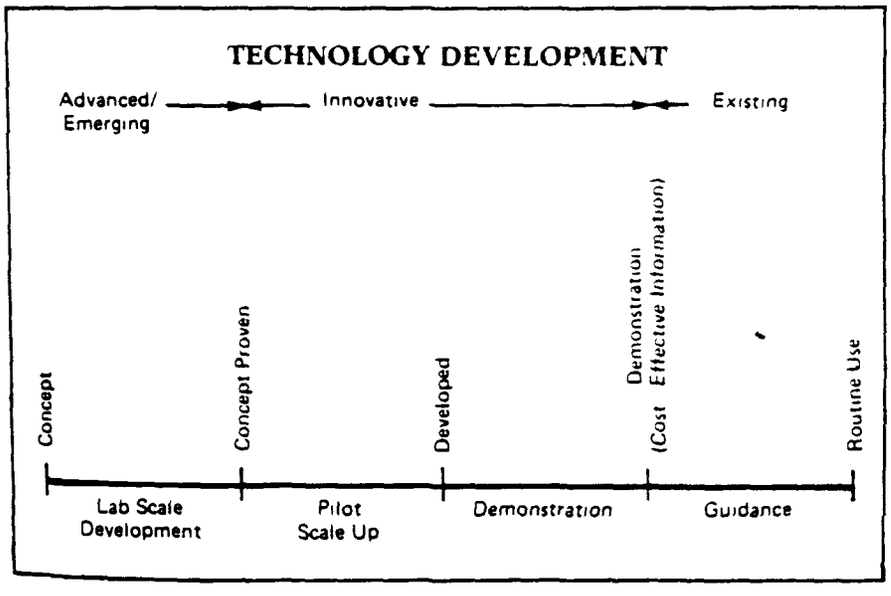
ALTERNATIVE TECHNOLOGIES

One of the major goals of the *Superfund program* in FY '86 is to increase the use of new technologies to treat and dispose of waste. This issue of the ROD Update is intended to provide a brief overview of what some of these new technologies are, where they have already been used at Superfund sites, and some current Agency work in this area.

First, some rough working definitions of the basic categories of alternative technologies are in order.

- ALTERNATIVE TECHNOLOGY is currently used by many to mean any treatment technology that reduces the mobility and toxicity of waste and thereby reduces its threat to the environment. Containment or land disposal without treatment is not considered to be alternative technology.
- INNOVATIVE TECHNOLOGY denotes existing technologies that have not yet been proven effective for their desired application or technologies that just need final field demonstration to be considered proven and available
- ADVANCED/EMERGING TECHNOLOGIES refer to technologies still in the lab research stage
- EXISTING TECHNOLOGIES are those which have proven to be effective for the desired application and are commercially available.

The various stages of technology development are discussed below.



Alternative technologies currently being tested and considered by EPA include the following:

INNOVATIVE TECHNOLOGIES UNDER DEVELOPMENT BY ORD

	CONTACT	FTS #
I. CONTAINMENT		
A. ISOLATION TECHNIQUES		
1. Barriers by Grouting (P)	Herbert Pahren	569-7874
2. In-situ Vitrification (ISV) Generated Underground Barriers for Confinement of Hazardous Wastes (P)	Don Sanning	569-7875
3. Use of Underground Mines as Repositories for Hazardous Waste (D)	Janet Houthoofd	569-7863
4. Bottom Isolation Barrier System (P)	Walter Grube	569-7798
B. STABILIZATION/FIXATION/ENCAPSULATION TECHNIQUES		
1. Applicability of Solidification/Stabilization Processes to NPL Sites (D)	Carlton Wiles	569-7795
C. AIR EMISSIONS/TREATMENT TECHNIQUES		
1. Air Stripping of Volatile Organics from Soil (L)	Paul dePercin	569-7797
2. Air Stripping of VOCs from Liquids at Superfund Sites (D)	Paul dePercin	569-7797
3. Control of Air Emissions from Superfund Surface Impoundments (D)	Paul dePercin	569-7797
II. SEPARATION/CONCENTRATION TECHNIQUES		
1. Treatment of Waste-Contaminated Ground by Electrokinetics (P)	Jonathan Herrmann	569-7839
2. Investigation of Treatment Methods Used in the Mining and Metallurgical Industry for Application at Waste Site Cleanups (L)	Don Sanning	569-7875
3. Artificial Freezing as a Remedial Action Technique (P)	Janet Houthoofd	569-7863
4. Mobile/Transportable Systems for Extraction of Pollutants from Excavated Soils (P/D)	Richard Traver	321-6677
5. In-situ Extraction of Contaminated Soils (P)	Richard Traver	321-6677
6. Management of Contaminated Sediments (L)	Anthony Tafuri	321-6604
7. Leachability of Toxic Organics from Contaminated Soils and Residues from Chemical and Biological Treatment of Contaminated Soils (L)	Mike Roulier	569-7796
8. Reverse Osmosis Concentration of Hazardous Waste Leachate (P)	John Martin	569-7758
9. Steam Stripping of Contaminants (L)	John Martin	569-7758
10. Metal Binding Compounds (L)	John Martin	569-7758
11. Supercritical Extraction Using Solvent and Solute Mixtures (L)	Mark Stutsman	569-7776
12. Sorption of Aqueous Hazardous Wastes with Treated Clays (L)	Mark Stutsman	569-7776
13. Pristine Lignin for Hazardous Waste Treatment (L)	David Ferguson	569-7518
III. DETOXIFICATION		
A. CHEMICAL TREATMENT TECHNIQUES		
1. Dioxin Radical Formation and Polymerization on Cu (II) Smectite (L)	Mark Stutsman	569-7776
2. Catalytic Decomposition of Halogenated Pollutants (P)	Charles Rogers	569-7757
3. Photodecomposition of Toxic Inorganics and Organics in Leachates Via Semiconductor Oxides (L)	Charles Rogers	569-7757
4. Slurry Process for Destruction of PCDDs and PCBs in Contaminated Soils, Sediments, and Sludges (P)	Charles Rogers	569-7757
B. BIOLOGICAL TREATMENT TECHNOLOGY		
1. Use of Colloidal Gas Aphrons (GCAs) for Solving Contaminated Ground water and Soil Problems	Stephen James	569-7877
2. Use of Support Aerated-Biofilm Reactors for the Biodegradation of Toxic Organic Compounds (L)	Ronald Lewis	569-7856
3. Anaerobic In-situ Degradation of Organic Compounds (L)	Stephen James	569-7877
4. Biochemical Processing of Leachates and Excavated Soils (P)	John Brugger	321-6634

5.	Detoxification Technology Using AWT Biological Methods (P/D)	Edward Opatken	569-7855
6.	Mycorrhizae and Host Plant Species as Hazardous Waste Detoxification Agents (L)	John Glaser	569-7568
7.	Bacteria Capable of Detoxifying Organomercurials (L)	John Glaser	569-7568
8.	Evaluation of Commercial Biochemical Preparations for Hazardous Waste Detoxification (L)	John Glaser	569-7568
9.	Selected Natural Microorganisms for the Detoxification of PCB-contaminated Soils (P)	John Glaser	569-7568
10.	White Rot Fungus as a Detoxification Agent of Halogenated Organic Hazardous Waste in Contaminated Soils (P)	John Glaser	569-7568
11.	Application Methodology for the In-situ Use of Soil Detoxification Microorganisms (L)	John Glaser	569-7568
C.	MIXED SYSTEMS		
1.	Combined Biological, Chemical, and Physical In-situ Treatment Processes (P)	Stephen James	569-7877
D.	THERMAL DETOXIFICATION		
1.	Mobile/Transportable Incinerator Systems (D)	James Yezzi	321-6703
2.	Mobile/Transportable Carbon Reactivator Systems (D)	Richard Traver	321-6677
3.	Molten Glass Technology (D)	Harry Freeman	569-7529
4.	Huber Advanced Electric Reactor (D)	Harry Freeman	569-7529
5.	Circulating Bed Combustion (D)	Harry Freeman	569-7529
6.	Plasma Arc Systems (D)	Harry Freeman	569-7529
7.	Shirco Infrared System (D)	Harry Freeman	569-7529

KEY: (P) — Pilot
(L) — Laboratory
(D) — Demonstration

Alternative Technologies Selected for Superfund Remedial Actions to Date

Listed below are the Superfund sites for which alternative technologies have been chosen as part of the remedial action.

HYDRAULIC REMOVAL AND TREATMENT

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
I	Nashua/NH	Soil	Construction	Chet Janowski 223-1943	Steve Hooper 475-6689
II	Goose Farm/NJ	Soil	Design	Don Lynch 264-8216	Bob Quinn 382 2350
II	Lipari Landfill/NJ	Soil	Design	Sal Badalamenti 264-1873	John Kingscott 382 7996
II	PAS Oswego/NY	Soil	Design	Steve MacGregor 264 9588	Bob Quinn 382-2350
III	Harvey-Knott/DE	Soil	Design	Joe Dugandzic 597 9023	Lisa Woodson 475-8246
X	Ponders Corner/WA	Soil	Design	Carol Thompson 399-2709	Steve Hooper 475-6689
X	Tacoma Well 12A/WA	Soil	Design	Phil Wong 399-7216	Steve Hooper 475-6689
X	Western Processing/WA	Soil	Design	Judy Schwartz 399-2684	Steve Hooper 475-6689

LAND TREATMENT

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
VI	Old Inger/LA	Sludges & Soils	Design	Bonnie DeVoss 729-9739	Debby Swichkow 382-2453

PHYSICAL/CHEMICAL/BIOLOGICAL TREATMENT

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
I	Keefe Environmental Services/ NH	Drums/Tanks	Completed	Chet Janowski 223-1943	Steve Hooper 475-6689
II	Bridgeport/NJ	Liquids	Completed/Design	Ron Barsolino 264-1913	John Kingscott 382-7996
II	PAS Oswego/NY	Drums/Tanks	Completed	Steve MacGregor 264-9588	Bob Quinn 382-2350
IV	Bluff Road/NC	Drums/Tanks	Completed	Nancy Redgate 257-2643	Debby Swichcow 382-2453
VI	MOTCO/TX	Liquids	Design	Don Porter 729-9712	Randy Kaltreider 382-2448

INCINERATION

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
I	Keefe Environmental (offsite)/ NH	Drums/Tanks	Completed	Chet Janowski 223-1943	Steve Hooper 475-6689
II	Bog Creek Farm (onsite)/NJ	Sludges/Soil	Design	Eric Swartz 264-1253	John Kingscott 382-7996
II	Bridgeport (offsite)/NJ	Drums/Tanks	Design	Ron Barsolino 264-1913	John Kingscott 382-7996
II	Bridgeport (onsite)/NJ	Sludges/Oil	Design	Ron Barsolino 264-1913	John Kingscott 382-7996
II	PAS Oswego (offsite)/NY	Drums/Tanks	Completed	Steve MacGregor 264-9588	Bob Quinn 382-2350
II	Pijack Farm (offsite)/NJ	Drums/Tanks	Design	Don Lynch 264-8216	Ed Barth 382-7998
II	Spence Farm (offsite)/NJ	Drums/Tanks	Design	Don Lynch 264-8216	Bob Quinn 382-2350
IV	Bluff Road/NC (offsite)	Drums/Tanks	Completed	Nancy Redgate 257-2643	Debby Swichcow 382-2453
IV	Acme Sullivan Reclaiming (onsite)/IL	Soil	Design	Paul Bitter 886-4742	Kitty Taimi 382-2449
V	Berlin & Farro (offsite)/MI	Drums/Tanks	Completed	Greg Kulma 886-3010	Kitty Taimi 382-2449
V	Byron Johnson Salvage Yard (offsite)/IL	Drums/Tanks	Design	Doug Yeskis 886-9296	Kitty Taimi 382 2449
V	Cemetery (offsite)/MI	Drums/Tanks	Design	Tom Thomas 886-1434	Kitty Taimi 382 2449
V	Cross Brothers (offsite)/IL	Drums/Tanks	Design	Dan Capice 886-0392	Kitty Taimi 382-2449
V	Laskin/Poplar Oil (offsite)/OH	Drums/Tanks	Completed	Jay Plucinski 353-6316	Carol Lindsay 475-6704
VI	Bio-Ecology Systems (offsite)/TX	Drums/Tanks	Completed	Bonnie DeVoss 729-9739	Debbie Swichcow 382 2453
VI	MOTCO (regional)/TX	Liquids	Design	Don Porter 729-9712	Randy Kaltreider 382 2448
VI	Triangle Chemical (offsite)/TX	Drums/Tanks	Design	Don Williams 729-9713	Ed Barth 382-7998
VIII	Woodbury Chemical (offsite)/CO	Soil/Rubble	Design	Walt Sandza 564-1531	Randy Kaltreider 382-2448
X	Western Processing (offsite)/WA	Drums/Tanks	Design	Judy Schwartz 399-2684	Steve Hooper 475-6689

SOIL WASHING

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
X	Tacoma Well 12A (source)/WA	Soil	Decision	Phil Wong 399-7216	Steve Hooper 475-6689

ENHANCED VOLATILIZATION

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
I	McKin (onsite)/ME	Soil	Design	Dave Webster 223-4909	Blake Velde 382-7995
V	Verona Well field (onsite)/MI	Soil	Design	Jack Kratzmeyer 353-6449	Carol Lindsay 475-6704
VI	Triangle Chemical (onsite)/TX	Soil	Design	Don Williams 729-9713	Ed Barth 382-7998

STABILIZATION AND SOLIDIFICATION (PRE-LANDFILL)

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
III	Bruin Lagoon/PA	Sludges	Construction	Ed Shoner 597-2193	Linda Boornazian 382-7997
III	McAdoo Assoc./PA	Soil	Design	Dom Digulio 597-3435	Linda Boornazian 382-7997
III	Tysons Dump/PA	Soil	Design	Joe Dugandzic 597-9023	Lisa Woodson 475-8246
IV	Davie Landfill/FL	Sludges	Design	Jim Orban 257-2643	Ed Barth 382-7998
VI	Bio-Ecology Systems/TX	Soil/Sludges	Design	Bonnie DeVoss 729-9739	Debby Swichkow 382-2453

CHEMICAL EXTRACTION FROM SOILS

Region	Site Name/State	Media	Status	Reg. Contact/FTS #	HQ Contact/FTS #
II	Bog Creek Farm (onsite)/NJ	Soils	Design	Eric Swartz 264-1253	John Kingscott 382-7996
II	Wide Beach (onsite)/NY	Soils	Design	Joel Singerman 264-9589	Bob Quinn 382-2350

Alternative Technologies at Removal Sites

The Removal program is using alternative technologies at a number of sites. Among these are:

Site	Location	Technique
Schaffer	Minden, WVA	Solvent extraction of PCBs
Peek Oil	Tampa, FL	Incineration of PCBs in soil
Lees Farm	Woodville, WI	Extraction of lead from soil and contaminated batteries by complexing with EDTA and recovering lead through electrolysis (This process is expected to produce lead pure enough for commercial sale.)

For more information, contact Steve Dorrler (FTS 340-6740)

A Line on RODS

DATA QUALITY OBJECTIVES WORKGROUP

A workgroup was formed in April raft guidance on developing pling and analytical plans for RI/FSs. The guidance will lay out an approach for: (1) defining data objectives (decision-making for which data is required) at the very beginning of the RI/FS; (2) determining criteria and data needed to make those decisions (how clean is clean, boundaries of waste, etc.); and (3) selecting the appropriate analytical options and sampling approaches that will produce the needed data. The DQO Workgroup has completed a draft of the stages related to analytical option selection. This draft is being circulated for review in Headquarters and the Regions. A supplemental draft will follow in the spring to provide more detail on sampling approach selection. The final guidance is scheduled for September 1986. For further information, call Linda Boornazian (FTS 382-7997).

NEW SECTION CHIEF

HSCD has another new section

chief in Steve Smagin. Steve comes to HSCD from Superfund's Office of Program Management. As chief of the Planning and Programs Section of the Remedial Analysis Branch, Steve's key responsibilities will include management of remedial planning, forecasting, and tracking activities, including the SCAP and the natural resource claims and response claims programs.

ROD ISSUE ABSTRACTS NO LONGER REQUIRED

The ROD abstracts prepared for the National Technical Information Service and summaries that appear in the ROD Update have proven so useful that, beginning this fiscal year, ROD issue abstracts will no longer be required for RODs signed either in Headquarters or the Regions. If there are special issues associated with a particular site that you would like highlighted, please feel free to submit short articles or notes for the ROD Update. Call Betsy Shaw at FTS 382-3304.

SUPERFUND
Records Of Decision
Update

From: Hazardous Site Control Division
To: EPA Regional Offices

December 19, 1985
Vol. 1, No. 9

ROD SUMMARIES

NYANZA CHEMICAL SITE, REGION I, MASSACHUSETTS
(Approved 9/4/85)

Description:
- The site is the location of a former textile dye manufacturing business. Wastewater and chemical sludges were disposed of onsite. Ground water and stream sediments are contaminated primarily with organic chemicals and some heavy metals.

Decision:
- Excavate sludge deposits and sediments; consolidate in onsite landfill.
- Cap historic onsite landfill
- Divert upstream surface and ground water

Contacts:
- Region: Rich Cavagnero
  FTS 223-1928
- Headquarters: Steve Hooper
  FTS 475-6689

PICILLO FARM, REGION I, RHODE ISLAND
(Approved 9/30/85)

Description:
- Illegal dumping of hazardous wastes occured onsite in 1977. An explosion and fire at the site brought it to the attention of regulatory agencies. Interim remedial actions taken include excavation and removal of all buried drums and land farming of phenol-rich soils. Phenol and PCBs have been found in soils and ground water.

Decision:
- Dispose of contaminated soil onsite in a RCRA landfill.
- Close landfill to RCRA standards.
- Monitor ground and surface water.

Issues:
- State has petitioned the court for reconsideration of the decision. State wants to dispose of PCB wastes at an offsite TSCA approved facility

Contacts:
- Region: Don Conklin
  FTS 223-1928
- Headquarters: Steve Hooper
  FTS 475-6689

GEMS LANDFILL, REGION II, NEW JERSEY
(Approved 9/27/85)

Description:
- The township landfill has been operated by private contractors. Hazardous wastes of all varieties were disposed of onsite: some in open trenches and others in a pit created by onsite sand and gravel excavation. Ground water, soils, and surface water are contaminated. Interim measures included construction of a berm to prevent surface water from entering adjacent development, construction of a fence to prevent access to surface waters, and the replacement of culverts.

Decision:
- Cap landfill; construct and gas collection and treatment system.
- Construct ground water pumping and treatment system. Discharge treated water to local sewer system, or more treatment, into surface water
- Construct surface water controls.
- Initial phase of remedial actions will involve ground water pumping and treatment between landfill site and residential development
- Monitor site.
- Account for possible future landfill settling in cap design and construction.

Contacts:
- Region: Ed Putnam
  FTS 264-1873
- Headquarters: John Kingston
  FTS 382-7996

HELEN KRAMER LANDFILL, REGION II, NEW JERSEY
(Approved 9/27/85)

Description:
- The site was used for sand and gravel extraction. Pits from extraction were used to land

hazardous wastes. Wastes were also stored in lagoons. Leachate from the landfill has entered surface water. Ground water has been contaminated. The air and soil contain contaminants.

Decision:
- Collect ground water and leachate through trenching.
- Cap site.
- construct upgradient slurry wall.
- Dewater lagoons and excavate and fill; fence site.
- Implement surface water controls; collect and treat.
- Monitor effect of actions.

Issues:
- Upgradient slurry wall creates changes in hydraulic pressures, minimizing further contamination of ground water.
- Design and construction of cap to account for future settling.

Contacts:
- Region: Ed Putnam
  FTS 264-1873
- Headquarters: John Kingscott
  FTS 382-7996

LIPARI LANDFILL, REGION II, NEW JERSEY
(Approved 9/30/85)

Description:
- A sand and gravel pit was backfilled with a variety of hazardous wastes, many of them uncontained liquids. Ground water and surface water have been contaminated. Interim measures have included removal of wastes, construction of fencing and a slurry wall, and capping.

Decision:
- Construct leachate extraction system and injection wells to dewater and flush site in a batch mode; flushing system will remove waterborne contaminants and substantially reduce risks of future release to ground water.
- Discharge treated leachate to local sewer treatment system or, with further treatment, to surface water.
- Install monitoring wells in downgradient aquifer.

Issues:
- Effectiveness of control of contaminants within contained area will be evaluated.
- Future study of offsite contamination in ground and surface waters.

Contacts:
- Region: Ron Borsalino
  FTS 264-1913
- Headquarters: John Kingscott
  FTS 382-7996

SAND, GRAVEL AND STONE, REGION III, MARYLAND
(Approved 9/30/85)

Description:
- A sand and gravel quarry was used as a landfill site for hazardous wastes. Excavated pits often served as impoundments for liquid wastes. Surface water, ground water, and soils have been contaminated.

Decision:
- Address shallow aquifer contamination and surface water seeps.
- Defer decisions on soil contamination and deep aquifer contamination until completion of Phase II RI/FS.
- Excavate buried drums and buried material; dispose of offsite.
- Install ground water collection and treatment system onsite; discharge treated water into surface waters and/or back into shallow aquifer.
- Level of treatment in shallow aquifer will be determined upon completion of Phase II RI/FS.

Contacts:
- Region: Roy Shrock
  FTS 597-0913
- Headquarters: Lisa Woodson
  FTS 475-8246

DAVIE LANDFILL (BROWARD COUNTY), REGION IV, FLORIDA
(Approved 9/30/85)

Description:
- County operated disposal site accepted residential wastes and industrial septic pump-out material, grease trap residues, and treated municipal sludges. Results of sampling indicate local industries were probably discharging electroplating wastes into septic systems.

Decision:
- Dewater and stabilize contents of sludges, lagoon.
- Place wastes in lined cell of onsite landfill; cap cell.

Issues:
- Stabilization should be evaluated before land disposal.
- Source control remedial measure only; need for ground water measures to be determined.

Contacts:
- Region: Jim Orban
  FTS 257-2643
- Headquarters: Ed Barth
  FTS 382-7998

  Debbie Swichkow
  FTS 382-2453

SUPERFUND RECORDS OF DECISION: KEY WORD INDEX

Listed below are major key word categories and their subcategories for Superfund Records of Decision (RODs). Opposite each of these categories are the sites whose ROD contains the listed key word. This list includes all RODs approved to date except those for the American Creosote, FL (IV) and Cannon Engineering/Plymouth, MA (I) sites. Regional counsels and Superfund branch chiefs have copies of all RODs. Copies are available for purchase by the public from the National Technical Information Service and the Environmental Law Institute.

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State (Region)
Primary Hazardous Substances Detected	
Acids	Charles George, MA (I)*, Nyanza Chemical, MA (I); Western Sand & Gravel, RI (I), Chemical Control, NJ (II); PAS Oswego, NY (II); Bruin Lagoon, PA (III), Douglassville, PA (III); Lackawanna Refuse Site, PA (III), A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Highlands Acid Pit, TX (VI), Tar Creek, OK (VI); Celtor Chemical Works, CA (IX), Stringfellow Acid Pits, CA (IX)*, Western Processing, WA (X)
Arsenic	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Chemical Control, NJ (II); D'Imperio Property, NJ (II)*, Helen Kramer, NJ (II), Lipari Landfill, NJ (II)*, Love Canal, NY (II), Sinclair Refinery, NY (II), Spence Farm, NJ (II); Douglassville, PA (III), McAdoo-IRM, PA (III), Moyer Landfill, PA (III), Davie Landfill FL (IV), Whitehouse Waste Oil Pits, FL (IV); Byron/Johnson Salvage Yard, IL (V), Chem-Dyne-EDD, OH (V), Morris Arsenic, MN (V), Milltown, MT (VIII); Milltown-S, MT (VIII), Celtor Chemical, CA (IX)*, McColl, CA (IX); Western Processing, WA (X)
Asbestos	New Lyme, OH (V), Mountain View/Globe, AZ (IX)
Carcinogenic Compounds	Charles George, MA (I), Hocomonco Pond, MA (I), Taylor Borough PA (III), Reilly Tar, MN (V)
Chromium	Hocomonco Pond, MA (I) Nyanza Chemical, MA (I), D'Imperio Property NJ (II), Lipari Landfill, NJ (II)*, Sinclair Refinery, NY (II), Spence Farm NJ (II), Douglassville, PA (III), Matthews Electroplating, VA (III), McAdoo-IRM PA (III) Davie Landfill FL (IV), Whitehouse Waste Oil Pits FL (IV), Northernaire, MI (V), Schmalz Dump, WI (V), Wauconda Sand & Gravel IL (V) Del Norte, CA (IX) Western Processing, WA (X)*
Dioxin	Love Canal, NY (II), Times Beach, MO (VII)
Heavy Metals	Charles George MA (I)* Hocomonco Pond MA (I), Nyanza Chemical MA (I) Keefe Environmental, NH (I), Re-Solve MA (I) Sylvester, NH (I), Bog Creek Farm NJ (II) Burnt Fly Bog, NJ (II) D'Imperio Property NJ (II), GEMS Landfill, NJ (II) Lipari Landfill NJ (II)*, Lone Pine Landfill NJ (II) PAS Oswego NY (II); Pijak Farm NJ (II) Sinclair Refinery, NJ (II), Enterprise Avenue PA (III) Harvey-Knott, DE (III); McAdoo-IRM PA (III), Moyer Landfill, PA (III), Sand, Gravel & Stone MD (III); Wade PA (III), Miami Drum Services FL (IV); A&F Materials-IRM, IL (V), A&F Materials-EDD, IL (V), Byron/Johnson Salvage Yard, IL (V), Schmalz Dump WI (V) Wauconda Sand & Gravel, IL (V) Bio-Ecology Systems, TX (VI), Highlands Acid Pit TX (VI), Old Inger, LA (VI) MOTCO TX (VI) Tar Creek, OK (VI), Milltown MT (VIII) Milltown-S, MT (VIII), Woodbury Chemical CO (VIII); Celtor Chemical Works CA (IX), Celtor Chemical, CA (IX)* Jibboom Junkyard, CA (IX), Stringfellow Acid Pits IRM, CA (IX), Stringfellow Acid Pits CA (IX)* Western Processing, WA (X) Western Processing, WA (X)*
Inorganics	Hocomonco Pond, MA (I), Nyanza Chemical MA (I), Sylvester, NH (I), Bog Creek Farm NJ (II); Chemical Control, NJ (II), D'Imperio Property, NJ (II), Friedman Property NJ (II) GEMS Landfill, NJ (II), Helen Kramer NJ Krysowaty Farm NJ (II), Love Canal NY Sinclair Refinery, NY (II), Douglassville PA (III); Drake Chemical, PA (III), Harvey Knott DE (III); McAdoo-IRM PA (III), Wade PA A&F Materials-IRM, IL (V), Acme Solvents (V), Cemetery Dump, MI (V); Chem-Dyne-EDD OH (V); Reilly Tar, MN (V), Wauconda Sand & Gravel, IL (V), MOTCO, TX (VI), Tar Creek (VI); Ellisville, MO (VII)
Mining Wastes	Tar Creek, OK (VI); Milltown MT (VIII) Celtor Chemical Works, CA (IX)
Oils	McKin, ME (I)*, Bridgeport, NJ (II) Burnt Fly Bog, NJ (II); Pijak Farm, NJ (II) Price Landfill NJ (II); Bruin Lagoon PA (III), Enterprise Avenue, PA (III), Miami Drum Services FL (IV), A&F Materials-IRM, IL (V), Laskin Poplar Oil, OH (V); New Lyme, OH (V) Old Mill OH (V); Outboard Marine Corp IL (V) Reilly Tar, MN (V), Old Inger, LA (VI), Ellisville MO Western Processing, WA (X)
Organics/VOCs	Beacon Heights, CT (I), Charles George MA (I), Hocomonco Pond, MA (I), Keefe Environmental, NH (I), McKin-IRM ME Nyanza Chemical, MA (I), Picillo Farm RI Sylvester, NH (I), Re-Solve MA (I) Western Sand & Gravel, RI (I); Bog Creek Farm NJ (II); Bridgeport NJ (II), Burnt Fly Bog NJ Chemical Control, NJ (II), D'Imperio Property NJ (II), Friedman Property, NJ (II) GEMS Landfill, NJ (II), Goose Farm NJ (II) Helen Kramer NJ (II) Lipari Landfill NJ (II) Landfill NJ (II)* Lone Pine Landfill NJ Love Canal, NY (II) Olean Well Field NY PAS Oswego, NY (II), Pijak Farm NJ Sinclair Refinery NY (II), Swope Oil NJ Douglassville PA (III), Drake Chemical (III) Harvey Knott DE (III), McAdoo-IRM (III) Moyer Landfill, PA (III), Sand, Gravel & Stone MD (III), Taylor Borough PA Tyson's Dump, PA (III), Wade PA (III), Cayne Aquifer Sites, FL (IV), A&F Materials IRM IL (V) A&F Materials Company EDD (V) Acme Solvents IL (V) Berlin & Farro (V) Byron/Johnson Salvage Yard IL Cemetery Dump MI (V) Charlevoix Municipal Charlevoix MI (V)* Chem-Dyne-EDD OH Eau Claire-IRM WI (V) Kummer Landfill (V), Main St Wellfield, IN (V) New Brighton Interim Water Treatment, MN (V) New Brighton-Water Supply System MN (V) New Lyme, OH (V), Old Mill OH (V) Verona Well Field-IRM, MI (V), Verona Well Field MI (V) Wauconda Sand & Gravel, IL (V) Highlands Acid Pit, TX (VI), MOTCO, TX (VI) Old Inger LA (VI); South Valley-IRM, NM (VI) Triangle Chemical, TX (VI); Aidex-IRM IA (VII) Aidex IA (VII)*, Ellisville, MO (VII), Woodbury Chemical, CO (VIII); Del Norte, CA (IX) McColl, CA (IX), Stringfellow Acid Pits IRM CA (IX); Stringfellow Acid Pits, CA (IX)* Ponders Corner-IRM, WA (X), South Tacoma WA (X) South Tacoma Channel-Well 12A WA (X)* Western Processing, WA (X), Western Processing, WA (X)*

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
PAHs	Douglassville, PA (III); Taylor Borough, PA (III); Whitehouse Waste Oil Pits, FL (IV); Laskin/Poplar Oil, OH (V); Reilly Tar, MN (V); Western Processing, WA (X)*
PCBs	Picillo Farm, RI (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Goose Farm, NJ (II); Hudson River, NY (II); Krysowaty Farm, NJ (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Swope Oil (II); Wide Beach (II); Douglassville, PA (III); Harvey-Knott, DE (III); Lehigh Electric, PA (III); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Laskin/Poplar Oil OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Waucon-da Sand & Gravel, IL (V), Bio-Ecology Systems, TX (VI); MOTCO, TX (VI), Jibboom Junkyard, CA (IX); Taputimu Farm, AS (IX); Western Processing, WA (X)*
PCE	Keefe Environmental, NH (I), Picillo Farms, RI (I); Fischer & Porter, PA (III), Charlevoix, MI (V); Charlevoix, MI (V)*, Main St Wellfield, IN (V); Verona Well Field-IRM, MI (V), Verona Well Field, MI (V)*, San Gabriel/Area I, CA (IX); Ponders Corner WA (X)* South Tacoma Channel-Well 12A, WA (X)*
Pesticides	Chemical Control, NJ (II), Krysowaty Farm, NJ (II); Lone Pine Landfill NJ (II) Love Canal NY (II); Pijak Farm, NJ (II), Douglassville, PA (III); Drake Chemical, PA (III), Miami Drum Services, FL (IV), Chem-Dyne-EDD OH (V), Old Inger, LA (VI); Aidex-IRM IA (VII), Ellisville, MO (VII), Woodbury Chemical, CO (VIII); Del Norte, CA (IX), Stringfellow Acid Pits-IRM, CA (IX), Stringfellow Acid Pits, CA (IX)*, Taputimu Farm, AS (IX), Western Processing, WA (X)
Phenols	Hocomonco Pond MA (I), Picillo Farm RI (I), Goose Farm, NJ (II); Helen Kramer NJ (II), Lipari Landfill NJ (II) Lipari Landfill NJ (II)* Love Canal, NY (II), Pijak Farm NJ (II) Sinclair Refinery NY (II) Douglassville PA (III) Sand, Gravel & Stone, MD (III) Whitehouse Waste Oil Pits, FL (IV), Laskin/Poplar Oil, OH (V); Ellisville, MO (VII), Western Processing, WA (X)*
Radioactive Materials	Lansdowne Radiation PA (III) Moyer Land-fill PA (III)
Sludge	Bridgeport NJ (II), Price Landfill NJ (II), Swope Oil, NJ (II), Bruin Lagoon PA (III) Enterprise Avenue, PA (III) Lackawanna Refuse Site, PA (III), McAdoo Associates, PA (III)*, Davie Landfill, FL (IV), Berlin & Farro MI (V); Laskin/Poplar Oil OH (V), New Lyme OH (V); Highlands Acid Pit TX (VI) MOTCO, TX (VI); Old Inger, LA (VI) Ellisville MO (VII) McColl, CA (IX)
Solvents	Keefe Environmental, NH (I) McKin ME (I)* Western Sand & Gravel RI (I) Burnt Fly Bog, NJ (II), Chemical Control NJ (II) Krysowaty Farm, NJ (II), Lipari Landfill NJ (II), Lone Pine Landfill, NJ (II), Spence Farm NJ (II), Enterprise Avenue, PA (III) Lackawanna Refuse Site, PA (III); McAdoo-IRM PA (III), McAdoo Associates, PA (III)* Miami Drum Services, FL (IV), A&F Materials-IRM IL (V), Berlin & Farro, MI (V), Charlevoix MI (V), Cross Bros., IL (V); New Brighton-Interim Water Treatment, MN (V), New Brighton Water Suply System, MN (V) New Lyme OH (V); Old Mill, OH (V), Verona Well Field, MI (V)*, Bio-Ecology Systems, TX (VI) Old Inger LA (VI); Ellisville, MO (VII) Taputimu Farm AS (IX); Ponders Corner-IRM, WA (X),

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
	Ponders Corner WA (X)* South Tacoma WA (X), Western Processing, WA (X)
Synfuels	Western Processing, WA (X)
TCE	Charles George, MA (I), Keefe Environmental NH (I); McKin-IRM ME (I) Western Sand & Gravel, RI (I), D'Imperio Property, NJ (II) Goose Farm, NJ (II), Olean Well Field NY (II) Fischer & Porter, PA (III), Heleva Landfill PA (III); Moyer Landfill PA (III); Taylor Borough PA (III), Acme Solvents, IL (V) Charlevoix MI (V), Charlevoix, MI (V)* LeHillier/Mankato MN (V), Main St Wellfield, IN (V), New Brighton-Interim Water Treatment MN (V) New Brighton-Water Supply System MN (V) Verona Well Field-IRM MI (VII) Verona Well Field MI (V)* Bio-Ecology Systems TX (VI), San Gabriel/Area I CA (IX), South Tacoma WA (X) South Tacoma Channel-Well 12A WA (X)* Western Processing, WA (X)
Toulene	Charles George, MA (I), Bog Creek Farm NJ (II), Bridgeport NJ (II) D'Imperio Property NJ (II), Goose Farm NJ (II)' Helen Kramer NJ (II), Lipari Landfill NJ (II), Lipari Landfill NJ (II)* Love Canal NY (II), Sinclair Refinery NY (II), McAdoo-IRM PA (III), McAdoo Associates, PA (III)* Moyer Landfill PA Taylor Borough, PA (III) New Lyme OH Verona Well Field, MI (V)* Triangle Chem TX (VI) Ellisville, MO (VII) Western Processing, WA (X)*
Contaminated Media	
Air	McKin-IRM, ME (I), Sylvester NH (I) GEMS Landfill, NJ (II) Helen Kramer NJ (II) Love Canal, NY (II), Heleva Landfill PA Borough, PA (III) Wade PA (III) Berlin & Farro, MI (V); Chem-Dyne-EDD OH (V) Old board Marine IL (V) Verona Well Field MI (V), Mountain View/Globe AZ (IX) Taputimu Farm AS (IX), South Tacoma WA (X)
Ground Water	Beacon Heights, CT (I), Charles George MA (I), Hocomonco Pond, MA (I) McKin ME (I), Nyanza Chemical MA (I), Picillo Farm RI (I) Re-Solve MA (I) Sylvester NH Western Sand & Gravel RI (I) Bog Creek Farm NJ (II) Bridgeport NJ (II) Burnt Fly Bog NJ (II) Chemical Control NJ (II) D'imperio Property NJ (II) Friedman Property (II) GEMS Landfill NJ (II) Goose Farm NJ (II) Helen Kramer NJ (II) Krysowaty Farm NJ (II) Lipari Landfill NJ (II) Lipari Landfill NJ (II)* Lone Pine Landfill NJ (II) Olean Well Field NY (II) PAS Oswego NY (II) Pijak Farm NJ (II) Price Landfill NJ (II) Sinclair Refinery NY (II) Spence Farm NJ (II) Swope Oil NJ (II) Bruin Lagoon PA (III) Douglassville PA (III) Drake Chemical (III) Fischer & Porter PA (III) Harvey-Knott DE (III), Heleva Landfill PA (III) Matthews Electroplating VA (III) McAdoo-IRM PA McAdoo Associates, PA (III)* Moyer Landfill PA (III) Sand, Gravel & Stone MD (III) Tyson's Dump PA (III) Wade PA (III) Big Cayne Aquifer Sites FL (IV) Davie Landfill FL (IV) Miami Drum Services FL (IV) Myers Spill Site FL (IV), Whitehouse Waste Oil Pits FL (IV), A&F Materials-IRM IL (V) Acme Solvents IL (V); Byron/Johnson Salvage Yard IL (V), Charlevoix MI (V), Charlevoix MI Chem-Dyne-EDD OH (V) Eau Claire-IRM WI (V); LeHillier/Mankato MN (V) Main St Wellfield, IN (V) New Brighton-Interim Water Treatment, MN (V), New Brighton-Water Supply System, MN (V), New Lyme OH (V) Northernaire, MI (V), Old Mill OH (V), Outboard

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
	Marine Corp., IL (V), Reilly Tar, MN (V), Verona Well Field-IRM MI (V), Verona Well Field, MI (V)*, Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI), Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI), MOTCO, TX (VI); Old Inger LA (VI), South Valley-IRM, NM (VI); Tar Creek, OK (VI), Aidex-IRM, IA (VII); Aidex, IA (VII)*, Milltown-S, MT (VIII), Celtor Chemical Works, CA (IX), Del Norte, CA (IX); McColl, CA (IX), San Gabriel/Area I, CA (IX), Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*, Ponders Corner-IRM, WA (X), Ponders Corner, WA (X)*, South Tacoma, WA (X), South Tacoma Channel-Well 12A, WA (X)* Western Processing, WA (X), Western Processing, WA (X)*
Sediments (Creek/ River Stream)	Hocomonco Pond, MA (I), Nyanza Chemical MA (I), Hudson River, NY (II), PAS Oswego, NY (II); Pijak Farm, NJ (II), Douglassville, PA (III); Sand, Gravel & Stone, MD (III), Tyson's Dump, PA (III), New Lyme OH (V), Northernaire, MI (V); Old Mill OH (V), Outboard Marine Corp., IL (V), Bayou Bonfouca, LA (VI); Western Processing, WA (X)*
Sludge	Hocomonco Pond, MA (I), Nyanza Chemical, MA (I), Bridgeport, NJ (II), Swope Oil, NJ (II), Berlin & Farro, MI (V), Bio-Ecology Systems TX (VI); Highlands Acid Pit TX (VI), Old Inger LA (VI)
Soil	Beacon Heights, CT (I) Hocomonco Pond, MA (I); Keefe Environmental NH (I) McKin-IRM, ME (I), Nyanza Chemical MA (I), Picillo Farm RI (I), Re-Solve, MA (I) Western Sand & Gravel, RI (I), Bog Creek Farm NJ (II), Bridgeport, NJ (II), Burnt Fly Bog, NJ (II), Chemical Control, NJ (II) D'Imperio Property, NJ (II), GEMS Landfill NJ (II) Goose Farm NJ (II), Helen Kramer NJ (II) Krysowaty Farm, NJ (II), Lipari Landfill NJ (II) Lipari Landfill, NJ (II)* Lone Pine Landfill, NJ (II) Love Canal NY (II), PAS Oswego NY (II) Pijak Farm, NJ (II) Price Landfill NJ (II), Sinclair Refinery, NY (II) Spence Farm, NJ (II), Swope Oil NJ (II), Wide Beach NY (II), Bruin Lagoon, PA (III), Douglassville, PA (III), Drake Chemical PA (III), Harvey-Knott DE (III), Enterprise Ave PA (III) Lackawanna Refuse Site, PA (III), Lansdowne Radiation, PA (III) Lehigh Electric PA (III) McAdoo-IRM PA (III), McAdoo Associates PA (III)* Mathews Electroplating, VA (III), Sand Gravel & Stone MD (III) Taylor Borough PA (III), Tyson's Dump PA (III), Wade PA (III) Miami Drum Services, FL (IV), Whitehouse Waste Oil Pits, FL (IV), A&F Materials-IRM IL (V) A&F Materials-EDD, IL (V) Acme Solvents IL (V); Berlin & Farro, MI (V) Byron/Johnson Salvage Yard, IL (V), Cemetery Dump MI (V) Chem-Dyne-EDD, OH (V) Cross Bros IL (V) Laskin/Poplar Oil, OH (V) LeHillier Mankato MN (V), Main St Wellfield MN (V), Morris Arsenic, MN (V), New Lyme OH (V) Northernaire, MI (V) Old Mill OH (V) Outboard Marine Corp., IL (V) Reilly Tar MN (V), Schmalz Dump WI (V) Verona Well Field, MI (V)*, Wauconda Sand & Gravel IL (V), Bayou Bonfouca, LA (VI), Bio-Ecology Systems, TX (VI); Highlands Acid Pit TX (VI) MOTCO TX (VI), Old Inger LA (VI) Triangle Chem TX (VI), Aidex-IRM, IA (VII) Aidex IA (VII)* Ellisville, MO (VII), Times Beach MO (VII), Milltown, MT (VIII), Milltown-S, MT (VIII) Woodbury Chemical CO (VIII) Celtor Chemical Works, CA (IX) Celtor Chemical CA (IX)* Del Norte CA (IX) Jibboom Junkyard, CA (IX), McColl CA (IX) Mountain View/Globe, AZ (IX), Stringfellow Acid Pits-IRM CA (IX), Stringfellow Acid Pits CA (IX)*

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
	Taputimu Farm, AS (IX), Ponders Corner IRM WA (X), Ponders Corner, WA (X)* South Tacoma, WA (X), South Tacoma Channel-Well 12A WA (X)* Western Processing, WA (X) Western Processing, WA (X)*
Surface Water	Beacon Heights, CT (I) Hocomonco Pond MA (I), McKin-IRM, ME (I), Nyanza Chemical MA (I); Re-Solve, MA (I), Sylvester NH (I) Burnt Fly Bog, NJ (II), GEMS Landfill NJ (II) Helen Kramer, NJ (II), Hudson River NY (II) Krysowaty Farm, NJ (II), Lipari Landfill NJ (II); Lone Pine Landfill, NJ (II), Love Canal NY (II); Pijak Farm, NJ (II), Sinclair Refinery NY (II), Bruin Lagoon, PA (III), Douglassville PA (III), Drake Chemical, PA (III) Enterprise Avenue, PA (III), Fischer & Porter PA (III) Harvey-Knott DE (III), Heleva Landfill PA Lackawanna Refuse Site, PA (III) McAdoo Associates, PA (III)*, Moyer Landfill PA Sand, Gravel & Stone, MD (III), Taylor Borough PA (III), Tyson's Dump PA Whitehouse Waste Oil Pits, FL (IV) A&F Materials-EDD, IL (V), Berlin & Farro MI (V) Byron/Johnson Salvage Yard, IL (V) Chem-Dyne-EDD, OH (V), Laskin/Poplar Oil OH (V), Old Mill, OH (V), Outboard Marine Corp (V), Reilly Tar, MN (V), Wauconda Sand & Gravel, IL (V), Bio-Ecology Systems TX (VI), MOTCO, TX (VI), Old Inger LA (VI) Tar Creek, OK (VI), Celtor Chemical Works CA (IX), Celtor Chemical CA (IX)* McColl CA (IX), Stringfellow Acid Pits-IRM CA (IX) Stringfellow Acid Pits, CA (IX)* Western Processing, WA (X)*
Wetlands	Hocomonco Pond, MA (I), Nyanza Chemical MA (I), Bog Creek Farm, NJ (II) Bridgeport NJ (II), Burnt Fly Bog, NJ (II) Helen Kramer NJ (II), PAS Oswego, NY (II), Wide Beach NY (II), Harvey-Knott, DE (III), Schmalz Dump (V), Old Inger, LA (VI), Tar Creek OK (VI)
Wood	Lansdowne Radiation PA (III) Old Inger LA (VI)
Public Health and Environmental Threats	
Direct Contact	Hudson River NY (II), Love Canal NY Pijak Farm NJ (II) Spence Farm NJ
Public Exposure	Burnt Fly Bog NJ (II) Love Canal NY Lansdowne Radiation PA (III) Verona Well Field IRM MI (V), McColl CA (IX)
Public Health Risk	Re-Solve MA (I) Reilly Tar MN (V)
Risk Assessment	Love Canal NY (II), Verona Well Field IRM MI (V)
Risk Level	Picillo Farm RI (I), Krysowaty Farm NJ Fischer & Porter PA (III) San Gabriel Area I CA (IX)
Volatilization	Hudson River NY (II)
Remedy Selection	
Consent Decree	Fischer & Porter PA (III), A&F Materials Company-EDD IL (V) Chem-Dyne-EDD OH (V)
Cost/Benefit	Krysowaty Farm NJ (II)
Cost Recovery	Wade, PA (III)
Deed Restriction	Friedman Property NJ (II), South Tacoma Channel-Well 12A WA (X)* Western Processing, WA (X)*
Fund Balancing	Outboard Marine Corp., IL (V)
Ground Water Strategy	Western Sand & Gravel, RI (I), Tar Creek OK (VI), Del Norte, CA (IX)
Negotiated Settlement	Western Sand & Gravel, RI (I), Wade PA (III)

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
No Action Alternative	Friedman Property, NJ (II); Varsol Spill, FL (IV); Morris Arsenic, MN (V)
O & M	Re-Solve, MA (I); Burnt Fly Bog, NJ (II); D'Imperio Property, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); PAS Oswego, NY (II), Pijak Farm, NJ (II); Price Landfill, NJ (II), Spence Farm, NJ (II); Bruin Lagoon, PA (III); Drake Chemical, PA (III); Heleva Landfill, PA (III); Matthews Electroplating, VA (III); Whitehouse Waste Oil Pits, FL (IV); Byron/Johnson Salvage Yard, IL (V); Charlevoix, MI (V), Chem-Dyne-EDD, OH (V); Eau Claire-IRM WI (V); Old Mill, OH (V); Reilly Tar, MN (V), Verona Well Field-IRM, MI (V), Bio-Ecology Systems, TX (VI), Old Inger, LA (VI), Tar Creek, OK (VI); Aidex, IA (VII)* Milltown MT (VIII); San Gabriel/Area I, CA (IX), Stringfellow Acid Pits, CA (IX)*, Ponders Corner-IRM WA (X); South Tacoma Channel-Well 12A, WA (X)* Western Processing, WA (X)*
PRP	Enterprise Avenue, PA (III), Moyer Landfill PA (III), Wade, PA (III)
PRP Alternative	Lone Pine Landfill NJ (II)
Supplemental ROD	Sylvester, NH (I), Milltown, MT (VIII)
Shared Costs	Matthews Electroplating, VA (III), Milltown MT (VIII)
Temporary Remedial Measure	Hudson River NY (II)
Other Agencies	
COE	Old Inger, LA (VI)
DOD	New Brighton-Interim Water Treatment MN (V), New Brighton-Water Supply System MN (V)
Water Supply	
Alternate Water Supply	Charles George, MA (I), Krysowaty Farm NJ (II), Bridgeport NJ (II), Olean Well Field NY (II), Price Landfill NJ (II), Fischer & Porter PA (III) Matthews Electroplating VA (III) Acme Solvents, IL (V) Charlevoix MI (V) Eau Claire-IRM WI (V) Kummer Landfill MN (V), New Brighton-Water Supply System MN (V), Old Mill OH (V) Reilly Tar MN (V) Verona Well Field-IRM MI (V) South Valley-IRM, NM (VI) Milltown MT (VIII)
Community Services Enhancement	Price Landfill NJ (II) Milltown MT (VIII)
Drinking Water Contaminants	Fischer & Porter PA (III), Eau Claire-IRM WI (V), Main St Wellfield IN (V) Verona Well Field-IRM MI (V) South Valley-IRM NM (VI)
Fire Protection	Western Sand & Gravel, RI (I), New Brighton Interim Water Treatment, MN (V) New Brighton-Water Supply System MN (V) Milltown, MT (VIII)
Internal Plumbing	Milltown-S, MT (VIII)
Water Rights	San Gabriel/Area 1, CA (IX)
Site Specific Characteristics	
Flood Plain	Helen Kramer NJ (II), Drake Chemical PA (III), A&F Materials-IRM IL (V), Bayou Bonfouca, LA (VI), Highlands Acid Pit TX (VI), MOTCO, TX (VI); Triangle Chemical TX (VI) Celtor Chemical, CA (IX)*
Ground Water Table	Re-Solve, MA (I), A&F Materials-IRM IL (V)
Hydrogeologic	Berlin & Farro, MI (V)
Seismic	McColl, CA (IX)
Sole-Source Aquifer	Price Landfill, NJ (II) Biscayne Aquifer Sites, FL (VI)
Subsidence	McAdoo Associates, PA (III)* Taylor Borough, PA (III); Wauconda Sand & Gravel IL (V), Highlands Acid Pit, TX (VI)

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site State (Region)
Standards/ Regulations/ Permits/Guidance	
Air Emissions	Verona Well Field-IRM MI (V)
Air Permits	San Gabriel/Area 1 CA (IX)
Air Quality	Bridgeport, NJ (II), Verona Well Field-IRM MI (V), San Gabriel/Area 1 CA (IX)
ACL	Sylvester, NH (I); Western Sand & Gravel RI (I), Bog Creek Farm, NJ (II), D'Imperio Property, NJ (II), Goose Farm NJ (II); Harvey-Knott DE (III); Old Mill, OH (V), Highlands Acid Pit TX (VI); Aidex, IA (VII)* Western Processing WA (X)*
Ambient Water Quality Criteria	New Brighton-Water Supply System MN (V
Aquifer Use Restrictions	Biscayne Aquifer Sites, FL (IV), Old Mill OH (V), Ponders Corner, WA (X)*
Background Levels	Nyanza Chemical, MA (I), Sand, Gravel & Stone, MD (III); Taylor Borough PA (III) Reilly Tar, MN (V); Triangle Chemical, TX (VI) Aidex, IA (VII)*
Clean Water Act 404 Permit	PAS Oswego, NY (II), Old Inger LA (VI) Tar Creek, OK (VI)
Discharge Standards	Old Inger, LA (VI)
Drinking Water Standards	Old Inger, LA (VI); South Valley-IRM NM (VI) Milltown MT (VIII)
Environmental Standards	San Gabriel/Area 1, CA (IX)
Feasibility Study Guidance Document	San Gabriel/Area 1, CA (XI)
Institutional Controls	Beacon Heights, CT (I), Friedman Property, NJ (II); Olean Well Field, NY (II), Biscayne Aquifer Sites, FL (IV), Charlevoix, MI (V)* Old Mill OH (V), Old Inger LA (VI), Ponders Corners WA (X)* South Tacoma Channel Well 12A WA (X)* Western Processing, WA (X
NEPA	Outboard Marine Corp., IL (V)
Public Health Advisory	Lansdowne Radiation, PA (III)
RCRA	Western Sand & Gravel RI (I) Love Canal NY (II) PAS Oswego NY (II) Aidex IA (V)
RCRA Part 264	Charles George MA (I)* PAS Oswego NY (II) McAdoo Associates PA (III)* Wade PA (III) Reilly Tar MN (V) Bio-Ecology Systems TX (VI) Old Inger LA (VI) Aidex IA (VII)* Sa Norte CA (IX)
RCRA Closure Requirements	Bridgeport NJ (II), Enterprise Avenue PA (III) Moyer Landfill PA (III) Tyson's Dump PA (III) South Tacoma, WA (X), Western Processing WA (X)*
RCRA Landfill Specifications	Picillo Farm RI (I) Drake Chemical PA (III) Tyson's Dump PA (III) Bio-Ecology Systems TX (VI) Western Processing, WA (X)*
RCRA Locational Requirements	Tyson's Dump PA (III) Berlin & Farro MI (V
RCRA Onsite Disposal Requirements	Picillo Farm RI (I), McColl CA (IX)
SNARL	Lipari Landfill NJ (II)*, San Gabriel/Area 1 CA (IX)
State Criteria	Bridgeport NJ (II); D'Imperio Property NJ (II) Goose Farm NJ (II), Sinclair Refinery NY (II) Swope Oil, NJ (II), South Tacoma, WA (X)
State Permit	D'Imperio Property, NJ (II), Goose Farm, NJ (II) Verona Well Field-IRM, MI (V)
TSCA Onsite Disposal Requirements	Krysowaty Farm, NJ (II)

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
Water Quality	Fischer & Porter, PA (III), Outboard Marine Corp., IL (V); Milltown, MT (VIII); South Tacoma, WA (X)
Water Quality Criteria	Lipari Landfill, NJ (II)*, Verona Well Field-IRM, MI (V)
Wetlands Regulations	PAS Oswego, NY (II)
Testing/Pilot Studies	
Leachability Tests	Re-Solve, MA (I)
Treatability Studies	Old Inger, LA (VI)
Technology	
Aeration	McKin, ME (I), Triangle Chem., TX (VI)
Air Stripping	Olean Well Field, NY (II), Tyson's Dump, PA (III); Biscayne Aquifer Sites, FL (IV), Main St Wellfield, IN (V), Eau Claire-IRM, WI (V); LeHillier/Mankato, MN (V), Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*, San Gabriel/Area 1, CA (IX), Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*, South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Alternative Technology	Bog Creek Farm, NJ (II); Bridgeport, NJ (II), Goose Farm, NJ (II), Wide Beach, NY (II), MOTCO, TX (VI); Triangle Chemical, TX (VI), Stringfellow Acid Pits, CA (IX)* Western Processing, WA (X)*
Best Reliable Technology	Reilly Tar, MN (V), Western Processing, WA (X)
Capping	Beacon Heights, CT (I), Charles George, MA (I)* Hocomonco Pond, MA (I), Re-Solve, MA (I), Sylvester, NH (I), Bog Creek Farm, NJ (II), D'Imperio Property, NJ (II), GEMS Landfill, NJ (II), Goose Farm, NJ (II), Helen Kramer, NJ (II), Lipari Landfill, NJ (II), PAS Oswego, NY (II), Sinclair Refinery, NY (II), Swope Oil, NJ (II), Douglassville, PA (III), Drake Chemical, PA (III), Enterprise Avenue, PA (III), Heleva Landfill, PA (III), Lackawanna Refuse Site, PA (III), Matthews Electroplating, VA (III), McAdoo Associates, PA (III)*, Moyer Landfill, PA (III), Tyson's Dump, PA (III), Wade, PA (III), Davie Landfill, FL (IV), Whitehouse Waste Oil Pits, FL (IV), Chem-Dyne-EDD, OH (V), New Lyme, OH (V), Old Inger, LA (VI), Aidex, IA (VII)*, Mountain View/Globe, AZ (IX), South Tacoma, WA (X), Western Processing, WA (X)*
Containment	Hudson River, NY (II), Lipari Landfill, NJ (II)*, Drake Chemical, PA (III), New Lyme, OH (V), Outboard Marine Corp., IL (V), Times Beach, MO (VII)
Dike Stabilization	Bruin Lagoon, PA (III), Ellisville, MO (VII)
Dredging	Hocomonco Pond, MA (I), Hudson River, NY (II), Love Canal, NY (II), Outboard Marine Corp., IL (V), Tar Creek, OK (VI)
Excavation	Beacon Heights, CT (I), Hocomonco Pond, MA (I), Bog Creek Farm, NJ (II), Bridgeport, NJ (II), Burnt Fly Bog, NJ (II), D'Imperio Property, NJ (II), Helen Kramer, NJ (II), Krysowaty Farm, NJ (II), Love Canal, NY (II), PAS Oswego, NY (II), Pijak Farm, NJ (II), Sinclair Refinery, NY (II), Spence Farm, NJ (II), Swope Oil, NJ (II), Wide Beach, NY (II), Douglassville, PA (III), Drake Chemical, PA (III), Lehigh Electric, PA (III), McAdoo-IRM, PA (III), McAdoo Associates, PA (III)*, Sand, Gravel & Stone, MD (III), Taylor Borough, PA (III), Tyson's Dump, PA (III), Miami Drum Services, FL (IV), A&F Materials-EDD, FL (IV), Acme Solvents, IL (V), Berlin & Farro, MI (V), Byron/Johnson Salvage Yard, IL (V), Cemetery Dump, MI (V), Chem-Dyne-EDD, OH (V), Cross Bros., IL (V), Northernaire, MI (V), Old Mill, OH (V); Outboard Marine Corp., IL (V), Schmalz Dump, WI (V); Bayou Bonfouca, LA (VI), Highlands Acid Pit, TX (VI), MOTCO, TX (VI); Old Inger, LA (VI), Aidex, IA (VII)*, Ellisville, MO (VII), Times Beach, MO (VII), Woodbury Chemical, CO (VIII), Celtor Chemical Works, CA (IX), Celtor Chemical, CA (IX)*, Del Norte, CA (IX), Jibboom Junkyard, CA (IX), McColl, CA (IX), Ponders Corner, WA (X)*, South Tacoma, WA (X), South Tacoma Channel-Well 12A, WA (X)*, Western Processing, WA (X)*
Filling	Lehigh Electric, PA (III), Taylor Borough, PA (III); Wade, PA (III), A&F Materials-EDD, FL (IV), Tar Creek, OK (VI), Woodbury Chemical, CO (VIII)
Granular Activated Carbon	New Brighton-Interim Water Treatment, MN (V), New Lyme, OH (V), Reilly Tar, MN (V), Old Inger, LA (VI), San Gabriel/Area 1, CA (IX); Stringfellow Acid Pits, CA (IX)*
Ground Water Diversion	Bruin Lagoon, PA (III)
Ground Water Monitoring	Beacon Heights, CT (I); Hocomonco Pond, MA (I); McKin, ME (I); Burnt Fly Bog, NJ (II); Friedman Property, NJ (II), Krysowaty Farm, NJ (II); PAS Oswego, NY (II), Pijak Farm, NJ (II); Drake Chemical, PA (III), Moyer Landfill, PA (III); A&F Materials-EDD, IL (V), New Lyme, OH (V); Bio-Ecology Systems, TX (VI), Highlands Acid Pit, TX (VI), Aidex, IA (VII), Woodbury Chemical, CO (VIII)
Ground Water Treatment	McKin, ME (I); Sylvester, NH (I), Sylvester, NH (I), D'Imperio Property, NJ (II), GEMS Landfill, NJ (II); Goose Farm, NJ (II), Helen Kramer, NJ (II); Lipari Landfill, NJ (II), Well Field, NY (II); PAS Oswego, NY (II), Harvey-Knott, DE (III); Heleva Landfill, PA (III), Whitehouse Waste Oil Pits, FL (IV), Dyne-EDD, OH (V); LeHillier/Mankato, MN (V), New Lyme, OH (V), Old Mill, OH (V), Verona Well Field, MI (V)*, Del Norte, CA (IX), Ponders Corner, WA (X)*, South Tacoma Channel-Well 12A, WA (X)*, Western Processing, WA (X)*
Hydraulic Barrier	South Tacoma, WA (X)
Incineration	Bog Creek Farm, NJ (II), Bridgeport, NJ (II), Swope Oil, NJ (II), Lackawanna Refuse, PA (III), Acme Solvents, IL (V), Berlin & Farro, MI (V), Laskin/Poplar Oil, OH (V), MOTCO, TX (VI), Triangle Chem., TX (VI), Woodbury Chemical, CO (VIII), Western Processing, WA (X)
Land Treatment	Old Inger, LA (VI)
Leachate Collection/ Treatment	Beacon Heights, CT (I), Charles George, MA (I)*, GEMS Landfill, NJ (II), Helen Kramer, NJ (II), Lipari Landfill, NJ (II)*, Moyer Landfill, PA (III), New Lyme, OH (V), Wauconda Sand & Gravel, IL (V)
Levees	Douglassville, PA (III), Old Inger, LA (VI)
Offsite Disposal	Keefe Environmental, NH (I), McKin-IRM, ME (I), McKin, ME (I)*, Re-Solve, MA (I), Burnt Fly Bog, NJ (II), Chemical Control, NJ (II), D'Imperio Property, NJ (II), Krysowaty Farm, NJ (II), Pijak Farm, NJ (II), Spence Farm, NJ, Swope Oil, NJ (II), Bruin Lagoon, PA (III), Enterprise Avenue, PA (III), Harvey Knott, DE (III), Lackawanna Refuse Site, PA (III), Lehigh Electric, PA (III), McAdoo-IRM, PA (III), McAdoo Associates, PA (III)*, Sand, Gravel & Stone, MD (III), Taylor Borough, PA (III), Miami Drum Services, FL (IV), A&F Materials-IRM, IL (V), A&F Materials-EDD, IL (V), Acme Solvents, IL (V), Berlin & Farro, MI (V), Byron/Johnson Salvage Yard, IL (V), Cemetery Dump, MI (V), Chem-Dyne-EDD, OH (V); Cross Bros., IL (V), Northernaire, MI

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
	(V), Old Mill, OH (V), Outboard Marine Corp., IL (V); Schmalz Dump, WI (V), Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Highlands Acid Pit, TX (VI), MOTCO TX (VI); Triangle Chem., TX (VI), Aidex-IRM IA (VII); Aidex, IA (VII)*, Ellisville, MO (VII) Woodbury Chemical, CO (VIII), Celtor Chemical Works, CA (IX), Celtor Chemical, CA (IX)*, Del Norte, CA (IX), Jibboom Junkyard, CA (IX), McColl CA (IX), Stringfellow Acid Pits-IRM, CA (IX), Ponders Corner, WA (X)* South Tacoma Channel-Well 12A, WA (X)* Western Processing, WA (X), Western Processing, WA (X)*
Onsite Containment	Re-Solve, MA (I); Enterprise Avenue PA (III), New Lyme OH (V), Outboard Marine Corp IL (V), Bio-Ecology Systems, TX (VI) Times Beach MO (VII), Western Processing, WA (X)*
Onsite Disposal	Hocomonco Pond, MA (I), Picillo Farm RI (I) Love Canal, NY (II) Drake Chemical PA (III) Enterprise Avenue, PA (III) Aidex IA (VII)* Mountain View/Globe AZ (IX), Western Processing, WA (X)*
Relocation	Lansdowne Radiation PA (III) Times Beach MO (VII); Mountain View/Globe AZ (IX)
Packed Column Aeration	Fischer & Porter PA (III)
Plume Management	Price Landfill NJ (II) Verona Well Field IRM MI (V)
Publicly Owned Treatment Works (POTW)	GEMS Landfill NJ (II) Helen Kramer NJ (II) Lipari Landfill NJ (II)* Del Norte CA (IX) Stringfellow Acid Pits CA (X)* Western Processing, WA (X)*
Slurry Wall	Sylvester NH (I) Helen Kramer NJ (II) Lipari Landfill NJ (II) Lone Pine Landfill NJ (II) PAS Oswego NY (II), Whitehouse Waste Oil Pits FL (IV)
Sour Levees	Times Beach MO (VII)
Stabilization	Re-Solve MA (I), Bruin Lagoon PA (III)

KEY WORDS (BY CATEGORY)	ASSOCIATED ROD SITES Site, State, (Region)
Surface Water Diversion/Collection	Charles George MA (I)* McKin ME (I)* Nyanza Chemical MA (I), Harvey Knott DE (III), Moyer Landfill PA (III), Taylor Borough PA (III),
Venting	Beacon Heights, CT (I), Charles George MA (I)* GEMS Landfill NJ (II) Helen Kramer NJ (II) Moyer Landfill PA (III) New Lyme OH (V)
Miscellaneous	
Competitive Bidding	Bridgeport NJ (II)
Deferred Decision	Lipari Landfill, NJ (II)* Swope Oil NJ (II), Douglassville, PA (III), McAdoo Associates PA (III)* Taylor Borough PA (III), Tysons Dump, PA (III), Davie Landfill FL (IV) Bayou Bonfouca, LA (VI) Ponders Corner WA (X) South Tacoma Channel-Well 12A WA (X)
Depth of Excavation	Burnt Fly Bog, NJ (II)
Dilution	South Tacoma, WA (X), South Tacoma Channel-Well 12A, WA (X)*
Environmental Impacts	Hudson River, NY (II), PAS Oswego NY Highlands Acid Pit TX (VI) Tar Creek OK (VI), Stringfellow Acid Pits, CA (IX)*
Federal Facilities	New Brighton-Interim Water Treatment MN (V), New Brighton-Water Supply System MN (V)
Key Indicator Analysis	Enterprise Avenue, PA (III)
Municipally Owned Site	Enterprise Avenue PA (III)
Off Base Contamination	New Brighton-Interim Water Treatment MN (V), New Brighton-Water Supply System MN (V)
Remnant Contamination	Bog Creek Farm, NJ (II) Krysowaty Farm (III)

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

WAUCONDA SAND AND GRAVEL, REGION V, ILLINOIS (Approved 9/30/85)

Description:
- A gravel pit was excavated to depths up to 40 feet below shallow aquifer water table. 43-acre unpermitted hazardous waste landfill operated onsite from 1950 to 1977. Shallow ground water and surface water, in a creek near the site boundaries, have been contaminated. A deep aquifer remains contaminated.

Decision:
- Prevent leachate from entering creek through collection; dispose of leachate at offsite facility.
- Fence site; regrade and revegetate; repair existing clayey loam soil; cap.
- Conduct further studies to determine final ground water and source remedy

Contacts:
- Region: Cindy Nolan FTS 886-0400
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A LINE ON RODs

RETURN OF THE ROD WORKSHOP

The Regional Counsel's ROD Workgroup is gearing up for two new ROD workshops to be held in February in Washington, D.C., and Dallas. Details coming soon.

EVIEW OF FY'85 RODs

SCD is preparing an annual report on FY'85 RODs to be issued in January. The review of RODs involved in this effort has revealed special points to be highlighted in the ROD workshops and in future guidance. For the time being, you should be aware that all RODs should include:

1 Specific clean-up levels for contaminated soils and waste (using SOCEM where appropriate);
2. Specific clean-up targets for ground water (based on health-based criteria);
3. Information on whether and how the clean-up is to be phased;
4 A description of the type of cap used;
5. Information on the consistency of the remedy with RCRA and other environmental statutes; and
6. An evaluation of alternative technologies for each source control measure. (Guidance on how to make decisions regarding alternative technologies with the objective of selecting highly reliable remedies is forthcoming.)
7 In addition, a letter from the State concuring with the remedy must be included in the ROD file.

REVISED HANDBOOK AVAILABLE

A revised edition of the ORD OSWER *Handbook on Remedial Action at Waste Disposal Sites* is now available. The handbook is a central reference ... remedial action techniques ... describes established ... emerging technologies and ... cludes information on their ... plication and limitations. It ... describes major design, ... struction, and maintenance ... siderations and includes ... and example cost data. To order a copy, call FTS 684-7562 The document number is EPA 625/6-85/006

SUPERFUND
Records Of Decision
Update

From: Hazardous Site Control Division
To: EPA Regional Offices

December 2, 1986
Vol. 2, No. 6

Superfund Reauthorization

On October 17, 1986, the President signed the Superfund Amendments and Reauthorization Act of 1986 (SARA) into law. The act codifies the process and program established in the revised National Contingency Plan (NCP) in November 1985 while adding some new provisions and statutory emphasis to portions of the program. Most significant for the remedy selection process are the cleanup standards provisions in §121. This section calls for remedial actions that are protective of human health and the environment, that are cost effective, that attain the applicable or relevant and appropriate requirements of other Federal environmental statutes and more stringent State requirements and that use permanent solutions and treatment technologies to the maximum extent practicable. Progress in developing implementation guidelines for the cleanup standards will be reported in the months to come

A Line on RODS

ROD Data Base

The Office of Emergency and Remedial Response (OERR) and the Office of Information Resources Management (OIRM) have been working together to enter the Superfund remedy selection documents (RODs and EDDs) into BASIS, an automated text search and retrieval system similar to LEXIS, which EPA purchased last year. At present, all of the RODs signed from FY'82 through FY'85 have been entered. Plans for institutionalizing this in-house system—conducting QA/QC, entering the FY'86 decision documents, training—are under development. EPA technical, legal, or policy staff interested in becoming early users are welcome. All you need is a PC, a modem to patch into the National Computer Center at RTP, and a user identification number. To obtain the latter, and for more general information, call Betsy Shaw at FTS 382-3304

FY'86 RECORD OF DECISION (ROD) SUMMARY TABLE

The FY'86 Record of Decision Summary Table provides an overview of site problems, selected remedies, cleanup criteria, and estimated costs provided in all RODs signed in FY'86. This table reflects remedial program accomplishments in incorporating alternative technologies into source control remedial actions. Sixty of the 84 RODs signed in FY'86 address source control remedies. Of these 60 RODs, 27 selected alternative technologies (ATs). Incineration was the AT most often selected in FY'86 (39 percent), while solidification was selected 22 percent of the time. These two technologies comprise 61 percent of all ATs selected in FY'86. For one site Fields Brook, Ohio, both incineration and solidification were selected as part of a source control remedial action

(Table begins next page)

FY'86 RECORD OF DECISION SUMMARY TABLE

SITE/STATE	ROD SIG. DATE	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
REGION I							
Auburn Road LF NH 1st O U	09/17/86	GW, SW, sediments & soils contaminated with VOCs, inorganics, & extractable organics	N/A	Extension of existing water supply	Remedy complies with SDWA & other ARARs	2 372 000 (present worth)	57 000
Baird and McGuire, MA 1st O U	09/30/86	Soils, sediments SW, & GW contaminated with VOCs, inorganics pesticides, dioxin phenols base-neutral compounds, PAHs & heavy metals	191 000 cy	Excavation & onsite thermal destruction of contaminated soils GW pump & treat	Excavation will remove approximately 95 percent of contamination by mass action levels for GW remediation will be developed during design	44 386 000	O&M costs included in cost estimate
Industri-plex MA 1st O U	09/30/86	GW soil & air contaminated with heavy metals, VOCs, toluene & benzene	1 000 000 cy	Soil grading and capping, GW monitoring, GW pump & treat institutional controls	Specific performance standards not outlined in ROD	8 380 000 or 8 570 000 depending on air treatment	411 600 - 429 600 depending on air treatment
Kellogg-Deering Well Field CT 1st O U	09/25/86	GW contaminated with TCE PCE DCE & other VOCs	N/A	Bring into operation existing air stripping facilities to remove VOCs from GW discharge to an existing treatment plant	GW treatment will achieve a 99 percent TCE removal efficiency which corresponds to a 10^{-6} excess cancer risk	263 000 (present worth)	50 836
Tinkham Garage, NH 1st O U (Final Remedy)	09/30/86	VOC-contaminated GW SW & soils	10 800 cy	Excavation & onsite treatment of soils via aeration soil washing or composting onsite disposal	Soil treatment to 1 ppm TVO or lower	2 058 000	874 000
Winthrop Landfill ME 1st O U (Final Remedy)	11/22/85	GW contaminated with organics	N/A	Alt water supply institutional controls GW monitoring RCRA cap	Establish ACT for each GW contaminant	6 000 000	42 000 - exceeded 360 000 - 1 480 000 exceeded
REGION II							
Brewster Well Field NY 1st O U	09/30/86	GW contaminated with volatile halogenated organic compounds (VHOs) including TCE PCE & DCE	N/A	Continue operation of existing air stripping system GW pump & treat	Existing air stripping system exceeds ARARs	763 912	27 [illegible]
Caldwell Trucking NJ 1st O U	09/25/86	GW & soils contaminated with VOCs PCBs inorganics & lead	28 000 cy	Excavation heat addition and onsite landfilling of soils GW treat & alt water supply	N/A	5 490 000	48 000
Combe Fill North NJ 1st O U (Final Remedy)	09/29/86	Soils & GW contaminated with low levels of VOCs, phenol & base-neutral compounds	N/A	RCRA Subtitle D LF closure	Remedy will conform to RCRA Subtitle D closure requirements	10,600,300	168 000
Combe Fill South NJ 1st O U (Final Remedy)	09/29/86	Soils & GW contaminated with VOCs	N/A	RCRA capping of LF GW pump & treat alt water supply	RCRA cap will achieve a 10^{-7} cm/sec permeability	46 060 700	673 000
Florence LF, NJ 1st O U (Final Remedy)	06/27/86	Soils & GW contaminated with heavy metals, phthalates & vinyl chloride	N/A	Removal & onsite disposal of lagoon liquids & sediments cap & slurry wall leachate collect & treat	N/A	8 027 000	170 000
Hyde Park, NY 1st O U (Final Remedy)	11/26/86	Soils & GW contamined with dioxin PCBs & organics	80 000 cy	Extraction & incineration of nonaqueous phase liquids, GW pump & treat	Cancer risk level of less than 10^{-6} will be achieved	17 000 000	O&M costs included in cost estimate

O U = Operable Unit
N/A = Not applicable or not available

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REGION II							
Kentucky Avenue Wellfield, NY 1st O U.	09/30/86	GW contaminated with VOCs, TCE, & chlorinated solvents	N/A	Hookup of all private well users to public water supply	N/A	303,000	19 000
Lang Property, NJ 1st O U. (Final Remedy)	09/29/86	VOC & heavy metal-contaminated soils, GW, SW, & sediments	6,500 cy	Excavation & offsite disposal of soils & waste material, GW pump & treat	Effluent from GW pump & treat will attain SDWA criteria	2,322,000	612 000
Marathon Battery, NY 1st O U	09/30/86	SW & sediments contaminated with cadmium nickel, & cobalt	84,000 cy	Excavation & offsite disposal, sediment thickening & chemical fixation marsh restoration, revegetation	Sediments will be treated to a 100 mg/kg established background concentration Standards for total cadmium water concentrations are 6.6×10^{-4} to 2.0×10^{-3} mg/l for water hardness levels of 50 & 200 mg/l, respectively	16 640 000	3 530 000 (for year 1 180 000 (for years 2 - 127 000 (for years 6 - 30
Metaltec/Aerosystems, NJ 1st O U.	06/30/86	Soils & GW contaminated with TCE, DCE, vinyl chloride, & copper	10,000 cy 4 000 cy	Excavation, heat treatment, & offsite disposal of soils Excavation & offsite disposal of soils Alt water supply	TCE & PCE, 5 µg/l, chromium & lead, 100 ppm, zinc, 350 ppm, copper, 170 ppm for soils based on federal MCLs & state criteria	7,005 000 (sanitary LF) or 11,735 000 (RCRA LF)	179 000
Price LF NJ 2nd O U (Final Remedy)	09/29/86	GW contaminated N/A with VOCs, inorganics, & TCE	N/A	GW pumping onsite pretreatment & discharge to a POTW, site capping	Extraction & treatment until TVO concentration in GW reaches 10 ppb or less	9 050 000	1 [illegible] years 1 -
Rockaway Borough Well Field NJ 1st O U	09/29/86	TCE & PCE contamination of GW	N/A	Rockaway Borough will continue to operate GW treatment system	Municipal treatment system designed to remove TCE & PCE to 5 ppb	0	[illegible]
Sharkey LF NJ 1st O U (Final Remedy)	09/29/86	Soils & GW contaminated with VOCs TCE inorganics & heavy metals	N/A	LF capping, GW pump and treat	Cap will have a permeability of 10^{-7} cm/sec	23,173,000	[illegible]
Syncon Resins NJ 1st O U	09/29/86	Soils sediments & GW contaminated with VOCs PCBs heavy metals, & base-neutral compounds	700 cy 2 000 cy	Excavation of lagoon sediments & highly contaminated subsurface soils with offsite disposal Excavation & offsite disposal of surface soils GW pump & treat	Soil removal to achieve these levels PCBs 5 ppm base-neutrals 100 ppm TVOs 1 ppm, and various levels for heavy metals	5 600 000	[illegible]
Vestal well 1-1 NY 1st O U	06/27/86	VOC- TCE-contaminated GW	N/A	Air stripping of Well 1-1	Treated water will exceed ARARs	389 400	-
REGION III							
Army Creek LF DE 1st O U	09/30/86	GW, SW, soil & sediments contaminated with VOCs benzene inorganics & heavy metals	1 900 000 cy	Downgradient GW pumping with monitoring LF capping possible upgradient controls	N/A	12 030 000 or 12 340 000 with upgradient controls	306 000 388 000 with upgradient [illegible]
Blosenski LF PA 1st O U	09/29/86	GW SW & soil contaminated with VOCs inorganics, benzene TCE PCBs & pesticides	N/A	Excavation & removal of buried drums offsite disposal alt water supply GW monitoring & onsite treatment capping source reduction program	Removal of contaminated media to attain a 10^{-6} excess cancer risk	11 000 000 to 15 000 000 (13 000 000 estimated baseline cost)	534 000 [illegible] years [illegible]
Bruin Lagoon PA 2nd O U (Final Remedy)	09/29/86	Soils & bedrock contaminated with acidic sludges & heavy metals noxious gas release	17 500 cy	Stabilization neutralization of sludge & perched liquid zone in-situ treatment of bedrock capping	N/A	2 695 000	15 000

SITE/STATE	ROD SIG. DATE	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
REGION III							
Chisman Creek VA 1st O U	09/30/86	GW & SW contaminated with heavy metals (nickel); 3 disposal pits contaminated with fly ash	484 600 cy	Capping (2 pits) capping & upgradient GW diversion in one pit	RCRA Subtitle D cap (2 pits) RCRA Subtitle C cap (1 pit)	$4 119 000	506 300 (1st year) 64 000 (years 2 30)
Delaware City PVC, DE 2nd O U	09/30/86	GW SW & soils contaminated with TCE, PVC EDC, & VCM	25 000 cy	Excavation & removal of contaminated soils & sludges offside disposal capping, GW monitoring	Recovery wells will operate until concentrations of VCM EDC & TCE reach 1 ppb, 0 94 ppb, & 2 7 ppb respectively for two consecutive sample analyses	1 904 000	43 000
Drake, PA 2nd O U	05/13/86	Soils (surface and subsurface), sludges, GW buildings, & debris contaminated with organics & inorganics	N/A	Incineration of onsite chemicals demolition and offsite removal of buildings tanks & debris pump & treat wastewater lagoons metal recycling, analysis & possible disposal of decontamination metal recycling fluid	N/A	1 300 000	N/A
Industrial Lane, PA 1st O U	09/29/86	GW contaminated with VOCs & vinyl chloride	N/A	Alt water supply no O&M	N/A	30 800	0
Lansdowne Radiation PA 2nd O U	09/22/86	Homes contaminated with radium & other radioactive materials	N/A	Demolition & offsite disposal of two homes Excavation & offsite disposal of contaminated soils	Soils, 5-15 pCi/g, radon-contaminated materials 0 03 WL gamma-contaminated materials 0 17 rem/yr	4 000 000 to 4 500 000	[illegible]
Leetown Pesticide WV 1st O U (Final Remedy)	03/31/86	Pesticide-contaminated soils & debris	3 600 cy (soil)	Excavation consolidation & anaerobic biodegradation of contaminated soil Removal & offsite disposal of contaminated debris	DDT less than 300 ppb for treated soils	1 014 000	10 300 [illegible] 7 500 [illegible]
Limestone Road MD 1st O U	09/30/86	Soils GW SW & sediment contaminated with VOCs heavy metals TCE PCE & base-neutral compounds	N/A	Site grading & capping, monitoring & data collection	N/A	1 192 580	To be [illegible]
Middletown Road MD 1st O U (Final Remedy)	03/17/86	No threat	N/A	No Action	N/A	0	0
Millcreek Dump PA 1st O U (Final Remedy)	05/07/86	Soils sediment & GW contaminated with VOCs PCBs inorganics heavy metals PAHs & phthalates	N/A	Excavation & onsite consolidation of soils under a RCRA cap GW pump & treat	PCBs 10 ppm PAHs 2 940 ppb TCE 10 ppb phenols 9 ppm toluene 1 780 ppb	12 000 000 to 18 000 000	1 760 [illegible] semi-annual
Taylor Borough PA 2nd O U (Final Remedy)	03/17/86	Possible GW contamination by VOCs & metals	N/A	Semiannual GW monitoring No action	N/A	0	To 300
Tybouts Corner DE 1st O U (Final Remedy)	03/06/86	Soils & GW contaminated with TCE, benzene VOCs, & inorganics	N/A	Excavation of waste & soils with onsite consolidation & capping GW pump & treat	For GW 100 ppb TVO 10^{-4} cancer risk for carcinogens	FS estimate $35 000 000 PRP estimate $15 000 000	4 600 [illegible] semi-annual
Westline Site, PA 1st O U (Final Remedy)	07/03/86	Soils contaminated with tars containing phenols & PAHs	710 cy	Excavation & offsite incineration of tar deposits	Soils will be excavated to a 10^{-4} cancer risk level for contaminants present onsite	744 000	0
REGION IV							
A L Taylor KY 1st O U (Final Remedy)	06/18/86	Soils & SW contaminated with VOCs PCBs, heavy metals, PAHs chlorinated aromatics & phthalates	N/A	Excavation of soils sediments & sludge with onsite containment & capping	Cap will achieve a permeability of 10^{-7} cm/sec	795 349	N/A

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REGION IV							
Coleman-Evans FL 1st O U (Final Remedy)	09/25/86	Soils sediments, SW, & GW contaminated with VOCs, PCP, organics, heavy metals, chromium & toluene	9,000 cy	Excavation & onsite incineration of soils onsite backfilling with decontaminated soils GW recovery & treatment storage & analysis of recovered GW onsite carbon adsorption GW treatment	Excavation of all soils containing PCP in excess of 10 mg/kg, GW will be treated to levels that comply with Drinking Water Standards or Water Quality Criteria	3,000 000 to 3 800 000	[illegible]
Distler Brickyard, KY 1st O U (Final Remedy)	08/19/86	Soils & GW contaminated with VOCs, TCE, toluene, heavy, metals, & inorganics	8,000 cy	Excavation & offsite disposal of contaminated soils GW pump & treat	Excavation of all soils to background levels, treatment of GW to background levels	7 500 000 (present worth)	[illegible]
Distler Farm KY 1st O U (Final Remedy)	08/19/86	Soils & GW contaminated with VOCs PCE, TCE, toluene, inorganics metals	N/A	Excavation & offsite disposal of all contaminated soil GW pump & offsite treatment at POTW	Soils will be excavated to background levels & GW will be treated to background levels	11 738 400	[illegible]
Gallaway Ponds, TN 1st O U (Final Remedy)	09/26/86	Pond sediments contaminated with pesticides, inorganics toxaphene & chlordane	1 600 cy	Excavation of sediments onsite disposal, RCRA Subtitle C closure	Site closure will meet RCRA Subtitle C requirements	344 735	[illegible]
Hipps Road LF FL 1st O U (Final Remedy)	09/93/86	GW contaminated with VOCs, TCE metals & BTX fractions	N/A	GW pump & treatment at POTW RCRA Subtitle D closure relocation of residents	LF closure will comply with RCRA Subtitle D requirements, GW will be treated to meet SDWA requirements or 10^{-6} cancer risk	3 900 000 to 4 400 000	[illegible]
Hollingsworth Solderless FL 1st O U (Final Remedy)	04/10/86	Soils & GW contaminated with TCE DCE vinyl chloride & heavy metal	N/A	Excavation aeration & onsite replacement of contaminated soils GW pump & treat	Soil criteria TVO, 1 ppm lead 0 5 mg/l nickel, 1 mg/l, copper 10 mg/l GW criteria TCE 3 2 µg/l vinyl chloride, 1 µg/l DCE, 70 µg/l	653 730	[illegible]
Lees Lane LF KY 2nd O U (Final Remedy)	09/25/86	Soil SW & GW contaminated with VOCs heavy metals inorganics	212 400 tons	Removal of exposed drums & offsite disposal capping, gas collection & venting system possible alt water supply GW monitoring, bank stabilization institutional controls	N/A	2 343 000	[illegible]
Mowbray Engineering AL 1st O U (Final Remedy)	09/25/86	Swamp soils contaminated with PCBs	4 800 cy (for a cleanup level of 20 ppm)	Excavation of PCB-contaminated soils with either onsite incineration offsite incineration or solidification/ stabilization of the waste	Soils with 25 ppm PCBs or greater will be excavated and treated	Onsite incin 1 1 1 8 M Offsite incin 1 2 2 0 M Solid/stab 750 000	[illegible]
Pepper s Steel, FL 1st O U (Final Remedy)	03/ 2/86	Soils sediments & GW contaminated with PCBs organics & heavy metals	PCB>1 ppm approx 48 000 cy lead>1 000 ppm 21 500 cy arsenic>5 ppm 9 000 cy (waste qtys not additive)	Excavation solidification stabilization & onsite disposal of soils Collection & offsite disposal of free oil	Excavation of soils exceeding 1 ppm PCB 1 000 ppm lead & 5 ppm arsenic	5 212 000	[illegible]
Pioneer Sand, FL 1st O U (Final Remedy)	09/26/86	Soil & pond waters contaminated with sludges heavy metals VOCs & inorganics	N/A	RCRA Subtitle D LF closure leachate collection treatment & onsite disposal SW treatment & onsite discharge cover system for sludge pond waste	LF closure under Subtitle D of RCRA & Chapter 17-7 of the Florida Administrative Code	462 025	[illegible]
Sapp Battery FL 1st O U (Final Remedy)	09/26/86	Soils GW SW & sediments contaminated with heavy metals	94 000 cy soil) 20 000 cy (sediment)	Excavation solidification & onsite disposal of contaminated soils & sediments GW pump & treat SW treatment indicator	Onsite LF will be built to Florida Class I Sanitary Landfill Standards cleanup criteria for indicator chemicals were set based on federal & state standards & risk-based levels	14 318 544	[illegible]

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REGION IV							
SCRDI/Dixiana, SC 1st O.U (Final Remedy)	09/26/86	GW contaminated with VOCs, PAHs, PCBs, PCE, inorganics, & pesticides	N/A	GW pump & treat; discharge to SW	GW will be treated to attain ACL equivalent to 10^{-6} excess cancer risk	751 250	2 128 000 (30-year period)
REGION V							
A&F, IL 2nd O.U (Final Remedy)	08/14/86	GW contaminated with VOCs, inorganics, TCE, & metals	N/A	GW monitoring; installation of additional monitoring wells, institutional controls	N/A	PRP will pay for remedy costs	PRP will pay for O&M costs
Arcanum Iron, OH 1st O U (Final Remedy)	09/26/86	Soils, GW, SW, & sediments contaminated with lead, antimony, & arsenic	Onsite soils with>500 ppm lead, 20,000 cy, battery casing chips, 3 800 cy, offsite soils not specified	Excavation & offsite disposal of all soils with>500 ppm lead, Excavation & onsite disposal of all soils with lead between background & 500 ppm	Offsite disposal of soils with>500 ppm lead Onsite disposal of soils with lead between background & 500 ppm Excavation of offsite soils will be conducted until background levels are reached	9 929,000	37 000
Arrowhead Refinery, MN 1st O U (Final Remedy)	09/30/86	GW, soils, & sediment contaminated with VOCs, PAHs, & lead	4 600 cy (sludge) 20 500 cy (soils & sediments)	Excavation & onsite incineration of contaminated soils sediments, & sludge GW pump & treat alt water supply	Soils & sediments will be excavated & treated to achieve a 10^{-6} excess cancer risk level, GW treatment will remove 98 percent of VOCs	22,000,000	130 000 130 000
Burlington Northern, MN 1st O U (Final Remedy)	06/04/86	Soils & small areas of GW contaminated with creosote wastes including PAHs phenols, & heterocycles	9,500 cy	Excavation & onsite aerobic breakdown & transformation of contaminated soils & sludges, capping	Possible goals are to achieve detoxification of soils as defined by the microtox test & to achieve total PAH & benzene extractable concentrations in the treatment zone less than or equal to concentrations present in soils left in place	582 000	36 000
Burrows Sanitation MI 1st O U (Final Remedy)	9/30/86	SW sediments GW & soils contaminated with heavy metals & cyanide	250 cy	Excavation solidification/fixation & offsite disposal of metal hydroxide sludges GW pump & treat	GW cleanup based on current lowest regulated conc for each indicator chemical soil cleanup based on endang assessment	1 256,700 to 1 335 400	[illegible]
Byron Johnson Salvage Yard, IL 2nd O U	09/23/86	GW contaminated with heavy metals, TCE, cyanide & VOCs	N/A	Provision for alt water supply via home carbon treatment units & bottled water	N/A	115 500	56 [illegible]
Fields Brook, OH 1st O U	9/30/86	Brook sediments contaminated with VOCs heavy metals TCE, PCE, PCBs, & base-neutral compounds	36 000 cy 16 000 cy	Excavation solidification & onsite disposal of contaminated sediments Excavation thermal treatment onsite residual disposal of contaminated sediments	Sediments will be excavated to a 10^{-6} excess cancer risk or to 50 ppm PCBs or less	35 100 000	[illegible]
Forest Waste, MI 2nd O U	06/30/86	Soils & sediments contaminated with organics & heavy metals	4 000 cy 110 000 gal	Excavation solidification & offsite disposal of soils & sludges Removal solidification & off site disposal of aqueous lagoon wastes	Cleanup levels will achieve an appropriate ingestion rate of 0 1 g/day of soil for a 70 kg adult	1 295 000	[illegible]
Lake Sandy Jo, IN 1st O U (Final Remedy)	9/26/86	Soils, SW & sediments contaminated with PAHS base-neutral compounds, & heavy metals	2 500 cy	Excavation & onsite consolidation of contaminated sediments soil capping alt water supply	Sediments with contaminants above the 10^{-6} excess cancer risk level will be excavated & consolidated	4 747 000	63 000
LaSalle Electric, IL 1st O U	08/29/86	Offsite soils contaminated with PCBs	25 530 cy	Excavation & onsite incineration of offsite soils	Excavation & incineration of soils with greater than 5 ppm PCBs in the first 12 inches of soil and greater than 10 ppm in soils at depths below 12 inches	26 400 000 (present worth)	[illegible]

SITE/STATE	ROD SIG. DATE	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
Metamora LF MI 1st O U	9/30/86	GW & soil contaminated with VOCs, including PCE & TCE, & heavy metals	18,150 cy	Excavation & offsite incineration of wastes from areas 1 & 4	The incinerator will comply with current RCRA standards	41 500 000 (30-year present worth)	N A
New Brighton/ Arden Hills/ St Anthony, MN 4th O U	06/30/86	GW contaminated with TCE, PCE, & other organics	N/A	Well construction to provide an alt water supply	N/A	600 500	22 820
Novaco Industries, MI 1st O U	06/27/86	Chromium-contaminated GW	36,000 000 gal	GW pump & treat, discharge to SW	GW treatment will achieve federal or state drinking water criteria	56 000	419 000 [illegible] 5 year period
Reilly Tar MN 2nd O U	05/30/86	Soils & GW contaminated with PAHs & phenols	N/A	GW pump & treat, capping & filling of exposed wastes discharge of hazardous waste to sanitary sewer	N/A	Cost estimates not fully developed	Cost estimates not fully developed
Seymour IN 1st O U	9/30/86	Soil & GW contaminated with VOCs, organics heavy metals toluene & benzene	N/A	Extraction & treatment of GW	Water discharge will conform with POTW standards	744 000	420 000 600 000 (estimated)
Spiegelberg LF MI 1st O U	09/30/86	Soils GW & sludges contaminated with paint wastes consisting of VOCs & base-neutral compounds	5 000 cy 10 000 cy	Excavation of waste materials offsite incineration of liquid paint sludges. Offsite disposal of solid paint sludges	All materials exceeding a 10^{-6} excess cancer risk will be excavated	15 771 000 to 18 395 000	[illegible]
REGION VI							
Cecil Lindsey AR 1st O U (Final Remedy)	05/07/86	No significant threat	N/A	No action with site access restriction & GW monitoring	N/A	61 000	[illegible]
Geneva Industries TX 1st O U	09/18/86	Soils & GW contaminated with VOCs PAHs PCBs TCE & fuel oils	22 500 cy	Excavation & offsite disposal of contaminated soils & drums GW pump & treat, cap	Excavation of soils to 100 ppm PCBs	14 990 000	[illegible]
Odessa Chromium I TX 1st O U	09/08/86	GW contaminated with chromium & other heavy metals	N/A	Negotiating agreements with Odessa City to extend water supply construct water distribution system	N/A	247 920	[illegible]
Odessa Chromium II TX 1st O U	09/08/86	GW contaminated with chromium	N/A	Extension of municipal water service to affected areas	N/A	476 570	[illegible]
Sikes Disposal Pit TX 1st O U (Final Remedy)	09/18/86	GW soils & SW contaminated with organics & BTX fractions	150 000 cy	Excavation & onsite incineration of sludges & soils onsite ash disposal	Sludges & soils will be excavated to 10 ppm VOAs	102 217 000	[illegible]
United Creosoting TX 1st O U	09/30/86	Soils contaminated with PCP PAHs & creosote	34 000 cy	Excavation & onsite consolidation of soils temporary cap permanent relocation of six households	Excavation & disposal of all soils contaminated above 100 ppm PAH	Cost estimate undeveloped	[illegible]
REGION VII							
Des Moines TCE, IA 1st O U (Final Remedy)	07/21/86	GW contaminated with TCE PCE & other organics	N/A	GW pump & treat discharge to SW	Extraction & treatment will continue until conc in monitoring wells is 5ug/l or less for 4 consecutive months	1 196 000	[illegible]
Ellisville, MO 2nd O U	09/29/86	Soil contaminated with dioxins heavy metals & VOCs	N/A	Excavation & onsite interim storage of dioxin-contaminated soil excavation transport & offsite land disposal of soils containing nondioxin waste	N/A	20 200 000 (estimated present worth)	O&M [illegible] included in estimated [illegible] cost's
REGION VIII							
Arsenic Trioxide ND 1st O U (Final Remedy)	09/26/86	GW contaminated with arsenic	N/A	Expansion of rural water system construction of system & hook-up of homes treatment system construction	Removal of arsenic to background concentration of 0 025 mg/l	2 296 000	2 34[illegible] [illegible]

SITE/STATE	ROD SIG. DATE	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
Denver Radium/ ROBCO, CO 2nd O U	09/30/86	Soil & buildings contaminated with radium	7,000 cy of soil 200 cy of demolished buildings	Excavation & offsite disposal of contaminated soils & debris, or	N/A	1 580 000	Not specified
				Excavation & temporary offsite storage of soils or	N/A	88 430	5 000
				Excavation, stabilization & onsite consolidation of contaminated soils	N/A	1 320 000	Not specified
Denver Radium Street Sites, CO 1st O U.	03/24/86	Asphalt contaminated with radium	38,500 cy	Leave contaminated material in place, institutional controls routine maintenance	Remedy meets standards for Remedial Action at Inactive Uranium Processing Sites	30,000	Costs will vary
Libby Ground Water, MT 1st O U.	09/26/86	Soil & GW contaminated with with creosote, organics, & inorganics	N/A	Alt water supply, institutional controls	N/A	152 000	64 000
Marshall, CO 1st O.U. (Final Remedy)	09/26/86	Onsite GW & SW & offsite GW contaminated with VOCs, organics, heavy metals, TCE, PCE, & benzene	N/A	Fencing, regrading, & revegetation of site construction of perimeter ditches to collect contaminated GW GW pump & treat air stripping, GW & SW monitoring	Contaminated water will be treated to achieve an effluent quality that meets all ARARs	1 819 000	152 800
Smuggler CO 1st O U (Final Remedy)	09/26/86	Soil & GW contaminated with cadmium lead, & heavy metals	4 010 000 cy	Excavation capping, GW monitoring, alt water supply	Remedy will conform to RCRA Subtitle D closure requirements GW will be monitored to comply with Safe Drinking Water Standards	1 500 000 to 1 800 000	31 700
Union Pacific, WY 1st O U (Final Remedy)	09/26/86	Soil & GW contaminated with PCBs, creosote organics	700 000 cy	Contaminant isolation system consisting of rechanneling the river treatment of contaminated water with a carbon adsorption system slurry wall GW pump & treat GW monitoring	Water discharge will conform to NPDS standards	7 000 000	57 000
REGION IX							
Iron Mountain Mine CA 1st O U	10/03/86	SW runoff from Iron Mountain contaminated with acid mine drainage (AMD) consisting of sulfuric acid & heavy metals Fish & sediment in local SW are also affected	2 5 acres to be capped)	Capping of selected cracked & caved ground areas dam enlargement	Cleanup program will be designed to meet EPA Water Quality Criteria for Protection of Aquatic Life for the worst case condition of 1978	72 100 000 to 85 100 000	Not specified
REGION X							
Queen City Farms WA 1st O U	10/24/85	Soils sediments & SW contaminated with VOCs chromium lead, TCE, PCBs, & acids	22 000 cy	Excavation stabilization & offsite disposal of sludges sediments & soils cap placement	N A	3 439 000	SW monitoring under
Toftdahl Drums WA 1st O U (Final Remedy)	09/30/86	No significant threat	N/A	No action GW monitoring by the State of Washington	N/A	0	
United Chrome, OR 1st O U (Final Remedy)	09/12/86	GW & soils contaminated with chromium	350 tons (for offsite disposal)	Excavation & offsite disposal of soils flushing of soils above shallow GW table GW pump & treat discharge to POTW or SW	Treated effluent 0 02 mg chromium confined aquifer 0 05 mg/l chromium unconfined aquifer 10 mg/l chromium	1 580 000	35

O U = Operable Unit
N/A = Not applicable or not available

TREATMENT TECHNOLOGIES SELECTED AT SITES TO DATE

Year	Region	Sites	Total No. of RODs Employing Treatment Technologies For Fiscal Year	On-Site Incineration	Off-Site Incineration	Stabilization/ Neutralization	Soil Washing/ Flushing	Solidification	Volatilization/ Soil Aeration	Biodegradation	Land Application/ Composting
FY'82			1								
	III	Bruin Lagoon, PA				X					
FY'83		0	0								
FY'84			5								
	V	Berlin & Farro, MI			X						
	V	Laskin/Poplar, OH			X	X					
	VI	Bioecology, TX				X					
	VI	Old Inger, LA								X	
	X	Western Processing, WA			X				X		
FY'85			14								
	I	McKin, ME							X		
	II	Bog Creek Farm, NJ					X				
	II	Bridgeport, NJ		X							
	II	Goose Farm, NJ					X				
	II	Swope Oil, NJ			X						
	II	Wide Beach, NJ				X					
	IV	Davie Landfill, FL				X					
	V	Acme Solvents, IL		X							
	V	Byron/Johnson, IL							X		
	V	Verona Well Field, MI							X		
	VI	MOTCO, TX			X						
	VI	Triangle Chemical, TX			X				X		
	VIII	Woodbury Chemical, CO			X						
	X	South Tacoma Well, WA					X				
FY'86			27								
	I	Barro & McGuire, MA		X							
	I	Tinkham Garage, NH					X		X		X
	II	Caldwell Trucking, NJ							X		
	II	Hyde Park, NY		X							
	II	Marathon Battery, NY				X					
	II	Metaltec Aerosystems, NJ							X		
	III	Bruin Lagoon, PA				X					
	III	Drake, PA			X						
	III	Leetown Pesticide, WV					X				
	III	Westline, PA		X							

Year	Region	Sites	Total No of RODs Employing Treatment Technologies For Fiscal Year	On-Site Incineration	Off-Site Incineration	Stabilization/ Neutralization	Soil Washing/ Flushing	Solidification	Volatilization/ Soil Aeration	Biodegradation	Land Application/ Composting
FY'86											
	IV	Coleman Evans, FL		X							
	IV	Hollingsworth, FL							X		
	IV	Mobray Engineering, AL		X				X			
	IV	Pepper Steel, FL						X			
	IV	Sapp Battery, FL						X			
	V	Arrowhead Refinery, MN			X				X		
	V	Burlington Northern, MN								X	
	V	Burrows Sanitation, MI						X			
	V	Fields Brook, OH		X				X			
	V	Forest Waste, MI						X			
	V	LaSalle Electric, IL		X							
	V	Metamora, MI			X						
	V	Spiegelberg Landfill MI			X						
	VI	Denver Radium/ROBCO, CO				X					
	VI	Sikes Disposal, TX		X							
	X	Queen City Farms, WA						X			
	X	United Chrome, OR					X				
FY'87			(incomplete at this time)								
	I	Ottati and Goss, NH		X							
	VI	Bayou Bonfouca, LA		X							
	VI	Cleve Reber, LA		X							
	VI	Gurley Pit, AR			X	X					
	VI	Hardage-Criner, OK		X							