Chapter 4

Other Cleanup Programs and Superfund

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INTRODUCTION

To most observers, the Federal Superfund program is *the* Nation's environmental cleanup program. In reality it is but one—the most visible—part of a complex, not necessarily comprehensive, fragmented and generally uncoordinated national effort to clean up chemically contaminated sites.

Besides the Superfund program, the national effort consists of separate programs for hazardous waste facilities and underground storage tanks; programs to remediate sites with mine wastes and mill tailings and to close old mine shafts and pits; programs that clean up specific materials, such as PCBs and asbestos; and individual Federal agency and State cleanup programs. When the national cost of this system is added up, the current annual Superfund budget of about $1.5 billion is matched by an estimated $1.7 billion spent by the other programs. Spending by private parties increases this cost by perhaps $1 billion.

Actions, or inaction, by these other cleanup programs affect how the Superfund program works, what the Superfund program accomplishes, future demands on the program, and, just as importantly, people's perceptions of the program. Depending on the goals of the Superfund program, it may be important for Congress to consider ways to limit some interactions and enhance others. A particular, important long-term issue for Superfund is whether impermanent or incomplete cleanups from other programs might someday become Superfund sites. In a broader context, Congress may wish to consider whether a set of separate, overlapping and parallel programs is the wisest way to clean up the environment.

OTA's review of other programs shows that they suggest ways to improve Superfund; many examples are used throughout this report. Overall, however, many effects of other programs are less positive. This chapter discusses those impacts, which lead to:

. underestimates of Superfund needs, because: 1) the movement of sites among programs may delay effective cleanups under Superfund, and 2) cleanups in other programs, rather than preventing the growth in numbers of Superfund sites, can create future Superfund sites as a result of incomplete, or less stringent cleanups in other programs;]
- overestimates of the needs of Superfund when sites that qualify for and at one time might have been placed in the Superfund program are shifted to other programs; and
- implementation problems because Superfund must share the available national workforce and supply of technology with other programs.

Some details on the national cleanup effort surrounding Superfund are provided in table 4-1. OTA has not done a comprehensive assessment of every Federal cleanup program and has not been able to obtain details on all State programs. In all cases, OTA sought only the kind of information that could shed light on the interaction of the programs with Superfund. Federal programs were chosen because of their obvious connection to Superfund. Included were Federal agency cleanups, which are partially covered by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and are overseen by EPA, and Federal cleanup programs that EPA has designated as current or future homes for sites deferred from Superfund. To reduce the analytical burden of 50 State cleanup programs, OTA has chosen to focus on programs, such as California, Illinois, New York, and Minnesota, that are highly regarded by most people. California and Illinois, for instance, have reputations for advancing treatment technology; Minnesota is always used as an example of the benefits of using enforcement to clean up sites.

A PYRAMID

The national cleanup effort may best be likened to a dynamic pyramid with the Superfund program occupying the pinnacle, the most visible portion of the pyramid. The height of the pyramid is growing as most cleanups occur and new sites are added below the pinnacle. The bottom of the pyramid

[1]If the Superfund program has t. assume just 10 percent of the cleanups now the responsibility of other programs, it could add $24 to $61 billion to the cost of the Superfund program (see table 4-1).

Table 4-1--Other Cleanup Programs

Program	Federal statute	Federal agency	Estimated annual budget ($ millions)	Federal funding method[a]	Estimated number of sites needing cleanup	Estimated national cost of cleanup ($ billion) Agency	OTA[b]
RCRA corrective action	RCRA	EPA	14	g	2,000-5,000		12 to 100
Leaking underground storage tanks (LUST)	RCRA	EPA	50	t	350,000-400,000 (tanks)	32	
Federal facilities[c]	CERCLA and RCRA	[d]	800	g	5,000-10,000		75 to 250
States	na		500	[e]	6,000-12,000+		3 to 120+
Asbestos in schools	AHERA	EPA	50t	g	40,000 (schools)	3	
	na	na	na	na	31 7,000+ (buildings)	51	
Inactive uranium mill tailings	UMTCRA	DOE	111	y	24	1.3	
Abandoned mine lands	SMCRA	DOI	193		22,300	55	
Marine sediments	na	na	na	na	?		> 10
Total			$1.7 billion			$242 to $612 billion	

na. not applicable
[a]g=general *revenues,* t=tax/trustfund.
[b]Based on min/max numbers of sites and min/max estimated cost per site.
[c]DOE data includes onty cleanup of hazardous wastes.
[d]Sixteen Federal agencies have sites to clean up.
[e]States fund own programs supplemented by about $200 million annually from Superfund.
[f]Minor part of cost; @q State and local government funded.

SOURCE: Office of Technology Assessment, 1989.

already covers thousands of sites more than Superfund.

It did not start out this way. Over time the Superfund program has been constricted, while the national cleanup effort has grown. These two trends are continuing. Two new cleanup programs are on the horizon: one to clean up toxic sediments found in many marine environments, another for cleaning up oil spills. And, while the major narrowing of Superfund occurred in 1982 with the writing of the first National Contingency Plan (NCP), EPA management practices continue to shrink the applicability of CERCLA. The longtime but growing efforts of EPA and others to defer cleanups away from the Superfund program was formalized in a comprehensive policy statement in the December 1988 proposed revisions to the NCP.[2]

The net effect of the narrowing of Superfund and the growth of other cleanup programs is that CERCLA and some of its unique provisions (i.e., public participation, cleanup standards, and permanency) are increasingly covering the fewest cleanups in the country. The bulk of the cleanups (those that conceivably affect the most people) at some lesser degree of cleanup might, over time, produce new generations of sites qualifying for cleanup under Superfund.

Other effects are highlighted in the two following statements. The first refers directly to the growth of other cleanup programs and their relationship to Superfund and was made by officials of ICF, one of the Superfund program's major contractor. The problems identified were called a "special challenge" to the Superfund program.

> These new programs will place additional burdens on the same infrastructure already shouldering the expanded Superfund program. They will create increased demands for environmental engineering talent and for analytical laboratory services. They will also place demands for program implementation on the States, many of whom are already strained to accommodate the current Superfund and RCRA programs. Moreover, unless the jurisdictions of these programs are carefully defined, there is a possibility of overlap, duplication, and inefficiency,

[2]This will not be part of the final NCP scheduled for 1990. The EPA administrator told Congress in June 1989 that the proposed deferral policy has been deferred for reconsideration during reauthorization of the Superfund program.

with deleterious consequences for the objectives these programs are intended to serve.[3]

The second statement refers to complications of a multitude of programs within one State-New Jersey:

> Thus ''major' cleanups are being conducted by different programs through different statutes presenting the problems of inconsistency on every topic, from public to private remediation, from regulated units to whole site, from in-house guidance on soils to ground water standards . . . overlap was presumed to be high. In a Department with limited resources and an enormous number of sites to address, overlap could not be afforded.[4]

As a result of these kinds of findings, New Jersey is implementing a new strategy to assure that sites of similar complexity be cleaned up using "the same technical standards and approaches . . . By developing a cohesive strategy, duplicate and inefficient actions will be minimized in achieving comprehensive and consistent management actions.

SHRINKING SUPERFUND

As a statute, CERCLA conveys broad coverage.[5] It begins with the statement:

> To provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.

The definitions of "hazardous substance" and ''release' and the restrictions on the use of the trust fund provide some limits. For instance, petroleum and various forms of natural gas used as fuel have been excluded from the definition of hazardous substance. A release has been defined very broadly but specifically excludes: workplace exposures, engine exhaust emissions, nuclear materials covered by other statutes, and the normal application of fertilizer. In general, the fund is to be used for government response costs taken for removal and remedial actions and the investigations that proceed them. It cannot be used for response actions at Federal agency facilities.

Limiting Through the NPL

The major restrictions on CERCLA coverage have been accomplished through the NCP, and the National Priorities List (NPL) is the device through which EPA first restricted coverage. While the NCP restrictions have been written by EPA and been approved by the administration, Congress has not totally accepted them. For instance, the Superfund Amendments and Reauthorization Act (SARA) requires EPA to revise the Hazardous Ranking System (HRS) and reconsider the cutoff score (see ch. 2).

In 1980, under CERCLA, Congress asked for a "criteria for determining priorities among releases . , . " and for EPA to use the criteria to create a list of ''national priorities."[6] EPA developed the HRS and proposed an initial 418 NPL sites in response to Congress asking for at least 400 sites initially. EPA implied program restrictions in the first NCP and then clearly stated in a revised version in 1985: ''Fund-financed remedial action is available only for sites on the NPL.

One way to interpret the original request by Congress for criteria and a priorities list is that it set up some way for a new program to determine which sites to start cleaning up frost. Reliable information was scarce in 1980. There were thousands of suspected sites in the country and there was a danger that the program could be quickly overwhelmed. The 1980 conference report on CERCLA says that the NPL was to serve "primarily informational purposes identifying for the States and the public

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[3]James R. Janis and Edwin Berk, ICF Inc., ''Superfund: Significant Accomplishments, " proceedings of *Anatomy of Superfund, 8th* Nationat Ground Water Quality Symposium, September 1986, Kansas City, MO.

[4]New Jersey, Division of Water Resources and Hazardous Waste Programs, ''Case Management Strategy Manual,'' draft, May 1989.

[5]There was discussion during the debate over CERCLA in 1980 about placing limits on the program. An amendment by Congressman Dave Stockman would have restricted cleanup under CERCLA to only those sites posing only ''a significant threat to human health. It was rejected by the House committee. During the floor vote in the House, another amendment was submitted to restrict EPA from cleaning up ''any dump *site in the country* '' It, too, was rejected. [*1980* Congressional *Quarterly Almanac*, p. 588,]

[6]CERCLA, Section lo and (B)

[7]50 Federal Register 5862, Feb. 12, 1985, p. 5867.

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those. . . sites . . . which appear to warrant remedial actions.

EPA made the HRS and the NPL a way to limit Federal responsibility under CERCLA. EPA decided that a' 'national priority' was not just a site that might require early attention but the ***only*** category of site requiting CERCLA attention. From the language in the NCP, the decision was clearly taken to conserve the trust fund, which was seen at that time as a finite, one-time allocation. Explaining the agency's 1982 decision, EPA said:

> The purpose of this restriction was to ensure that the limited Fund monies were only used for remedial action at NPL sites.[9]

And, by labeling NPL sites as those "posing the greatest potential threats to human health and the environment, ' EPA fostered the concept of the Superfund program as one to remediate the *worst* sites. [10]

Limiting Through Management

Limiting the size and duration of the program has been an overriding objective of the managers of the Superfund program. The attempt to hold the size of the NPL to the original 418 sites is well known now as the "there will be no Son of Superfund" strategy. Since 1983, when congressional action prompted wholesale changes in Superfund managers, program cost has still been the driving force. For example, the evolution of the preremedial part of the Superfund program (discussed inch. 2) and its effect on the size of the program may be as effective as the original strategy but more subtle.

Limiting program size (and, therefore, cost) has been carried out primarily by holding down the number of Superfund sites: by not going out and actively looking for potential sites, by not placing all known potential sites in the official inventory, by eliminating sites at high rates as they proceed through evaluation stages, and by deferring sites out of the program. The program is also constricted by delaying actions, by reducing the extent of cleanups, and by using low-cost remedies. All of these tactics and their effect on the environmental mission of the Superfund program, which EPA does not explicitly address when using them, are discussed elsewhere in this report.

Deferring Cleanups Elsewhere

Deferral moves sites *qualifying for the NPL* out of the Superfund program. EPA offered for consideration a deferral policy in the December 1988 proposed NCP. Even though near-term implementation of that comprehensive policy has been halted by public opposition, deferral has been occurring since 1982. Then, EPA stated that active RCRA facilities would not be placed on the NPL and asked for comments about its policy, at that time, of including mining sites.11

Less well known are deferrals practiced by the removal program. According to a 1988 paper, it is EPA policy that when time permits the regional office must "aggressively pursue cleanup' by a Potentially Responsible Party (PRP) or State or local government before initiating Superfund cleanups.[12]

EPA has justified deferral, not on an environmental basis, but on the basis that, because another cleanup authority exists, it is appropriate to defer to that authority. EPA does not determine a site will receive a quicker, better, or even *comparable*

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[8]U.S. Congress, Senate Report No. 96-848, 1980, p. 60. Post-CERCLA and with the development of the NPL, the term 'remedial action'' has taken on a legal definition. It is no longer just a reference to an environmentally needed cleanup but is a cleanup that qualifies for the Superfund program under CERCLA.

[9]50 Federal Register 5862, Feb. 12, 1985, p. 5867.

[10]Worst sites is a concept rarely defined. To some people it means complex sites; to others, sites that are expensive to clean up. Worst Cm also imply greater risks although when applied to NPL sites makes unfounded assumptions about the accuracy of HRS scoring. The worst sites can also be sites that pose current risks v. sites that pose future, speculative risks.

[11]47 Federal Register 58476, Dec. 30, 1982, p. 58478.

[12]Karen Burgan and Bruce Engelbert, U.S. Environmental Protection Agency, and Verna Montgomery, Booz, Mien & Hamilton, Inc., ' 'Setting Removal Program Priorities,' proceedings from *Superfund* '88, 9th National Conference and Exhibition, Washington, DC, November 1988, pp. 32-34,

cleanup if the cleanup is deferred to another program. According to several public interest groups:

> ... ***the*** [deferral] proposal is also devoid of any analysis of the likely environmental effects of deferral. [13]

Individual proponents of deferral do often assume that by scattering cleanups among more authorities and by avoiding the CERCLA process and procedures, the pace of cleanups will quicken. [14] That conclusion, however, ignores the limited national supply of technical resources and assumes that the process and procedures do not contribute to the desired CERCLA outcome and that other programs have the people and funding to handle additional work.

The real significance of avoiding CERCLA may be to encourage deferrals. EPA has reasoned that requiring States to "strictly conform to NCP requirements might result in fewer States choosing to undertake a site remediation that could be deferred. [15] As part of EPA's discussions with the Department of the Interior (DOI) to gain acceptance for the deferral of mine sites to DOI's Abandoned Mine Lands Reclamation (AMLR) program, a Superfund official said:

> EPA's position is that States choosing to use AMLR funds to clean up non-coal sites would **not be** subject to the standards and procedures prescribed in the National Continence Plan (NCP) [emphasis added] .16

In the December 1988 proposed deferral policy, EPA reasoned that expanding deferral of sites should be done because it ''may be appropriate' and because it will conserve CERCLA effort and funds for sites where "remedial action cannot be achieved by other means. "[17] Logically, this implies that, to the extent that other cleanup programs offer less stringent cleanups than Superfund, sites moving to other programs (or their communities) are penalized. EPA proposed to

> ... view the non-Federal [agency] section of the NPL merely as a list for informing the public of hazardous waste sites that appear to warrant CERCLA funding for remedial action through CERCLA funding alone [emphasis added].[18]

This shrinks the CERCLA program (and, perhaps, applicability) down to only those sites that cannot be deferred to other programs. It also appears to eliminate the listing of CERCLA enforcement sites (EPA suggests formally deferring those to responsible parties) since they would not be paid for with CERCLA funding.

The comprehensive deferral policy would turn the Superfund program into the "court of last Federal resort, ' which is not the same as saying that Superfund handles the *worst* sites. That is, a *worst* site (i.e., one with an HRS score of 28.50 or more) would be moved to another program if it qualifies under another program. Once there, however, it may receive a less stringent cleanup than if it were in Superfund, the public may get less of an opportunity to participate and could not obtain Technical Assistance Grants (TAGs), the Agency for Toxic Substances and Disease Registry health assessments would not be done, and cost recovery on sites that

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13 ''Comments of Natural Resources Defense Council, U.S. Public Interest Research Group, and National Audubon Society on U.S. Environmental Protection Agency's Proposed Rule for National Oil and Hazardous Substances Pollution Contingency Plan, " Mar. 23, 1989, p. 5.

14 In letters to OTA supporting cleanup deferrals to States, both the National Governor's Association and the Association of State and Territorial Solid Waste Management Officials say that foregoing the procedural requirements of the NCP will hasten cleanup actions but not Jeopardize the integrity of the cleanup itself.

15 53 Federal Register, Dec. 21, 1988, p.5 1418.

16 U.s. Environmental Protection Agency, Office of Solid Waste and Emergency Response, letter from J. Winston porter to Jed O. Christensen, director, Office of Surface Mining, Department of the Interior, Jan. 20, 1988.

17 53 Federal Register 51394, Dec. 21, 1988, p. 51415. See ' 'Cements of Natural Resources Defense Council, U.S. Public Interest Research Group, and National Audubon Society on U.S. Environmental Protection Agency Proposed Rule for National Oil and Hazardous Substances Pollution Contingency Plan," op. cit., footnote 13, for counter arguments to EPA's use of the "appropriate factors" clause of CERCLA to support the proposed deferral policy. These organizations say that EPA's interpretation ''ignores the clear thrust of the legislative history, and subverts CERCLA's carefully structured program to expeditiously identify, list, and remedy the worst sites in the country according to nationally uniform, protective standards' [p. 13].

18 53 Federal Register 51394, Dec. 21, 1988, p. 51416.

return to the Superfund program could be compromised.[19]

SUPERFUND STANDS ALONE

National programs to clean up the environment and protect the public have been a growth area ever since the 1970s. The Clean Water Act was enacted in 1972. Its premise was that, by slowing the rate at which contaminants were added to the Nation's surface waters, natural attenuation would eventually produce clean water. The same perspective was the basis of the Clean Air Act in 1970. The Clean Water Act also contains a provision allowing the Federal Government to act in emergency situations when petroleum products are spilled in waterways.

Superfund is unique because it is the first-and only—program designed expressly for environmental cleanup and for all media. Amendments under SARA in 1986 added sections on cleanup standards, which included a call for permanent remedies, and public participation, which provides for technical assistance grants. These are features that no other cleanup program has.

Other cleanup programs are not as stringently guided by statute or by current regulations.[20] Most other statutes have the kind of flexibility of the original Superfund statute (later rejected by Congress in SARA) that allow site-by-site decisions on the meaning of protection of human health and the environment. Public participation is mentioned in other statutes but not to the extent that it is in CERCLA.

Programmatically, most other programs-again, unlike Superfund-have dual roles. They set and enforce management regulations for active facilities while at the same time setting and enforcing cleanup regulations and procedures. Examples are the RCRA and Underground Storage Tank (UST) programs and those implemented by DOI under the Surface Mining Control and Reclamation Act (SMCRA) and the Department of Energy (DOE) under the Uranium Mill Tailings Radiation Control Act (UMTRCA).[21]

For dual programs, cleanup goals may clash with other program goals. For example, the RCRA program has identified the preservation of adequate waste management capacity as a critical item of Concern.[22] Thus, at active RCRA sites EPA (and States) must balance their regulatory responsibilities to compel cleanup with their goal to keep sufficient treatment and disposal facilities open. Additional pressure arises from the congressional requirement in SARA that States provide assurance that capacity will exist to manage hazardous wastes or face the loss of Superfund cleanup funding.[23]

One stated mission of the management side of many dual programs is to ''prevent Superfund sites. '' The phrase implies either preventing uncontrolled sites from being abandoned or from becoming expensive, complicated sites, or both, Future Superfund sites are also prevented by proper management practices and, more fundamentally by not generating hazardous substances that need to be managed.[24] Thus, a major contribution to the national cleanup effort each regulatory system could provide is to encourage pollution prevention and to provide early warning and site discovery. The latter entails having both effective inspection and enforcement, which is often lacking,[25] Under the Leaking Underground Storage Tank (LUST) regulations, EPA rejected, as too costly, a requirement that implementing agencies actively seek out tanks that have been abandoned.

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[19] EPA argued in the proposed policy that Provisions could be made to retain these features but they would add to the costs of cleanups.

[20] Alone among the Federal programs OTA reviewed, RCRA corrective action *may eventually* have regulations or guidance that is similar to Superfund. However, the program has been underway for 4 years without regulations and very minor guidance, allowing for maximum flexibility. Meanwhile, sites are being studied, remedies are being selected, and cleanups are occurring.

[21] Both the DOI and DOE programs deal with mine waste problems. Most of the information in this chapter on the DOE and DOI programs relates to the cleanup of *inactive* sites. Under SMCRA, the DOI's Abandoned Mine Lands (AML) program remediates both coal and noncoal mine areas. The DOE program is narrow; it only has authority over uranium mill tailings that are a consequence of processing uranium mine ores.

[22] U.S. Environmental Protection Agency, *The Hazardous Waste Management System*, 1987.

[23] SARA, Section 104(k).

[24] See OTA's *Serious Reduction of Hazardous Wastes* and *From Pollution to Prevention: An Update on Waste Reduction*.

[25] See, for instance, General Accounting Office, *Hazardous Waste Facility Inspections Are Not Thorough and Complete*, GAO/RCED-88-20, November 1987,

Cleanup programs differ among themselves in other ways. For example, the UMTRCA inactive uranium mill tailings and AML mine cleanup programs are like Superfund in that the government is responsible for evaluating sites, making remedy decisions, and doing the actual cleanups. Others are purely enforcement programs in which the government role is to coerce others, through administrative or court orders or negotiation, to evaluate and clean up sites. Usually, in the latter case, the government holds an oversight role but, as OTA's work on the Superfund program has shown, oversight is dependent on having sufficient resources and expertise, Like Superfund, "but unlike other programs, the LUST program does have a trust fund to handle cleanups it cannot get done through enforcement, The AML program is a hybrid. It has no enforcement provisions and is funded by taxes collected from the coal industry. AML funds cannot be used for a cleanup if a responsible party is known. Thus, once a PRP search is successful under Superfund, a mining site becomes ineligible for the AML program.

Contracting Links All Programs

In all of the programs, including Superfund, consultants and contractors are heavily relied on to do some or all of the study and field work. The South Carolina State program, for instance, has three major contracts that consume most of the available resources: 1) a remedial activities (physical cleanup work) contract, 2) an RIFS study contract, and 3) an emergency response contract.[26]

By and large the contractors hired for other programs are the same firms that Superfund hires. For instance, NUS has a contract to survey DOE's facilities; Ebasco Services, Inc., won NASA's site evaluation contract; and Roy F. Weston has a DOE and several U.S. Army contracts. The UMTCRA program at DOE is contracted out to a joint venture of Jacobs Engineering and Roy F. Weston. In California, of seven State remedial contracts, five with a total value of $23.5 million were held in 1988 by Superfund contractors.[27] As discussed later, this expanding but largely inexperienced workforce adds stresses to Superfund, as well as the other programs,

Programs Proliferate

Despite its unique role, Superfund has not been used to incorporate new cleanup efforts. Three other cleanup programs were created prior to 1980 when CERCLA was enacted; the other programs were created since then. Instead of building a comprehensive cleanup effort by adding newly recognized problems to existing programs, Congress has filled the gaps by building new, separate programs.

The growth of cleanup programs has followed the Nation's traditional structure of single media environmental programs and the existing authority for mining issues. That is, as knowledge about a new cleanup problem has become available, its solution has been crafted within the confines of existing structure. As each separate program is developed, its authority excludes that given to existing programs. Thus, CERCLA prevents the Superfund program from handling certain uranium mill tailing cleanups already handled under UMTCRA and the LUST program cannot clean up hazardous wastes released by underground storage tanks regulated by RCRA. The Superfund program has spawned new programs. Most State programs were created or existing ones enhanced to handle sites excluded by Superfund policy decisions. Widely held views that Superfund requirements are *too* stringent or costly and that its implementation is too burdensome and slow has supported political pressures to exclude certain types of facilities or substances from CERCLA.

Two cleanup problems—marine sediments and oil spills—not adequately covered by Superfund or other existing authority are being discussed; either could end up as separate programs or be closely linked to or subsumed into Superfund. The Superfund trust fund is excluded by statute from being used to clean up petroleum products, whether released on land or discharged into the Nation's waters. Under the NCP, however, the Superfund removal program or the Coast Guard responds to oil spill emergencies covered by section 311 of the

[26] South Carolina Department of Health and Environmental Control, ' 'Report to the South Carolina General Assembly, Hazardous Waste Cent.mgency Fund Activities, July 1, 1986- June 30, 1987, p. 14. ASTSWMO found in 1987 that 33 out of44 States had a total of $258 million available for contractors.

[27] Included were Metcalf and Eddy, CH2MHill, Dames and Moore, Tetra Tech, and ***Ecology*** and Environment.

Clean Water Act. Incidents such as the March 1989 spill in Valdez, Alaska, and the Ashland Oil spill in January 1988 have pointed out deficiencies. For instance, critical time delays can occur because of a presumption that, even in an emergency, the Federal Government should allow the responsible party to take initial action. Low funding has also limited Federal response capabilities. Congress is now considering legislation that would broaden Federal powers.[28]

Toxic marine sediments can be cleaned up under Superfund but, because few of the potential hundreds of sites are, a comprehensive, separate program is being advanced by advocates of an Aquafund. The majority of known sites are not in the Superfund program because current HRS scoring does not account for sediments as a unique media or for their biological impacts .29 Thus, an alternative to creating a separate program is to make relatively simple adjustments in Superfund. This would greatly increase the size and cost of the Superfund program but bring technically similar problems under the same authority. A National Academy of Science report says that contaminated marine sediments are widespread throughout U.S. coastal waters, Preliminary estimated costs of cleaning up just 10 of 30 known contaminated areas in the Great Lakes range from $2.9 to $3.4 billion.[30]

ARE OTHER PROGRAMS THE SOLUTION?

All of the actions taken and being taken to limit the Superfund program can be rationalized. They do not, however, necessarily assure that Superfund's environmental or public health benefits will remain intact. Limiting the Superfund program's scope and workload, however, might allow the Superfund program to improve its public image, Or, as some public interest groups say, ". . . maintain an illusion of progress on the NPL. ' '[31] Indeed, that objective seems to have overridden concerns about the potential for a reduction in environmental protection because of less stringent cleanups outside of Superfund.

The National Costs of Cleanup

The policy of reducing Superfund's work does not limit national costs. It just shifts costs around and in the process might even increase overall costs. If cleanups are necessary, someone pays and not always under the Superfund principle of "polluter pays. " Superfund monies come mostly from industry with a relatively small contribution from general revenues. All of the Federal programs-even those that rely on enforcement for cleanup-receive some funding from general revenues to pay for developing program rules and regulations and for oversight, monitoring, and enforcement costs.

Table 4-1 shows that the annual budgets of the programs, excluding Superfund, add up to at least $1.7 billion per year. Estimates for future national costs are very uncertain but may be greater than $600 billion. Comprehensive data on the current cost of all the State cleanup programs is not readily available. The Association of State and Territorial Solid Waste Officials (ASTSWMO) reported data on State funding mechanisms in 1988. Out of 50 States, 39 collected an average total of almost $300 million per fiscal year to pay for cleanups. Based on available, current budget data, OTA has estimated that States are spending about $500 million of their own funds for cleanups.[32]

The real issue is *how well these* other programs are funded and *how good our* knowledge is about future resource needs. If the other programs are underfunded they will have difficulties handling their own

[28]For example, the Senate passed S.686 in August 1989 that would create a $1 billion cleanup fund and provide for timely Federal emergency response. This bill would not necessarily set up a separate response capability but could, instead, enhance the existing structure.

[29]Examples of Sites that have scored hi@ enough to get on the NPL are Waukegan Harbor (Outboard Marine), Sheboygan Harbor, and Ashtabula (Fields Brook) in Region 5.

[30]Cate Leger, Northeast. Midwest Institute, ''Cleaning up Great Lakes Toxics Hotspots: How Much Will It Cost; How Can h Be Paid For?' September 1989.

[31]''Comments of Natural Resources Defense Council, U.S Public Interest Research Group, and National Audubon Society on U.S. Environmental Protection Agency's Proposed Rule for National Oil and Hazardous Substances Pollution Contingency Plan, " op. cit., footnote 13, p. 6.

[32]Many States Supplement their resources with Federal Superfund monies. EPA's Superfund budget includes about $200 million each year for States, which are granted through Cooperative Agreements and CORE funding. Kansas, for instance, has been getting $300,000 per year; New Jersey, about $2 million. Minnesota pays for 31 staff with Federal funds.

problems. This would create two problems for Superfund. First, other programs may be unable to take deferrals from Superfund. And, if resource needs for Superfund are based on deferrals that will not occur, then Superfund has underestimated its needs. Second, underfunded programs may be under pressure to compromise extent of cleanup. Sites with incomplete cleanups could eventually become Superfund problems. This ultimate outcome can also occur as the result of programs that are structured and funded as enforcement programs, for which current government costs are relatively low. As OTA has shown in chapter 3, enforcement cleanups that are the result of negotiated settlements tend to compromise cleanup goals.

If estimates about the future are based on poor information that causes underestimates, then the Superfund system will be in periodic, perpetual crisis. It appears that the Superfund program, although it frequently doesn't use it, has some of the best information available with which to predict the future need for cleanups. All cleanup programs tend to collect, with varying degrees of effort, their own list of potential or known sites needing cleanup. There is no coordination among lists, no common definitions, no understanding of possible duplications. These multiple, noncomparable lists severely complicate the Nation's ability to understand the full nature and extent of its cleanup needs (see ch. 2).

Comparative Costs, Availability of Funding

There is no evidence to suggest that programs other than Superfund are more efficient, i.e., provide quality cleanups at lower cost to the public. As discussed below, many cleanups outside of Superfund are less stringent than ones inside it, Nor is there evidence that other programs have the funding available to support deferred cleanups from the Superfund program. In some cases the programs do not have the resources to handle their own problems. State programs that emphasize enforcement do not do so because of the quality of site cleanup received but because it means that more sites can get attention. In other words, States rely on enforcement to expand their constrained resource base.[33]

Some States do assert that their programs, unencumbered by the "cumbersome bureaucratic/ administrative practices under CERCLA are more efficient, but there are no statistics to show whether State transaction costs are higher or lower than those of Superfund.[34] Available data on State average costs per site are considerably less than Superfund's (at $30 million per site) .35 California, among State programs, may have the highest average cost per site at $2.7 million; most States appear (o pay between $200,000 and $500,000 per site. These average costs are much lower than Superfund's because low cost containment and disposal options are often chosen by State programs and because States have a higher proportion of smaller sites to clean up than does Superfund. In fact, State cleanup spending is more comparable to the Superfund removal program.

The RCRA corrective action program relies totally on enforcement to get sites cleaned up. Even then, it has a budget that seems unrealistic, especially since that it may rival Superfund in number of sites needing remediation. For fiscal year 1989, EPA requested $14 million for this national program, an amount equal to 1 percent of the annual Superfund budget. The effect of low budgets is that Regions, which implement the program, either have to delay issuing orders to owners to clean up sites or to provide less oversight than necessary, or both. Either way, public health and the environment can suffer.[36]

The Federal UMTCRA program appears to be less efficient than Superfund. It has spent $474 million in its 10 years, through fiscal year 1988, and claims to have remediated 2 of the 24 sites in the program. The program projections are that another $500 million will be spent to finish remediation of all the sites, *excluding* contaminated groundwater. Funds for cleaning up groundwater, estimated at $800 million,

[33]Over 80 percent of *all* State cleanups are enforcement, according to a 1988 statement made by J. Winston Porter, then EPA assistant administrator in charge of Superfund.

[34]Minnesota spends 65 percent of its annual budget on administrative costs, half of which is to secure commitments from responsible parties. OTA has found (see ch. 1) that EPA spends 44 percent of the Superfund budget on administration and management activities.

[35]According t. Federal Register notices, current Superfund total cleanup costs are about $20 million, including capital and *Jong-term operating* and maintenance costs. EPA's June 1989 ''Management Review of the Superfund Program report states that costs are higher, about $30 million per site.

[36]Low finding and these kinds of consequences are discussed in an EPA document, ''Draft Corrective Action Outyear Strategy,' that reflects the views of EPA headquarters and regional staff expressed during workshops held in early 1989,

are not yet budgeted. At $1.8 billion for 24 sites, the program is projected to cost over twice as much per site ($74 million) than the Superfund program. Although UMTCRA sites are large, they are all similar to one another (i.e., uranium mill tailings) and do not each present radically different engineering challenges. The standard remedy in the UMTCRA program is the relatively cheap option of earthen containment, which, even for large sites, is relatively low cost.

While a few States have managed to stretch their available Federal AML funds to cover needed mine cleanups, nationally the program has long been recognized as one that is underfunded. Given the program's tax rate (its source of funding) and the short time that is left under its authorization, DOI estimates-based on the numbers of projects remaining that qualify for AML funds—show that there may beat least a ***$2*** billion shortfall. The future viability of the program will be determined by whether *or* not and how Congress extends SMCRA taxing authority beyond 1992.

Limited Technical Expertise

When EPA defers cleanups from the Superfund program, the agency does not consider whether the programs to which the sites are deferred have adequate resources. All the cleanup programs are, in fact, linked together by the national pool of technical expertise and technology. Cleanups, whether they be asbestos from schools or mine wastes or toxic wastes, all require the same basic technical expertise and often the same technologies. People are needed to collect relevant site information, analyze the data, develop remedial alternatives, perform tests, and carry out remedial action. Similarly, the same commercial treatment and disposal facilities are the ultimate receivers of wastes from Superfund, Federal agency, and State cleanup sites.

Private contractors aggressively compete for expertise among themselves and with Federal and State agencies. A real possibility is that the expansion of other cleanup programs will only exacerbate the workforce and contractor problems felt by Superfund. The burgeoning growth of cleanup programs is causing the supply of expertise to be outstripped by the demand. For all programs, this will drive up the cost of cleanup (i.e., as wages are pushed up) but lower the quality of the work (as the pool of expertise is stretched thin).

The evidence of talent constraints is compelling. Staff in the RCRA corrective program say that EPA is at a disadvantage in negotiating cleanups with owners and operators of RCRA facilities. Not only do industrial representatives have better technical backgrounds and experience, they also have greater knowledge of EPA and its operations. As soon as EPA's people gain experience and skills, they are recruited by private industry and contractors and move to the other side of the table.

State programs always seem to be the most disadvantaged. Arizona, according to the assistant director of Arizona's waste programs, has a 36 percent personnel turnover rate; most leave for "better-paying jobs in industry. "[37] The New York program has identified "shortage of experienced staff' as one its major issues. The consequences are a slowdown in progress at State sites and reduction in the oversight of PRP field work. The latter will ''increase the risk that responsible party and other cleanups will be improperly performed and will require additional work in the future. ' '[38] New York claims that it is having to compete for qualified personnel with the Federal Government, other States, and consulting fins.

For two of the Federal cleanup programs—Superfund and asbestos in schools—the problems caused by the mismatch between supply and demand have been detailed. OTA's report, *Assessing Contractor Use in Super-fund* (and work by the General Accounting Office, EPA's Inspector General, and environmental groups), concluded that poor technical performance has been a problem in the Superfund program, not all of the time, but all too frequent.ly. As OTA said:

> Much of this results from the rapid initiation and expansion of the program and the enormous pressures imposed by the public and Congress to perform

[37] Norm Weiss, assistant director for waste programs, Arizona Department of Environmental Quality, as quoted in the Phoenix New *Times,* Mar. 15, 1989.

[38] New York State, Department of Environmental Conservation, ''New York State Inactive Hazardous Waste Site Remedial Plan Update and Status Report," Oct. 30, 1987, p. vii.

quickly. The limited number, limited experience, and high turnover of EPA's staff has made it very difficult for EPA **to assure the** environmental performance and economic efficiency of Superfund's contractors all of the time. And the problem is compounded by the inexperience and high turnover of workers for contractors, resulting from the explosive growth of that industry .39

The asbestos in schools program [under the Asbestos Hazard Emergency Response Act (AHERA)] has also shown the negative effect of expansive growth. Not only has demand for contractors increased but it appears that the expertise does not exist to properly oversee their work. Various business analysts have estimated that the demand for asbestos evaluation and cleanup has caused the creation of some 2,000 new firms in the past few years. The market is expected to grow from a current $2 billion per year to $6 or $7 billion in a few years and to $100 billion in 20 years.@ During congressional hearings in 1988, a member of a school board in New York State told Congress:

> . . . a serious problem exists concerning the quality of work being performed by consulting and contracting companies . . . AHERA has set up a situation where the group that is calling the shots is the newly created group of asbestos consultants and removal contractors. These people are, by and large, not at all driven by health and safety considerations, but by economic considerations. And it is their economic self-interest, not the school districts', which concerns them most.[41]

The EPA Inspector General reported at the same hearings that proper asbestos work practices were expensive thus the incentive to circumvent them was great and results in large profits for contractors,[42]

Additionally, EPA, which is responsible for training and certifying asbestos abatement fins, doubts that the supply of trained asbestos professionals will be sufficient to meet the time frames set out in AHERA. The agency has used this inadequate infrastructure of accredited personnel and enforcement staff' as one of its major arguments against extending asbestos regulations to public and commercial buildings.[43]

On the plus side, the set of national cleanup programs offers an opportunity for sharing of technical expertise and knowledge that could improve the performance of all programs. This kind of technical transfer is difficult because each program has its own regulations and procedures that can cause individuals in one program to view the work or knowledge gained in other programs as irrelevant or inappropriate. Even within the Superfund program, OTA has found examples of poor technology transfer among regions, headquarters, and EPA's own Office of Research and Development. Although certain individuals may seek outside information, mechanisms have to be created to facilitate the sharing of information for the benefit to accrue systemwide.

Confusion Among Overlapping Programs

As the venn diagram in figure 4-1 shows, while some programs pick up where another leaves off, many have overlapping jurisdictions. At the same time, there are sites that remain outside the existing structure, such as marine sediments. While the problem of sites without cleanup authority is obvious, overlapping jurisdictions don't just double the coverage but cause competition for control of a site and can increase expenditures.[44] It is overlapping jurisdictions that makes the deferral of Superfund sites possible.

Overlapping jurisdictions are not necessarily intentional but are often caused by differing bases for programs, For instance, Superfund coverage is based on the presence of a hazardous substance. (Hazardous substances are a collection of pollutants defined

[39]U.S. Congress, Office of Technology Assessment, *Assessing Contractor Use in Superfund, OTA-BP-ITE-51* (Washington, DC:U.S. Government Printing Office, January 1989).

[40]See, for instance, "Why Throw Money at Asbestos, " *Fortune,* June 6, 1988, and "Cleanup Dollar Flow Like Water But industry Is Awash In Problems," *ENR Special Report,* Mar. 9, 1989.

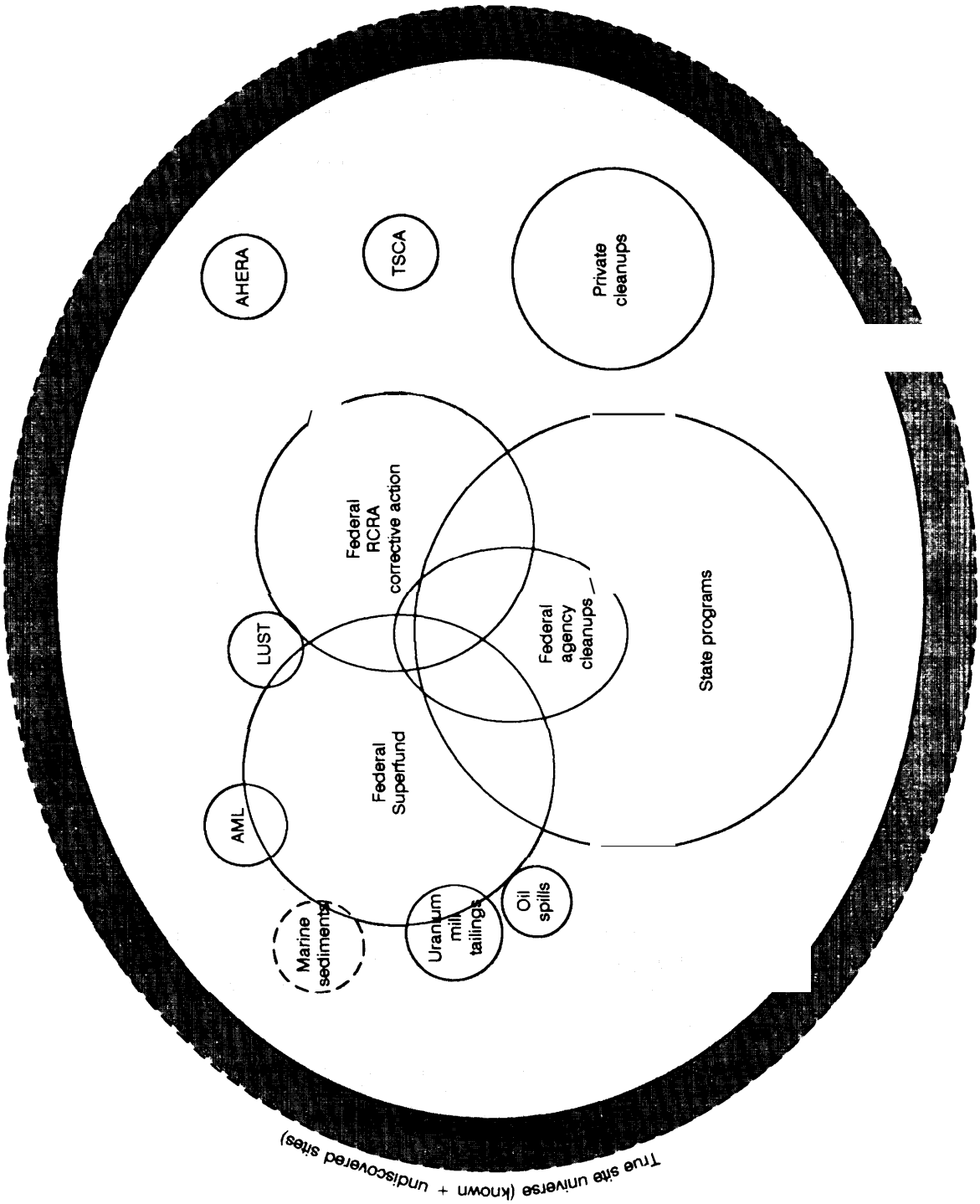
[41]Bill Kitchen, member of the Johnstown, N, Y., schoolboard, hearings before the Environment, Energy, and Natural Resources Subcommittee of the Committee on Government Operations, House of Representatives, June 1, 1988.

[42]Donald E. Kirkdendall, Deputy Inspector General, U.S. Environmental Protection Agency, June 1, 1988.

[43]54 Federal Register 13632, Apr. 4,1989. p. 13636.

[44]Startup costs increase national costs. In the first 2 years of the LUST program, 50 percent of the fund money distributed to States was spent for administrative costs to develop programs.

Figure 4-l-The National Cleanup Effort



SOURCE: Office of Technology Assessment, 1969.

by other environmental statutes or regulations, less those substances that Congress has explicitly excluded from program authority.) The discovery of a hazardous substance, which has been released and is uncontrolled, any where in the Nation, can be remediated by the Superfund program.

RCRA and LUST corrective action programs, on the other hand, are based on a community of regulated facilities. In the case of RCRA, Subtitle C regulations cover the management of hazardous wastes by treatment, storage, and disposal facilities (TSDFs). Because all hazardous wastes are hazardous substances, all RCRA corrective actions could, theoretically, be included under Superfund. Only some are because EPA has decided-through its NPL policy—to keep cleanups in the RCRA fold to the maximum extent possible.[45]

Included in the LUST program are regulated underground storage tanks (USTs) that contain either petroleum products or hazardous substances (except those hazardous substances that are at the same time hazardous wastes). Because the Superfund statute excludes petroleum products from the definition of hazardous substances and most USTs store petroleum products, the Superfund program can only handle a minor portion of the problems caused by USTs. And, because of the exemption of hazardous wastes in the LUST statute, USTs with hazardous wastes fall into the RCRA program. Thus, cleanups resulting from leaking underground storage tanks can be (and are) handled by Superfund, RCRA, or LUST programs.

EPA's deferrals map the overlaps between Superfund and other programs. EPA has and is deferring cleanups to RCRA (Subtitle C facilities) and UMTRCA programs and would have been to the AML program except that restrictions on that program have prevented deferrals. But, one AML site--Colorado Tailings-has moved into the Superfund program. Pending deferrals are to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), RCRA (operating Subtitle D landfills), LUST, and States.[4b] (EPA has also proposed deferring cleanups to PRPs, which would move cleanups outside of the government and into the private sector,)

Early in Superfund's history, EPA made open attempts to exclude mine site cleanups from the program. Those attempts were thwarted by court rulings and congressional action. Current policy is to defer mine waste cleanups to the AML and UMTRCA programs in the cases where those programs are broad enough to have authority. UMTRCA cleanup of tailing sites belonging to *inac[ive* mills is restricted to 22 sites identified specifically by statute, plus **2** sites added by DOE; CERCLA excludes these sites from Superfund. Superfund deferrals are made to the *active* mills cleanup program. The AML program for noncoal sites is restricted by the fact that any State has to cleanup its coal sites before it can proceed with noncoal problems, unless the Governor declares an emergency. So far, only Wyoming is reaching the end of its coal cleanups and is the only State that may in the near future be able to use AML funds for cleanups deferred from Superfund.

Except for those to the RCRA Subtitle C corrective action program, relatively few official deferrals have occurred from Superfund. It is the future that EPA may be most concerned about. For instance, OTA estimated in 1985 that 5,000 municipal landfills may require cleanup. EPA data indicates that, as of July 1988, only 220 landfills were on the NPL. While this is only 4 percent of a large universe, it is a significant fraction of the NPL (almost 20 percent) and represents a growth rate of about 10 percent per year since 1986.

Overlaps in program authority cause situations in which a particular site is simultaneously or sequentially handled by different programs. The decision of which authority prevails is sometimes made by the Superfund deferral policy but not always. For Federal agency NPL sites a negotiated agreement between EPA, the agency, and the State determine the cleanup authority. Under the UST regulations, EPA has made the UST implementing agency

[45]EPA policy on cleaning up RCRA Subtitle C sites under Superfund is based on criteria outlined in the Federal Register on June 24, 1988, pp. 23978-23986. Basically, a finding must be made that site owners are bankrupt or otherwise lack financial capability or have shown unwillingess to proceed with a RCRA corrective action.

[46]FIFRA has no corrective action provisions, and the proposed Subtitle D corrective action rules address groundwater only with no attention to contaminated soil, surface water, or air.

(which can be a State or local agency) the determinator of whether it or CERCLA will govern a cleanup qualifying for either program. And, States can effectively defer cleanups to themselves by not entering sites in EPA's CERCLIS inventory database.

Complying with a varying set of rules can be frustrating. At an Air Force installation where EPA and the State were pushing for an Interagency Agreement (IAG), a RCRA permit, and a State action, the base commander was quoted by a congressional report as saying:

> ,.. the use of these three separate procedural frameworks to address the same problem places the AF in an untenable if not impossible situation, questions of efficiency aside. Compliance with one set of procedures may or may not satisfy the requirements of the other's procedures. It is entirely conceivable that compliance with one set may violate another's, especially in the area of scheduling of activities and prioritization of sites.[47]

Two of the many sites with overlapping authorities are detailed in boxes 4-A and 4-B. The first covers a private sector site in Arkansas; the second, a controversy over Basin F, a part of the huge Rocky Mountain Arsenal site in Colorado.

There have been a few attempts to officially coordinate or integrate the various cleanup programs or the flows of sites between them. One recent example is EPA's "Environmental Priorities Initiative. " This plan routes potential RCRA corrective action sites through the existing Superfund program's preremedial site evaluation process. EPA argued that this initiative will ''enable the Agency and the States to identify and cleanup first those sites that present the greatest threat to human health and the environment. ' Since the system being used to evaluate RCRA sites is the system currently in use in the Superfund program and since, as OTA has shown in chapter 2, it does not necessarily accomplish that goal for Superfund sites very well, it should not be expected to do so for RCRA sites. Nevertheless, there may be gains from this initiative through the reduction in RCRA program costs by using art existing system, rather than developing a new one exclusively for RCRA, and because of the time saved by not having to wait for the development of a separate evaluation system. However, delays have occurred in implementation; the high priority sites that were to get preliminary assessments in fiscal year 1989 had not, as of July 1989, been entered into the CERCLIS inventory, a step that precedes evaluation.

Different Programs, Different Cleanups

If cleanups conducted by other programs are as permanent as Superfund cleanups are supposed to be, there should be no future impact on the Superfund program. Unfortunately, most evidence shows that other programs tend to choose containment onsite or removal of contaminants to commercial or especially designed land disposal sites. The Superfund program had the same focus before SARA was passed in 1986; its enforcement side still has.

Superfund is the only Federal cleanup program that has a statutory basis for cleanup standards (''applicable or relevant and appropriate' standards, called ARARs) and has been pushed by Congress toward permanent remedies through the use of treatment technology. Both the basis for standards and the cleanup preference came with the 1986 reauthorization of, and were reactions to deficiencies in, the Superfund program. All of the other Federal cleanup programs-by statute and regulations-leave the definition of *protection of health and the environment* pretty much up to individual site decisions. While this, by itself, does not necessarily mean that site cleanups will be inconsistent around the country, it does mean that there is no guarantee that they will be consistent with Superfund cleanups.[49] As for State cleanup programs, J. Winston Porter, then EPA's assistant administrator responsible for the Superfund program, said in 1988: "There is some concern about cleanup standards-whether

[47] U.S. Congress, "A Report to the Committee on Appropriations, U.S. House of Representatives, on the Department of Defense Environmental Restoration Fund," August 1987, p. 23.

[48] U.S. Environmental protection Agency, Office of Solid Waste and Emergency Response, "Annual Report, Fiscal Year 1988, " EPA/68-01-7259, November 1989.

[49] During the Senate debate on the SARA amendments, Senator Chafee stressed that the Superfund standards were the minimum allowable for Superfund cleanups and that 'compliance with standards promulgated under the authority of other laws will not necessarily assure compliance with this general standard. " [132 Congressional Record S14925, Oct. 3, 1986.]

Box 4-A—From RCRA to the State to Superfund: Vertac Site, Arkansas

The Vertac site is an **example of a RCRA enforcement site that turned into a State site and a Superfund site. A cleanup delay of almost 2 years, so far, has** occurred because enforcement **failed and the State** did not have sufficient funds to contract for the necessary work. Now, Superfund is involved in supporting the State cleanup action and has taken on the responsibility to finish the extensive cleanup remaining for the site. And, if an impermanent initial action done by the responsible party fails, Superfund may have to redo that work.

Vertac Inc., was still operating a chemical plant on the property when it became a Superfund site in 1983 with an HRS score of 65.46. **Also in 1983 a RCRA consent order was signed; Vertac agreed to set aside $10.7 million (a trust** fund plus a letter of credit) for necessary cleanup and to handle an initial cleanup that consisted of onsite disposal of contaminated liquids and solids. Although both the State **and EPA objected to the way** Vertac proceeded with the work, the judge on the case ruled that **Vertac was** complying with the order.

In January 1987, Vertac abandoned the property and subsequently filed for bankruptcy. That left the State with the job of finding a treatment company to incinerate over 27,000 drums of materials contaminated with dioxins and chlorinated phenols that had been found onsite. Meanwhile, the trust fund had become caught up in litigation by the shareholders of **Vertac, and** questions were raised as to whether there were sufficient funds to cover incineration. Negotiations with the first company selected by the State for the incineration job failed because IT Corp. asked for $15 million, which the State could not afford. As of June 1989, the State has found one company-MRK-who has agreed to incinerate the drums and material for the available $10 million.

But, more cleanup remains. The Region 6 Superfund program tried in early 1988 to obtain approval for funds to supplement the incineration project (including an air monitoring plan, ash disposal, and a delisting petition) and to proceed with an RIFS to cover the remaining contamination onsite, which includes the plant, buildings, tanks, and surrounding areas. The funds were denied in fiscal year **1988.** Region 6 has now completed a plan for an interim action, costing $2 million, to support the incineration job, and those funds are available. The region is also in negotiation with Hercules Corp., who owned the plant prior to Vertac, to do an RIFS for the additional work needed onsite. There are also offsite problems involving contaminated creeks, a sewage treatment plant with contaminated sewer lines, and a stream with contaminated sediment yet to be studied.

Although site cleanup appears to be finally underway, there is future uncertainty about the initial onsite disposal facility completed under RCRA in 1986. It is leaking and a more permanent solution-a second cleanup may be necessary for "Mt. Vertac" as the initial cleanup is known locally.

cleanup levels are equivalent [to Superfund], and so forth. ' '[50]

Federal Programs and Their Regulations

EPA has acknowledged a difference between Superfund and other Federal program cleanups. Under the proposed deferral policy, EPA said other Federal programs". . . do not necessarily present the same level of assurance of remediation that meet the environmental protection standards of CERCLA' '[51]

A partial review of the basis for some programs' cleanups provides insight into the varieties of cleanups that are to be expected, since there is no reason to assume that any program will follow rules other than its own:

- For the LUST program, EPA decided to allow a site-specific approach to standards that it says will "adequately protect human health and the environment. '[52] Earlier EPA suggested three options: 1) national standards, 2) site-specific standards, or 3) a combination of both dependent on groundwater classification schemes. Site-specific standards were chosen not for their environmental strengths but because they would accommodate existing State programs, minimize the overall regulatory impact on

50 J. Winston Porter, speech at *Superfund* '88, 9th National Conference and Exhibition, Nov. 28, 1988.

51 53 Federal Register 51394, Dec. 21, 1988, p. 51418.

52 53 Federal Register 37082, Sept. 23, 1988. p. 37174.

Box 4-B-CERCLA v. RCRA: Basin F at Rocky Mountain Arsenal

Federal agencies often find themselves caught between EPA and CERCLA and States and RCRA. CERCLA gives States only a consultant role in Federal agency cleanups. States view this role as inadequate and the enforcement relationship of EPA, the Department of Justice, and Federal agencies as one with a high potential for conflict of interest. Thus, States with RCRA authority generally prefer that Federal agency cleanups be conducted under RCRA giving States greater leverage. Portions of Federal agency NPL site cleanups are officially placed under RCRA corrective action through an interagency agreement drawn up on sites.

The cleanup of Basin F, part of the Rocky Mountain Arsenal site in Colorado, has been caught up in this CERCLA/RCRA issue. The dispute between the State and the Army involves which authority takes precedence and ultimately what kind of cleanup will occur and how fast. Basin F has also been affected by changing EPA deferral policy.

Basin F was added to the existing Rocky Mountain Arsenal NPL site in March 1989. It had been originally excluded when Rocky Mountain was proposed for the NPL because EPA believed that Basin F would be subject to RCRA corrective action and thus, under the agency's RCRA deferral policy of September 1983, might be appropriate for deferral. Subsequently, EPA decided that Federal agency facilities that qualify for RCRA corrective action will not be deferred from listing (as is done for non-Federal sites).[1] That changed policy meant that Basin F should be included instead of excluded.

The U.S. Army constructed Basin Fin 1956 to store and dispose of contaminated liquid wastes; Shell Oil also contributed wastes. Approximately 240 million gallons of hazardous liquids and an estimated half a million cubic yards of contaminated soils resulted. The Army has projected the cost of cleaning up Basin F to be about $42 million; a ROD is scheduled for 1993.

The Army implemented a two-part strategy; an interim action has been taken to reduce existing migration pending the decision on a final, permanent remedy. The liquids were moved to holding tanks and surface impoundments and the soil was excavated and placed in a double-lined waste pile. The State and local citizens have been against the Army taking the interim action, preferring that the contaminated materials be removed from Basin F and disposed of elsewhere. They have subsequently criticized the effectiveness of the interim solutions. The case of Basin F went to court over whether or not CERCLA can preempt the State's ability to enforce its own regulations and RCRA corrective action. The judge issued a memorandum of opinion that the State of Colorado has authority over the Basin. Thus, the legal answer here seems to be that CERCLA does not preempt RCRA. According to the ruling:

> It is not inappropriate that the present and future victims of this poison legacy, left in their midst by the Army and Shell, should have a meaningful voice in its cleanup. In RCRA, Congress has plainly provided them that voice through representation by the State. I hold that RCRA enforcement by the State is not precluded by CERCLA in the circumstances here presented.[2]

[1] 54 Federal Register 13296, Mar. 31, 1989.

[2] "Memorandum Opinion and Order," in *Colorado* v. *the U.S Army*, U.S. District Court, Denver, CO, Feb. 24, 1989.

small businesses, and reduce the cost of compliance for all owners.[53]

. When cleanups of PCBs occur under the Toxic Substance Control Act (TSCA), the cleanup levels are based on the standards in the regulations but can vary, as occured in the Texas Eastern Pipeline case (see later).

. Cleanup rules for uranium mill tailings differ depending on whether the cleanup is of an active or inactive mill. For active sites, RCRA corrective action regulations apply and cover both radioactive substances and hazardous wastes; for tailings at inactive sites only radioactive substances are covered. EPA stated in proposed groundwater standards that inorganic and organic hazardous constituents ***should*** be assessed rather than stating they must despite the conclusion that the "concentrations

[53] 52 Federal Register 12662, Apr. 17, 1988, p. 12681. EPA asserted that national standards would not necessarily assure national consistency.

of (nonradioactive) materials vary from pile to pile, ranging from 2 to more than 100 times applicable standards. ' '[54]

- For the AML program, neither SMCRA nor the resultant regulations require the use of any specific methods or application of specific cleanup standards. Implementing agencies are directed, instead, to a guidance document written in 1980, which suggests that containment methods be used for toxic materials.[55] A National Academy of Sciences report that reviewed the program in 1986 supports that approach and suggests covering the materials with ''impermeable clay or capping them with synthetic materials. "[56] There is no requirement for groundwater cleanup.

For the RCRA corrective action program, no cleanup regulations have yet been issued. EPA has made a number of statements that the RCRA rules. when published, will be similar to Superfund's. In testimony before Congress in 1987, the head of EPA's Superfund program claimed that 'the level of environmental protection provided by a cleanup proceeding under RCRA authority should be the same as that under CERCLA. ' '[57] Meanwhile, cleanups underway are based on existing regulations (that only cover groundwater contamination) and a guidance document, ''National RCRA Corrective Action Strategy,' issued in 1986. The only advice in that document about cleanup standards is: ''. . . final remedies will . . . be required to meet applicable health and environmental standards promulgated under RCRA and other laws' [emphasis added] .5x There is no statement about preference for permanent cleanups.

Currently, differences do exist between Superfund and RCRA as a report released by the House Committee on Appropriations on DOD's Environmental Restoration Fund pointed out. The report says that ''generally RCRA remedial actions tend to favor containment as a technical solution, while SARA remedial actions are mandated to favor permanence of remedy for treatment technologies. "[59] In an example covering one potential cleanup, the report said an EPA RCRA program manager stated that he would approve a remedy that consisted of containment with monitoring for metal-contaminated soils. The CERCLA program manager stated that he would not approve of containment and that perhaps soil washing combined with other emerging technologies would be required.

How closely RCRA cleanups eventually resemble Superfund cleanups and avoid being Superfund problems some day may await the outcome of negotiations between EPA, who has drafted proposed rules, and the office of Management and Budget (OMB) who has taken over 7 months so far to review them. OMB apparently does not agree with EPA's rules for permanence, for not allowing facilities to postpone cleanup until groundwater outside its property is contaminated, and for setting cleanup targets in the same range as Superfund's, OMB also wants only direct contact by the public to trigger a RCRA cleanup. Conversely, the HRS that identifies Superfund sites uses various indirect pathways, and direct contact will be an added Superfund pathway if the new HRS is approved.

RCRA corrective action is an enforcement program and whatever the rules, RCRA cleanups may eventually be similar to and have the same problems as Superfund enforcement cleanups. One difference will persist, however. EPA has no backup funding under RCRA corrective action as it does with the Superfund trust fund. Thus, when an owner or operator of a RCRA facility is intransigent, a cleanup waits resolution. In some instances, clean up will await transfer of sites to the Superfund program for attention,

[54] 52 Federal Register, "Standards for Remedial Actions at Inactive Uranium processing Sites, " Sept. 24, 1987, p. 36001.

[55] A GAO report in 1988 (*Surface Mining: Information on the Updated Abandoned Mine Land Inventory)* quoted one State official as complaining because the Office of Surface Mining had never provided any policy guidance on acceptable reclamation methods.

[56] National Research Council, *Abandoned Mine Lands: A Mid-course Review of the National Reclamation Program for Coal*, November 1986, p. 26,

[57] J. Winston Porter, former assistant administrator, U.S. Environmental Protection Agency, statement before the Environmental Restoration Panel of the Readiness Subcommittee of the Committee on Armed Services, Nol. 19, 1987.

[58] U.S. Environmental Protection Agency, "National RCRA Corrective Action Strategy, ' p. 13.

[59] U.S. Congress, ''A Report to the Committee on Appropriations, U S. House of Representatives, on the Department of Defense Environmental Restoration Fund, " August 1987, p. 26.

Actual Cleanups Differ

Another, better way to assess the difference between Superfund and other program cleanups is to obtain information on what has actually happened. Unfortunately, little of this information is available at the national level and some not even at the State level.

Federal Agency Programs—For Federal agency cleanups CERCLA provisions only apply to NPL sites. Out of the thousands of potential cleanups, only 115 so far are on the NPL. Thus, most agency cleanups will take place under States laws or other Federal corrective action programs, such as RCRA or LUST Even some NPL sites or portions of NPL sites will be cleaned up under RCRA corrective action rather than CERCLA.[60] Still, it may be too early to make comparisons based on actions. Agency programs are, in general, behind most other programs. The U.S. Department of Energy (DOE) program indicates in its fiscal year 1988 report that all NPL sites are still in the site evaluation stage; the report has no information on non-NPL sites.[61]

DOD seems to be furthest along, but little permanency has been achieved. Its annual report for fiscal year 1989 says that 36 NPL sites have had some kind of interim action and one has a final remedy completed.[62] Although the report claims some action underway at over 1,000 sites, it only provides details on types of remedies selected for the interim actions. Forty-one percent were waste removals (i.e., contaminated soils or liquids were transported off site for disposal) and 28 percent were classified as site treatment/remediation. (The latter category might more properly be titled ‘ ‘miscellaneous. According to information DOD supplied OTA on the individual remedies, none used treatment technology.) The balance of the interim actions involved providing alternative water supplies (13 percent), groundwater treatment (6 percent), long-term monitoring (9 percent), or decontamination of munitions (3 percent). At one site, explosive contaminated soil is being incinerated.

State ***Programs—For*** State cleanup programs, information on actual remedy selection varies from nonexistent to comprehensive:

- The Illinois State program has a reputation for choosing incineration, and officials told OTA that mobile incineration has been used at four sites of the 45 sites cleaned up so far. Details about what remedies were selected for the other 41 sites are unknown by the State office.[63]
- Little specific information is available at the State level in Florida; the program is independently implemented by six districts. The State does produce an annual “The Sites List” that gives the status of hundreds of Florida sites under various kinds of cleanup programs, but information on remedy selection is not included.
- A Kansas State report for 1988 provides many statistics on site cleanups including the status of sites. The only information in the report on remedies is a statement that remediation may involve removal, onsite detoxification, or containment. No weight or preference is given to the three options.[64]
- New York State included a breakdown of remedies in a 1986 report but has not done the same in successive annual reports. The 1986 data shows that (for 129 projects) 62 percent of the actions taken were onsite containment, 15 percent were removals of soils for offsite disposal, and 33 percent involved treatment of

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[60] EPA has left this determination to be made on a site-be-site basis in the interagency agreement signed between an agency, EPA, and the State.

[61] U.S. Department of Energy, “Annual Report to Congress for Fiscal Year 1988, ’ December 1988. Under CERCLA Section 120, all Federal agencies are required to report annually to Congress on the status of their cleanup programs. Of the 16 agencies with sites in the Federal Docket, OTA could only locate reports from 6 agencies.

[62] Of the total 8,139 sites identified by the agency, more than half (4,435 sites) are expected to need an RIFS and 96 percent of those have a completed RIFS or one underway. For the 2,486 sites expected to need a remedial design or action, 60 percent (1,482 sites) have had or are undergoing a removal or an interim remedial action or longterm monitoring.

[63] Illinois’ annual report says: “*The* Agency now requests the use of alternative treatment technologies such as incineration, and is less dependent on landfill disposal of hazardous wastes generated from cleanup operations. [Illinois Environmental protection Agency, ‘Cleaning Illinois, ’ Spring 1988, p. 8] For sites discussed in the report for which sufficient detail was given, OTA found that onsite containment was *used* at five sites, contaminated soils from six were sent to offsite landfills. incineration was chosen at one site, and soil flushing was used at one site.

[64] Kansas Department of Health and Environment, “ 1988 Summary of Bureau of Environmental Remediation Sites in Kansas, ” January 1989, p. 3.

groundwater,[65] The 1987 report stated that New York was inconsistent with the Federal Superfund program, and the 1988 report listed a goal to establish policies and regulations to increase consistency in site cleanups.

- In South Carolina, 5 remedial actions were conducted between July 1986 and June 1987. All contaminated soils were taken to commercial landfills; liquids were incinerated.[66]
- A 1988 report on the Tennessee State Superfund program says that many of the 24 cleanups accomplished are of "dubious effectiveness" because of inadequate attention to groundwater, use of clay caps over buried wastes, and no long-term monitoring.[67]

OTA was able to obtain more comprehensive, up-to-date information from California, Minnesota, and New Jersey. California's report for 1988 says: ''State law and (agency) policy . . . support the use of cleanup solutions other than excavation and redisposai of untreated waste. "6[8] And, the State does have an extensive program to test alternative technologies. Still, California data show that 80 percent of actions in 1987 and 79 percent in 1988 involved moving soil offsite to landfills. Incineration was used for one action in 1988 and in each year one action consisted of soil bioremediation.

In New Jersey, there are four separate State programs that have cleaned up or overseen the cleanup of almost 40 sites. Ten cleanups in one program consisted primarily of groundwater pumping and treating or monitoring. OTA was told that when contaminated soil was involved it was usually land disposed (in some other State). In one case, PCBs were incinerated. Three cleanups in another program involved sending most contaminated soils and materials to landfills, liquids were usually incinerated or, in one instance, sent through a municipal water treatment plant. The enforcement program under the State's Environmental Cleanup Responsibility Act is credited with the most completed cleanups (about ***20), New*** Jersey was unable to supply OTA with information on remedy selections, however.

The Minnesota Superfund program has completed 38 NPL and non-NPL cleanups since 1983 and "is recognized nationally as being very effective at insuring the cleanup of hazardous waste sites. "[69] Out of 27 completions for which information was provided to OTA, soil treatment (of some unknown kind) occurred at two sites. The balance of remedies were: containment onsite, excavation and transport to landfills offsite, monitoring of wells, and providing alternate water supplies. Extensive groundwater pumping and treating is done in Minnesota.[70] Box 1-B (ch. 1) discusses in detail one recent cleanup decision made by Minnesota authorities. Given the statistics available on the program, that decision seems to be representative of the overall trend of cleanups in Minnesota.

Federal Programs-OTA contacted several States that have used the Federal AML program to clean up mine wastes. A Montana State official said that cleanup standards are chosen on a site-by-site basis; they rely on their consulting engineers for advice.[71] In Wyoming, State disposal standards "materials similar to those found in mine wastes are the guide to cleanup levels. The usual option is to move contaminated materials to a land disposal cell where natural materials are used to protect against future migration. Copper tailings, for instance, have been moved from a river bed site and disposed in a

[65] New York State, Department of Environmental Conservation, Divisions of Solid and Hazardous Waste, ''New York State inactive Hazardous Waste Site Remedial Plan," Oct. 15, 1986, p. V-5.

[66] The South Carolina Department of Health and Environmental Control, ' 'Report to the South Carolina General Assembly-Hazardous Waste Contingency Fund Activities—July 1, 1986 to June 30, 1987, op. cit., footnote 27.

[67] Kirsten Dow et al., ''Tennessee Superfund After Four Years: A Critical Appraisal, " May 6, 1988. The report was sponsored by the Legal Environmental Assistance Foundation and the Tennessee Environmental Council.

[68] California Department of Health Services, "Expenditure Plan for the Hazardous Substance Cleanup Bond Act of 1984, ' revised January 1988, p. 13.

[69] ''Minnesota Pollution Control Agency's Report on the Use of the Environmental Response, Compensation and Compliance Fund During Fiscal Year 1988," November 1988, p. 15.

[70] In a 1988 report, the Minnesota Pollution Control Agency said that site-specific groundwater cleanup goals were being established. Meanwhile, ''targets for soil contamination will be developed later. ' ["Minnesota Pollution Control Agency's Report on the Use of the Environmental Response, Compensation and Compliance Fund During Fiscal Year 1988, " November 1988, p. 14.]

71 Ben Mundie, Montana AML program, personal conversation, April 1989.

cell above the water table. Monitoring is ongoing to evaluate any leachate. Tailings from a gold mining site contaminated with mercury and arsenic will be similarly disposed. Clay materials are used to stabilize metals in mine pits, and contamination in groundwater is left to naturally attenuate after sources have been cleaned up.

In some programs, especially those covering mine wastes, the use of containment can often be justified because of the huge volumes of contaminated material. Still there is fiction between Superfund and other programs regarding the appropriate kind of containment to use and whether the materials should be treated frost. One case, the Colorado Tailings mining site in Montana, has been caught between the AML program and Superfund (see box 4-C).

In the UMTCRA program, most cleanup plans call for containing the tailings in place or somewhere onsite or offsite, using natural materials and no leachate collection systems. The UMTCRA choice is driven by a requirement in the regulations that a remedy be effective up to 1,000 years and at least 200 years.[72] No one can, of course, assure that a remedy that does not destroy contaminants will last 200, much less 1,000 years. The DOE program has decided that-since radioactive materials cannot be destroyed-the best way to approach that requirement is to construct simple earthen containment systems that have no mechanical components to avoid the need for human intervention over 200 years.

An EPA publication for the Superfund program on radioactive sites, *Technological Approaches to the Cleanup of Radiologically Contaminated* ***Superfund Sites,*** offers many treatment alternatives to containment.[73] The publication says that excavation and containment in ‘‘either permanent or temporary above-ground containment facilities” has been the choice in most remedial decisions and that the 1,000 year requirement is applicable to uranium mill tailings only and thus is not necessarily “applicable or relevant and appropriate” (a SARA phrase) for Superfund site cleanups. It also points out that ‘‘some Superfund (radioactive) sites contain various types of hazardous wastes, and the radioactive portion may pose a relatively minor problem, ”

This difference between UMTCRA and Superfund suggests that better interactions between the programs on a technical level might change the ways *both are* doing their job, if regulations allowed changes. From one perspective, the kind of containment remedies the UMTCRA program is selecting have been abandoned as inappropriate for hazardous substances. However, the 1,000 year requirement is based on the UMTCRA perspective that it is the radioactive emissions from the materials that harm human health and that over a period of time those emissions will decay, resolving the problem. Metals that are hazardous substances, however, have intrinsic toxicity that does not decay and are toxic forever. Thus, the RCRA requirement-used in Superfund—for containment with a 30-year lifetime for materials that never decay may not be an improvement.[74] However, the simpler UMTRCA solution may not retain its integrity longer than 30 years, much less 200 to 1,000 years.

Classifications Create Problems

Cleanups can also differ because of the ways substances are classified. When they do differ, especially when they are inconsistent with CERCLA, future Superfund cleanup costs and problems may be increased.

RCRA hazardous wastes area subset of CERCLA hazardous substances so that a cleanup under RCRA covers fewer substances. However, the differences may not be profound. Mine wastes and radionuclides, for instance, are not hazardous wastes, but they are only infrequently found in the TSDFs that RCRA corrective actions cover. And, while mine wastes are not classified as hazardous wastes, some of their constituents, such as heavy metals, are.

Asbestos is an example of a hazardous substance, the cleanup of which under AHERA, State, and Superfund programs may lead to future Superfund sites. Under current law and regulations, asbestos can be considered *dangerous* enough to be removed from schools—and from Superfund sites—but *safe*

[72] 40 Code of Federal Regulations 192.02(a)(1).

[73] U.S. Environmental Protection Agency, Office of Research and Development, *Technological Approaches to the Cleanup of Radiologically Contaminated Superfund Sites*, EPA/540/2-88/002, August 1988.

[74] RCRA systems, double-lined with synthetic materials, have leachate collection systems for which periodic monitoring is necessary.

Box 4-C-From *AML to* Superfund *to the State: The Colorado Tailings Site*

Colorado Tailings in Butte, Montana is part of the Silverbow **Creek site, which was placed** on NPL in 1982. As early as 1979, however, the Montana AML program was involved in the Colorado Tailings site. Now, despite its NPL status, State negotiations may settle on the basis **of State, rather than CERCLA, cleanup provisions.**

The initial AML cleanup plan for the tailings contaminated with heavy metals was estimated to cost $1 million, but Montana was denied the funding by DOI's Office of Surface Mining Reclamation and Enforcement. In fiscal year 1984 Congress appropriated the money as a special line item in the budget for the AML program. Because the **site was by that time on the NPL, the State AML office worked with EPA on the cleanup plan. Both agencies agreed on a land disposal option for the tailings but disagreed on its extent. EPA's version was estimated at** $3 million and included multiple liners and a monitoring system; the AML program wanted a lesser $1 million cleanup. The State was told by EPA that if it did the Colorado Tailings cleanup it **could become liable (a PRP) if the cleanup adversely affected the Silverbow Creek site. According to a current Montana AML official, this liability issue, more so than the disagreement over the cleanup method led to the State declining to handle the cleanup.**[1] However, **a former State official told OTA that the project was rejected because of the $3 million cost and the belief that the imposition of EPA performance standards** ***were unnecessary, as*** **well as the question of liability.**[2]

The project reverted to the Superfund program in 1984. Colorado Tailings is now part of one operable unit of the Silverbow Creek NPL site. The feasibility study was completed in October 1986. As of early 1989, no cleanup decision had been made. Meanwhile, the State-which has the lead on the site-was under negotiation with the PRPs for settlement. A State official told OTA that they would not necessarily settle under provisions of Superfund even though the site is on the NPL because CERCLA does not take precedence over State laws.

[1] Ben Mundie, Montana AML program, personal conversation, April 19s9.

[2] Richard Jutunen, former Bureau chief, Montana AML program, personal conversation, October 19ss.

enough to end up in a municipal solid waste landfill. Under EPA's offsite policy there is now some protection against hazardous substances ending up in an out-of-compliance landfill at a subtitle C facility. That policy does not cover subtitle D facilities. Thus, it is possible to move asbestos from a Superfund site (or a school under AHERA) to **any** municipal landfill, including ones that are already contaminating groundwater and may have to be cleaned up.[75] The Sup-fund removal program has **taken** asbestos from over **30** sites. OTA was told that only when State laws require it is this material sent to a hazardous waste landfill.

This movement is legal because asbestos, although a hazardous *substance* under CERCLA, is not a hazardous *waste* under RCRA. **Air** emissions of asbestos are considered the primary source of harm to public health and the environment. The reasoning for not listing asbestos under RCRA has been that RCRA rules are meant to protect groundwater and, since asbestos tends to bind to soils, it will not leach from landfills into groundwater. (Data from one Superfund site—Asbestos Dump, where asbestos has been found in groundwater—may refute this theory, but it is being ignored at that site, and it is doubtful that the information is being transferred elsewhere.) Although asbestos can be treated and the fibers that cause harm destroyed, treatment is rarely the option of choice in the Superfund or AHERA program.[76]

The way asbestos waste is managed suggests that once placed in a landfill it may cause or help a landfill to qualify for the Superfund program and thus have to be moved again. The general management practice for asbestos is to wet the materials and place them in plastic bags prior to disposal. Once at a landfill, they may be segregated from other wastes (although no Federal regulation requires segrega-

[75] The amount of asbestos that may be deposited in landfills because of the A HERA program is not trivial. One rural county in California has estimated that it must reserve landfill space for 50 tons of asbestos. A conservative estimate is that about 500,000 tons of asbestos will be placed m the Nation's landfills.

[76] In the ROD for the Asbestos Dump—Millington Site in New Jersey treatability studies are included in the post-ROD remedial design phase. However, EPA and the PRPs are negotiating over whether or not the conclusions from the treatability Studies will change the ultimate cleanup, scheduled to be onsite containment.

tion), placed in a specially dug trench, and covered with soil. These practices can vary if State or county regulations differ from Federal regulations. They also vary because of poor enforcement. According to an EPA IG report and EPA's own statement, "many asbestos removals and the subsequent waste disposal operations are performed out of compliance with [the existing regulations]. ' '[77] The IG also reported that inspections and enforcement are weak and penalties for violations are inadequate.[78] As EPA administrator William K. Reilly has said:

> I still fear where it goes [when asbestos is removed from buildings], whether it really is disposed of in a place where we can trust that it's been put to rest and **it won't come** back again in the future.[79]

Sites containing PCBs are cleaned **up under** Superfund and TSCA. When PCBs are cleaned up under TSCA only the PCB contamination is considered even though a site may contain other hazardous substances as well. This occurred when Texas Eastern Pipeline Co. agreed to pay a $15 million fine and cleanup costs (estimated at $400 million) for areas contaminated by PCBs (89 sites in 14 States) along its 10,000-mile natural gas pipeline. The cleanup agreement did not cover any substances other than PCBs and Superfund cleanup standards were not invoked. The agreement also did not require offsite or groundwater cleanup nor does it set any compliance schedule for the company to meet. PCB levels of cleanup were based on Federal PCB standards and varied depending on the area being cleaned up (. . . pits, surrounding soil, etc.) and three rankings of sites. The agreement requires the company to test for other hazardous substances but does not set any cleanup requirements for them if found. While it does not foreclose EPA or States from moving under Superfund to handle such eventualities, doing so will require that new cases are brought against the company. For Superfund to use trust funds to clean up any of these 89 sites, they would first have to be individually taken through the NPL listing process.

OTA was unable to obtain details on actual LUST cleanups, which mostly deal with petroleum liquids and contaminated soils. Although petroleum products are relatively easily destroyed by incineration and are amenable to microbial biodegradation, an OUST handbook, *Cleanup of Releases From Petroleum USTs: Selected Technologies, says* that excavation and disposal of contaminated soil is the "most widely used corrective action. "[80] Soil contaminated with petroleum is not a RCRA hazardous waste, but some States regulate it as hazardous. In States that do not regulate it, contaminated soils removed from petroleum tank sites can be put in low-cost municipal landfills. In some cases, it is cheaper to pay shipping costs and transport excavated soils from a State that considers them hazardous to a State that does not.[81] Once petroleum wastes are put in a landfill, they can--depending on the actual substance--qualify as hazardous substances and secondary cleanup under Superfund.

Other Programs Are Also Slow

Assessing the pace of cleanup is, to most observers, the relevant way to determine program effectiveness. Thus, many argue that a benefit of using other cleanup programs is that cleanups can be done quicker because they are not encumbered with the inflexible process and procedures of CERCLA and the NCP. But, some other cleanup programs are experiencing delays in getting down to cleanup. Meanwhile, the cleanups assigned to them wait.

Some State data does show that State enforcement cleanups are quicker than State-funded cleanups.[82] But, State-funded cleanups appear to take the same time as CERCLA-funded cleanups. Conclusions from a 1987 ASTSWO survey show that, on

[77] 54 Federal Register 912. Jan 10, 1989, P. 915.

[78] U.S. Environmental Protection Agency, Office of the Inspector General, ''Consolidated Report on EPA's Administration of the Asbestos National Emission Standard for Hazardous Air Pollutants, " Mar. 24, 1988.

[79] A8 quoted in "Good Riddance?" *National Journal*, July 29, 1989, p. 1930.

[80] U.S. Environmental Protection Agency, Office of Underground Storage Tanks, Cleanup *of Releases From Petroleum USTs: Selected Technologies,* EPA/530/UST-88/001, April 1988, p. ix.

[81] The OUST handbook, cited above, cites a ' 'reasonable $12 per square yard' for soils sent to nonhazardous landfills and ''up to $160 per square yard if the soil is considered hazardous" [p. ix].

[82] OTA compared all Superfund sites which gained a ROD in fiscal year 1988. There was no difference between enforcement and fund sites in the average time it took the program to move them from placement on the NPL to ROD completion.

average, State staff have to work a little harder on NPL sites than non-NPL sites but that the elapsed time is about the same.[83] Data from California shows that an RIFS on a State-funded site takes from 11 to 42 months compared to EPA's 21 to 38 months for an RIFS.[84] That is, an RIFS in California can consume less *or more* time than a Superfund one. In New York State the average time for an RIFS is 24 months v. EPA's average 32 months, as determined by OTA in *Are We Cleaning Up?* In another example of pace, New York State said in a 1987 report that only 2 of the 15 planned starts (13 percent) for the State program actually were initiated while 12 of the 22 planned starts (54 percent) under the Superfund program in the State were initiated. The identified causes of the difference were: 1) resources shifted to oversee work by responsible parties, 2) lengthy contract procurement procedures, 3) a shortage of experienced staff, and 4) a liability insurance problem.[85] This performance measure improved the following year. The reason may have been that staff had been added to the State program.

Under RCRA, some cleanup regulations have been in place since 1983, but EPA's authority was greatly expanded in 1984. Five years later, several thousand sites are just beginning the initial assessment process, the new regulations covering cleanup have not been proposed, and OTA was only able to identify 12 sites with completed Corrective Measures Studies (CMSs).[86] Although some cleanups may have been completed as part of permits in the RCRA program, information on progress is not available. Out of some 5,000 RCRA facilities in the country, initial site evaluations have been done at 1,372 facilities. Of the 1,122 of those facilities determined to need further evaluations, EPA regions have formally required owners to proceed with 499 of them, either through orders or as part of permits.

For other Federal programs, the pace varies. The UMTRCA inactive mills program has been authorized for 10 years and by the end of fiscal year 1988 had only claimed to have completed the cleanup of 2 out of 24 sites.[87] On the other hand, the LUST program, whose statutory authority dates from 1984 and 1986, appears to be moving briskly. A recent annual report claims that responsible parties are beginning cleanups at "thousands of sites' and that more than 155 corrective actions have begun using fund monies.[88] But over 300,000 tanks may need attention, so the program's pace is an unknown. The AML program has moved fairly aggressively on coal mine cleanups, but substantial work is left to be done at noncoal mines because they are the third priority of the program.

Not Enough Public Participation

Congress has not, for other cleanup programs, given nearly as much attention to public participation as it has under CERCLA, where an entire section outlines the scope of public participation. Lack of statutory direction does not necessarily mean that public participation will not be as broad under other programs. But the level of complaint about how public participation slows the process in Superfund suggests otherwise. However, Superfund's public participation has been a significant factor in moving Superfund implementation toward more compliance with statutory requirements. When other cleanup programs have less public participation, the prospect for less stringent cleanup (and potential for creating future Superfund sites) increases.

Not everyone agrees that EPA allows the public to adequately participate in the Superfund program and certainly not to the extent that PRPs do, But CERCLA does encourage public participation at an early stage and throughout the cleanup process, and

[83] The work effort required of State staff is 4.5 work years on a State-lead NPL site and 3.4 years On a non-NPL site. The average time elapsed per site is 5.5 years on an EPA-lead NPL site, 5.6 years on a State-lead NPL site, and 4.7 years on a non-NPL site. [Association of State and Territorial Solid Waste Management Officials, "State Programs for Hazardous Waste Site Assessments and Remedial Actions, ' June 1987.]

[84] California data from ' 'Expenditure Plan for the Hazardous Substance Cleanup Bond Act of 1984, Revised January 1988, ' op. cit. footnote 69. Data on EPA from OTA's *Are We Cleaning Up?*

[85] New York Department of Environmental Conservation, ''New York State inactive Hazardous Waste Site Remedial Plan Update and Status Report, " Oct. 30, 1987.

86A RCRA corrective action CMS is comparable to a Superfund RIFS, but it includes the facility owner's suggested remedy.

[87] OTA did not review active mill cleanups.

[88] U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, ' 'Annual Report, Fiscal Year 1988, " op. cit., footnote 48.

participation is set up to be active, rather than passive. For remedial actions, the regional community relations program is supposed to establish contact with local citizens before any action is planned or undertaken and follow up with notice of proposed and final remedial actions. Once a preliminary decision has been made on the selected site remedy, the public has an opportunity to comment and EPA must respond to those comments. For removal actions, an onsite public coordinator is assigned to answer any questions the public may have. In addition, under CERCLA the public has been given the right to sue to enforce the law.

Unique to Superfund is the provision for awarding technical assistance grants to public citizen groups. TAGs were meant to assist the affected community at sites at understanding and evaluating the problems posed and to help assure that cleanups were chosen in accordance with SARA. However, the concept has not necessarily been well implemented by EPA. Criticism has been raised by Congress and public interest groups about the way EPA translated statutory language into practice. For instance, one congressional survey found the system so complex and cumbersome that it tended to discourage groups to participate.[89] Still, groups who have obtained TAGs have been helped (see box 3-F in chapter 3).

Despite the implementation flaws, public participation with the Superfund program is supposed to be very broad. TSCA has no provisions for public participation and since cleanups under TSCA are enforcement cases, the public may have no knowledge of how their interests are being protected until a court settlement has been completed and avenues for changes are essentially closed. The same kind of public closeout occurs in the Superfund program at enforcement sites. When EPA wrote the regulations for the UST program, provisions for public participation were included only for the last of six possible phases prior to actual cleanup. When a confirmed release requires a cleanup plan, the implementing agency must notify the public and release information but has the option to decide whether or not to hold a public meeting to discuss the plan.

Under RCRA the public must be notified when EPA intends to issue a permit (which may include cleanup requirements) and hold a hearing. Under an enforcement order, citizens only become involved after a facility has completed its investigation and recommended a cleanup plan. As in the LUST program, a public hearing is only held if the authorities decide there is enough interest to merit one.

Information Tough To Get

Most other programs receive less public scrutiny than Superfund and even Federal ones are largely implemented at the State level. This can make gathering information to understand what is happening in these programs difficult and time-consuming. For those programs that rely on enforcement, information is even less available because of its negotiation value.

It is possible to track progress at most Superfund sites by examining a copy of the Superfund Comprehensive Assessments Plan. No such national database exists for any of the other programs, although the RCRA program is attempting to put one together. So far, not all information originally designed for the system is maintained and regions have been inconsistent in entering data. Thus, to make sure how many CMSs have been finished under RCRA, OTA had to call 10 EPA regional offices. For the LUST program, most relevant information resides at the State or local level. OTA was not able to, for instance, obtain from the EPA headquarters office any specific information about sites that have been cleaned up under the LUST program. If one wants to know about a LUST site, it is necessary to first find the relevant agency in charge. Because of the flexibility that EPA has built into the UST programs, the mix of responsible agencies is broad. According to a 1987 report, five were in ''the State Fire Marshall's Office, one in the State Corporation Commission, about eight in the water program and the remainder in the hazardous waste program. ''[90]

Specific sites deferred from the Superfund program are discussed in the Federal Register when

[89] U.S. House of Representatives, Representatives Edward J. Markey (D-MA) and James J. Florio (D-NJ), ' 'EPA's Superfund TAG Game, A Report on the Implementation of the Superfund Technical Assistance Grant Program by the U.S. Environmental Protection Agency, ' Mar. 2, 1989.

[90] U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, ''Solid and Hazardous Waste Report for Fiscal Year 1987," November 1987, p. 3-2.

EPA makes a decision. For instance, in 1988 EPA announced and listed the names and location of 30 sites on the NPL to be moved from Superfund to RCRA and 15 to be retained. For those gone from Superfund, the public tracking system disappears. EPA's proposed policy in December 1988 discusses the relevance of the NPL as a source of public information but claims that reducing the numbers of sites qualifying for the NPL will ". . . provide **more meaningful** information to the public and the States" [emphasis added].[91] What EPA may mean is that with an NPL confined to sites actually being cleaned up by the Superfund program, the public will not get confused about who is responsible. To keep the public informed about sites that have been deferred, EPA discusses various alternatives, such as notices in local newspapers or letting States handle notification.

The way information about non-Superfund cleanups is diffused throughout the Nation makes it all the more difficult to ascertain the extent to which cleanups in other programs may eventually produce new work for Superfund.

CONCLUSIONS

The job of cleaning up past mismanaged hazardous wastes has only just begun. While it is clear that the Superfund program needs to get its own house in order, **there are compelling reasons to worry that cleanups occurring outside of Superfund may one day provide it with a whole new class of sites-sites for which cleanup has been mismanaged. This is** not occurring-like past mistakes did—because we do not understand the consequences or do not have enough information to do things better. It is happening because we have created one premier cleanup program that gets all the attention, while the others operate in the shadows.

Given the large estimates for numbers of potential sites for each program, it is impractical to suggest that there ought to be ONE cleanup program. But, there are ways to coordinate actions among the cleanup programs so as to minimize failures and their impacts. As discussed in chapter 1, a set of national cleanup standards is one option. With cleanups so widely dispersed, better program cleanup tracking systems (and ones that are compatible with each other) would help Congress and the public know what is happening so that when cleanup failures occur they could be corrected early. The programs could be partially integrated and long-term savings accrue to all through a national site discovery program (see ch. 2). Solutions for the technical resource stresses of the Superfund program, if *not* viewed from the perspective of the ongoing national cleanup effort, might be only a partial or patchwork affair. And, mechanisms could be constructed to encourage sharing of technical knowledge.

91 53 Federal Register 51394, Dec. 21, 1988, p. 51416.