



Joint Institute
For Energy
& Environment

Report Number: JIEE/2000-03

**OPPORTUNITIES FOR REGULATORY
REFORM FOR DOE CLEANUP**

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April 26, 2000

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PREFACE AND ACKNOWLEDGEMENTS

This paper was supported jointly by the Office of Science and Risk Policy and the Office of the Deputy Assistant Secretary for Planning, Policy and Budget within the Department of Energy's Office of Environmental Management (EM). It is addressed to the senior manager who participates in determination of compliance agreements and in discussions of end-state choices within the context of regulatory requirements. It is one of a series of reports by the Joint Institute for Energy and Environment (JIEE) that seeks to probe alternatives to EM's status quo and identify new strategic options available to EM. By design, this series adopts a perspective more general than the project-specific focus often found describing the cleanup program and more behavioral than the technical discussions that typically underlie waste cleanup planning.

The central argument presented herein is that due to a unique set of circumstances, DOE should seek regulatory flexibility through designing a "custom-cleanup," based on risk to human health and the environment. Such a custom-cleanup would be freed from the rigid guidance commonly applied to cleanup activities under CERCLA and RCRA. These circumstances include the commitment by DOE to spend the needed dollars to manage risks and accomplish other local ends, the considerable data base already available for these sites, and the extensive set of stakeholder relationships already in place. Review of the legislative history of RCRA and CERCLA suggests that doing this would be well within the spirit of the legislation and that were DOE to pursue this option it would not require exemption from the legislation. Doing so should permit a better cleanup at lower cost.

This is not, however, to say that obtaining regulatory flexibility would be a simple task. DOE would first have to convince regulators that the new approach to cleanup would be at least as protective of health and the environment as previous practices and perhaps, more protective. It would also have to convince local stakeholders that it accepts responsibility for assisting in economic transition away from dependency on DOE economic activities, and that a portion of the savings would be applied to this end. In other words, DOE must first convince its partners that granting regulatory flexibility would be a win-win outcome, and it must then make good on its word.

We would like to take this opportunity to thank the many individuals who have contributed to this report. Mark Gilbertson and Dan Berkovitz provide support throughout the course of the study. Milton Russell of JIEE provided many insightful comments on the various drafts the report went through. Within JIEE, Sherry Estep edited the report and Kathy Ballew and Glenda Hamlin produced the report in final

form. The authors, of course, retain final responsibility for any remaining shortcomings.

Under the terms of our agreement with DOE, the authors are accountable for the contents of the document. Neither DOE nor its employees have had control over nor bear responsibility for the views expressed herein.

I. INTRODUCTION AND EXECUTIVE SUMMARY

Since the Second World War, the Federal government has operated facilities to develop and produce nuclear weapons and related nuclear materials. These facilities are geographically dispersed and are relatively isolated from major population centers. They have operated in obscurity and have been overseen by a series of Federal agencies, most recently, the Department of Energy (DOE). With the close of the Cold War, it became apparent that large quantities of radiological and other hazardous wastes were produced as by-products of the Cold War mission, not all of which were in stable condition.¹ The Federal government, through DOE, accepted the responsibility for managing what has come to be known as the legacy waste cleanup. DOE is now several years into an effort that will continue well into the Twenty-First Century. In the face of budgetary pressures it is challenged to develop cleanup guidelines that protect public health and safety and also make wise use of fiscal resources.

The process for establishing environmental standards on which to base cleanup evolved over the course of the Cold War and has continued to do so during cleanup. Initially, DOE and its predecessors were essentially self-regulating. Later, in 1984, a Tennessee court hearing *Legal Environmental Assistance Foundation v. Hodel* ruled that DOE was not exempt from the provisions of the Resource Conservation and Recovery Act (RCRA) and by implication from the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Federal Facilities Compliance Act further directed that affected groups and individuals that came to be known as local stakeholders be party to regulatory negotiations. At present, cleanup activities are guided by the rigid procedural practices that guide the Federal government's dealings with the private sector, interpreted through the regulatory and stakeholder processes, and codified by a series of judicially enforceable consent decrees.

Our study of this activity has led us to conclude that cleanup could be improved and fiscal resources saved if RCRA and CERCLA could be applied to the DOE sites in a manner that took into account the unique circumstances of DOE cleanup while preserving the intent of the enabling legislation. Our argument is as follows: RCRA and CERCLA were enacted to meet environmental risk management goals through the application of general procedural practices, promulgated by EPA. EPA followed this course because developing risk-based guidelines specific to each individual site was costly and contentious. CERCLA's National Priorities List

¹Descriptions and data are provided for these wastes and by-products in *Linking Legacies* (U.S. DOE/EM 1997).

(NPL) contains a large number of relatively small sites many of which are located in heavily populated areas. The polluters responsible for cleanup typically resist any negotiation that might increase costs. To design a custom-cleanup would require developing extensive local data bases, interacting with large numbers of local constituents, and litigating each step of the process with polluters. For the typical Superfund site, general procedures therefore reduce costs and move the process of cleanup forward. But DOE sites are not typical Superfund sites. There is a small number of large DOE sites. Extensive data bases have already been developed, a stakeholder process is in place, and DOE has accepted fiscal responsibility.

This set of conditions leads to what we view as an enviable circumstance. It should be possible to adopt cleanup practices and schedules that obtain a better cleanup at a lower cost. However, realizing these gains is fraught with obstacles. First, DOE must depart from the path to which it is, at present, legally obligated. DOE cannot do this without first obtaining permission from regulators and stakeholders. To obtain permission it must convince regulators and local stakeholders that the quality of the cleanup would be at least as great as under the older guidelines. It would also have to convince local stakeholders that they would share in the cost savings. Accomplishing this would be a major component of a strategy to reduce the national burden of risks and costs imposed by the nuclear legacy.²

In this paper we focus on the economic advantage and legal basis for renegotiating the environmental requirements for DOE's legacy waste cleanup. We begin, in Section 2, with a discussion of how the current system evolved. In Section 3 we turn to an examination of the current "compliance-driven," process-based system of environmental regulation, including a discussion of the costs and benefits of this type of regulation. Section 4 discusses the potential for renegotiating compliance as it applies to the DOE cleanup. Finally, Section 5 returns to a discussion of the unique aspects of the cleanup program and how they would support or restrict renegotiation of compliance.

²Russell (2000).

II. CLEANUP BACKGROUND AND ORIGINS

The activities now known collectively as the DOE cleanup include remediating contaminated environmental media, processing collected wastes now in storage, decontaminating and decommissioning buildings no longer in use, and storing special materials, mostly depleted uranium from enrichment operations. About forty sites are the subject of cleanup. Using a “bottom-up” costing process, DOE estimated (in 1995) that total programmatic costs would range between \$230 billion and \$350 billion and extend over 75 years.³ Completing the task is limited by technologies, likely budgets, and the desire of some affected localities to see DOE activities reduced when there is arguably other work that could be productively undertaken. It is also limited by a lack of flexibility in adjusting to cost saving or risk reducing opportunities.

As the Cold War came to a close, the Nation reduced weapons development and production activities, freeing funds for cleanup. To refocus, DOE created an Office of Environmental Management (initially the Office of Environmental Remediation and Waste Management). Early activities by this office were devoted to a large-scale information-gathering task that documented the array of wastes, both in and out of containment, and to a planning task that developed a series of “baseline” reports describing the efforts required to restore the Complex to the condition dictated by legal mandate and/or the technical state-of-the-art.

Even as EM set about its work, it was apparent that virtually all elements of the DOE Complex were out of compliance with EPA’s RCRA regulations. DOE sites were brought under CERCLA authority in 1986 and placed on the National Priorities List (NPL) to ensure that a program for cleanup was established.⁴ One consideration in requiring the establishment of the cleanup program was DOE’s practice of storing wastes beyond the timeframes permitted by RCRA. A second consideration lay in the fact that there were no suitable treatment methods for many of the mixed (co-mingled hazardous and radiological) wastes stored at the facilities. A third was that there was no place to dispose of some wastes, such as transuranics, even if their

³U.S. DOE/EM 1995.

⁴RCRA and CERCLA are closely linked: CERCLA mandates the cleanup of inactive sites while RCRA dictates how hazardous substances are to be dealt with at sites where additional wastes are being actively produced. For the private sector, CERCLA is the driving force behind ensuring that past releases are cleaned up, while RCRA contains provisions to guide the storage and treatment of materials that pose immediate or imminent danger to human health or the environment. The 1986 amendments to CERCLA established a program to insure the cleanup of waste sites owned by the Federal government and caused these sites to become part of the CERCLA Superfund program.

isolation and treatment were complete. Finally, budgets were inadequate to support the level of cleanup required by regulation, even if other constraints were relaxed. All in all, there was no hope of meeting the strict time limitations specified by RCRA, a circumstance that in literal terms meant that DOE was in violation of the law.⁵

Since DOE's sites were out of compliance with RCRA regulations, RCRA was amended by the Federal Facilities Compliance Act (FFCA) to include specific requirements for the development of mixed waste inventory reports, inventories of treatment capacities and technologies, and plans for the further development of treatment capacities and technologies with the aim of bringing DOE facilities into compliance with regulations governing mixed and hazardous wastes.⁶ The FFCA also required DOE to develop Site Treatment Plans (STPs) for each site that identified technologies and types of facilities needed to treat the wastes located at the facilities. Once the STPs were approved with public comment, they were included in consent decrees that made DOE legally bound to agreed upon schedules and waste treatment protocols.

As a concession to DOE's inability to establish compliance within the required RCRA timeframes, EPA additionally issued guidance documents dictating a policy of "relaxed enforcement" of the storage time limitations for DOE facilities, so long as these facilities are complying with formal, agreed-upon requirements to address the problem as provided in the FFCA.⁷ To reestablish a legal basis for its operations, DOE quickly signed off on a set of consent decrees containing rigid and ambitious treatment and remediation schedules.⁸ Having established the basic cleanup guidance, EPA delegated enforcement of this guidance to its counterpart state regulatory bodies. At the same time, the FFCA required the development of a stakeholder process that, while implemented differently at each site, required DOE to submit all cleanup plans to stakeholder review and to solicit stakeholder input on all key decisions. These two circumstances had the general effect of increasing the local influence on the extent and character of cleanup required.

⁵Purely radiological wastes are governed by Atomic Energy Act regulations (overseen by the Nuclear Regulatory Commission) rather than by RCRA.

⁶42 U.S.C. §6939(c).

⁷61 Fed. Reg. 82, 18591.

⁸Tri-party agreements and consent decrees are agreements between DOE, regulators, and the states in which the facility is located, designed to address and solve the lack of appropriate treatment technologies or methods to clean up hazardous waste. Interagency agreements are agreements designed to set forth a plan for compliance with the provisions in CERCLA.

Following the tradition established in its planning process, DOE has chosen to view each cleanup task separately and each site as distinct from all other sites. This has led to separate consent decrees for each site regarding the schedule of environmental remediation actions. While this relieves the sites of the burden of competing with one another for cleanup dollars, it costs DOE the ability to concentrate its efforts since each site is legally bound to schedules applicable to only that site. Moreover, individual years are isolated from one another through the embedding of schedules in the consent decrees and the process Congress uses to fund these cleanup activities. This means that efforts at “mortgage reduction” are often thwarted. Even though the specific agreements have been frequently modified, the stakeholder/regulatory/DOE process has led to a cleanup program with a seventy-five year time horizon, and little or no discretion on the part of DOE due to its legal obligations as set forth in consent decrees.⁹ By dragging the DOE cleanup through the eye of the RCRA needle, the regulatory process has virtually precluded DOE from making adjustments that might lower costs or shorten schedules, even to the extent that it has been difficult to deploy new more effective technologies developed explicitly for cleanup, because of potential delays in legally binding schedules.¹⁰ For practical purposes, cleanup is managed to maintain compliance with legal agreements, literally forced upon it, rather than to provide the best cleanup at the least cost.

⁹Wise and O’Leary (1997) have found no clear tilt of responsibility for environmental management between Federal and state levels of government in recent Federal court decisions. In the case of solid waste (primarily municipal, not hazardous), Weiland and O’Leary (1997) find general guidance at the Federal level combined with specific managerial responsibilities assigned to state and even local levels. They appear to find this a relatively efficient division of authority and responsibility for a problem with local impacts and many locale-specific particularities. The agreements and decrees in the DOE cleanup have tilted authority for environmental regulation toward states and responsibilities for environmental management toward the Federal level (DOE in particular). The potential impacts of the environmental damages at the DOE sites clearly are local, which invites state interest in supervision, but the structure of the agreements and consent decrees puts states in competition with one another on a first-come first-served basis because of the budgetary linkage among DOE sites in different states: a single Congressional authorization must be divided among locations in different states in a bargaining procedure that sidesteps the issue of where the greatest marginal gains from environmental restoration actions would occur. Russell (1998) discusses the incentives of local stakeholders to piggyback employment concerns in the post-Cold War spending era with concerns over local environmental degradation in a fashion entirely consistent with the outcomes of the tri-party agreements and consent decrees.

¹⁰The role of R&D in cleanup is discussed in detail in Bjornstad (2000).

III. COMPLIANCE AND DOE'S CLEANUP

To remain in compliance, DOE must perform a set of precisely specified cleanup tasks, using agreed upon technologies according to a set schedule, all of which are recorded in the consent decrees. If DOE fails to live up to the terms of these agreements, it can be made subject to civil and, potentially, to criminal penalties. Although the agreements have been continuously revised, they form the basis for managing what has become known as a compliance-driven cleanup.

1. The Structure of Compliance

The content of the consent decrees is influenced by a number of factors. First, the characteristics and quantities of the legacy wastes themselves determine the hazards with which cleanup must contend. For practical purposes, these characteristics and quantities are fixed. States and localities have attempted, with some success, to make the wastes themselves the subject of cleanup. An alternative approach would have been to focus more directly on protecting human health and the environment from the risks that wastes possessed of hazards pose.

The second factor in determining the nature of cleanup is the technology base available for storing, treating, and disposing of wastes and for remediating contaminated environments. The base is relatively fluid in that DOE operates a number of basic, applied, and developmental activities intended to enhance the technology base, thus leading to lower costs, better end-states, and the potential to treat previously untreatable hazards. In the best of all worlds, DOE would seamlessly substitute the best available technology for each hazard, but this has typically not been the case. Because the cleanup agreements specify schedules and sometimes technologies, substitution would disrupt the legally required progress. As a result many new technologies have not been deployed.

Third is the environmental guidance. Through a series of legislative actions, Congress has passed laws intended to protect human health and the environment. These, in turn, are implemented by EPA and other agencies typically using risk analysis to determine rules, regulations, cleanup processes and procedures, and cleanup endpoints that guide the production and release of pollutants and the treatment and remediation of existing pollutant stocks. We discuss these further below.

The fourth influence is the stakeholder/negotiation process noted above. This process is applied differently at each site and generally takes the form of a number of ad hoc and standing committees that advise DOE. These committees typically discuss general goals, such as end-states and broad technical options, but may deal with very

specific issues as well. Groups and individuals may also intervene through the courts. The states participate in this process through their regulatory roles. Congress influences the process by providing cleanup budgets, and especially by tightening budgets over time. Finally, the courts record binding agreements, in the form of consent decrees and enforce their terms. DOE proposes its own solutions to cleanup issues, and attempts to qualify the implications of alternative proposals raised by other parties.

2. Enforcing Compliance

The consent decrees implementing compliance carry the force of law. Consent decrees result from negotiations initiated when a responsible party is out of compliance with regulations but the party enforcing the regulation does not wish to levy fines or impose other penalties.¹¹ Here, the enforcing party and the responsible party enter into a consent decree which establishes guidelines and timetables for the responsible party to achieve compliance.

Failure to comply with the decrees can lead to a number of remedial and punitive consequences that include civil, criminal, and administrative penalties. Civil penalties can be levied in amounts up to \$25,000 per day for each violation. As an example, the state of Utah sought to fine a waste disposal firm, Envirocare, \$100,000 for a single violation, although settlement negotiations resulted in a fine of \$80,000.¹² The state of Idaho fined the Idaho National Engineering and Environmental Laboratory \$750,000 for incorrect handling of hazardous waste in 1998—specifically, for leaving hazardous waste in storage for more than 90 days; and the state of Washington fined DOE Hanford \$90,000 for the 1997 chemical accident that blew off the roof of a building and contaminated a number of workers. Orders for civil penalties can include the suspension of a permit or a revocation of authorization to continue to conduct business. Criminal penalties can combine fines with possible jail time as long as five years. Administrative penalties are similar to civil penalties and can be levied in amounts up to \$25,000 per day for each violation.

Citizens' suits provide another option for enforcing compliance. Citizens' suits are law suits brought by citizens who are directly affected by a responsible party's noncompliance. These suits are subject to notice provisions which prevent a suit from being prosecuted before proper notice is given to the Administrator of EPA,

¹¹See Dümmer (1998), Appendix 5.1.2 for further discussion of consent decrees.

¹²Gehrke (1998) and Israelsen (1998).

the state's environmental protection agency, and the party responsible for the violation. Citizens' suits are not allowed if the responsible party's violation is the subject of current enforcement proceedings or consent decrees instituted by the Administrator of the U.S. EPA or of the state in which the violation occurred.

If DOE follows the requirements set forth in regulations or meets the requirements in the consent decrees the courts will disallow the penalties and citizens' suits, because DOE, for all practical purposes, would be operating within the law. Consequently, there is a significant disincentive for DOE to seek out flexibility that would reduce costs or change the character of cleanup.

3. Potential Sources of Flexibility

There are two principal sources available for DOE to gain cleanup flexibility. The first lies in the manner in which environmental guidance is applied to cleanup, and the second lies in the ability to revise the schedules embedded in the consent decrees. We examine each in turn.

The goal of environmental legislation is to reduce likely damages to human health or the physical environment. The expected values of the damages are referred to as risks. This legislation is implemented by the responsible executive agency, typically the EPA, through a body of regulations that emphasize procedures and processes that regulated bodies are to follow rather than specific outcomes they are to achieve.¹³ These regulations are, of necessity, generic and must be applicable to a broad set of circumstances.

The process that sets EPA's regulatory standards typically follows traditional risk analysis. First, a hazard is identified along with the population or ecosystem at risk. A dose-response analysis is then undertaken to determine the likely damage that the groups at risk would sustain from exposure. From this, acceptable levels of exposure are determined. Clearly, no level of exposure to a hazardous substance is perfectly safe, but likely damages, often expressed as "statistical deaths," can be compared with risks due to other aspects of life to obtain reasonable risk targets. Next, the physical relationship between the source of the hazard and the population or environment at risk is examined. For risks to be meaningful, there must be a mechanism or pathway through which the harm occurs. For example, hazardous materials may travel through air, water, or soil.

¹³The Dümmer (1998) Appendix provides a background discussion of how the major environmental regulations affecting cleanup deal with risk.

To achieve these targets, a set of rules to control risk to acceptable threshold levels is developed. For example, a rule may require certain liquids be stored in double thickness barrels to prevent spillage due to barrel oxidation. This effectively disrupts the pathway between hazard and receptor. A second type of guidance assumes a pathway and restricts release. For example, a guideline may restrict discharges into a river. A third type of guideline restricts access to the receptor by changing the behavior of the receptor, for example, by fencing off an area that is contaminated. A variety of other types of guidance are possible. One RCRA guideline, for instance, requires that 99 percent of a substance be removed during remediation. Others call for wastes to be stored for no more than 90 days. Most guidance takes the form of thresholds or limits. These limits are often called “bright lines” because they define compliance as a binary condition, that is, one is either in or out of compliance. Bright lines tend to be generic, so that they can be applied to multiple circumstances.

This method of rulemaking tends to be “process-based,” rather than “outcome-based.” The rules implementing the legislation describe the types of behavior in which regulated entities must engage rather than the outcomes they must achieve. The reason for this is straightforward. If the goal is to prevent deaths, measured by statistical lives on the order of one in ten thousand to one in a million, observing the outcome (deaths) and enacting punishment at that point may not be reliable or practical. For example, if a number of cleanup firms are at work in an area and a death due to some exposure occurs years later, there is little prospect of identifying the guilty party.

Process-based rules and regulations are often criticized for increasing costs because they restrict the regulated entity to a specified type of behavior when, for specific circumstances, other types of behavior might be superior. The difficulty lies in the fact that the guidance must be applicable to a wide range of circumstances. Moreover, because generic rules seek to provide “adequate margins of safety,” they typically err on the side of too much control rather than too little. Flexibility could be gained by applying superior procedures to specific circumstances or by applying guidance better suited for meeting risk targets. But arguing for relaxed guidance in specific cases would seem to be arguing that risks for these cases be increased. While it generally is agreed that custom-designed rules would improve efficiency, undertaking the process is difficult.¹⁴

The second source of additional flexibility lies in gaining the ability to modify the schedules, technologies, and sequences contained in the consent decrees. As noted above, these schedules derive from the EPA’s policy of relaxed enforcement that

¹⁴Burtraw (1999); Portney (1999).

permits DOE to be out of literal compliance if it is in compliance with the agreed upon set of activities contained in the consent decrees. Despite the fact that these agreements are sometimes modified, this process can be long and arduous. For this reason DOE often misses opportunities to improve cleanup, as by employing superior technologies that may not have existed at the time the agreement was written. A second cost of interpreting compliance too narrowly lies in a reduced ability to address the mortgage cost issue. Mortgage costs are the fixed costs of maintaining facilities that are idle. Often the operating and maintenance costs that can be saved by decommissioning a facility will offset the actual costs of decommissioning the facility in a short period of time, but since decommissioning often is not part of compliance plans, it may be impossible to realize these savings. In addition, if decommissioning fails to meet compliance needs, funds may not be available for decommissioning. Common sense dictates that a slightly longer term view would lead to reduced costs and/or greater risk reduction.

Again, there are two sides to every argument. DOE's critics have argued that cleanup progress has been slow and that DOE is biased toward study and toward inaction to avoid conflicts and potential risks to cleanup workers that might harm bureaucratic careers. From this it follows that, rather than impeding progress, the consent decrees are responsible for the progress that has occurred.

4. Flexibility Versus the Status Quo

The principal benefit from the current compliance-driven, process-based system of environmental regulation is that it avoids the transactions costs required to develop regulations that take into account the specific circumstances of situations subject to regulation and then custom-design a regulatory environment. This is not insignificant, because the process that sets guidelines and schedules is complicated, time consuming, and can open DOE to tertiary criticism. In Oak Ridge, for example, a debate over the health-related effects of an incinerator opened the doorway for a broader debate over the health-related effects of past DOE operations unrelated to the incinerator. But the costs are not so great as to be impossible. Another experience, also in Oak Ridge, found the community proposing that DOE spend less money rather than more when it was clear that the proposed treatment added little to risk reduction.¹⁵ EPA's broad guidelines seek to achieve appropriate levels of control, coupled with relatively cost-effective means of achieving control, without incurring extraordinary transactions costs.

The principal benefit from exercising flexibility is that it permits the cleanup to be based on the superior knowledge of local cleanup conditions and circumstances

¹⁵Schweitzer (1997).

that have been developed through years of study. As we have discussed above, many process-based regulations are generic and arbitrary. There is no magic surrounding the removal of 99 percent of the waste from an “operable unit” during a remediation exercise. As was learned during the Hanford tanks cleanup, defining an individual tank as an operable unit led to the embarrassing circumstance that the hazard left in the one percent residual for some tanks exceeded the total hazard in other tanks. Likewise, there is no particular reason for a 90-day storage limit or for virtually any of the process-based guidelines. And there is no excuse for a system that is biased against deploying technologies developed for the explicit purpose of cleanup deployment.

But this is not to say that there are no impacts from gaining flexibility. First, the cleanup program has long been criticized as one of study rather than action. Any DOE initiative that would call for negotiation based on further study would have to answer a strict benefit/cost test. DOE should not undertake such negotiations without having thought through their ramifications.

Second, arguing flexibility from rigid, risk-based guidelines is based on the assumption that the cleanup is fundamentally a risk-management program, and there is far from universal agreement on this. Elsewhere we have discussed at length the fact that DOE is seeking to accomplish community economic goals through cleanup as well as risk management goals.¹⁶ Unless there is specific attention to the divorce of cleanup from economic transition, the stakeholder process will be resistant to steps that will send fewer dollars through local economies. In the example noted above where Oak Ridge relaxed spending requirements for an ineffective cleanup task, community leaders came to believe that dollars were transferred to other communities rather than applied to other local tasks. Localities must realize benefits if they are to buy-off on improved cleanup practices.

Third, DOE has not yet obtained the full confidence of local leaders regarding its ability to bring successful closure to the cleanup activity. One reason for this is the apparent lack of attention to long-term stewardship issues. For example, some technologies for cleanup, like in-situ capping, require long-term surveillance. These questions and the numerous other concerns that will surely surface as new cleanup technologies and approaches are proposed must be anticipated and answered.

Finally, DOE must work to provide its cleanup contractors with assurance that they can avoid regulatory penalties while engaging in practices otherwise outside of compliance guidelines. In a sense, firms that accept compliance-based regulation buy insurance. By engaging in the proper behavior, keeping proper records, and encouraging proper practices, these firms essentially avoid regulatory penalties under the law. This is not to say that these practices wholly indemnify firms from civil

¹⁶Russell (1998).

procedures, and firms typically also engage in risk-averting behavior to avoid charges of negligence, but they do provide a basis for a defense.

IV. THE LEGAL AND PRACTICAL BASIS FOR NEGOTIATING FLEXIBILITY

Thus far we have argued that extending the negotiations over compliance to include risk targets would offer a better cleanup. We argue next that the process may be less burdensome than it might appear.

1. Renegotiating Compliance Is Within the Spirit of the Law

The legislation governing protection of the environment under RCRA and CERCLA is broad in scope and seeks to minimize future harm to the environment and human health while ensuring that past and potential harms are eliminated. The wording of these two pieces of environmental legislation is far from explicit in terms of dictating exact methods of protecting the environment and human health. To determine if the renegotiation of risks within the umbrella of compliance is feasible for DOE, it is necessary to examine first the intent behind the legislation itself.

Review of the legislative history of RCRA and CERCLA suggests that a renegotiation of compliance, as we have described it, is well within the spirit of the law. While the legislative history of RCRA indicates that the environment and human health is to be protected regardless of cost,¹⁷ the legislative history of CERCLA delves more deeply into the cost issues involved. For example, the history of CERCLA indicates that “action at a given site must be that cost-effective response which provides a balance between the need for protection of public health or the environment at the site . . . and the availability of funds to respond to other sites which present or may present a threat. . . .”¹⁸ In addition, the legislative history indicates that “cleanups must be cost-effective and utilize, to the maximum extent practicable, permanent solutions and alternative treatment technologies or resource recovery technologies.”¹⁹ The EPA Administrator must “evaluate alternatives which

¹⁷H.R. REP. NO. 198, 98th Cong., 2d Sess. (1984), *reprinted in* 1984 U.S.C.C.A.N. 5576, 5622.

¹⁸H.R. REP. NO. 1016, 96th Cong., 2d Sess. (1980), *reprinted in* 1980 U.S.C.C.A.N. 6119, 6132.

¹⁹H.R. REP. NO. 253, 99th Cong., 2d Sess. (1986), *reprinted in* 1986 U.S.C.C.A.N. 2835, 2839.

protect public health and the environment and assess the cost-effectiveness of such alternatives.”²⁰

When CERCLA was being debated it was clear that technologies required to achieve a permanent cleanup solution for many wastes covered by this Act did not presently exist.²¹ The legislative history acknowledges that it is necessary for the Administrator of EPA to “. . . carefully fashion an appropriate response. . . . This may necessitate the selection of responses that do not achieve total cleanup and containment.”²² The legislative history called for the Administrator to “specifically assess the long-term effectiveness of various alternatives, including an assessment of permanent solutions and alternative treatment technologies.”²³ When conducting this assessment, the Administrator is to take into account “long-term uncertainties associated with land disposal; . . . the goals, objectives, and requirements of the RCRA, . . . , the potential threat to human health and the environment associated with excavation, transportation, and redisposal; short and long-term potential for adverse health effects from human exposure; [and] long-term maintenance costs.”²⁴

The legislative history of CERCLA also indicates that the Administrator can waive the requirement of a standard with respect to any facility and devise an alternative action if the Administrator makes a finding that: 1) the alternative action will provide protection of human health and the environment and is substantially equivalent to the prescribed requirement; 2) compliance with the requirement would result in greater risk than the alternative; 3) compliance with the requirement is technically impracticable; or 4) compliance will consume a disproportionate share of the Superfund. This section goes on to say that the findings necessary to waive a required action which is then replaced by an alternative action also apply to cleanups

²⁰*Id.* at 2878.

²¹The legislative history of this Act indicates that “. . . many cleanup technologies are just being developed and, in fact, ‘cost-effective permanent cleanup technologies have not yet been developed for some [toxic waste] problems.’ The legislation reflects a concern that to require EPA to complete cleanups before it has adequately assessed the site or before it knows how to perform a permanent cleanup would make little environmental or economic sense. . . .” See H.R. REP. NO. 253, 99th Cong., 2d Sess. (1986), *reprinted in* 1986 U.S.C.C.A.N. 2835, 2838.

²²H.R. REP. NO. 1016, 96th Cong., 2d Sess. (1980), *reprinted in* 1980 U.S.C.C.A.N. 6119, 6132.

²³H.R. REP. NO. 253, 99th Cong., 2d Sess. (1986), *reprinted in* 1986 U.S.C.C.A.N. 2835, 2878.

²⁴*Id.*

financed by funds other than Superfund.²⁵ Perhaps the most important and apt phrase to bolster the arguments set forth in this paper was included in the legislative history of the 1986 amendments to CERCLA. This statement indicated that “an important change is to provide EPA with appropriate flexibility and discretion in order to respond appropriately to each site.”²⁶

It seems clear from an examination of the legislative history of RCRA and CERCLA that, while cleanup and protection of human health and the environment are of paramount importance, costs and other factors, such as availability of permanent solutions, should be thoroughly examined as well. The legislative history also indicates that the EPA Administrator must be afforded flexibility and discretion in the cleanup process. The renegotiation of procedures and schedules in favor of increasing flexibility would simply follow the original intent of the legislation. In sum, the Administrator of EPA could approve these types of renegotiations with no additional legislative action. However, DOE has not enjoyed a close working relationship with EPA in the past, and to accomplish this renegotiation, such a relationship would be necessary.

2. Site-Specific Analysis Is No Obstacle

The second component of environmental regulation is the required analysis that leads to the development of implementing rules. We have noted that EPA uses broad, rather than circumstance-specific, guidelines and analyses to regulate the environment. To do otherwise likely would result in high transactions costs because most of the sites that are regulated by EPA are small and dispersed. Requiring specialized studies of each of these sites’ unique waste characteristics and corresponding risks would require a substantial outlay of resources which might not be offset by the benefits derived from the better-tailored cleanup. However, this argument does not hold true for the DOE cleanup. DOE has an extensive data base describing the risks posed by the wastes located at its sites. It already has compiled the information necessary to conduct specialized studies tailored to the specific circumstances of the wastes at its facilities. In many cases, DOE has already conducted extensive analyses with these data.

Because DOE has already compiled an extensive data base pertaining to the risks posed by the wastes located at its facilities, the transactions costs associated with

²⁵*Id.* at 2880.

²⁶*Id.* at 2838.

conducting specialized studies are, for all practical purposes, “sunk costs” (bygones; costs that, once incurred, could not be recovered through resale), so the benefits derived from conducting cleanup that is tailored to the specific circumstances of the wastes would not need to outweigh potential transactions costs. Increasing flexibility by allowing the use of these types of specialized studies in the design of cleanup plans may well provide opportunities for cost savings.

3. Machinery for Public Involvement Is Already in Place

The third component of environmental regulation is the set of rules that indicate how a specific regulation is to be implemented. Environmental regulations such as RCRA and CERCLA require that there be a high level of interaction among interested parties and that interested parties have an opportunity to make their concerns known. In order to effectively renegotiate compliance for the Weapons Complex cleanup, the interested parties would have to be afforded the opportunity to be part of the renegotiation process. While this may be difficult to accomplish for a private cleanup, it is not as difficult to ensure in the DOE case.

Interested parties have long been involved throughout the process of negotiating the compliance agreements and consent decrees that are in place now. The infrastructure for this type of public involvement already exists, and it would not be difficult to apply it to the renegotiation process. The interested parties are already familiar with the cleanup process and the process of public involvement. Using this existing structure would allow renegotiation to move more quickly than if no public involvement mechanism existed. The interested parties are already educated about the process of public involvement and simply would be presented with a different way of going about the cleanup.

4. Potential Barriers to Renegotiating Compliance

There may be some barriers, however, to accomplishing the renegotiation of compliance. These barriers stem from the fact that the DOE has not answered two crucial questions. The first is how to effectuate what Milton Russell has called a “productive divorce.”²⁷ The second is the question of long-term stewardship. For a renegotiation to be successful, these two questions must be answered to the satisfaction of the parties involved.

²⁷Russell (1998). See also Probst and Lowe (2000).

For renegotiation to be successful, DOE has to achieve a “productive divorce” of cleanup decisions from decisions on how best to achieve post-cleanup economic viability for the communities subject to an eventually completed cleanup. Given the current structure of compliance and the absence of specific machinery for economic transition, stakeholders have a vested interest in extending cleanup for as long as possible. DOE has typically argued that cleanup should not be a “jobs program” and has resisted this separation. The difficulty with this position is that it flies in the face of the incentives that communities face. The longer and more thorough the cleanup, the longer DOE dollars will be present in the affected communities. “Productive divorce” would separate cleanup activities from community transition assistance. Focus can then be directed to the important issue of how to accomplish the greatest level of cleanup within given budgetary constraints. The fact that DOE has not achieved a “productive divorce” at this time may make renegotiation of compliance more difficult.

Along these same lines, DOE must also address the issue of long-term stewardship. At present, no mechanism exists to ensure that required monitoring, surveillance, and maintenance will take place for those sites requiring such activities.²⁸ Since the goal of renegotiating compliance is to increase the flexibility and discretion of environmental managers in making cleanup decisions, processes must be established that will allow cleanups that may in turn require long-term stewardship. Adopting a policy that implements an unbiased consideration (on life-cycle risk and cost terms) of the stewardship option when selecting remedies is a key element in reducing the legacy burden. Acceptance and viability of such a policy depends on effective and reliable stewardship performance in which all parties can have confidence.²⁹ Addressing the issues that are raised by these two questions will aid DOE in bolstering the argument for renegotiating compliance.

²⁸DOE settled a lawsuit in 1998 which requires it to prepare a study on dealing with long-term stewardship issues. As part of the initial scoping process for this study, DOE issued a report entitled *From Cleanup to Stewardship* (U.S. DOE/EM 1999), which provides background information and summaries of the nature and extent of current and anticipated long-term stewardship needs of the DOE. For additional information related to long-term stewardship see Probst and McGovern (1998).

²⁹Russell (2000). See especially pp. 35-37.

V. IMPLICATIONS

Our review of legislative history and environmental legislation supports the conclusion that Congress intended that protection of the environment and public health and safety be given first priority, but that choices of how specifically to do so be guided by common sense and a recognition of constraints. Logic dictates that a custom-designed regulatory environment would allow achievement of some combination of lower costs and improved management of risks. We conclude that within the context of the DOE cleanup, renegotiating compliance is both possible and desirable.

It is also true that DOE currently conducts extensive negotiations with regulators and stakeholders over virtually all elements of compliance, including timetables, end-states, and other aspects of cleanup. Our proposal, to place specific procedures for risk management explicitly on the table, is, in fact, implicitly embedded in many ongoing debates. However, at present, the trigger for this negotiation is usually the lack of suitable technology or some other constraint. Thus our suggestions might be viewed as giving formal recognition to a practice that has occurred in the past. This is not to suggest, however, that our proposal is trivial. Including risk management goals within the compliance debate removes the “technology test” as the sole instance in which to depart from EPA guidance. It instead substitutes explicit community preferences as an integral part of the debate over cleanup procedures, thereby opening the door for opportunities to improve cleanup and/or lower costs. This could be viewed as weakening the communities’ hands, because cost savings can translate into fewer dollars flowing into communities long dependent on Federal support.

As a consequence, we do not foresee regulatory reform for DOE’s cleanup occurring without resistance. To overcome this resistance DOE must, at minimum, face up to what we describe as two barriers. The first barrier is the divorce of risk management dollars from dollars intended to help with community economic transition. The second barrier deals with local stakeholders’ perceptions of DOE’s willingness and ability to commit to serve stewardship functions over long periods of time. It is also unlikely that the states themselves will voluntarily discard any tool that strengthens their hands in negotiations with DOE. Thus, despite our belief that the Nation would be well-served by a move to a risk-planning-based management structure accompanied by a rethinking of past commitments, this latter action is unlikely to occur without some outside encouragement.

This encouragement is most likely to come from Congress and, given recent budget trends, is already underway. If and when Congress further tightens cleanup budgets, it would appear that environmental regulation need not stand in the way of

pursuing new avenues for cost savings, provided that DOE is prepared to take advantage of this opportunity.

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