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## Understanding the New Era in Environmental Law

Adam Babich

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# UNDERSTANDING THE NEW ERA IN ENVIRONMENTAL LAW

ADAM BABICH\*

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## I. INTRODUCTION

The fundamental changes necessary to prevent wholesale destruction of the nation's (and the world's) natural resources will occur only if people have powerful incentives to rethink and reform their behavior toward the environment.<sup>1</sup> But because Congress either was supremely

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1. According to former United States Environmental Protection Agency (EPA) administrator William D. Ruckelshaus, an adequate response to environmental problems will require "a modification of society comparable in scale to only two other changes: the agricultural revolution of the late Neolithic period and the Industrial Revolution of the past two centuries." Ruckelshaus, *Toward a Sustainable World*, 261 Sci. Am. 166, 167

confident in its ability to transform the nation by fiat or simply underestimated the problem at hand, the major federal antipollution statutes of the 1970s rest on the assumption that, if outlawed, harmful pollution will stop.<sup>2</sup> Of course, the threat of government enforcement provides one incentive for change, but the nation's exercise of its police power is neither certain nor efficient enough, and environmental regulations are not comprehensive enough, to force the expeditious, basic changes in attitude and behavior that are needed.<sup>3</sup> To be successful, environmental laws must move beyond command-and-control regulation and become largely self-enforcing.

In the 1980s, Congress—jolted into action by several highly publicized environmental disasters—began a fundamental restructuring of environmental law, creating persuasive new incentives for private action to prevent pollution.<sup>4</sup> For years, legal scholars had argued that

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(1989). Mr. Ruckelshaus further notes that, because the required societal changes must be "a fully conscious operation, guided by the best foresight that science can provide," the undertaking would be "absolutely unique in humanity's stay on earth." *Id.*

2. The Clean Air Act, 42 U.S.C.A. §§ 7401-7642 (West 1983 & Supp. 1989), set the general pattern for the other major environmental statutes of the 1970s including: the Clean Water Act (also known as the Federal Water Pollution Control Act), 33 U.S.C.A. §§ 1251-1376 (West 1983 & Supp. 1989); the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), 42 U.S.C.A. 6901-6991i (West 1983 & Supp. 1989); the Safe Drinking Water Act (SDWA), 42 U.S.C. §§ 300f - 300j-11 (1982 & Supp. V 1987); the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601-2629 (1988); and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. §§ 136-136y (1988).

An exception to the general pattern for 1970s environmental laws is the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4370(a) (1982 & Supp. V 1987), which, rather than imposing substantive environmental quality standards, requires development of information to ensure that government agencies make decisions only after considering significant potential environmental impacts. Congress adopted an analogous information based approach to environmental protection in the Emergency Planning and Community Right-to-Know Act (EPCRA or SARA Title III), 42 U.S.C. §§ 11001-11050 (Supp. V 1987). EPCRA requires owners and operators of industrial facilities to report to public agencies about the kinds and quantities of dangerous chemicals they store, dispose of, and release from their facilities. The statute requires government agencies to use this information to develop plans for averting and responding to chemical emergencies.

3. Violators often receive economic benefits from their violations that exceed the fines that the EPA imposes, even assuming that the EPA discovers the violations. *See, e.g., "Forceless Enforcement" Found by OMB at EPA; Inspector General Cites Millions in Reduced Fines*, 20 Env't Rep. (BNA) 1087, 1088 (Oct. 20, 1989). Arguably, the government might improve its enforcement record by increasing the use of the criminal provisions of environmental statutes to deter violators. *See Starr, Too Many Cooks . . .*, 6 ENVTL. F. 9 (Jan.-Feb. 1989). There are so many businesses subject to environmental regulation, however, that it is difficult to imagine an enforcement staff large enough to police the entire regulated community effectively.

4. *See United States v. Shell Oil Co.*, 605 F. Supp. 1064, 1071 (D. Colo. 1985) (Congress enacted the Comprehensive Environmental Response, Compensation, and Liability

traditional, command-and-control regulatory mechanisms were inadequate to control pollution and urged an overhaul of environmental legislation.<sup>5</sup> Rather than adopting the largely market-based schemes of these theorists, however, Congress turned for inspiration to a system that for centuries has used the threat of civil liability as a means of social control: the common law tort system.<sup>6</sup>

The resulting statutes—including the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA),<sup>7</sup> the Hazardous and Solid Waste Amendments of 1984 (HSWA),<sup>8</sup> which amended the Resource Conservation and Recovery Act (RCRA),<sup>9</sup> and the Superfund Amendments and Reauthorization Act of 1986 (SARA),<sup>10</sup> which amended CERCLA and created the Emergency Planning and Community Right-to-Know Act (EPCRA or SARA Title III)<sup>11</sup>—herald a shift in the primary focus of environmental law from prospective regulation to retroactive liability.<sup>12</sup> The effect of these new, liability-based statutes is to assign much of the responsibility for planning for a dangerous and uncertain environmental future to that segment of society most capable of finding innovative and efficient solutions: the private sector. Congress's environmental initiatives of the 1980s disrupt the normal routines of businesses and consumers.

Act after concluding that existing prospective laws were inadequate to address environmental disasters such as Love Canal.).

5. See, e.g., Ackerman & Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Breyer, *Analyzing Regulatory Failure: Mismatches, Less Restrictive Alternatives, and Reform*, 92 HARV. L. REV. 547 (1979); Hahn & Hester, *Marketable Permits: Lessons for Theory and Practice*, 16 ECOLOGY L.Q. 361 (1989).

6. Congress's focus on the common law tort system in enacting the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA), 42 U.S.C.A. §§ 9601-9675 (West 1983 & Supp. 1989), is clear from Congress's decision to allow significant issues to be determined by the courts as a matter of federal common law, see, e.g., *United States v. Aceto Agricultural Chem. Corp.*, 872 F.2d 1373, 1382 (8th Cir. 1989); *Colorado v. Asarco, Inc.*, 608 F. Supp. 1484, 1486 (D. Colo. 1985); *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802, 808 (S.D. Ohio 1983), and from Congress's requirement for studies of the adequacy of common law remedies for injuries to the public not addressed in CERCLA. See 42 U.S.C. § 9651(e)(3) (1982).

7. Pub. L. No. 96-510, 94 Stat. 2767 (1980). Unless otherwise specified, "CERCLA," as used in this Article, refers to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986, and codified at 42 U.S.C. §§ 9601-9675.

8. Pub. L. No. 98-616, 98 Stat. 3221.

9. 42 U.S.C.A. §§ 6901-6991i (West 1983 & Supp. 1989).

10. Pub. L. No. 99-499, 100 Stat. 1613.

11. 42 U.S.C. §§ 11001-11050 (Supp. V 1987).

12. The courts uniformly have upheld the constitutionality of retroactive liability in this context. See *United States v. Monsanto Co.*, 858 F.2d 160, 173-74 (4th Cir. 1988), cert. denied 109 S. Ct. 3156 (1989); *United States v. Northeastern Pharmaceutical & Chem. Co.*, 810 F.2d 726, 733-734 (8th Cir. 1986), cert. denied, 484 U.S. 848 (1987).

Businesses now must analyze potential environmental liabilities not only for their waste disposal operations, but also for a vast array of other activities. Consumers ultimately may find familiar conveniences of the chemical era becoming unavailable or prohibitively expensive.<sup>13</sup> Nonetheless, a broad, liability-based approach to protecting the environment has the potential to bring about a quantum leap in the effectiveness of environmental laws. Whether short-term disruptions will cause Congress to retreat from this new approach before the long-term benefits are realized remains an open question.<sup>14</sup>

## II. THE LIMITS OF PROSPECTIVE REGULATION

Most federal environmental laws, originally enacted during the 1970s, rely on a system known as command-and-control regulation.<sup>15</sup> Under these laws, the United States Environmental Protection Agency (EPA) and other government agencies try to control pollution by issuing detailed regulations and permits that prescribe the manner in which the regulated community may generate, transport, store, dispose of, and release chemicals that the government believes are dangerous.

Command-and-control regulation presupposes the government's ability to: (1) identify environmental problems and set rational priorities; (2) develop regulations that provide technologically workable and politically viable solutions; and (3) enforce those regulations effectively. Unfortunately, in the area of environmental protection none of these presuppositions has proven true.<sup>16</sup> The enormous scope and complexity of environmental problems and resulting scientific and political uncertainties explain much of this failure. Other problems result from

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13. See *infra* note 102 and accompanying text (regarding the effect of liability-based statutes on business transactions); see also Davidoff, *Multiple Chemical Sensitivities*, 11 AMICUS J. 12, 23 (Winter, 1989) (consumers have become accustomed to the convenience of living with many of the chemicals that threaten public health and the environment).

14. See *Domenici Declares Superfund "Failure," Suggests Revamped Liability Scheme*, 10 INSIDE E.P.A. 4 (Sept. 22, 1989) (Senator Pete Domenici has suggested that it might be time to consider a public-works rather than liability-based approach to cleaning up toxic waste sites. *Id.*

15. See, e.g., Davis, *Approaches to the Regulation of Hazardous Wastes*, 18 ENVTL. L. 505 (1988); Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CALIF. L. REV. 1256 (1981); Hahn, *Book Review*, 4 YALE J. ON REG. 173 (1986) (review R. LIROFF, *REFORMING AIR POLLUTION REGULATION: THE TOIL AND TROUBLE OF THE EPA'S BUBBLE*).

16. See Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENVTL. L. 153, 156-158 (1988); Commoner, *Failure of the Environmental Effort*, 18 ENVTL. L. REP. (Envtl. L. Inst.) 10195 (1988); Muskie, *Reflections on a Quarter Century of Environmental Activism: On Postponing Deadlines, Second-Guessing the Congress, and Ignoring Problems Until It is Too Late*, 18 ENVTL. L. REP. (Envtl. L. Inst.) 10081 (Mar. 1988).

deficiencies in various antipollution statutes and regulations. A more fundamental cause is rooted in the seemingly inherent inability of large government bureaucracies to accomplish their missions efficiently.

### A. Institutional Constraints

The EPA bureaucracy's attempts to use command-and-control regulation to impose nationwide pollution control have been compared to the debacle of central economic planning in the Soviet Union.<sup>17</sup> No incentives are built into the regulatory process for the EPA to operate efficiently or creatively. Attempts to solve this problem through "regulatory reform" so far have only added paperwork (e.g., Regulatory Impact and Regulatory Flexibility Analyses) and still another layer of bureaucracy (i.e., the Office of Management and Budget) to an already bloated process.<sup>18</sup> Although bureaucratic inefficiencies provide no excuse for wholesale deregulation,<sup>19</sup> they do point to the need to augment the regulatory system to encourage private antipollution initiatives.

When faced with complex environmental issues, the EPA is much more capable of responding to immediate political pressures than of anticipating long-term environmental problems, setting priorities, or developing solutions. For example, despite Congressional enactment of RCRA—an ambitious law governing hazardous waste management—in 1976, the EPA did not even begin significant regulation of hazardous

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17. See Ackerman & Stewart, *supra* note 5, at 1334.

18. Under Executive Order 12,291, the EPA must judge whether each regulation will cause sufficient economic impacts to qualify as a "major rule." The Agency generally must conduct a Regulatory Impact Analysis of major rules. Executive Order 12,291 also requires the EPA to submit proposed rules to the Office of Management and Budget (OMB) for review. Regulatory Flexibility Analyses are required by 5 U.S.C. § 603 (1988). Under the Paperwork Reduction Act, 44 U.S.C. § 3507 (1982 & Supp. V 1987), EPA information collection requirements must be approved by OMB. See generally *Dole v. United Steelworkers of America*, 110 S. Ct. 929 (1990).

OMB has imposed controversial delays on EPA promulgation of significant regulations. See *House Panel Democrats Release OMB/EPA Papers Showing Interference in Superfund Regulations*, 19 Env't Rep. (BNA) 2459 (Mar. 17, 1989); *House Subcommittee Denies OMB Funds for Rule Review Unit Pending Authorization*, 20 Env't Rep. (BNA) 604 (July 28, 1989); *OMB Rejects Proposed Incinerator Regs, Citing High Cost, Low Return*, 10 Inside E.P.A. 1 (March 10, 1989).

19. Damage to the nation's environment would have been worse if not for EPA regulation under the command-and-control environmental laws of the 1970s. Former EPA administrator Russell E. Train has stated that "[n]o nation in the world has grappled so successfully with those issues as the United States . . . Without these accomplishments where would we be today? We would be like Mexico City or São Paulo." Shabecoff, *Minor Gains in Ecology and Major Challenges*, N.Y. Times, Nov. 30, 1988, at B10, col. 1.

waste until four years later, when required to do so by court order.<sup>20</sup> Congress's frustration with the EPA's consistent failure to implement environmental laws by statutory deadlines is reflected in the "hammer" provisions of HSWA, the 1984 amendments to RCRA.<sup>21</sup>

Congress itself, however, is no better than the EPA at responding to complex, and sometimes poorly understood, threats to the environment. This fact is highlighted by Congress's difficulties throughout the 1980s in reauthorizing the Clean Air Act.<sup>22</sup> Even when the EPA and Congress do act, powerful economic interests such as the oil and mining industries often persuade both institutions to grant broad exemptions from environmental laws, thus allowing vast quantities of dangerous materials to go unregulated.<sup>23</sup> Similarly, the United States Justice Department has convinced the EPA not to bring other federal agencies to court over pollution problems.<sup>24</sup> As a result, the federal government

20. See *Illinois v. Costle*, 9 Env'tl. L. Rep. (Env'tl. L. Inst.) 20243 (D.D.C. Jan. 3, 1979); see also *Environmental Defense Fund, Inc. v. Gorsuch*, 713 F.2d 802 (D.C. Cir. 1983) (court of appeals discussed district court's jurisdiction to review further actions of EPA after district court had ordered EPA to promulgate RCRA regulations). See generally *infra* note 132 (EPA's priorities may be more closely aligned with public opinion than with estimated risks).

21. As amended by HSWA, RCRA not only provides deadlines for EPA action, but also sets forth, in the so-called "hammer provisions," specific consequences for the EPA's failure to meet those deadlines. See, e.g., 42 U.S.C. § 6921(d)(8) (Supp. V 1987) (unless EPA promulgates standards for small quantity generators by the statutory deadline, congressionally selected standards shall apply); 42 U.S.C. § 6924(g)(6)(c) (Supp. V 1987) (land disposal of certain hazardous wastes shall be banned if EPA fails to promulgate regulations under 42 U.S.C. § 6924(g)(5)). See generally Florio, *Congress as Reluctant Regulator: Hazardous Waste Policy in the 1980's*, 3 YALE J. ON REG. 351 (1986) (Congress has taken on role of regulator due to EPA's refusal to carry out congressional intent); Mugdan & Adler, *The 1984 RCRA Amendments: Congress as a Regulatory Agency*, 10 COLUM. J. ENVTL. L. 215 (1985) (amendments to RCRA indicate congressional distrust of EPA's implementation of regulations). Congress's frustration with EPA inaction is documented in Shapiro & Glicksman, *Congress, the Supreme Court, and the Quiet Revolution in Administrative Law*, 1988 DUKE L.J. 819, 826, n.34 (1988).

22. See Kilgore, *Muddling Through: Congressional Activity in 1988*, 19 Env'tl. L. Rep. (Env'tl. L. Inst.) 10016 (Jan. 1989); Ruckelshaus, *supra* note 1, at 169-70.

23. See, e.g., 42 U.S.C. § 6921(b)(3)(A) (1982) (exempting, *inter alia*, waste from most mining and milling activities from RCRA regulation pending an EPA determination to be made after the completion of studies); 42 U.S.C. § 7419 (1982) (authorizing EPA to grant extra time for certain nonferrous smelters to comply with Clean Air Act regulations); 42 U.S.C. § 9601(14) (1982 & Supp. V 1987) (excluding "petroleum, including crude oil or any fraction thereof" from CERCLA's definition of "hazardous substance" unless specifically listed or designated); 42 U.S.C. § 9607(i) (1982 & Supp. V 1987) (exempting from CERCLA's liability provisions contamination caused by application of a registered pesticide product); 40 C.F.R. § 261.4(b)(5), (7) (exempting most mining wastes and wastes associated with exploration, development or production of crude oil from RCRA Subtitle C's definition of hazardous waste).

24. See EPA, *FEDERAL FACILITIES COMPLIANCE STRATEGY VI-3* (Nov. 1988) (Pursuant

is one of the nation's most persistent violators of environmental laws.<sup>25</sup>

### B. Assessing the Risks

Issues of EPA and Congressional competence aside, full regulation of the staggering number of dangerous chemicals in use and development is not a realistic possibility. Assessing the danger that even a single chemical poses to public health and the environment is a formidable task, clouded by scientific uncertainty.<sup>26</sup> Because scientists cannot ethically experiment on people to determine a chemical's toxicity, carcinogenicity, mutagenicity and teratogenicity, regulators must rely on relatively soft data in deciding which chemicals to regulate and how stringently to regulate them.

To determine the need for regulation, the government generally proceeds chemical by chemical, employing a risk assessment approach that is slow and resource intensive. Because industry constantly adds new chemicals to the thousands already on the market,<sup>27</sup> this chemical-by-chemical approach provides little assurance that the government has analyzed all or even most significant hazards.<sup>28</sup>

to the position of the U.S. Justice Department, the "EPA will not bring civil judicial suits against Executive Branch Agencies." (emphasis omitted)).

25. See, e.g., UNITED STATES GENERAL ACCOUNTING OFFICE, *WATER POLLUTION: STRONGER ENFORCEMENT IS NEEDED TO IMPROVE COMPLIANCE AT FEDERAL FACILITIES* 3 (1988) (GAO/RCED-89-13) ("Federal facilities' rate of noncompliance with [Clean Water Act] priority program requirements is twice that of nonfederal industrial facilities."); Wald, *Waste Dumping that U.S. Banned Went on at Its Own Atom Plants*, N.Y. Times, Dec. 8, 1988, at A1, col. 1 (Extensive environmental damage at Federal nuclear weapon plants is largely a result of crude waste disposal practices that were banned in the private sector a decade ago.). Indeed, the United States Army's Rocky Mountain Arsenal reportedly is "the worst hazardous and toxic waste site in America." *Colorado v. United States Dep't of the Army*, 707 F. Supp. 1562, 1570 (D. Colo. 1989).

26. See, e.g., Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89, 91 (1988). See generally *Risk Assessment in Environmental Law*, 14 COLUM. J. ENVTL. L. 289 (1989) (various symposium articles concerning risk assessment).

27. See Lave, *Risk Assessment and Regulatory Priorities*, 14 COLUM. J. ENVTL. L. 307, 308 (1989) (scientists have provided reasonably complete evidence on human toxicity on only about 1000 of the approximately 60,000 chemicals in common use).

28. One commentator stated:

"[W]e may well find ourselves in the midst of a chemical holocaust brought upon ourselves by bureaucratic incrementalism and corporate tunnel vision. . . . After all, we are being asked to trust the same people who gave us DDT, Kepone, dioxin, PCBs, EDB in our foods, asbestos in our schools and houses and public buildings, DES to prevent miscarriages, UFFI, unvented gas heaters, tris flame retardant in children's sleepwear, hormones and antibiotics in our meat, pesticide residues in our food, and formaldehyde in our permanent press fabrics and paper towels. The list goes on and on. Those same folks who are supposed to be guarding the barn keep shutting the door after each horse



Generally, to assess the risks that a chemical poses to the public, government agencies must answer three questions:

- What types of risks does the chemical pose?
- At what dose is the chemical dangerous?
- How many people are exposed, or at risk of exposure, to how much of the chemical?<sup>29</sup>

Answering the first two questions, that is, performing the hazard identification and dose-response evaluation steps in a risk assessment, requires the agency to evaluate data from experiments on animals, epidemiological studies (generally of occupational exposures), if any, and theoretical analyses.<sup>30</sup> Essentially all of the techniques used to draw conclusions from these data, however, are controversial. For example, the fact that a chemical does or does not cause cancer in laboratory animals does not conclusively establish what dangers the chemical may pose to people. And it is not self-evident that chemicals that harm workers exposed to relatively large doses over long time periods will have similar effects on the population at large when those chemicals enter, and are diluted by, the environment.<sup>31</sup>

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has been stolen."

Davidoff, *supra* note 13, at 23 (quoting Earon Davis).

Recently, Congress amended the Clean Water Act to authorize use of creative alternatives to a chemical-by-chemical approach. See 33 U.S.C. § 1314(a)(8) (1982 & Supp. V 1987) (EPA "shall develop and publish information on methods for establishing and measuring water quality criteria for toxic pollutants on other bases than pollutant-by-pollutant criteria, including biological monitoring and assessment methods."). Similarly, Congress's direction to the EPA to develop regulations under RCRA identifying measures or indicators of toxicity will reduce reliance on chemical-by-chemical analyses. See 42 U.S.C. § 6921(h) (1982 & Supp. 1987).

29. See 52 Fed. Reg. 12,870 (1987) (setting forth guidelines of the Agency for Toxic Substances and Disease Registry (ATSDR) for developing toxicological profiles under 42 U.S.C. § 9604(i)); see also Daggett, Hazen & Shaw, *Advancing Environmental Protection Through Risk Assessment*, 14 COLUM. J. ENVTL. L. 315, 317 (1989); Gordis, *Epidemiologic Approaches for Studying Human Diseases in Relation to Hazardous Waste Disposal Sites*, 25 Hous. L. REV. 837 (1988).

30. See F. CROSS, ENVIRONMENTALLY INDUCED CANCER AND THE LAW, 52-60 (1989); Lave, *supra* note 27, at 312.

31. As one commentator reports:

Toxic risk assessment suffers from fundamental uncertainties about causal mechanisms for cancer and other hazards, extrapolative relationships between high-dose and low-dose responses and between animal test data and human risks, latent effects and latency periods, special sensitivities in exposed subpopulations, synergistic or co-carcinogenic effects of various substances, past and present exposure levels, dispersion patterns for contaminants, and virtually every other area of required knowledge. *These uncertainties generally preclude reliable assessments of relevant effects, and there is no scientific consensus on how they should be resolved.*

Latin, *supra* note 26, at 91 (emphasis added) (footnote omitted); see also Office of Sci-

To further complicate matters, dose-response relationships often differ between population groups. Children, fetuses, the aged and smokers are especially vulnerable to some chemicals.<sup>32</sup> Moreover, combinations of chemicals may have impacts greater than the sum of the effects of individual chemicals. Such synergistic effects are poorly understood and difficult to predict.<sup>33</sup>

Answering the third question accurately, that is, performing the exposure assessment step of a risk assessment, requires intensive data-gathering that is complicated and expensive.<sup>34</sup> Regulators who attempt to determine the quantities, types, and locations of chemicals present in the environment must rely on data, if any, from the monitoring of pollutants at the source or in the environment, estimates of chemical releases made in lieu of monitoring, and controversial attempts to model the dispersion of chemicals in air, water and soil.<sup>35</sup> To assess the extent to which people are exposed to these chemicals, regulators must have data—or make assumptions—about the behavior of the exposed population. For example, exposures will vary with the amount of contaminated soil ingested by children, or the extent to which people use polluted ground water to irrigate their gardens.<sup>36</sup>

Not surprisingly, scientists draw conclusions from risk assessment data that conflict wildly in their implications for environmental policy. Some scientists argue that we face an epidemic of cancer and other diseases caused by ubiquitous chemical contamination of our environment.<sup>37</sup> Others assert that environmental hazards are greatly exaggerated and that the government overregulates industry in a misguided

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ence and Technology Policy, Chemical Carcinogens: A Review of the Science and Its Associated Principles, 50 Fed. Reg. 10,372 (1985) (adopting assumptions to resolve scientific uncertainties). See generally, F. CROSS, *supra* note 30, at 62-65 (discussing limitations of risk assessment). Indeed, even the definition of harm is controversial. See, e.g., *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1156-61 (D.C. Cir.), *cert. denied*, 449 U.S. 1042 (1980) (affirming EPA's decision to set lead standard to protect against change in blood chemistry despite Lead Industries Association's claim that the change "is a mere 'sub-clinical effect'—a biological response to lead exposure—which is without health significance.").

32. Commoner, *The Hazards of Risk Assessment*, 14 COLUM. J. ENVTL. L. 365, 372 (1989); Latin, *supra* note 26, at 91.

33. S. EPSTEIN, *THE POLITICS OF CANCER* 58 (1978); Latin, *supra* note 26, at 91.

34. See Stanfield, *Problems with Data Collection Hinder Efforts on Pollution*, *Experts Say*, N.Y. Times, Nov. 8, 1988, at C4, col.1.

35. Finkel, *Is Risk Assessment Really Too Conservative?: Revising the Revisionists*, 14 COLUM. J. ENVTL. L. 427, 443-44 (1989).

36. Lave, *supra* note 27, at 311. See generally Paustenbach, *Health Risk Assessments: Opportunities and Pitfalls*, 14 COLUM. J. ENVTL. L. 379, 402-06 (1989) (detailing the exposure assessment phase of risk analysis).

37. See, e.g., S. EPSTEIN, *supra* note 33.

effort to create a risk-free society.<sup>38</sup> Because scientists and others present these arguments to a public that lacks the scientific expertise to evaluate them, the debate is essentially political. Occasional chemical disasters such as the Bhopal incident,<sup>39</sup> and mounting evidence of the global effects of pollution, including ozone depletion, acid rain and the greenhouse effect,<sup>40</sup> make it unlikely that the public soon will be convinced that the government is being overprotective.

### C. Imposing Standards

Once risks are assessed—however accurately or inaccurately—regulators face the difficult job of deciding how much danger to the public and environment to tolerate. Setting an “acceptable” level of risk involves the scientifically, legally and politically complex task of balancing, either implicitly or explicitly, public health and welfare con-

38. See M. DOUGLAS & A. WILDAVSKY, *RISK AND CULTURE* (1982); E. EFRON, *THE APOCALYPTICS* (1984). See generally F. CROSS, *supra* note 30; Elliott, *The Future of Toxic Torts: Of Chemophobia, Risk as a Compensable Injury and Hybrid Compensation Systems*, 25 Hous. L. REV. 781, 785 nn.14-15 (1988).

39. In December 1984 methyl isocyanate released from a Union Carbide Corporation pesticide plant in Bhopal, India, killed more than 2,800 people and injured more than 300,000. See *All Claims from Bhopal Disaster Settled for \$470 Million by India*, Union Carbide, 3 Toxics L. Rep. (BNA) 1157 (Feb. 22, 1989). One court called the Bhopal incident “the most tragic industrial disaster in history.” *In re Union Carbide Corp. Gas Plant Disaster at Bhopal, India* 634 F. Supp. 842, 844 (S.D.N.Y. 1986), *aff’d*, 809 F.2d 195 (2d Cir.), *cert. denied*, 484 U.S. 871 (1987). The tragedy gave rise to fears that a similar disaster could occur in the United States, especially at Union Carbide’s methyl isocyanate plant in West Virginia. Chern, *Union Carbide’s Plant at Institute, W. Va.: Lessons from Bhopal*, 11 EPA J. No. 6 21 (July-Aug. 1985).

More recent incidents keep hazardous waste issues before the public. See, e.g., *Chemical Disaster Spurs Doubts over EPA Chemical Awareness Program Success*, 9 Inside E.P.A. 11 (May 1988) (discussing chemical explosion at Nevada manufacturing facility); Schmitt, *Leak Ends a Town’s Idyllic Life*, N.Y. Times, Dec. 27, 1988, at A13, col. 6 (city ed.) (describing effects on public welfare and property values of an underground leak of one million gallons of leaded gasoline in Long Island, New York); Hanley, *Buried Chromium Poses a Threat to New Jersey*, N.Y. Times, June 28, 1989, at A12, col. 1 (nat’l ed.) (one person dead and tens of thousands face health risks from hexavalent chromium leaking from dump sites). Recent reports have publicized risks posed by storage of hazardous substances near population centers. For example, one such report states:

[T]he water treatment plant for the District of Columbia keeps chlorine in tank cars stored on its premises. If one of those cars ruptured, it could send a plume of dense, highly poisonous chlorine gas 40 miles across the city and surrounding countryside. In all likelihood, the gas would pass directly over the Capitol and the White House.

Shabecoff, *The Early Returns of a Toxic Poll*, N.Y. Times, Nov. 20, 1988, at F10, col. 3.

40. See Graedel & Crutzen, *The Changing Atmosphere*, 261 Sci. AM. 58 (1989); Schneider, *The Changing Climate*, 261 Sci. AM. 70 (1989).

siderations against the economic costs of risk reduction. This balance necessarily depends on the value of the human life or environmental resource to be protected: a value that can be expressed, albeit controversially, in terms of dollars.<sup>41</sup>

Regulators can estimate (with questionable accuracy) the amount of money each regulation will require society to devote to risk reduction and the number of injuries, including deaths, that each regulation will avoid. As regulators attempt to save more and more lives, the cost of regulation per life saved generally increases. Presumably, at some point, the marginal cost of saving additional lives is too high to justify further regulation.<sup>42</sup>

Exactly how much money is too much to spend to save a life is a question that government officials avoid answering directly. Instead, the EPA tends to express risk management decisions in terms of a range of "acceptable risks," that the Agency purports to justify without reference to the cost of further risk reduction.<sup>43</sup> Alternatively, the EPA imposes regulatory limits based on the capabilities of reasonably available technology. The government usually does not justify these limitations (e.g., Best Available Control Technology (BACT) and Lowest Achievable Emissions Rate (LAER)) in terms of risk.<sup>44</sup>

Arguably, the question of how many of society's dollars to spend

41. See C. GILLETTE & T. HOPKINS, *FEDERAL AGENCY VALUATIONS OF HUMAN LIFE; A REPORT TO THE ADMINISTRATIVE CONFERENCE OF THE UNITED STATES* (July 7, 1988) at 1; F. CROSS, *supra* note 30, at 70-73.

42. C. GILLETTE & T. HOPKINS, *supra* note 41, at 2 (Office of Management and Budget has documented "implicit" agency decisions that economic value of life is as low as \$70,000 and as high as \$312 million).

43. In setting a standard for benzene under the National Emission Standard for Hazardous Air Pollutants program, the EPA responded to the D.C. Circuit's holding that the Clean Air Act requires the Agency to determine an acceptable level of risk *before* considering cost. *Natural Resources Defense Council, Inc. v. EPA*, 824 F.2d 1146 (D.C. Cir. 1987). Rather than deciding that, if cost is not considered, only trivial risks are acceptable, the EPA compiled a "Survey of Societal Risk" and purported to base its decision on accepted risks "in the world in which we live." 54 Fed. Reg. 38,044, 38,046-47 (1989). The risk survey, set forth at 53 Fed. Reg. 28,496, 28,512-13 (1988), includes risks posed by car accidents, city air inhalation, home accidents, radon in homes, and pesticides. Because people presumably would reduce such risks if cost were not a factor, the EPA's use of its Survey of Societal Risk as the basis for a risk-acceptability decision allows cost to influence decisions through the back door.

44. See, e.g., 42 U.S.C. § 7475(a)(4) (1982) (major air pollution sources in areas that have attained ambient air quality standards must use "the best available control technology" (BACT) to prevent significant deterioration of air quality); 42 U.S.C. § 7503(2) (Supp. V 1987) (major air pollution sources in areas that have *not* attained ambient standards must meet "the lowest achievable emission rate" (LAER)). For a general (and critical) description of technology-based standards, see Ackerman & Stewart, *supra* note 5, at 1335-38; see also B. ACKERMAN & W. HASSLER, *CLEAN COAL/DIRTY AIR* 94 & n.39 (1981).

protecting the environment is so fundamental that our democratically elected officials, rather than bureaucrats or courts, should answer it.<sup>45</sup> Congress, however, clearly is unwilling to face the issue squarely. Neither sacrificing environmental quality and public health for economic reasons nor bankrupting the economy to create a risk-free environment is acceptable politics.

Congress enacts environmental statutes that, on their face, call for virtual elimination of harmful pollution, but allows the EPA to promulgate regulations replete with explicit and implicit economic trade-offs.<sup>46</sup> For example:

- The Clean Water Act's stated goal is to *eliminate* discharge of pollutants into waters of the United States by 1985.<sup>47</sup> Yet the EPA ignores the Act's goal of pollution elimination in favor of a regulatory approach designed to protect designated uses of surface waters and to minimize further degradation.<sup>48</sup>
- The Clean Air Act requires the EPA to adopt National Ambient Air Quality Standards (NAAQS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) that not only protect public health but also provide, respectively, "adequate" and "ample" margins of safety.<sup>49</sup> By defining the term "ambient air" to include only air to which the public has access, however, the EPA limits the applicability of NAAQS and thus avoids imposing stricter standards on polluters.<sup>50</sup> To obviate the need to

45. See B. ACKERMAN & W. HASSLER, *supra* note 44, at 122-26;

Ackerman & Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVT. L. 171, 188-90 (1988).

46. Dean Guido Calabresi explains such seemingly hypocritical government behavior as a response to an irreconcilable conflict between society's need to view each human life as priceless and the scarcity of resources available for actually treating each life as priceless. Thus, society tends to affirm the pricelessness of life in visible, symbolic ways (e.g., spending a million dollars rescuing a single downed balloonist) while declining to spend money on projects that would prevent future deaths (e.g., providing shore patrols). G. CALABRESI & P. BOBBIT, *TRAGIC CHOICES* (1978).

47. 33 U.S.C. § 1251(a)(1)(1982) ("[I]t is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985."); see also 33 U.S.C. § 1362(7) (1982) (defining "navigable waters" to mean "the waters of the United States").

48. See 40 C.F.R. § 131.11 (1989) (governing adoption of water quality criteria to protect designated uses); 40 C.F.R. § 131.12 (1989) (setting forth EPA's antidegradation policy).

49. 42 U.S.C. § 7409(b)(1) (1982) (Primary National Ambient Air Quality Standards); 42 U.S.C. § 7412(b)(1)(B) (1982) (National Emission Standards for Hazardous Air Pollutants).

50. See 40 C.F.R. § 50.1(e) (1989) (defining "[a]mbient air" as "that portion of the atmosphere . . . to which the general public has access"). By defining ambient air in terms of access, the EPA allows companies to avoid violating ambient standards by purchasing and fencing off the property where standards are exceeded. This technique of

require strict controls on most hazardous air pollutants, the Agency declines to regulate more than a handful of the myriad potentially carcinogenic and toxic air pollutants.<sup>51</sup>

- Congress intended RCRA to assure that hazardous waste is managed in a manner "so as to *minimize* the present and future threat to human health and the environment."<sup>52</sup> The EPA, however, avoids extensive regulation of various dangerous waste management practices by defining "hazardous waste" to exclude them.<sup>53</sup>
- CERCLA requires a level of cleanup of hazardous substances that, at a minimum, "*assures* protection of human health and the environment."<sup>54</sup> Nonetheless, the EPA interprets CERCLA to allow a wide "acceptable risk" range.<sup>55</sup>

Thus, Congress publicly—and largely symbolically—mandates that the environment be free of dangerous pollutants. But the EPA, rather than taking Congress at its word and imposing regulations that

achieving standards by limiting access enables businesses to avoid or minimize the need to reduce emissions. This result might make sense if Congress had intended *only* to require compliance with ambient standards. Congress, however, also intended ambient standards to lead to emission reductions. See 42 U.S.C. § 7423 (1982) (prohibiting businesses from avoiding the need to reduce emissions by building excessively tall smokestacks or adopting other techniques that use atmospheric conditions to disperse pollutants).

51. Graham, *The Failure of Agency Forcing: The Regulation of Airborne Carcinogens under Section 112 of the Clean Air Act*, 1985 DUKE L.J. 100 (1985).

52. 42 U.S.C. § 6902(b) (Supp. V 1987) (emphasis added).

53. RCRA Subtitle C regulations list hazardous wastes, see 40 C.F.R. § 261.30-.33 (1989), and also set forth characteristics that identify hazardous wastes even if they are not listed, see 40 C.F.R. § 261.20-.24 (1989). EPA regulations set forth only four characteristics for identifying hazardous wastes: (1) ignitibility; (2) corrosivity; (3) reactivity; and (4) toxicity. *Id.* In 1984, Congress ordered the EPA to identify "additional characteristics of hazardous waste, including measures or indicators of toxicity" by November 1986. See 42 U.S.C. § 6921(h) (1982). Perhaps because there is no "hammer provision" associated with section 6921(h), see *supra* note 21, the EPA did not revise its regulations governing the toxicity characteristic until 1990. See 55 Fed.Reg. 11,798 (1990).

Similarly, prior to enactment of HSWA, the EPA created out of whole cloth an exemption from RCRA requirements for "small quantity generators" (i.e., businesses that generate less than 1,000 kilograms of hazardous waste in a month). See 45 Fed. Reg. 33,084, 33,102-05 (1980); 45 Fed. Reg. 76,620 (1980). Congress, with enactment of HSWA, adopted the concept of applying special rules to small-quantity generators, but sharply limited the EPA's approach. 42 U.S.C. § 6921(d) (Supp. V 1987). Additionally, the EPA will not regulate various wastes from mining operations under RCRA Subtitle C, despite the fact that the EPA "recognizes, as evidenced by the mining waste sites on the National Priorities List, the potential for problems from mining sites." 51 Fed. Reg. 24,496, 24,499 (1986).

54. 42 U.S.C. § 9621(d)(1) (Supp. V 1987) (emphasis added).

55. See 55 Fed. Reg. 8666, 8716-18 (1990) (discussing EPA's decision to set a range of acceptable risks for carcinogens in regulations promulgated under CERCLA).

would either force an economic restructuring or cause Congress to revise the laws,<sup>56</sup> makes *ad hoc*, painfully slow decisions as to how far to push congressional goals. Although Congress routinely lambastes the EPA for failing to implement the law as written, it rarely interferes with the Agency's actual decisions. Consequently, the system works well as a matter of politics, but does little to inspire confidence in command-and-control regulation as the sole means of protecting our environment.

#### D. Implementation and Enforcement

Once finally made, the EPA's regulatory decisions generally are questionable enough to allow special interests to tie up implementation and enforcement in months, if not years, of litigation.<sup>57</sup> Similarly, in recent years, the Office of Management and Budget has imposed long delays on the EPA's issuance of regulations while the Office pressures the Agency to reduce the economic impact of the regulations and accept greater environmental risks.<sup>58</sup>

Even after regulations are final, some environmental laws are extremely cumbersome to enforce. For example, to enforce many Clean Air Act requirements, the EPA must notify the violator of its violation and may file suit only if the violation persists over thirty days after the notice.<sup>59</sup> The regulatory structure of RCRA has become so byzantine that the prospect of explaining many of its provisions to a court can be quite daunting.<sup>60</sup> Overall, the EPA neither conducts nor requires sufficient monitoring of emissions or environmental quality to support a vigorous enforcement effort.<sup>61</sup> And as amply demonstrated during the early years of the Reagan administration, EPA enforcement often is complicated by the vagaries of politics.<sup>62</sup>

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56. Cf. *Tennessee Valley Auth. v. Hill*, 437 U.S. 153 (1978) (the snail darter/Tellico dam case). In *Hill*, the Supreme Court declined to second-guess congressional policy decisions despite the fact that those decisions would lead to unintended economic impacts. See *id.* at 154. As Justice Powell noted in his dissent, if Congress is unhappy with the literal application of its statute, Congress may revise that statute. *Id.* at 195-96 (Powell, J., dissenting).

57. See Ackerman & Stewart, *supra* note 45, at 182; Stewart, *supra* note 16, at 157.

58. See *supra* note 18.

59. 42 U.S.C. § 7413(a) (1982).

60. For example, the definition of "hazardous waste" under RCRA covers more than ten pages in the Code of Federal Regulations. See 40 C.F.R. § 261.3-.33 (1989).

61. See Stanfield, *supra* note 34; see also *Bethlehem Steel Corp. v. EPA*, 782 F.2d 645, 657-65 (7th Cir. 1986) (Swygert, J., concurring in part and dissenting in part).

62. See generally Mintz, *Agencies, Congress and Regulatory Enforcement: A Review of EPA's Hazardous Waste Enforcement Effort, 1970-1987*, 18 ENVTL. L. 683 (1988).

The greatest weakness of command-and-control environmental statutes is that they are not self-enforcing. In other words, the laws fail to provide incentives for members of the regulated community to police themselves and one another. Moreover, under the command-and-control system, the regulated community's sole responsibility is to comply with government edicts. If a statute or regulation does not forbid a particular practice, industry may engage in that practice with impunity.<sup>63</sup> Thus, the risk that environmental hazards have escaped scientific scrutiny and regulatory control is borne by the public. Command-and-control regulation leaves the task of planning ahead to steer society through complex environmental problems solely to a government bureaucracy that simply is not up to the job.

### III. THE MARKETABLE PERMIT MODEL

Several commentators argue that Congress should replace command-and-control regulation with a system that uses marketable permits to create economic incentives to reduce pollution in a more efficient manner.<sup>64</sup> In general, the current command-and-control system is designed to force each source of pollution to comply with specific emission limitations which, as a practical matter, require adoption of particular pollution control technologies.<sup>65</sup> In contrast, a marketable permit system would allow businesses to buy and sell rights to pollute within government designated areas, enabling businesses to make the same overall emission reductions less expensively. By regulating the amount of pollution rights available in each designated area, the EPA would protect the environment while eliminating some aspects of the central planning required under the current system.<sup>66</sup>

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63. Of course, the possibility of tort actions may provide some deterrent. The tort system, however, as it has evolved to date, does not provide a consistent, credible threat that companies will have to pay for injuries that they cause. See F. CROSS, *supra* note 30, at 183-217.

64. See *supra* note 5 and accompanying text; see also Ackerman & Elliot, *Air Pollution "Rights,"* N.Y. Times, Sept. 11, 1982, at 23, col. 2.

65. See *supra* note 44 and accompanying text.

66. Professors Ackerman and Stewart argue that a marketable permit system would greatly reduce the EPA's information processing burden because the EPA would not need to determine the Best Available Technology (BAT) for limiting emissions. Similarly, Ackerman and Stewart suggest that their proposals would reduce the burden on the courts by eliminating appeals of BAT decisions. See Ackerman & Stewart, *supra* note 45, at 180. However, although a marketable permit system would reduce the government's involvement in assigning specific emission limitations to businesses, the EPA would continue to assign limits to pollution control regions (i.e., determine the volume of pollution rights on the market). This decision necessarily would involve a determination of feasibility or risk—and the decision would be appealable. See 5 U.S.C. § 702 (Supp. V



Although ingenious, marketable permit schemes have yet to gain widespread acceptance. One reason is that the wholesale scrapping of command-and-control regulation, and replacement with a new system, would disrupt the status quo in favor of a theory that is largely untested.<sup>67</sup> Furthermore, a marketable permit program would not solve two of the most severe problems plaguing environmental protection programs: lack of adequate monitoring and insufficient enforcement.<sup>68</sup>

Unless carefully regulated, a system that allowed industry to redistribute pollution rights could result in excessive local impacts from individual facilities.<sup>69</sup> And although Congress presumably could use a marketable permit system to limit generation of hazardous materials,<sup>70</sup> it is unclear how marketable permits would enhance regulation of hazardous waste disposal facilities, since the regulatory goal generally is to prevent—rather than control—releases of pollutants.

The government continues to experiment with variations of the marketable permit idea to supplement existing programs.<sup>71</sup> In fact,

1987). Moreover, the EPA's chemical-by-chemical approach to risk identification and assessment presumably would continue unchanged.

67. See Ackerman & Stewart, *supra* note 5, at 1333-34.

68. Professors Ackerman and Stewart argue that a marketable permit system would motivate the EPA to enforce the law more effectively since poor enforcement would reduce the price of pollution rights, which, under the Ackerman/Stewart system would in turn reduce the Agency's funding. Ackerman & Stewart, *supra* note 45, at 183. Assertions that economic incentives will improve a huge federal bureaucracy's behavior, however, are unproven at best.

69. Professors Ackerman and Stewart nonetheless suggest that pollution rights could be traded freely for 5 to 10 years in existing air quality control regions and watershed boundaries. Ackerman & Stewart, *supra* note 5, at 1350. Stewart, however, acknowledges elsewhere that:

[marketable permit systems] control aggregate pollution or risk levels, but not the levels produced by any one facility or at any one location. They are therefore best adapted to deal with environmental problems that are *not* local in character. . . . Local effects can, however, often be dealt with by a combination of regulation and economic incentives.

Stewart, *supra* note 16, at 167 (emphasis added).

In addition to the practical problem of local impacts, a marketable permit system could lead to political problems. A system that allows emissions to vary depending on the market for pollution rights may frustrate the desire of those who live or work near a pollution source to know, specifically, the amount of pollutants the source will emit and whether the source will employ state-of-the-art pollution control equipment.

70. Alternatively, generation of hazardous waste could be taxed. See Davis, *supra* note 15, at 521-22; see also Russell, *Economic Incentives in the Management of Hazardous Wastes*, 13 COLUM. J. ENVTL. L. 257 (1988) (advocating a "deposit-refund" system to control hazardous waste).

71. See Hahn & Hester, *supra* note 5, at 366-406 (describing experiments in marketable permits including emissions trading (i.e., "offsets," "netting," "bubbles," and "banking")) and inter-refinery averaging of lead in gasoline); see also 135 CONG. REC. H4450, H4451-52 (Daily ed. July 27, 1989) (remarks of Rep. Lent); Wicker, *Bush's Acid*

there are good reasons to conclude that, carefully applied, such a system could reduce some emission reduction costs.<sup>72</sup> But ultimately a program based on marketable permits depends—as does command-and-control regulation—on the EPA's ability to identify environmental hazards prospectively, determine acceptable levels of pollution, and enforce its decisions.<sup>73</sup> Like command-and-control regulations, marketable permits do not force the private sector to shoulder the risk that the level of regulation imposed by the government will be insufficient to protect the public.

#### IV. THE NEW LIABILITY-BASED INCENTIVES TO AVOID POLLUTION

Current regulatory programs, however flawed, result from years of legislative and administrative effort and comprise a system familiar to the regulated community, environmentalists, lawyers and politicians. And regardless of the shortcomings of command-and-control regulation, the environmental statutes of the 1970s did lead to some improvements, albeit in limited areas.<sup>74</sup> Nonetheless, even if the wisdom of attempting a massive overhaul of current regulatory programs remains unclear, by 1980 the need to supplement the system was obvious.<sup>75</sup>

In December 1980, during the final days of the Carter administration, Congress enacted the sweeping Superfund statute known as "CERCLA."<sup>76</sup> Public attention surrounding CERCLA focused on creation of the multi-billion dollar Superfund to pay for government cleanup of abandoned waste sites. But it is CERCLA's broad and retroactive liability provisions that fundamentally alter environmental law, imposing new planning and cleanup obligations on all segments of the economy.

Confounding those who considered CERCLA the last gasp of a liberal, lame-duck Congress and President, Congress enacted—and President Reagan signed—HSWA in 1984<sup>77</sup> and SARA in 1986,<sup>78</sup> increasing

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Test, N.Y. Times, Oct. 31, 1989, at A19, col. 1 (President Bush proposed acid rain control program that depends, in part, on "market approach" to allocate emission reductions.).

72. Ackerman & Stewart, *supra* note 45, at 175-78.

73. See Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267, 1301 nn.166 & 169 (1985).

74. Shabecoff, *supra* note 19.

75. See *supra* note 4.

76. For a legislative history of CERCLA, as enacted in 1980, see Grad, *A Legislative History of the Comprehensive Environmental Response, Compensation and Liability ("Superfund") Act of 1980*, 8 COLUM. J. ENVTL. L. 1 (1982).

77. See *supra* note 8.

the environmental liabilities of the business community still further. The use of retroactive, liability-based statutes to encourage private investment in environmentally sound practices clearly is an idea whose time has come.

### A. *The Creation of Strict, Joint and Several Liability*

The liability-based statutes of the 1980s reflect a policy choice by Congress that those in some way responsible for the release of toxic chemicals, rather than the public at large, must bear the costs of environmental pollution.<sup>79</sup> Thus, Congress imposed strict, joint, several and retroactive liability for toxic contamination on broad categories of parties whom Congress deemed responsible for contaminated sites.<sup>80</sup> Furthermore, Congress authorized all citizens (in addition to the EPA, the states, local governments and Indian tribes) to enforce important provisions of the law.<sup>81</sup> By casting such a wide net of liability, and deputizing so many potential enforcers, Congress imposed a burden on the business community to anticipate, avoid and clean up environmental contamination that knows only ill-defined limits.

Congress designed CERCLA primarily to address inactive hazardous waste sites such as Love Canal—a problem that did not fall squarely within the ambit of previous environmental laws.<sup>82</sup> Nonetheless, CERCLA applies to essentially *any* actual or threatened release of a hazardous substance whether at an inactive or active site, regardless of the applicability of other statutes.<sup>83</sup> Under CERCLA, “responsible parties” are liable for investigation, cleanup and litigation costs, and natural resource damages. Such parties include current owners or oper-

78. See Atkeson, Goldberg, Elrod & Connors, *An Annotated Legislative History of the Superfund Amendments and Reauthorization Act of 1986 (SARA)*, 16 *Envtl. L. Rep.* (Envtl. L. Inst.) 10360 (Dec. 1986).

79. See *United States v. Aceto Agricultural Chems. Corp.*, 872 F.2d 1373, 1380 (8th Cir. 1989); *Walls v. Waste Resource Corp.*, 761 F.2d 311, 318 (6th Cir. 1985); *United States v. Shell Oil Co.*, 605 F. Supp. 1064, 1072 (D. Colo. 1985); *Ohio ex rel. Brown v. Georgeoff*, 562 F. Supp. 1300, 1312 (N.D. Ohio 1983). See generally Grad, *supra* note 76.

80. *Dedham Water Co. v. Cumberland Farms Dairy, Inc.*, 889 F.2d 1146 (1st Cir. 1989); see also *infra* notes 103-06 and accompanying text.

81. See CERCLA, 42 U.S.C. § 9659 (Supp. V 1987); RCRA, 42 U.S.C. § 6972(a)(1)(B) (Supp. V 1987); see also CERCLA, 42 U.S.C. § 9607(a)(1)-(4) (Supp. V 1987).

82. See *United States v. Waste Indus.*, 556 F. Supp. 1301 (E.D.N.C. 1982) (district court holding, prior to HSWA, that RCRA applies to active conduct and *not* to leaching from waste disposed of before RCRA became effective), *rev'd*, 734 F.2d 159 (4th Cir. 1984). HSWA clarified that RCRA *does* apply retroactively to problems created before its enactment. See, e.g., 42 U.S.C. § 6972(a)(1)(B) (Supp. V 1987).

83. See, e.g., *Colorado v. United States Dep't of the Army*, 707 F. Supp. 1562 (D. Colo. 1989); *Colorado v. Asarco, Inc.*, 616 F. Supp. 822 (D. Colo. 1985).

ators of pollution sources and contaminated sites, those who owned or operated such sites at the time of disposal of hazardous substances, those who "arranged for disposal" of hazardous substances, and those who transported the substances to disposal sites.<sup>84</sup>

The federal government, the states, Indian tribes and "any other person" may conduct CERCLA studies and cleanups (i.e., "removal" and "remedial action") at contaminated sites and recover their costs from responsible parties.<sup>85</sup> In addition, the EPA may issue administrative orders requiring responsible parties to conduct removal or remedial action when "there may be an imminent and substantial endangerment to public health or welfare or the environment."<sup>86</sup> The United States, the states, Indian tribes and, arguably, local governments may recover damages for injuries to natural resources from those same parties.<sup>87</sup>

CERCLA cleanups must proceed in a manner "consistent" (or "not inconsistent") with the EPA's National Contingency Plan (NCP).<sup>88</sup> Before permanent cleanups ("remedial actions") are con-

84. 42 U.S.C. § 9607(a)(1)-(4) (Supp. V 1987). CERCLA's imposition of liability on those who "arranged for disposal" of hazardous substances encompasses generators whose hazardous substances arrive at contaminated sites in a variety of ways. See e.g., *Colorado v. Idarado Mining Co.*, 707 F. Supp. 1227, 1241 (D. Colo. 1989) (by allowing hazardous substances to erode into river, defendants "arranged for" disposal of hazardous substances at downstream site); *O'Neil v. Picillo*, 682 F. Supp. 706, 720, 731 (D.R.I. 1988) (waste generator is liable for releases from disposal site even though generator arranged for disposal of waste at different site and waste hauler took waste to site at issue without generator's authorization), *aff'd* 883 F.2d 176 (1st Cir. 1989), *cert. denied*, 110 S. Ct. 1115 (1990). See generally *United States v. Aceto Agricultural Chems. Corp.*, 872 F.2d 1373, 1378-82 (8th Cir. 1989) (discussing CERCLA's "arranged for" language).

85. 42 U.S.C. § 9607(a)(1)-(4)(A), (B), (D) (Supp. V 1987). The terms "removal" and "remedial action" are defined at 42 U.S.C.A. § 9601(23)-(25) (West Supp. 1989).

86. 42 U.S.C. § 9606(a)(1982); *United States v. Conservation Chem. Co.*, 619 F. Supp. 162, 191-97 (W.D. Mo. 1985); see *infra* note 97.

87. 42 U.S.C. § 9607(a)(1)-(4)(C) (1982). See generally *Ohio v. United States Dep't of Interior*, 880 F.2d 432 (D.C. Cir. 1989) (overturning U.S. Department of the Interior regulations regarding the measure of natural resource damages under CERCLA); Cross, *Natural Resource Damage Valuation*, 42 VAND. L. REV. 269 (1989); Kenison, Buchholz & Mulligan, *State Actions for Natural Resource Damages: Enforcement of the Public Trust*, 17 ENVT'L. L. REP. (ENVT'L. L. INST.) 10434 (1987); Landreth & Ward, *Natural Resource Damages: Recovery Under State Law Compared With Federal Laws*, 20 ENVT'L. L. REP. (ENVT'L. L. INST.) 10134 (1990). At least two courts have held that local governments are included within CERCLA's definition of "states" and, thus, may recover natural resource damages. See *City of New York v. Exxon Corp.*, 697 F. Supp. 677, 683-86 (S.D.N.Y. 1988); *Mayor of Boonton v. Drew Chem. Corp.*, 621 F. Supp. 663 (D.N.J. 1985). But see *City of Philadelphia v. Stepan Chem. Co.*, 713 F. Supp. 1484 (E.D.Pa. 1989).

88. The National Contingency Plan (NCP) is codified at 40 C.F.R. §§ 300.1-.920. The EPA revised the plan effective April 9, 1990. 55 Fed. Reg. 8666 (1990); see also 53 Fed. Reg. 51,394 (1988) (the proposed revisions). Cleanups conducted by the United

ducted, the NCP requires an expensive array of studies for which responsible parties ultimately must foot the bill. The NCP mandates:

- Studies to identify the nature and extent of contamination at polluted sites ("the remedial investigation");
- Studies to evaluate cleanup or mitigation alternatives ("the feasibility study");
- Studies to evaluate the risks posed by the contamination ("the risk assessment");
- Identification of standards to be applied to the cleanup ("applicable or relevant and appropriate standards");
- Public education and participation; and
- Selection of a site-specific cleanup plan that complies with statutory and regulatory criteria ("the remedial action plan").<sup>89</sup>

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States, a state, an Indian tribe, and, arguably, a local government (*see supra* note 87) must be "not inconsistent" with the NCP. 42 U.S.C. § 9607(a)(1)-(4)(A) (Supp. V 1987). In other words, government-conducted cleanups are presumed consistent with the NCP unless defendants in an enforcement action meet their burden of proving otherwise. *United States v. Northeastern Pharmaceutical & Chem. Co.*, 810 F.2d 726, 747-48 (8th Cir. 1986), *cert. denied*, 484 U.S. 848 (1987). Private plaintiffs, however, must prove that their response actions were "necessary" and "consistent" with the NCP. 42 U.S.C. § 9607(a)(1)-(4)(B) (Supp. V 1987); *New York v. Shore Realty Corp.*, 648 F. Supp. 255, 263 n.5 (E.D.N.Y. 1986).

89. Federally-financed remedial action is governed by 40 C.F.R. §§ 300.420-435. (The Code of Federal Regulations citations contained in this footnote are the to-be-codified sections as they are set forth in the EPA's revised National Contingency Plan, 55 Fed. Reg. 8813-65 (1990)). Such action may be taken by federal agencies and—pursuant to EPA delegation—by states, Indian tribes or local governments. *See, e.g.*, 42 U.S.C. § 9604(d)(1) (Supp. V 1987); 40 C.F.R. Part 300, Subpart F (authorizing, *inter alia*, cooperative agreements and Superfund Memoranda of Agreement between EPA and other government bodies). The requirements of 40 C.F.R. §§ 300.420-435 also serve as guidance for actions by states, Indian tribes or local governments that are not federally funded. *Id.* § 300.400(i)(2); *see also id.* § 300.515(e)(2)(ii) (EPA concurrence is not a prerequisite to state actions that are not federally-financed). Remedial action by private parties is governed by 40 C.F.R. § 300.700(c)(5)(vii)-(ix), (6), (7) & (8), which incorporates many of the standards of 40 C.F.R. §§ 300.420-435.

If a "remedial site evaluation" (including a "remedial preliminary assessment" and a "remedial site inspection," 40 C.F.R. § 300.420), reveals the need for remedial action, the NCP requires the responding government or person to perform "scoping" to ensure that the response is appropriate to conditions at the contaminated site. *Id.* § 300.430(b). This step includes: evaluation of existing data; identification of potential cleanup alternatives; limited data collection (when appropriate); identification of the type, quality and quantity of data to be collected in future studies; preparation of health and safety plans (including an employee training plan); notification of appropriate natural resource trustees (so that they may begin steps to recover natural resource damages); development of a sampling and analysis plan (including a field sampling plan and a quality assurance plan); and preliminary identification of cleanup standards. *Id.* § 300.430(b)(1)-(8).

Next, the NCP requires a "remedial investigation" to determine the nature and extent of the threat posed by releases or threatened releases of hazardous substances. *Id.* §

In addition, the NCP specifies procedures for taking short-term

300.430(d)(1). The remedial investigation involves, as appropriate, data collection (including sampling, monitoring and treatability studies), a risk assessment study, and identification of applicable or relevant and appropriate requirements (ARARs). *Id.* § 300.430(d)(1)-(4). "Applicable" requirements specifically address the circumstances found at the site; "relevant and appropriate" requirements address problems sufficiently similar to those encountered at the site that their use is well-suited to the site. *Id.* § 300.5.

The NCP requires the responding government or person to perform a "feasibility study," more or less concurrently with the remedial investigation, to develop and evaluate alternative cleanup goals and technologies. *Id.* § 300.430(e). The feasibility study involves consideration of a broad range of options, including, as appropriate, recycling, treating, removing and containing hazardous substances, limiting public access, and taking no action. *Id.* § 300.430(e)(2)-(3). The NCP requires screening of these alternatives (as appropriate) to narrow the list of options and eliminate those that are ineffective, impractical or unduly expensive. *Id.* § 300.430(e)(7)(i)-(iii). Alternatives may be eliminated on the basis of cost when cheaper alternatives are available that are similarly effective and practical and that use similar technologies or when costs are grossly excessive compared to the overall effectiveness of the cleanup. *Id.* § 300.430(e)(7)(iii).

After the screening, each remaining alternative that represents a "viable" cleanup approach must be analyzed in detail, according to nine criteria for evaluation: (1) overall protection of the public and environment; (2) compliance with ARARs; (3) long-term effectiveness; (4) reduction of toxicity, mobility or volume through treatment; (5) short-term effectiveness and impact; (6) implementability; (7) cost; (8) acceptability to the affected state or Indian tribe; and (9) acceptability to the community. *Id.* § 300.430(e)(9).

Based on the remedial investigation/feasibility study, the NCP requires selection of a cleanup plan according to these same nine evaluation criteria. *Id.* § 300.430(f). Criteria 1 and 2 are "threshold criteria" that, subject to limited exceptions, must be met by any remedy. *Id.* § 300.430(f)(1)(i)(A), (ii)(A)-(C). Criteria 3 through 7 are "primary balancing criteria"—allowing for trade-offs between them. *Id.* § 300.430(f)(1)(i)(B), (ii)(D)-(E). Finally, criteria 8 and 9 are "modifying criteria" which must be considered, but cannot justify departure from threshold criteria. *Id.* § 300.430(f)(1)(i)(C), (ii)(E).

The NCP requires the responding agency or person to present its proposed selection of a cleanup plan to the public in conjunction with an ongoing community relations program. *Id.* § 300.430(f)(2)-(3); see also *id.* § 300.430(c) (setting forth community relations requirements). A final plan is selected after evaluation of public comment. *Id.* § 300.430(f)(4). The selected cleanup plan must (1) be protective of human health and the environment; (2) meet ARARs (subject to narrow exceptions); (3) be "cost-effective," providing that threshold criteria are met; and (4) provide the best balance of primary balancing criteria with an emphasis on long-term effectiveness and reduction of toxicity, mobility or volume through treatment. *Id.* § 300.430(f)(1)(ii).

To determine cost-effectiveness, the responding agency or person must compare cost with a balance of three of the five primary balancing criteria: long-term effectiveness; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness and impact. *Id.* § 300.430(f)(1)(ii)(D). Under the NCP, an alternative is cost-effective if costs are "proportional" to overall effectiveness. *Id.* The cost-effectiveness requirement does not, however, require a cost-benefit study. See 55 Fed. Reg. 8666, 8726-30 (1990) (EPA's explanation of its approach to cost); see also HOUSE CONFERENCE COMM. REP., SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, H.R. CONF. REP. NO. 962, 99th Cong., 2d Sess. 245 (1986), reprinted in 1986 U.S. CODE CONG. & ADMIN. NEWS 3276, 3338 (The term "cost-effective" means that the decision-maker "first determines the ap-

actions ("removal actions") to protect the public and environment from contamination pending selection, design and completion of permanent cleanups.<sup>90</sup>

Without changing this basic scheme, SARA—the 1986 amendments to CERCLA<sup>91</sup>—increases the cost of cleanups by requiring that remedial action provide "permanent solutions . . . to the maximum extent practicable."<sup>92</sup> SARA also enhances the states' ability to influence the EPA's remedy selection decisions, allows citizens to enforce standards that "have become effective" under CERCLA,<sup>93</sup> and authorizes states to obtain court-ordered cleanups.<sup>94</sup>

Under SARA, the Agency for Toxic Substances and Disease Registry (ATSDR) must prepare toxicological profiles of hazardous substances. Also, SARA Title III created the Emergency Planning and Community Right-to-Know Act (EPCRA), which requires businesses to submit reports to public agencies about the nature, quantity and location of dangerous chemicals that they use, store, dispose of and release.<sup>95</sup> Information provided by EPCRA and ATSDR's toxicological profiles may increase public pressure for additional government action and also may prove useful to plaintiffs using the tort system to respond to environmental risks.<sup>96</sup>

HSWA amended RCRA in 1984 by, among other things, authorizing any person (including states, local governments and Indian tribes) to bring suit against any transporter, generator, owner or operator who contributes or contributed to handling or disposal of any solid or hazardous waste that "may present an imminent and substantial endangerment to health or the environment."<sup>97</sup> This provision creates a fed-

appropriate level of environmental and health protection to be achieved and then selects a cost-efficient means of achieving that goal.").

Selection of the cleanup plan is followed by documentation and design and by operation and maintenance. 40 C.F.R. §§ 300.430(f)(5), (6), .435.

90. See 55 Fed. Reg. 8842-44, 8858 (1990) (to be codified at 40 C.F.R. §§ 300.410-415, .700(c)(5)(v)-(vi), (6), (8)).

91. See *supra* notes 10 & 78.

92. 42 U.S.C. § 9621(b) (Supp. V 1987).

93. See 42 U.S.C. § 9621(f) (Supp. V 1987) (state participation); *id.* § 9659 (citizen enforcement).

94. *Id.* § 9621(e)(2); *Colorado v. Idarado Mining Co.*, 707 F. Supp. 1227, 1232 (D. Colo. 1989); see Babich & Hanson, *State Enforcement of CERCLA: The Idarado Decision in Perspective*, 20 Env't Rep. (BNA) 735 (1989). But see *United States v. Akzo Coatings of Am., Inc.*, 719 F. Supp. 571, 577-78 (E.D. Mich. 1989).

95. 42 U.S.C. § 9604(i) (Supp. V 1987) (ATSDR); *id.* §§ 11001-11050 (EPCRA).

96. See Sherwood & Fitzsimmons, *The ATSDR: A Plaintiff's Dream Come True?*, 2 Toxics L. Rep. (BNA) 1072 (Mar. 2, 1988).

97. 42 U.S.C. § 6972(a)(1)(B) (Supp. V 1987). The courts have interpreted the phrase "may present an imminent and substantial endangerment" to refer to a significant risk of eventual environmental harm. An "endangerment" (*i.e.*, threat) is "immi-

eral cause of action, as well as broad, strict, joint, several and retroactive liability, for public nuisances that pose a significant risk of eventual harm to the public or environment.<sup>98</sup>

HSWA also added provisions to RCRA to protect the public from leaking underground storage tanks,<sup>99</sup> mandate that the EPA and the states force parties regulated under RCRA to clean up past contamination,<sup>100</sup> and, generally increase the stringency, expense and complexity of RCRA compliance.<sup>101</sup>

In short, Congress's environmental initiatives of the 1980s impose strict, joint, several and retroactive liability for cleanup and for expensive federally-mandated studies on essentially every party who ever had significant involvement with hazardous waste or contaminated property.

### B. Creating Incentives to Clean Up

Strict, joint and several liability directly threatens the profits of the countless businesses involved—directly or indirectly—with polluting activities, including businesses that acquire real estate polluted by

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nent" even if the harm may not occur for many years. *See* United States v. Conservation Chem. Co., 619 F. Supp. 162, 194 (W.D. Mo. 1985). Thus, the situation need *not* present an emergency for RCRA to apply. *See* United States v. Waste Indus., 734 F.2d 159, 165 (4th Cir. 1984); *cf.* United States v. Midway Heights County Water Dist., 695 F. Supp. 1072, 1076 (E.D. Cal. 1988) (holding, under the Safe Drinking Water Act, that the court need not wait until actual harm occurs before acting under the "may present an imminent and substantial endangerment" standard).

Moreover, actions under 42 U.S.C. § 6972(a)(1)(B) are not limited by the EPA's regulatory definition of RCRA Subtitle C "hazardous waste". Instead, such actions may be based upon the broad, statutory definitions of "hazardous" and "solid" waste. *Cf.* 40 C.F.R. § 261.1(b)(2) (1989) (the regulatory definition does not limit EPA's authority to respond to potential imminent and substantial endangerments).

98. *Middlesex County Board of Chosen Freeholders v. New Jersey*, 645 F. Supp. 715, 722 (D.N.J. 1986) (Congress intended to codify public nuisance remedies). Persons who contribute or contributed to "the past or present handling, storage, treatment, transportation or disposal" of solid or hazardous waste are strictly liable for any resulting endangerment. *Vermont v. Staco, Inc.*, 684 F. Supp. 822, 835 (D. Vt. 1988); *cf.* *United States v. Northeastern Pharmaceutical & Chem. Co.*, 810 F.2d 726, 740 (8th Cir. 1986) (Congress intended 42 U.S.C. § 6973(a) to impose liability without fault or negligence), *cert. denied*, 484 U.S. 848 (1987). Moreover, 42 U.S.C. § 6972(a)(1)(B) authorizes courts to impose joint and several liability. *Cf.* *United States v. Aceto Agricultural Chems. Corp.*, 872 F.2d 1373, 1382-84 (8th Cir. 1989); *Conservation Chem. Co.*, 619 F. Supp. at 199 (construing the substantially identical language of 42 U.S.C. § 6973).

99. 42 U.S.C. §§ 6991-6991i (Supp. V 1987).

100. *Id.* § 6924(u)-(v).

101. *See, e.g., id.* § 6924(c)-(k). *See generally* R. FORTUNA & D. LENNETT, HAZARDOUS WASTE REGULATION—THE NEW ERA (1987).



others.<sup>102</sup> Under strict liability statutes, responsible parties are liable for environmental contamination regardless of individual degrees of

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102. See generally ABA Standing Committee on the Environment, *Burdens of Environmental Regulation on Private Property Ownership and Business Transactions: Reasonable or Unreasonable?* 18 Env'tl. L. Rep. (Env'tl. L. Inst.) 10348 (Sept. 1988); Evans, *Environmental Audits of Real Property*, 3 NAT. RESOURCES & ENV'T 20 (1988); Marcotte, *Toxic Blackacre: Unprecedented Liability for Landowners*, 73 A.B.A. J. 66 (Nov. 1, 1987); McNerney, McInnis & Towe, *Tilting at Windmills: Trying to be an Innocent Purchaser*, 4 Toxics L. Rep. (BNA) 135 (July 5, 1989); Leifer, *EPA's Innocent Landowner Policy: A Practical Approach to Liability Under Superfund*, 20 Env't Rep. (BNA) 646 (August 4, 1989).

Generally, the courts have read CERCLA's imposition of liability on "owners" and "operators" of contaminated property very broadly. See, e.g., *Colorado v. Idarado Mining Co.*, 18 Env'tl. L. Rep. 20578 (Env'tl. L. Inst.) (D. Colo. 1987) (parent corporation and subsidiary are liable as "owners" and "operators" of site owned by another subsidiary); *United States v. Maryland Bank & Trust Co.*, 632 F. Supp. 573 (D. Md. 1986) (lender that took title to contaminated property at foreclosure sale is liable for cleanup costs.); *United States v. Mirabile*, 15 Env'tl. L. Rep. (Env'tl. L. Inst.) 20,994 (E.D. Pa. 1985) (lender who foreclosed on borrower's property may be liable for cleanup).

An owner or operator is *not* liable if he or she can prove that the act or omission of a third party (other than an employee or agent or one whose act occurs in connection with a "contractual relationship" with the defendant) was the sole cause of the contamination and that (1) the defendant exercised due care with respect to the hazardous substances at issue, and (2) the defendant took precautions against foreseeable acts or omissions of third parties. See 42 U.S.C. § 9607(b) (1982). As used in section 9607(b), the term "contractual relationship" includes contracts for sale or transfer of real property *unless* (1) the defendant acquired the property after contamination and (2) the defendant proves that he or she did not know and "had no reason to know" of the contamination, or the defendant is a government that acquired the property by escheat, by other involuntary transfer, or by eminent domain, or the defendant acquired the property by inheritance or bequest. *Id.* § 9601(35)(A) (Supp. V 1987).

To prove that he or she "had no reason to know" of the contamination, a defendant must have undertaken "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice in an effort to minimize liability." *Id.* § 9601(35)(B). This "innocent landholder" exception to CERCLA liability is of uncertain scope, since the courts have yet to define "all appropriate inquiry." See *United States v. Pacific Hide & Fur Depot, Inc.*, 716 F. Supp. 1341 (D. Idaho 1989) (under some circumstances, *no* inquiry may be sufficient). The exception does not apply to an innocent landholder who contributes to the release of hazardous substances or, after discovering the contamination, transfers the property to another without disclosure. 42 U.S.C. § 9601(35)(C)-(D). See generally *Superfund Program: De Minimis Landowner Settlements and Prospective Purchaser Settlements*, 54 Fed. Reg. 34,235 (1989).

Another exception to CERCLA liability, codified as an exception to the definition of "owner or operator," applies to a lender who "without participating in the management of a . . . facility holds indicia of ownership primarily to protect his security interest in the . . . facility." 42 U.S.C. § 9601(20)(A) (Supp. V 1987). A facility is "any site . . . where a hazardous substance has . . . come to be located." *Id.* § 9601(9). See generally *United States v. Fleet Factors Corp.*, 724 F. Supp. 955 (S.D. Ga. 1988) (holding that a secured party was not an "owner or operator" under CERCLA).

fault.<sup>103</sup> In other words, it is unnecessary to prove that a responsible party negligently or intentionally caused contamination in order to force cleanup and recover costs and damages.

The doctrine of joint and several liability holds each responsible party at a contaminated site individually liable for the entire cleanup and the entire amount of damages.<sup>104</sup> Joint and several liability simplifies enforcement by making proof of each responsible party's specific contribution to the problem unnecessary. In many cases in which there are several responsible parties, such proof would be impossible, since chemicals in the environment rarely can be "fingerprinted" (i.e., traced back to their original owners).<sup>105</sup> Congress provided liable parties with legal recourse against one another for contribution, to ensure that each pays its fair share of cleanup costs and damages.<sup>106</sup>

When liability for pollution threatens profits, businesses invest in reducing that threat until they judge it to be outweighed by the cost of taking further precautions.<sup>107</sup> Of course, in the short run, much of that investment consists of paying lawyers to find loopholes in the law and lobbyists to seek legislative changes. As it becomes clear, however, that Congress and the courts will not weaken the laws, the focus inevitably shifts to investment in more environmentally beneficial projects, such as early identification and management of pollution problems and min-

103. *United States v. Bliss*, 667 F. Supp. 1298, 1304 (E.D. Mo. 1987). The standard of liability under CERCLA is "the standard of liability which obtains under [the Clean Water Act, 33 U.S.C. §] 1321." 42 U.S.C. § 9601(32) (1982 & Supp. V 1987). The Clean Water Act, 33 U.S.C. § 1321, undoubtedly imposes strict liability. *See, e.g.*, *United States v. Hollywood Marine, Inc.*, 625 F.2d 524 (5th Cir. 1980), *cert. denied*, 451 U.S. 994 (1981); *United States v. Marathon Pipe Line Co.*, 589 F.2d 1305, 1309 (7th Cir. 1978). Thus, CERCLA also provides for strict liability. *See, e.g.*, *New York v. Shore Realty Corp.*, 759 F.2d 1032, 1042 (2d Cir. 1985); *Colorado v. ASARCO, Inc.*, 16 Env'tl. L. Rep. (Env'tl. L. Inst.) 20,561 (D. Colo. 1985) (Carrigan, J.); *United States v. Conservation Chem. Co.*, 589 F. Supp. 59, 62 (W.D. Mo. 1984); *United States v. South Carolina Recycling & Disposal, Inc.*, 653 F. Supp. 984, 991 (D.S.C. 1984), *aff'd in part, vacated in part sub nom.* *United States v. Monsanto Co.*, 858 F.2d 160 (4th Cir. 1988), *cert. denied*, 109 S. Ct. 3156 (1989); *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802, 805 (S.D. Ohio 1983); *United States v. Price*, 577 F. Supp. 1103, 1113-14 (D.N.J. 1983).

104. *O'Neil v. Picillo*, 883 F.2d 176, 178-79 (1st Cir. 1989), *cert. denied*, 110 S. Ct. 1115 (1990); *United States v. Stringfellow*, 661 F. Supp. 1053, 1059-61 (C.D. Cal. 1987); *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802, 810-11 (S.D. Ohio 1983).

105. *See United States v. Wade*, 577 F. Supp. 1326, 1332-33 (E.D. Pa. 1983).

106. 42 U.S.C. § 9613(f) (Supp. V 1987); *see also* *Chemical Waste Management, Inc. v. Armstrong World Indus.*, 669 F. Supp. 1285 (E.D. Pa. 1987) (RCRA compliance costs may be recovered from other responsible parties under CERCLA). *Colorado v. Asarco, Inc.*, 608 F. Supp. 1484 (D. Colo. 1985) (right to contribution is available under CERCLA as matter of federal common law).

107. *See* Dechert & Smith, *Environmental Liability and Economic Incentives for Hazardous Waste Management*, 25 Hous. L. Rev. 935 (1988); Frost, *Strict Liability as an Incentive for Cleanup of Contaminated Property*, 25 Hous. L. Rev. 951 (1988).

imization of toxic waste.<sup>108</sup>

### C. *Thy Brothers' (and Sisters') Keeper*

Because the new environmental laws impose liability regardless of fault, potentially responsible parties must police not only their own conduct but also that of their peers. For example, a landowner—or a lender with an interest in property—may be liable for pollution that a tenant, borrower or even a prior owner has caused.<sup>109</sup> Thus, an increasing number of landowners, lenders, real estate investors and others with interests in property now insist on environmental audits to identify pollution problems before completing business transactions.<sup>110</sup> Similarly, because waste generators no longer may avoid liability by paying a waste hauler to take responsibility for disposal, generators have a powerful incentive to ensure that hazardous waste is handled properly by all involved.<sup>111</sup>

Liability-based laws empower parties facing potential liability due to contamination caused in whole or in part by others to bring private actions for cleanup and to recover their investigation, litigation and cleanup costs.<sup>112</sup> These private enforcement actions allow responsible parties to avoid liability to the EPA and the public by cleaning up problems at the expense of other, more culpable parties. Thus, strict, joint and several liability provisions inspire far more cleanups than could be achieved by the government acting alone.

### D. *Past Pollution, Future Liability*

It is a commonplace that what the business community seeks most from government regulators is consistency and certainty. Yet just as the uncertainties of the market economy force industry to be creative and flexible in production activities, increasing the uncertainty of environmental liability can motivate businesses to approach environmental

108. See Hays, *Chemical Firms Press Campaigns to Dispel Their "Bad Guy" Image*, Wall St. J., Sept. 20, 1988, at 1, col. 6; Elkins, *Toxic Chemicals, The Right Response*, N.Y. Times, Nov. 13, 1988, at F3, col. 1.

109. See *supra* note 102.

110. See, e.g., Evans, *supra* note 102. See generally Environmental Auditing Policy Statement, 51 Fed. Reg. 25,004 (1986).

111. See 42 U.S.C. 9607(a)(3) (Supp. V 1987); see *supra* note 84.

112. E.g., *Dedham Water Co. v. Cumberland Farms Dairy, Inc.*, 889 F.2d 1146, (1st Cir. 1989); *Smith Land & Improvement Corp. v. Celotex Corp.*, 851 F.2d 86 (3rd Cir.), cert. denied, 109 S. Ct. 837 (1989); *General Elec. Co. v. Litton Business Sys., Inc.*, 715 F. Supp. 949 (W.D. Mo. 1989); *Chemical Waste Management, Inc. v. Armstrong World Indus.*, 669 F. Supp. 1285 (E.D. Pa. 1987).

issues with more care, creativity and flexibility. With its environmental legislation of the 1980s, Congress shattered industry's expectations of consistency by demonstrating a willingness to impose retroactive liability for pollution that was legal when caused.<sup>113</sup>

Following enactment of CERCLA, businesses are on notice that they can no longer rely on current EPA or Congressional decisions—whether based on risk assessments, cost or politics—to shield them from liability in the future.<sup>114</sup> To avoid future liability, *all* potential polluters must conduct independent assessments to anticipate and avoid the dangers their activities might otherwise create. Even industries that have convinced Congress to exempt them from requirements of today's regulatory and liability statutes (for example, the oil and gas industry) would be well-advised to minimize the damage they cause. Their exemptions may not last forever.<sup>115</sup>

Investors in property contaminated with substances not currently subject to CERCLA should carefully consider whether cleanup actions taken today can reduce the threat of liability for expensive EPA-directed cleanups in the future. By raising the spectre of retroactive liability, Congress has offered the business community compelling reasons to identify environmental problems as early as possible and to plan carefully to reduce risks.

### *E. The Role of Bureaucratic Waste*

In an ironic twist, presumably unanticipated by Congress, the liability-based environmental statutes of the 1980s use the inherent inefficiency of the federal bureaucracy to motivate private businesses to conduct their own cleanups. Once a contaminated site comes to the EPA's attention and is placed on the National Priorities List,<sup>116</sup> the Agency generally will spend millions of dollars on studies, reports and community relations activities long before any actual cleanup takes

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113. See *United States v. Northeastern Pharmaceutical & Chem. Co.*, 810 F.2d 726, 732-37 (8th Cir. 1986), *cert. denied*, 484 U.S. 848 (1987); *United States v. Shell Oil Co.*, 605 F. Supp 1064, 1068-79 (D. Colo. 1985).

114. Indeed, CERCLA settlements generally contain reopeners so that defendants are not released from liability if additional problems develop at the site. See 42 U.S.C. § 9622(f)(6) (Supp. V 1987).

115. See *Eagle-Picher Indus. v. EPA*, 759 F.2d 922 (D.C. Cir. 1985) (waste that is exempt from the definition of "hazardous waste" of RCRA Subtitle C nonetheless may be a "hazardous substance" under CERCLA).

116. The National Priorities List is an EPA-determined list of sites that present enough significant hazards to require federal action under CERCLA. 42 U.S.C. § 9605(a)(8)(B) (Supp. V 1987). The list is neither complete nor exclusive. See U.S. GENERAL ACCOUNTING OFFICE, *SUPERFUND: EXTENT OF NATION'S POTENTIAL HAZARDOUS WASTE PROBLEM STILL UNKNOWN*, (GAO/RCED-88-44) (Dec. 1987).

place.<sup>117</sup> When cleanup begins, it is unlikely to proceed in what members of the private sector would recognize as a cost-effective or efficient manner.<sup>118</sup> Thus, in assessing potential environmental liabilities, businesses must consider not only the potential for legitimate cleanup costs and natural resource damages, but also the probability that the EPA will waste a great deal of money that it will expect to recover from responsible parties.

The prospect of bureaucratic waste encourages responsible parties to organize and take responsibility for site investigations and cleanups.<sup>119</sup> If the EPA already has decided to address problems at the site under CERCLA, the Agency will require an expensive panoply of studies, no matter who performs them. But responsible parties can reduce costs by doing the studies themselves and in many cases can influence ultimate cleanup decisions.<sup>120</sup> Moreover, because strict compliance with the NCP is necessary only if the cleanup is directed or authorized by the EPA—or by another party who wishes to preserve the right to recover cleanup costs under CERCLA<sup>121</sup>—responsible parties who achieve a cleanup *before* a site receives the EPA's attention may save millions of dollars.

For these reasons, the relatively few—but highly publicized and alarmingly expensive—cleanups that the EPA actually has conducted have made a strong and constructive impression on the business community. In terms of inspiring private efforts to identify and clean up pollution problems and reduce waste generation, the EPA's inefficient Superfund program provides a great deal of bang for the buck.

### F. Enhancing the Regulatory System

To reconcile its new, liability-based approach with existing regulatory programs, Congress carved an exception to liability under CERCLA for "federally permitted releases" of hazardous substances.<sup>122</sup>

117. See *supra* note 89.

118. See, e.g., Lee, *EPA Response Action: Contracting and Cost Recovery Under CERCLA*, 4 *Toxics L. Rep. (BNA)* 216, 219 n.41 (1989) ("the government may spend from 100 percent to 500 percent more than a private client would spend to accomplish essentially the same site study or cleanup").

119. See, e.g., *INFORMATION NETWORK FOR SUPERFUND SETTLEMENTS, PRP ORGANIZATION HANDBOOK* (1989).

120. See EPA, *A MANAGEMENT REVIEW OF THE SUPERFUND PROGRAM* 2-19 to -21 (1989) (discussing EPA oversight of cleanups conducted by potentially responsible parties).

121. See 55 *Fed. Reg.* 8835 (1990) (to be codified at 40 C.F.R. § 300.185(d)).

122. See 42 U.S.C. §§ 9607(j), 9601(10) (Supp. V 1987). An analogous provision precludes recovery of natural resource damages for an environmental injury that was "specifically identified as an irreversible and irretrievable commitment of natural resources in

Under this exception, responsible parties are not liable for contamination authorized by permits issued under federal, and some state, environmental laws. The provision encourages polluters to obtain and comply with permits, enhancing the effectiveness of the regulatory system. It also provides an incentive for those who discharge currently unregulated substances to encourage government regulation and provide information to aid the government in setting reasonable standards.

Nonetheless, the "federally permitted release" exception to CERCLA liability could work better. Currently, a permit based on inadequate or even false information could, arguably, insulate a polluter from liability. If the exception applied only to pollution for which the government had issued a permit after considering all potential environmental harm, it would encourage dischargers to provide complete, accurate, and detailed information to regulators during the permitting process.

### G. Continuing the Restructuring

Because current liability-based statutes hold responsible parties liable for cleanup costs and damage to natural resources, but *not* for damage to the health of individuals, the laws create an incentive for reducing some risks of environmental contamination but not others. For example, pollution of ground water or soils with heavy metals is discouraged, since such pollution is long-lasting and expensive to clean up. No similar deterrent exists, however, to pollution of air with toxic chemicals, which, although dangerous, disperse in the atmosphere and, thus, often do not require expensive cleanup.<sup>123</sup> If polluters faced a realistic threat of liability for creating risks to public health, they would devote their efforts to reducing a greater variety of pollution problems.

The common law tort system, which governs most injuries to individuals, is not well-suited to problems of toxic pollution and, thus, fails to provide a credible threat of liability in many situations. In fact, the common law of many jurisdictions does not even recognize some of the injuries caused by exposure to toxic waste—such as increased risk of cancer or birth defects.<sup>124</sup>

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an environmental impact statement" or comparable analysis. *Id.* § 9607(f)(1). See generally *Idaho v. Hanna Mining Co.*, 882 F.2d 392 (9th Cir. 1989) (construing 42 U.S.C. § 9607(f)(1)).

123. See *Number of Air Pollution-Related Deaths in U.S., Canada, May be 50,000 Annually*, 19 Env't Rep. (BNA) 2629 (1989); Shabecroff, *Industrial Pollution Called Startling*, N.Y. Times, April 13, 1989, at D21, col. 4; Shabecroff, *U.S. Calls Poisoning of Air Far Worse than Expected and Threat to Public*, N.Y. Times, March 23, 1989, at B11, col. 1.

124. See, e.g., *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988). See

By the time a victim of toxic contamination actually develops cancer or has a child with a birth defect, years or even decades may have passed, making recovery of damages difficult. Often it is scientifically impossible to establish conclusively that a cancer or birth defect was caused by a particular chemical or pollution incident.<sup>125</sup> Thus, to provide an effective deterrent to polluters, victims' legal remedies for toxic contamination must be expanded and the burden of proof simplified.

One solution would be for Congress to create a legal remedy for those who suffer increased risks of cancer, birth defects or other injuries due to exposure to toxic chemicals.<sup>126</sup> The pollution victim's burden of proof could be set at a level that people who suffer such increased risks can practically achieve. Once a person who has been exposed to a dangerous pollutant makes a showing of an increased risk of harm, it would be the polluter's burden to show that the jury should not award damages. The polluter is in the best position to monitor and analyze his or her waste to rebut potential victims' claims of increased risk and to reduce exposures in the first place. By making polluters liable for risks to public health, and adjusting the requirements of proof appropriately, Congress can encourage polluters to study and control the risks that their activities create.

## V. CONCLUSION

Some industry representatives contend that the strict, joint and several liability provisions of modern environmental laws are unfair and should be abolished.<sup>127</sup> Current liability-based statutes, however, embody a basic principle of American jurisprudence—long part of the common law tort system—that liability for harm should be assigned to those in the best position to prevent the harm from occurring.<sup>128</sup> Be-

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generally Gluckstern, *In Support of a Uniform National Discovery Statute*, 4 *Toxics L. Rep.* (BNA) 551 (1989).

125. See Farber, *Toxic Causation*, 71 *MINN. L. REV.* 1219 (1987); Whitehead & Es-  
pel, *Legal Proof of Causation in Toxic Tort Litigation*, 2 *Toxics L. Rep.* (BNA) 1040  
(1988).

126. See Robinson, *Probabilistic Causation and Compensation for Tortious Risk*,  
14 *J. LEGAL STUD.* 779 (1985).

127. See, e.g., Address by D.C. Thomas, *Pollution Liability: The Tort System's  
Ticking Time Bomb* (Feb. 16, 1988) (available in Oct. 1988 Inside Superfund Conference  
program).

128. Cf. *Escola v. Coca-Cola Bottling Co.*, 24 Cal. 2d 453, 462, 150 P.2d 436, 440  
(1944) (Traynor, J., concurring) ("Even if there is no negligence . . . public policy de-  
mands that responsibility be fixed wherever it will most effectively reduce the hazards to  
life and health . . ."). See generally Special Committee on the Tort Liability System,  
*Towards a Jurisprudence of Injury: The Continuing Creation of a System of Substan-  
tive Justice in American Tort Law—Report to the American Bar Association* 4-3 to -8

cause problems of environmental pollution profoundly threaten the economic well-being and quality of life in every segment of society, the fairest solution is that which works best, most quickly, and least expensively.

A more sophisticated attack on current liability-based cleanup statutes is based on allegations that the EPA's Superfund program works poorly, slowly and is extremely expensive.<sup>129</sup> Citing the few, shockingly expensive cleanups obtained by the EPA and the tremendous amount of resources spent on litigation rather than cleanup, some businesses assert that a huge public works program to clean up existing sites would be preferable.<sup>130</sup> This argument, however, ignores the incentives that current statutes—regardless of EPA inefficiency—provide businesses to avoid creating pollution problems, clean up their own messes, and plan carefully to avoid future retroactive liability for chemicals that currently are not part of the federal statutory and regulatory scheme.<sup>131</sup>

Another argument for retreat from the environmental initiatives of the 1980s is grounded in an attack on EPA and congressional priorities. There is evidence—based on admittedly soft risk assessment data—that hazardous waste sites pose less of a day-to-day threat than other environmental problems, such as air pollution and pesticide contamination of food.<sup>132</sup> Arguably, if liability-based statutes divert soci-

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(1984).

129. See OFFICE OF TECHNOLOGY ASSESSMENT, ARE WE CLEANING UP? 10 SUPERFUND CASE STUDIES: A SPECIAL REPORT OF OTA'S ASSESSMENT ON SUPERFUND IMPLEMENTATION (June 1988); SURVEY AND INVESTIGATIONS STAFF, A REPORT TO THE COMMITTEE ON APPROPRIATIONS, U.S. HOUSE OF REPRESENTATIVES, ON THE STATUS OF THE ENVIRONMENTAL PROTECTION AGENCY'S SUPERFUND PROGRAM (Mar. 1988).

130. Greenberg, *Opinion*, 18 Chem. Waste Litig. Rep. 192 (1989) (setting forth an insurance industry proposal for a public works program).

131. See EPA, *supra* note 120, at 4. The EPA states the following in partial answer to critics of its Superfund program:

When all is said and done, few realize that the environmental benefits of Superfund go well beyond Superfund cleanups. Since the passage of CERCLA, many States have enacted their own hazardous waste site cleanup laws. The Superfund liability standard has also provided a powerful incentive for businesses, Federal facilities, and local governments to properly manage their wastes. Additionally, the threat of potential Superfund liability has spurred businesses, particularly during property transfers, to conduct environmental audits and remediate environmental problems, not only for hazardous wastes but for environmental problems in general.

*Id.*

132. See EPA, UNFINISHED BUSINESS: A COMPARATIVE ASSESSMENT OF ENVIRONMENTAL PROBLEMS—OVERVIEW REPORT (Feb. 1987). The EPA concluded that its rankings of environmental problems by risk do not correspond closely with the EPA's program priorities. See *id.* at xv. The EPA believes that criteria air pollutants, ozone depletion, and pesticide residues on food generally pose higher risks than active and inactive hazardous



ety's resources from more pressing problems to hazardous waste problems that can wait, Congress should revise the statutes. Nonetheless, until memories of environmental disasters and near misses involving hazardous substances fade, efforts to place hazardous waste problems on the back burner probably are doomed to failure.<sup>133</sup> Instead, Congress should seek ways of expanding its liability-based approach to address other significant risks.

The use of liability-based statutes to supplement regulatory programs and encourage the private sector to focus its energy, competence and creativity on protecting the environment is one of the most promising developments in the history of environmental law. Although the business community cannot be expected to shoulder its new environmental planning and cleanup responsibilities gladly, it is uniquely qualified to do so competently and efficiently. Continued reliance on strict, joint, several and retroactive liability is our surest means of achieving real progress in environmental protection.

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waste sites. *See id.* at 95. Overall, "EPA's priorities appear more closely aligned with public opinion than with estimated risks." *Id.* at 96; *see also* Hanley, *New Jersey Questions Superfund Priority*, N.Y. Times, Nov. 7, 1989, at B1, col.2.

133. *See supra* note 39.