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The Toxics Political Economy

Scientific issues concerning emissions and potential effects on health and the environment are necessarily secondary to economic and political issues in the United States.

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Following World War II, the expanding economy of the United States was the engine of growth in the global economy. The United States set about restructuring the world economy so that the reemergence of Germany and Japan could drive capitalist growth and development in Europe and Asia.[1] The United States was virtually unchallenged in its global economic and political hegemony. The long boom (1950–1965) was followed by a period of fall in profitability and a turn from boom to crisis (1965–1973). A long downturn continued into the 1990s. The U.S. economy in the later periods was marked by slow growth in relation to accelerating expansion in Japan and Germany. The "intensified competition" between the three global blocs and "uneven development" led to overcapacity, overproduction, and a fall in profitability.[2] At the root of the post-war toxics crisis in the U.S. was the great economic expansion in competition with Japan and Germany and the Cold War military industrial complex.

The basis of the rapid growth of the U.S. economy following World War II was the chemical industry. By the 1960s, the United States was predominantly an urban nation, and a monopoly waste industry had emerged centered around two companies, Waste Management Incorporated and Browning Ferris Industries. Beginning their operations in Chicago,

they colluded to take over a large portion of the waste industry nationwide. This industry, virtually unregulated until the 1980s, is an integral part of the U.S. economy, with the central sectors of the economy—banking, insurance, and big oil—all investing and sharing in the profits.

With the production and handling of waste such a major, profitable sector of the economy, the waste industry militated against needed changes, such as source reduction and recycling. This development is, in fact, exactly what one would expect in a capitalist economy in which policies are largely made and controlled by the largest and most powerful corporations. De facto "sustainable development" contradicts the inner logic of profits and accumulation under capitalism. The bottom line is profits and the necessity of achieving global competitiveness.

More than forty years of environmental regulation in the United States has resulted in a failure to protect the environment from toxic pollution and people's health from its effects.[3] The degradation of the environment should not be viewed as a failure to regulate effectively. Rather, the destruction of the environment is systemic: a necessary and integral part of the liberal-capitalist political economy of production, consumption, and waste. Seemingly ambitious attempts to protect the environment come down largely to window dressing, as large corporations control public policies in the protection of profits.

The extent of the threat of hazardous wastes to the environment and human well-being has become clearer over the past two decades as Congress has legislated to deal with the problem and attempted to devise strategies for cleanup and containment of hazardous wastes at the most contaminated sites. One indication of environmental crisis was the proliferation of Superfund sites—created and managed by the federal government to deal with the most hazardous toxic wastes—at the end of the 1980s. In 1987, the Government Accounting Office (GAO) reported to Congress that 70 percent of hazardous waste sites assessed by the Environmental Protection Agency (EPA) were leaking contaminants and that some 2,500 operating sites could require corrective action at a cost of some $22.7 billion.[4] Another government survey showed that "75 percent of permitted land disposal facilities were not in compliance with EPA requirements for groundwater, were leaking, or in a condition unknown to the agency."[5] Moreover, cleanup technologies were often merely cosmetic. Reports showed that 68 percent of remedies selected in 1987 failed to use any treatment whatsoever on the source of contamination. Forty-four percent of the remedies selected merely minimized exposure to contamination with fencing and capping.[6] Even after waste was removed from Superfund sites, 87 percent of landfills receiving Superfund waste were in an unacceptable condition. The EPA reported that most landfills would likely attain high failure rates shortly after fifty years of operation.[7]

Perhaps no area of public policy has created greater conflict between the interests of polluting industries, the public, and government regulatory agencies than that of the regulation of hazardous waste. The resulting "Superfund Syndrome" led to "a condition of constant confrontation among nearly everyone involved" and a failure to resolve one of the most critical conflicts in the United States.[8] Pollution continues, as indeed it must, while new methods of storage and disposal merely postpone the problem fifty to a hundred years down the road. Landfills remain toxic for hundreds or even thousands of years. Private corporations are increasingly given immunity from financial liability for their despoliation of the earth.

Such environmental destruction could not be kept a secret from the people forever. Due to an explosion in public awareness, greenwashing became a necessity for large corporations concerned about their public image. In the 1990s corporate interests in the United States launched a major public relations campaign to establish the perception that the crisis of environmental degradation from industrial pollution and other forms of waste had passed and that this was the "time for optimism."[9] Greenwashing is part of the new "corporate environmentalism," which touts "voluntary action" by corporations rather than government regulation and "command and control" confrontation. Such propaganda serves only to confuse and obfuscate the issues.

The crucial point, as John Bellamy Foster has pointed out, is that the history of capitalism has been a history of a war with the environment. Capitalism is a system of "creative destruction" driven by the logic of profit. This will not end except with a "socialization of nature and production" that will allow for "concern for other species and future generations."[10]

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The consumer revolution was seen as nothing less than the road to utopia. It depended on consumption and waste. The rapid expansion of the U.S. economy in the post–World War II period was largely based on the petrochemical industry as part of the emerging military industrial complex (MIC). Most of the more than 70,000 chemicals now used regularly have been produced since World War II.[11]

The emergence of the petrochemical revolution was marked by an upsurge in new miracle products, such as insecticides, plastics, synthetic rubber, rayon, dacron, and nylon—all derived from new products that were developed for the military in World War II. Petrochemicals, or organic feedstocks, were the bases for new products that began replacing "natural materials such as cotton, wood, rubber, metals, soap, manure, and natural solvents."[12]

The chemical industry, the "engine of growth" of the U.S. economy in the post war period, is its largest manufacturing sector, accounting for 10 percent of U.S. GDP from manufacturing and 2 percent of total U.S. GDP.[13] This industry has grown at roughly twice the rate of the U.S. economy since World War II and is characterized by very large industries. There are some 12,000 chemical manufacturing plants in the U.S. and 400,000 major chemical storage facilities.[14] The value of shipments of chemical and allied products in the U.S. rose from $268.1 billion in 1990 to $367.4 billion in 1996. The value of shipments of agricultural chemicals alone totaled $18.8 billion in 1992 and $23.4 billion in 1996.[15] Exports of chemicals were 17 percent of product shipments in 1995.[16] In the same year, U.S. shipments abroad were 13 percent of world exports.[17] Corporate profits were high in the chemical industry, averaging 13.2 percent for the five years prior to 1997 and 11.6 percent in 1997.[18]

The chemical manufacturing sector includes drugs and pharmaceuticals, which make up 25 percent of the industry, with $86.5 billion in products shipped in 1996. Industrial organic chemicals, the second largest component of the chemical industry, accounted for 20 percent of the industry, with $75.7 billion worth of products shipped. Finally, the plastics materials and synthetics components accounted for 15 percent of the industry, with $59.6 billion in products.[19] The U.S. is the world's largest consumer of chemicals, totaling $318 billion in 1995, not including plastics and resins.[20]

The chemical industry, as valuable as it is to the U.S. economy, comes at a high price. It is the largest industrial source of toxic chemical pollutants. It has played a "historical role" in the introduction of toxic substances into the production process.[21] As the source of toxics flowing through the economy, the chemical industry is the area where the issue of pollution prevention must be addressed.

The amount of toxic waste created by this industry is significant, as evidenced by the releases reported in the Toxic Release Inventory (TRI). For 1996, on- and off-site releases totaled 785 million pounds for 3,855 reporting facilities; production-related waste totaled some 10 billion pounds; non-production-related waste totaled 9.4 million pounds; other on-site waste management was reported as 8.3 billion pounds, while transfers off-site for further waste management came to 899 million pounds.[22]

Where did it all go? Fully half of all on- and off-site releases in chemical manufacturing were spewed into the air (392 million pounds); the earth was impregnated with a quarter of it (200 million pounds) in underground injection wells; 11.5 percent (90.4 million pounds) was dumped into surface water; other on-site land releases accounted for 8.7 percent, while 3.9 percent was transferred off-site to disposal. Some 2.4 million pounds were entombed in hazardous waste landfills on-site.[23] The largest transfer type off-site in the chemical industry was to "energy recovery," which means burning as fuel in cement kilns, boilers, asphalt plants, and so on. This totaled 378 million pounds. A reported 109.5 million pounds was sent to POTWs (Public Operated Treatment Works).[24]

What constitutes "hazardous waste" is quite complex. Definitions and criteria are set forth by the Resource Conservation and Recovery Act of 1976 (RCRA), the Superfund Law (CERCLA), and the EPA. But while objective, scientific criteria exist for classification, whether a particular substance is actually classified as hazardous is sometimes a political decision, depending on the added costs of production and handling of materials classified as hazardous to industries compelled to compete in the global marketplace.

Under RCRA, hazardous waste is defined as:

> a solid waste or combination of solid waste which because of its quantity, concentration, physical, chemical, or infectious attributes may (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

General RCRA criteria governing hazardous waste include toxicity, persistence, degradability, potential for accumulation in tissue, flammability, and corrosiveness.[25] It should be noted here that some wastes are considered hazardous but not under RCRA. These are special wastes, such as PCBs, asbestos, and radionuclides. PCBs and asbestos are regulated under the Toxic Substances Control Act (TSCA) and radionuclides under the Atomic Energy Act (AEA).

The definition of a hazardous waste under the Comprehensive Environmental Response, Compensation and Liability Act, or CERCLA, is broader. Specific contaminants include:

> any element, substance, compound or mixture, including disease causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through the food chain, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunction (including malfunctions in reproduction), or physical deformations in such organisms as their offspring.[26]

According to the EPA, there are two ways a waste material is defined as hazardous: its presence on EPA developed lists of hazardous wastes ("listed wastes"); and evidence that the waste exhibits ignitable, corrosive, reactive, or toxic characteristics ("characteristic wastes"). Hazardous wastes include many substances from industrial processes, such as halogenated solvents, nonhalogenated solvents, electroplating baths, waste water treatment sludges, heavy ends, light ends, bottom tars, side cuts from distillation processes, and commercial chemical products when discarded. Among these chemicals are acute arsenic acid, cyanides, many pesticides, benzene, creosote, phenols, and toluene.[27] The EPA further divides hazardous wastes into five categories.[28]

Whether the EPA actually lists a substance as a "RCRA hazardous waste" depends on various factors—and here is where the matter becomes more complex, where definitions and criteria do not ultimately determine what is "hazardous." Any number of interpretations are possible; any number of exceptions permitted. A substance may be excluded by a "variance"—that is, be "delisted." Some commercial chemical products, for instance, "are not solid wastes if they are applied to the land in their ordinary manner of use or if they are fuels." Examples include pesticides when used as directed or fuel used in cement kilns, which would otherwise be classified as hazardous. Also excluded from classification as "hazardous waste" is household waste (although it is well established that it can indeed be hazardous); fertilizers from the growing of crops and animals; mining overburden returned to the mine site; fly ash, bottom ash, slag, flue gas emissions from the combustion of fossil fuels; wastes associated with the development of oil, natural gas, and geothermal energy; other wastes from leather tanning, waste water treatment sludges, and the production of titanium oxide; cement kiln dust; wood and wood products that failed the toxicity characteristics for arsenic; and petroleum-contaminated media and debris.[29]

Sometimes a hazardous waste may be classified nonhazardous by simply diluting it. "When the dilution rules apply, the mixture of a hazardous waste with the dilutent does not cause the dilutent to become hazardous

and may render the hazardous waste nonhazardous."[30] In some cases dilution of hazardous wastes is permitted "for characteristic wastes and in those cases where the listed waste is not to be land-disposed."[31] And in some cases, hazardous wastes can be diluted for underground injection.[32]

While the EPA sets forth scientific and technological criteria for the classification of wastes as "hazardous," at some point what is treated as hazardous may well rest on political and economic grounds, rather than objective, scientific ones. A classic example is the mechanism whereby companies can petition to have wastes delisted, although these wastes are de facto hazardous. Whether or not a waste is classified as "hazardous" can be momentous in terms of the bottom line. Handling hazardous waste means significant operating expense for companies, while at the same time regulations open up opportunities for the waste companies doing the handling to make profits. For instance, Amoco planned to build and own its own disposal facilities while providing hazardous waste services to other companies. If delisted, de facto hazardous waste can be handled rather cheaply. It can be put in a non-hazardous waste landfill, or it can be used as fuel in a cement kiln.

Pivotal here—in this matter of delisting—is the "Hazardous Waste Identification Rule" (HWIR). The HWIR "identifies methods by which certain listed hazardous wastes, waste mixtures, and derived-from residue are no longer designated hazardous, either because they are generated with constituent concentrations that pose low risks or they are treated in a manner that reduces the concentrations to low levels of risk."[33] In one case, in December 1995, the EPA proposed that certain low-risk categories of hazardous waste not be included under subtitle C of RCRA. What is hazardous waste is not exactly fixed, not exactly pinned down. This is the point.

Those working in the "environmental industry" can often be straightforward about what is behind regulatory decisions at the EPA. As John F. Chadbourne, of Chadbourne Environment and Safety Programs, states, "Decisions on changes at EPA come to recognize the value of economic incentives to shape social policy, irrespective of incidental positive or negative effects on health and the environment." Health and the environment

are not the top priorities of EPA policies, as Chadbourne reminds us. Social policy is driven by economic incentives. "The key factor is an acceptable economic return, which is essential to create the necessary incentives to solve material handling and operating problems."[34]

To comprehend what is happening to the environment, one must distance oneself from the notion that the EPA is about "environmental protection." Like most other bureaucracies of the federal government, it ensures that the interests of the U.S. corporate sector will be well served. If profits are large enough—for any number of related industries (waste producers, kilns using cheap waste as fuel, etc.)—then cement kilns will be de facto hazardous waste incinerators, spreading dioxins and other toxics in communities all across America. The waste industry, dealing with the excrement of industry as a lucrative commodity in itself, is at the center of capitalism.

Delisting, in general, clearly serves the interests of U.S. corporate capitalism. It gives corporations greater freedom to pollute without penalty, whether they send their de facto hazardous waste to nonhazardous waste landfills, dump it directly into the environment, or sell it for fuel. Even though hazardous waste companies might have made a profit on the handling of the waste if it had not been delisted, nevertheless, delisting serves the interests of most industries as it cuts production costs and allows them to compete more easily under globalized production. As a first approximation, delisting, giving firms greater freedom to pollute, tends to enhance the bottom line.

If what constitutes "hazardous waste" is ultimately determined by the interests of large corporations, whose political and economic power in the United States continues to grow by leaps and bounds, then it is equally true that the method of reporting toxic releases, the Toxics Release Inventory, is part of this same equation. Firms have often saved money by cutting corners, such as not reporting, misreporting, dumping hazardous materials illegally, or using hazardous materials illegally, such as in road building materials. The TRI was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). After

passage of the Pollution Prevention Act of 1990, the TRI was expanded to include mandatory reporting of additional waste management and pollution prevention activities.[35]

According to the EPA, a "release" means "a discharge of a toxic chemical to the environment." Included are emissions to the air, discharges to bodies of water, releases to land (hazardous waste landfills), and to underground injection wells. Land releases may also include application farming (toxic sludge increasingly being used as fertilizer), surface impoundments, waste piles, spills, leaks, and RCRA Subtitle C (hazardous waste) landfills in future TRI reports.[36]

Data on toxic releases is collected according to the Biennial Reporting System (BRS). Whether reporting is required depends on the size of the company generating the waste. To report, the company must be a large-quantity generator (LQG); or must treat, store, or dispose of RCRA hazardous waste on-site in units subject to RCRA permitting requirements. A LQG is any site that generates 1,000 kilograms or more of RCRA hazardous waste in a single month; generates one kilogram or more of RCRA acute hazardous waste in a single month or at any time; or generates or accumulates at any time more than 100 kilograms of spill cleanup material contaminated with RCRA hazardous waste.[37] The situation is more complicated, however, as some states require that small-quantity generators report, and this data is included in the data for LQGs. Also the receivers of SQG hazardous wastes have to report their wastes, and so SQG waste should be included in the data reported in the National Biennial Report. This report includes only RCRA regulated hazardous wastes.

There are many limitations to the TRI. Through 1997, the program applies to industries in the manufacturing sector and those owned by the federal government only. Thus many sources of releases are not covered. Second, the TRI does not cover all toxic chemicals or all industry sectors. Facilities with fewer than ten full-time employees are not required to report. Also chemicals used in products such as pesticides and fertilizes are not reported or at most a small fraction of their actual release into the environment. The TRI does not account for toxic emissions from cars and

trucks. Furthermore, facilities report "estimated data," and the program does not mandate that they monitor their releases. Different facilities use different methodologies for estimation. The EPA stresses that reporting requirements are being expanded and that many chemicals that are carcinogens have been added to the list. New industry sectors are being added to the list.

These developments might raise the question as to why the program did not use a more complete list of chemicals and require more sectors of industry to report earlier. The first reports required from RCRA Subtitle C treatment and disposal facilities (hazardous waste incinerators, landfills, and so on) came due on July 1, 1999, for the 1998 reporting year.[38] The terms used for reporting how the waste has been handled can be misleading unless one goes directly to the EPA publications to read the definitions used. For example, "used for energy recovery on-site" means that this quantity of the toxic chemical was burned as fuel in a cement kiln, boiler, or other such facility. The term "treated on-site" means the quantity of the toxic chemical destroyed in on-site operations such as burning in a hazardous waste incinerator.[39]

Given the various exclusions relating to what is defined as hazardous waste, the inconsistent and misleading methods of reporting toxic releases, and possible political maneuvering, numbers given for the disposal of hazardous wastes are not very meaningful, and it is quite difficult to interpret what the numbers really mean in terms of environmental degradation of the earth. Nonetheless, one thing remains clear: the amount of hazardous waste produced each day in the U.S. is alarming.

Clearly a toxic nightmare prevails in hundreds of communities who face corporate assaults of hazardous toxics in incredible amounts. These come through hazardous as well as solid waste landfills, hazardous waste incinerators, cement kilns burning hazardous waste, asphalt plants, and industrial boilers using toxic fuels. The costs of America's toxic nightmare are heavy. Air and water quality is unhealthy for at least 150 million. Drinking wells and ground water aquifers have frequently become contaminated with industrial chemicals, organic solvents, and metals. [40] No

data is available on the toxic effects of 80 percent of all chemicals, and complete data exists for only some 2 percent or less. Occupational exposure limits have been set for only about 700 chemicals. Moreover, the EPA does not require testing for health effects before most chemicals go on the market.[41]

More than 200 industrial chemicals and pesticides have been found in the body tissues of 95 percent of Americans tested. The milk of 99 percent of mothers in the U.S. contains significant levels of DDT, and the average breast-fed infant ingests 9 times the permissible level of dieldrin.[42] And dioxin is found in milk, fish, meat, and paper in the United States as well.[43] Many chemicals, including these, now banned in the U.S., enter the country from Third World countries in the form of pesticide residues in imported foods. According to U.S. government reports, 25 percent of pesticides sold overseas by U.S. companies have been banned in the U.S.[44]

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Government Regulation: Environmental Legislation

As Peter Montague has pointed out, no environmental legislation has ever been put in place that was not previously approved by the largest American corporations. Given the bottom line of profit making and capitalist accumulation, and the necessity of global competition, it is a foregone conclusion that environmental degradation is going to continue.[45] It is not a question of why the system of regulation did not work to protect the environment. The system did work, as it was supposed to, but its priority was to give U.S. industries the ability to compete with emerging nations abroad, where environmental regulation was often extremely lax or nonexistent. This was absolutely necessary if U.S. industries were to compete successfully with the emerging economies of Europe and east Asia and "win" the Cold War.

Beginning in the 1960s, Congress passed a series of laws nominally under the rubric of "protecting the environment." This legislation was prompted by a number of environmental disasters and new understanding accomplished by studies such as Rachel Carson's *Silent Spring*. The National Environmental Policy Act (NEPA) of 1969 was the first of 20

major federal environmental laws.[46] NEPA, for the first time, mandated that ecological considerations based on science must be a criterion for development, apart from economic and political factors. It was the basis for new legislation signaling that Congress intended to have a clear environmental bias, one that would be protected from capture by those business interests to be regulated.[47] NEPA required environmental impact statements and created the Council on Environmental Quality.

The new generation of legislation built on earlier laws. In 1955, Congress passed the Air Pollution Control Act, the first such federal legislation, which provided technical and financial assistance to the states. This legislation was prompted by a series of killer fogs, such as the London fog of December 1952, that had caused 4,000 deaths. It was designed to address catastrophic air pollution around areas of heavy smokestack industries.[48] Another London fog in 1962, killing some 700, helped prompt the Federal Clean Air Act of 1963. An air pollution crisis in New York in 1966 led to passage of the Federal Air Quality Act of 1967. The Federal Motor Vehicle Pollution Control Act of 1965, aimed at controlling vehicular emissions, was passed after a series of smog incidents in California. These efforts attempted to help states cope with the problem of air pollution but made no real progress.[49] The Clean Air Act of 1970 authorized greater federal involvement in air pollution control, but the provisions to regulate toxic air pollutants foundered on "scientific uncertainty." Under the complex system that emerged, regulators in the states defined regional emissions limitations in order to meet federal standards. Except for lead emissions, which declined by 65 percent in the first decade, total emissions of sulfur oxides, nitrogen oxides, and other particulates increased with the growth in motor vehicle use.[50]

Another area where legislation was overdue was in the area of safe drinking water. The Federal Water Pollution Control Act of 1948 subsidized publicly owned sewers. Heavy industrial pollution led to the notorious fire on the Cuyahoga River in 1969. Following this, the Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act) contained two key provisions: first, all pollutant discharges to navigable waters must

inroads into penetrating markets of the Global South illustrate some of the challenges ahead for environmentally sound alternative development. The struggle for actually sustainable development with local solutions is under threat by global capitalism. The following six principles could serve as guidelines for local development: First, there should be social reforms, women's education, and people's empowerment. Second, there should be a balance between industrial and agricultural activities, between urban and rural development. Third, communal ownership should be organized for the management of natural and productive resources. Fourth, technologies should be adopted that are employment-friendly and eco-friendly. Fifth, the exploitation of natural and productive resources for rampant consumerism must be avoided. Finally, a decentralized energy strategy should be adopted, that is ecologically viable and non-exploitative.[64] In linking grassroots NGOs to international environmental organizations, states can be "educated" as to the real needs and demands of the people, helping to create real people's democracy.[65] At its root, environmental justice challenges the systemic structure of developed capitalist society and the global system of discrimination.

Endnotes

Chapter One

1. Noam Chomsky, *Deterring Democracy* (New York: Hill and Wang, 1992), pp. 331–50; Robert Brenner, "The Economics of Global Turbulence," *New Left Review*, no. 229 (May-June 1998).
2. Brenner, p. 9.
3. Harold C. Barnett, *Toxic Debts and the Superfund Dilemma* (Chapel Hill, NC: University of North Carolina Press, 1994); Robert Gottlieb, ed., *Reducing Toxics: A New Approach to Policy and Industrial Decisionmaking* (Washington, DC: Island Press, 1995); Norman J. Vig and Michael E. Kraft, eds., *Environmental Policy in the 1990s* (Washington, DC: CQ Press, 1990); James P. Lester, ed., *Environmental Politics and Policy: Theories and Evidence* , 2nd ed. (Durham, NC: Duke University Press, 1995); Lamont C. Hempel, *Environmental Governance* (Covelo, CA: Island Press, 1996); Brian Keating and Dick Russell, "Inside the EPA Yesterday and Today . . . Still Hazy after All These Years," *E Magazine* (July-August 1992), pp. 31–37; Mike Davis, "Dead West: Ecocide in Marlboro Country," *New Left Review*, no. 200 (July-August 1993), pp. 49–73; Lois Marie Gibbs, *Dying from Dioxin* (Boston: South End Press, 1995).
4. Barnett, *Toxic Debts*, p. 259. In fact all landfills leak and pollute the groundwater. For example, the testimony of Dennis E. Williams, a geologist and hydrologist, before the Board of Supervisors of San Bernardino County, California, May 9, 1995: "Landfills Leak." This document can be found on the www.stopwmx website. More technical information on both solid and hazardous waste landfills can be found in Harry M. Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, 2nd ed. (New York: McGraw-Hill, 1998). The fragility and temporary nature of landfills can be understood from several articles here. Even when the best technology is used, water leaks into the landfills resulting in large accumulations of hazardous leachates. Attempts are made to remove this leachate for some thirty years after the closure of the landfill, but after this, the continued accumulation will contaminate the groundwater. In discussing aboveground storage, the point is made that "In a sense, anything we do with our solid-waste residue is only storage, since it will likely remain an environmental hazard for at

least hundreds of years." Also burrowing animals go into the tops of landfills, breaching the cover. Roots of plants and trees grow through the linings. The waste in landfills may be mined in the future, presumably when environmental considerations require it or when this becomes economically feasible. Two case studies are given here. The Marathon County Area A Landfill in Ringle, Wisconsin, produced 36.71 million gallons of leachate between 1981and 1996. In 1993 a plume of contaminated groundwater was detected, containing manganese and six organic chemicals, including benzene and 1,1- dichloroethene. Technically, several problems arose. Solids in the leachate plugged up the drainage system, contaminating groundwater. Gas pressure inside the landfill resulted in numerous seeps and blowouts. Sealings around leachate removal lines could not be maintained, resulting in more contamination. Leachate depths in the cells built up to 5 to 20 feet. There were similar problems with the other facility surveyed. The engineering literature documents such problems during the active life of these landfill facilities. Once these sites are abandoned to the forces of nature, the private sector that reaped the profits has no ownership or liability for whatever happens. The public will pay the future unknown toxic debt. See K.W. Brown, David C. Anderson, and James C. Thomas, "Aboveground Disposal," in Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, pp. 10.66–10.75.

5. Barnett, Toxic Debts, p. 170.
6. Ibid., p. 244.
7. Ibid., p. 170. Today, engineers stress that some technologies are not proven and there are many problems in the operation of landfills. See, for example, Robert Hauser, "Ash Leachate Problem Demands Innovative Solution," *Waste Age*, February 1997, wasteage.com; Cheryl L. Dunson, "Controlling Leachate When Your Juice Gets Loose," *Waste Age*, March 1997, wasteage.com; Charles W. Leung and David E. Ross, "Hazardous Waste Landfill Construction," in Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, pp. 10.3–10.30. Many technical problems that arise are discussed here and in other articles in the same volume.
8. Barnett, *Toxic Debts*, p. 49.
9. Tom Athanasiou, "The Age of Greenwashing," *Capitalism, Nature, Socialism* 7, no. 1 (March 1996), pp. 1–36; Gregg Easterbrook, *A Moment on the Earth: The Coming of Environmental Optimism* (New York: Viking, 1995); Michael Fumento, *Science Under Siege: Balancing Technology and the Environment* (New York: William Morrow and Company, Inc., 1993).
10. John Bellamy Foster, *The Vulnerable Planet* (New York: Monthly Review Press, 1994), chap. 7.
11. Walter H. Corson, ed., *Global Ecology Handbook* (Boston: Beacon Press, 1990), p. 246.
12. Barnett, *Toxic Debts*, p. 14.
13. Maureen Smith and Robert Gottlieb, "The Chemical Industry: Structure and Function," in Gottlieb, ed., *Reducing Toxics*, pp. 210–11; U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 Toxics Release Inventory* (Washington, DC: U.S. Government Printing Office, 1998), p. 207.
14. Smith and Gottlieb, "The Chemical Industry: Structure and Function," pp. 209–32; U.S. EPA, *1996 TRI*, pp. 207–11; Jan Naar, *Design for a Livable Planet* (New York: Harper and Row, 1990), p. 39.
15. *Statistical Abstract of the United States*, 1998 (Washington, DC: U.S. Government Printing Office, 1998), pp. 741, 874.

16. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 TRI*, p. 207.
17. *Statistical Abstract*, p. 751.
18. Ibid., p. 563.
19. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 TRI*, p. 208.
20. Ibid., pp. 207, 210.
21. Smith and Gottlieb, "The Chemical Industry: Structure and Function," p. 209.
22. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 TRI*, pp. 212–13.
23. Ibid., pp. 216–17.
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25. Barnett, *Toxic Debts*, p. 11.
26. Ibid.
27. MacKenzie L. Davis, "Definition and Classification of Hazardous Waste," in Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, p. 2.3.
28. Ibid., pp. 2.3–2.5.
29. Ibid., pp. 2.5–2.7
30. Ibid., p. 2.10.
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32. Ibid., p. 2.11.
33. Ibid., p. 2.12.
34. John F. Chadbourne, "Cement Kilns," in Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, pp. 8.58, 8.76.
35. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 TRI*, pp. 5–6.
36. Ibid., p. 21.
37. Kristen A. Crockford, "Quantities of Hazardous Waste," in Freeman, ed., *Standard Handbook of Hazardous Waste Treatment and Disposal*, p. 2.35.
38. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *1996 TRI*, pp. 11–12.
39. Ibid., pp. 9–10, 55.
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Chapter Two

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27. "PA, NJ Agencies Empowered by Brownfield Laws." It is interesting to note that the governor who signed the Brownfield law in New Jersey in 1998 was Christie Whitman, now head of the EPA in the Bush administration. Recently, President Bush signed legislation increasing brownfields funding, with states and localities eligible to receive up to $250 million annually for five years to clean up polluted sites; potential developers have no liability for cleaning up toxic wastes existing at a site prior to the time of purchase. (See Lew Sichelman, "Feds Increase Brownfields Funding," *Realty Times*, 14 January 2002, http://realtytimes.com/rtnews/rtcpages/20020114_brownfields.htm.) Liability is indeed a crucial issue in protecting corporate assets. Under Michigan law, for example, stockholders and parent corporations are shielded from liability. Corporations can spin off hazardous waste and other high potential liability operations. That is, the parent company creates a hazardous waste company as a subsidiary. This provides a great deal of protection of the parent company from potential liability. The case of *Donahey v. Bogle* in 1997, decided in the U.S. Court of Appeals for the Sixth Circuit, sheds light on why brownfields legislation is needed by companies to launder toxic liabilities. Bogle's brother was the sole stockholder of St. Clair Rubber Company in Marysville, Michigan. Donahey later bought the property for $115,000 with St. Clair agreeing to pay for the cost of cleanup. Instead, St. Clair simply ceased to exist as a corporation after the sale. St. Clair had polluted the property so badly that it would cost $1 million to clean it up. The court ruled that Bogle was stuck with the toxic liability, with the former sole shareholder having no liability under the Superfund law. The court relied primarily on the case *of U.S. v. Cordova Chem*