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Collective Bads: The Case Of Low-Level Radioactive Waste Compacts

ABSTRACT

In low-level radioactive waste (LLW) compact development, policy gridlock and intergovernmental conflict between states has been the norm. In addition to the not-in-my-backyard (NIMBY) phenomenon, LLW compacts must contend with myriad political and ethical dilemmas endemic to a particular collective bad. This paper characterizes the epistemology of collective bads, and reviews how LLW compacts deal with such bads. In addition, using data from survey questionnaires and interviews, this paper assesses the cooperative nature of LLW compacts in terms of their levels of regional autonomy, regional efficacy, allocation of costs and benefits, and their technocentric orientation.

DILEMMAS IN RADIOACTIVE WASTE POLICY DEVELOPMENT

Energy produced from a nuclear fission reactor constitutes a Faustian bargain: In exchange for the technological prowess which has enabled us to produce nuclear energy, we must deal with the wastes. Nuclear waste is the "dirtiest" modern society has produced, for no technology can secure, isolate, protect, neutralize and control the waste. Although we attempt to separate wastes from our neighborhoods, many people continue to interact with, and often reside in, communities plagued by waste-related problems. Nuclear waste will remain a burden to future human and non-human beings alike.¹

In the United States, a majority of low-level radioactive waste (LLW) comes from the 120 operating commercial nuclear power plants.²

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1. K. Shrader-Frechette, *Burying Uncertainty: Risk and the Case Against Geological Disposal of Nuclear Waste* (1993).

2. M. English, *Siting Low-Level Radioactive Waste Facilities 4* (1992).

In 1990, plants in New York, Pennsylvania, Tennessee, Illinois, South Carolina, Oregon, California, Virginia, North Carolina and Alabama accounted for about two-thirds of the approximately 1.1 million cubic feet of LLW produced.³ If not adequately contained, LLW will emit alpha, beta, or gamma radiation.⁴ Each of these kinds of radiation poses a threat to human and non-human beings, and can leak into underground aquifers, contaminate other biophysical elements, or be carried by water and wind.⁵

LLW is a particularly "hot potato" which the federal government has passed to the states.⁶ In the Low-Level Radioactive Waste Policy Act (LLWPA), Congress delegated responsibility to states and interstate compacts to find alternative LLW sites.⁷ LLW compacts are negotiated contracts between two or more states which are ratified by Congress.⁸ The states, through the National Governors' Association, lobbied for the passage of the LLWPA because they believed that the states were better qualified than the federal government to protect citizens and the environment.⁹ Three principles were incorporated in the LLWPA: (1) state responsibility for providing the LLW disposal capacity; (2) encouragement of interstate compacts for the exercise of this responsibility.

3. U.S. General Accounting Office, GAO RCED 92-61, *Nuclear Waste: Slow Progress Developing Low-Level Radioactive Waste Disposal Facilities* 9 (1992).

4. Council of Scientific Affairs, *Radioactive Waste*, 26 JAMA 669 (Aug. 4, 1989).

5. Under national standards set by the Nuclear Regulatory Commission (NRC) in 10 CFR § 61.1-.84 (1993), release of radioactivity must not exceed .25mSv (25 mrem) per person per year. *Id.* at 61.41. The U.S. Environmental Protection Agency (EPA) estimates that people living near a LLW disposal facility would be exposed to up to 10m rem per person a year. D. Bartlett & J. Steele, in *Forevermore: Nuclear Waste in America* (1985) state that the NRC acknowledged that the repository in Barnwell, S.C. has buried LLW which was emitting up to 10,000 rems per hour (and a three minute exposure would be lethal to a human being). See also R. Fuchs & Culbertson-Arendts, U.S. Department of Energy, DOE/LLW-132, 1990 *State-by-State Assessment of Low-Level Radioactive Waste Received at Commercial Disposal Sites* (1991) for a report on the volumes and curie content of wastes shipped for storage by type of waste generator and state of origin.

6. Low-level waste can be defined as all radioactive wastes not classified as high-level radioactive waste, transuranic waste or by-product materials as defined in 42 U.S.C. § 2014(e)(2) (1988) or waste classified by the NRC as LLW. LLW varies in composition from rags and contaminated paper and tools to waste treatment materials, filters, sludges, ion exchange resins, and used components from reactor plant systems. Office of Technological Assessment, OTA-0-426, *Partnership Under Pressure: Managing Commercial Low-Level Radioactive Waste* (1989).

7. Low-Level Radioactive Waste Policy Act of 1980, Pub. L. No. 96-573, 94 Stat. 3347, *codified as amended at* 42 U.S.C. §§ 2021b-2021d (1988).

8. 42 U.S.C. § 2021d(2)(b).

9. Office of Technological Assessment, *supra* note 6, at 29. See also H. Brown, *Low-Level Waste Handbook: A User's Guide to the Low-Level Radioactive Waste Policy Amendments Act of 1985* (1986) and C. Bullard, *Low-Level Radioactive Waste: Regaining Public Confidence*, 20 *Energy Pol'y* 713 (1992).

ty; and (3) the right of any compact to prohibit disposal at their facilities of LLW generated in states not belonging to the compact.¹⁰ The LLWPA set forth a series of milestones, incentives and penalties related to the development of new LLW sites.¹¹

The federal government believed that LLW can best be managed on a regional basis.¹² Despite the ambitious but unclear goals of the LLWPA, states have yet to form regional compacts and resolve myriad dilemmas associated with the collective bad represented by LLW.¹³ The principal cause of siting failures is the not-in-my-backyard (NIMBY) phenomenon.¹⁴ This paper offers a supplemental explanation for siting failures, and reviews the cooperative nature of LLW compacts in terms of their levels of regional autonomy and regional efficacy, allocation of costs and benefits, and technocentric orientation.

The Epistemology of Collective Bads

LLW lies in the domain of "transcience" which, as one scholar notes, "inevitably involves the intermingling of facts and values."¹⁵ In LLW siting, technical and scientific issues are not value-free, but are rife with disputes rooted in different epistemic values. Proposed solutions are predicated on how one defines the problem and the particular values policy makers and others bring to decision-making. Scientific understanding and political consensus are hampered by the lack of control and objectivity, and perceptions of technological and health risks.¹⁶ There is

10. 42 U.S.C. §§ 2021b-2021d (1988). See also D. Condon, *The Never Ending Story: Low-Level Waste and the Exclusionary Authority of Noncompacting States*, 30 Nat. Res. J. 65, 65-86 (1990).

11. 42 U.S.C. § 2021e.

12. 42 U.S.C. § 2021d(a)(1). For a description of the regional plan set up by the Federal Government, see I. White & J. Spath, *Low-level Radioactive Waste: How Are States Setting Their Sites?*, 26 Env't 16 (1984); Condon, *supra* note 10, at 69.

13. R. Kearney, *Low-Level Radioactive Waste Management: Environmental Policy, Federalism, and New York*, 23 Publius 57 (1993).

14. NIMBY is a multifaceted syndrome and depends on several key factors: the nature of participation afforded to the public, the public's knowledge of nuclear waste problems and alternative solutions, the public's perception of the credibility and competence of government, and the public's assessment of the technical data on site characteristics and impacts. M. Kraft & B. Clary, *Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal* The W. Pol. Sci. Q. 299, 324 (June 1991). In addition to the NIMBY phenomenon, English shows that there are other issues compacts must contend with: LLW definitions, regulatory and disposal responsibilities, exposure standards, volume and source reduction, fee structures, and liability concerns. *Supra* note 2, at 17.

15. English, *supra* note 2, at 97.

16. As English suggests, "Cultural contexts and the values they inculcate help to shape answers to such fundamental questions as . . . How *bad* is it? Can and will it be managed? And because these answers inevitably will differ, especially across cultures (including organizational cultures), efforts at risk communication that strive to . . . attain a consensus

no "fail-safe" technological fix or scientific solution to siting or disposal of LLW.¹⁷ For example, the United States Environmental Protection Agency (EPA) notes that we cannot rely on institutional or technological safeguards to contain nuclear waste beyond 100 years.¹⁸ There is no guarantee that technological enhancements will increase public acceptance of a site or confidence in administrators and government to deal with LLW issues. Even the experts disagree on the ability of science and technology to resolve siting dilemmas.¹⁹ Uncertainty and ambivalence on the part of administrators has been dealt with through greater emphasis on probabilistic risk assessments. The political and technological complexities of siting for LLW precludes a reductionist approach to LLW management. Although surprise-free forecasts and benefit-cost analysis are necessary in LLW siting, they are insufficient decisionmaking methods because they leave us unprepared to interpret improbable eventualities and uncertainties rooted in a particular collective bad. To cause the minimum adverse impact on diverse ecosystems and human communities, we need LLW policies that can be revisited. Ideally, an iterative policy-making design is essential for responsible and effective containment of LLW.²⁰

It is appropriate to think of LLW as a collective bad.²¹ Collective bads have the following general characteristics: (1) one cannot understand collective bads without understanding the context in sufficient detail; (2) policy makers justify decisions as either good or bad; (3) there are few opportunities to find solutions by trial and error; (4) collective bads are symptomatic of other collective bads; (5) collective bads transcend political boundaries and are thus transboundary; and, (6) collective bads foster a high level of public fear and mistrust.²² With respect to collec-

on risk are doomed to be at best limited success." *Id.* at 112.

17. *Id.* at 97.

18. D. Hawkins, *Considerations of Environmental Protection Criteria for Radioactive Waste* 27-29 (1978).

19. J. Flynn & P. Slovic, *Nuclear Wastes and Public Trust*, 8 *Forum* 92-100 (1993).

20. D. Ludwig et al. argue that an iterative design is necessary to deal with biological and physical uncertainties in *Uncertainty, Resource Exploitation, and Conservation: Lessons from History*, 260 *Sci.* 17, 36 (1993).

21. "Collective bad" is a term derived from M. Crenson, *The Private Stake in Public Goods: Overcoming the Illogic of Collective Action*, 20 *Pol'y Sci.* 259-276 (1987). In his analysis of collective bads, Crenson is theoretically concerned with collective actions dealing with the "lesser evil" of ordinary neighborhood trash. Nuclear waste, in contrast, presents an entirely different scenario due to the much higher level of potential risk and public fear.

22. M. McGinnis, *Technocentric Delusions and Problems in Siting Low-Level Radioactive Waste, Bioregionalism: Reconciling Nature and Public Life* (1993) (unpublished Ph.D. Dissertation, University of California).

tive bads, the public generally considers science and technology to be the source of risk rather than the solution.²³

Problems at commercial LLW facilities in West Valley, New York and Sheffield, Illinois have fostered public distrust, fear and dread.²⁴ In a survey conducted by the author of key participants involved in compact decisionmaking, 42 percent of the respondents "strongly agreed" with the statement "Public fear and mistrust is a major impediment to interstate cooperation". As Table 1 shows, 67 percent of the survey respondents "strongly agreed" with the statement "Risks are perceived by the public to be high".

In light of such fears, most compacts include "free-riders" who, motivated by NIMBY, cooperate when it appears their LLW will be stored elsewhere (i.e., outside of the state's political boundaries). In general, when a state has been chosen as the designated host for LLW, the negotiation process has stalled and/or the state has threatened to withdraw from the compact. In light of the NIMBY syndrome, conflict between compact participants is the norm.²⁵ Compact decisionmaking takes place in a hostile environment.

One might expect the federal government to play a major role in inducing or sustaining cooperation among conflicting states and LLW compacts. However, as Table 1 depicts, 80 percent of the respondents did not agree with the statement "The federal government acts as a mediator to resolve conflict between compact participants". In the policy making process, the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE) provide technical expertise and information, but they do not serve as mediators.²⁶

Since the adoption of the LLWPA, some 42 states are members of nine interstate compacts as depicted in Table 2.

Figure 1 shows that not all compacts have been organized on a regional basis.

23. M. Douglas & A. Wildavsky, *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers* 10 (1982).

24. P. Slovik, *Perceptions of Risk*, 236 Sci. 280 (1987).

25. Non-compact states face several serious problems in addition to those that interstate compacts face. Since a single state does not constitute a compact, the state might be required to accept out-of-state wastes. See *infra* notes 68-71 and accompanying text. In addition, states that withdraw from compacts have the same administrative, operational, and political needs of interstate compacts. They do not escape these requirements for issue resolution when embarking on an independent siting program.

26. Low Level Radioactive Amendments Act of 1985, 42 U.S.C. § 2021g(a).

Table 1

Frequency Distributions for LLW Compacts on Public Fears, Risks, and Cooperation

a. *Public fear and mistrust is a major impediment to interstate cooperation between participants.*

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
31 42%	20 27%	10 14%	9 12%	4 5%	74

Mean = 2.12
Std Dev = 1.06

b. *Risks are perceived by the public to be high.*

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
51 67%	17 22%	5 7%	2 3%	1 1%	76

Mean = 1.49
Std Dev = 1.11

c. *Public fears related to the regional issues addressed by the interstate compact are:*

	N	%
Extremely high	24	36%
High	26	39%
Moderate	14	21%
Low	3	4%
Extremely Low	0	0%
Total	67	100%

Mean = 1.98
Std dev = .97

d. *Conflict between participants in the interstate compact is inevitable given the nature of the issues with which the compact has to deal with.*

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
12	33	15	9	5	76
16%	43%	20%	12%	7%	

Mean = 2.40

Std Dev = 1.19

e. *The federal government often acts as a mediator to resolve conflict between regional council participants.*

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
0	3	11	28	27	69
0%	4%	16%	41%	39%	

Mean = 4.10

Std Dev = .96

Table 2
LLW Compact Groupings

Compact	Members
Central States	Arkansas, Oklahoma, *Nebraska, Louisiana, Kansas.
Central Midwest	*Illinois, Kentucky.
Southwest	*California, Arizona, North Dakota, South Dakota.
Midwest	Wisconsin, Indiana, Iowa, * O h i o , Minnesota, Missouri.
Southeast	Georgia, Florida, Alabama, Tennessee, *North Carolina, **South Carolina, Mississippi, Virginia.
Northwest	Idaho, **Washington, Montana, Hawaii, Oregon, Alaska, Utah.
Rocky Mountain	Colorado, **Nevada, New Mexico, Wyoming.
Appalachian	*Pennsylvania, Delaware, Maryland, West Virginia.
Northeast	*Connecticut, *New Jersey.
Independent	Texas; New York, Massachusetts.
Unaligned	Rhode Island, Vermont, New Hampshire, Maine, Michigan.

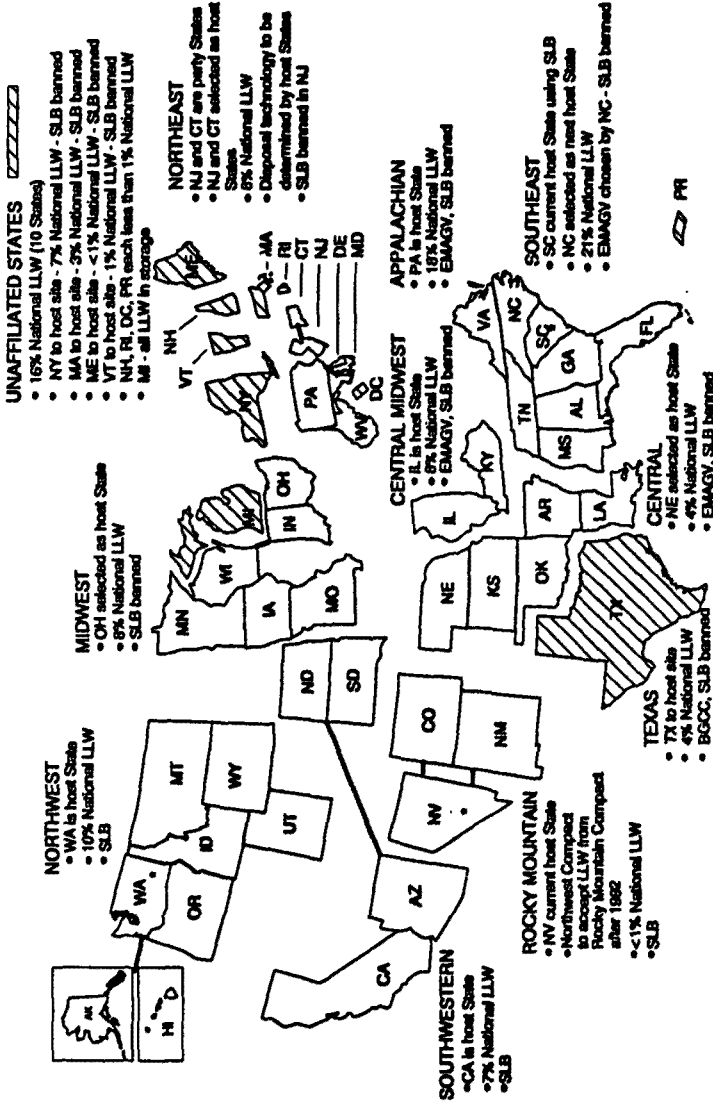
* host state

** sited state

Source: Office of State Programs, Nuclear Regulatory Commission, August 1992.

LOW-LEVEL RADIOACTIVE WASTE COMPACT STATUS

AUGUST 1992



Note: National LLW volume for 1991 = 1.4 million cubic feet disposed
SLB = shallow land burial
EMAGV = Earth mounded above grade vault
BGCC = below ground concrete canisters

Source: Office of State Programs, NRC

The problem remains as much a political problem as a technological one. Compacts have failed to secure protection against liability for new repositories and overcome public sentiment regarding the risks of LLW storage.²⁷ Moreover, compacts have failed to avoid challenges by public action groups and those afflicted with NIMBY (NIMBies) against new LLW sites.²⁸ Whether a state is a member of a compact or not, LLW continues to generate a common set of ethical and political dilemmas.

Ethical Dilemmas

Two ethical dilemmas faced by states in their attempt to site LLW facilities are the consent dilemma²⁹ and the intergenerational dilemma,³⁰ Kristin Shrader-Frechette describes a consent dilemma as follows:

The consent dilemma is that siting radwaste facilities and employing waste management workers requires the consent of those put at risk; yet those most able to give free, informed consent are usually unwilling to do so, and those least able to validly consent are often willing to give alleged consent.³¹

The issue of consent is grounded in problems associated with the inequitable distribution of bads. Is it fair for a local community to receive the crux of the costs and the collective bad while the region benefits? Local communities which have lower incomes, no job security and lower levels of education may be willing to accept and give "consent". The incentive for a local community's citizens to accept uncertain health risks is the hope of jobs and economic promise. Shrader-Frechette argues that the exchange, wages for a risky job, is grounded in a coercive context which jeopardizes legitimate, free, and informed consent.³²

LLW compacts have dealt with the issue of consent in many ways. To foster free consent, compacts have established complex compensation packages. In the northeast compact, for example, a compensation package for the local community which accepts the waste includes: a percentage of the facility's gross receipts, a mitigation agreement not to exceed \$150,000, a payment in lieu of taxes provision, and a property value guarantee program. In the southwest compact, United States Ecology hired a favorite local teacher as its liaison, bought \$3,000 worth of science books for the local high school district, and offered a scholarship to graduating high school students. In addition, local citizens have been

27. English, *supra* note 2, at 22.

28. Kearney, *supra* note 13, at 68.

29. K. Shrader-Frechette, *Ethical Dilemmas and Radioactive Waste: A Survey of the Issues*, 13 *Envtl. Ethics* 327, 335-39 (1991).

30. R. Kasperson, *Equity Issues in Radioactive Waste Management* (1983).

31. Shrader-Frechette, *supra* note 29, at 335.

32. *Id.* at 335-36; English, *supra* note 2, at 132-39.

included in compact commissions.³³ Despite such selective incentives, local communities have generally been "dissenting" voices in compact siting processes.³⁴

Local citizens have responded unfavorably to the promise of jobs in exchange for increased health risks. In general, the NIMBY phenomenon has taken a toll on compact negotiations and led to local discontent. Local citizens fear long-term costs to the community: decreased public safety, decreased property value, and increased health risks. A market approach to reconciling local opposition and NIMBY has not sufficed.³⁵

Another ethical dilemma with ecological consequences is spawned by the phrase "Out of site, out of mind." Geographically and geologically "suitable" disposal sites are in areas that are isolated and undeveloped, and have limited annual rain falls. However, permanent disposal of nuclear wastes in such areas assumes complete knowledge and that perpetual containment across generations can be achieved.³⁶ As Shrader-Frechette states, "Complete isolation appears to preclude adequate monitoring, and adequate monitoring appears to preclude isolation."³⁷ LLW siting is predicated not only on the best available technology and science but also on the institutional capacity to deal with the multitude of values and perceived risks in a particular community, landscape and place. In cases justifying permanent disposal of LLW, what is called "good" science tends to be that which supports one's position.

An additional ethical dilemma associated with LLW is exporting the risks to future generations. The estimated half-life of LLW ranges from 100 years upward. Few institutions, broadly defined, have lasted over one hundred years. Roger Kasperson proposes that imposing the financial and medical-related debts to future generations is ethically suspect.³⁸ In light of the intergenerational nature of nuclear wastes, Alvin Weinberg suggests that a "priesthood" or a "permanent cadre of experts" would be required to guard the reactors and the waste to assure their safety over time.³⁹ In fact, the Department of Energy (DOE) is seriously considering the technological priesthood to deal with high-level radioactive wastes.⁴⁰

33. This material was derived from interviews with compact members.

34. English, *supra* note 2, at 136.

35. E.g., K. Portney, *Allaying the NIMBY Syndrome: The Potential for Compensation in Hazardous Waste Treatment Facility siting*, 1 *Hazardous Waste* 411 (1984); M. O'Hare, *Not On My Block You Don't: Facility Siting and Strategic Importance of Compensation*, 25 *Public Pol'y* 407 (1977); and M. Elliot, *Improving Community Acceptance of Hazardous Waste Facilities Through Alternative System for Mitigating and Managing Risk*, 8 *Hazardous Waste* 397 (1984).

36. Shrader-Frechette maintains that permanent disposal of nuclear waste in a geological suitable and isolated facility is ethically suspect because, for example, uncertainties about the future performance of a radwaste repository. *Supra* note 1, at 182-212.

37. Shrader-Frechette, *supra* note 29, at 332.

38. Kasperson, *supra* note 30, at 17.

39. A. Weinberg, *Technology and Ecology-Is There a Need for Confrontation?* 23 *BioScience* 41, 42 (1973).

40. Interview with Officials in the NRC Office of State Programs, Washington, D.C. and

There are significant shortcomings associated with an emphasis on the development of a "technological priesthood". There is no way to assure that a social and political system will be stable for the duration of the LLW's half life. Resolving such a LLW dilemma is predicated on the technocentric belief that we can foresee the future and control future events.⁴¹ The ethical and political obstacles to LLW siting have not been legally or politically resolved in amendments to the LLWPA or by the courts.⁴²

The 1985 Amendment, the Take-Title Provision, and the Court

At the outset of Congress' enactment of the LLWPA, scholars and practitioners maintained that the development of regional compacts represented a promising solution to a serious national problem.⁴³ Such optimism was premature. Unhappy with the states' progress in finding alternative repository sites, Congress, in 1985, amended the LLWPA and added "incentives" for states to join regional compacts (hereafter, the LLWPAA).⁴⁴ Under the LLWPAA, the three sited states, Washington, Nevada and South Carolina, could eventually collect a surcharge on LLW from out of state.⁴⁵ A sited state could also deny access to a non-sited state that does not belong to its compact and that failed to meet certain deadlines.⁴⁶ By 1992, surcharges and denial of access could be imposed on any state that failed to develop a site, alone or in conjunction with other states.⁴⁷ In addition, the amendment's take-title provision (TTP) mandated that beginning in 1996 such states would assume legal liability for wastes generated within their political boundaries.⁴⁸

with Officials at DOE, Department of Environmental Management, Washington, D.C. (Aug. 26, 1992) (the officials requested anonymity).

41. "Technocentrism" is a term found in T. O'Riordan, *Environmentalism* 11-17 (1978) to describe an environmental world view oriented towards control of nature, a distinction between fact and value in decisionmaking, and an administrative approach based on suspicion of public participation.

42. Congress, in its amendment to the LLWPA, recognized the need to clarify the relationship between the interim storage of LLW, especially storage at reactor sites, and permanent LLW disposal. The goal in the TTP was to force "the disposal of all such waste generated within such State or compact region". 42 U.S.C. § 2021e(d)(2)(C).

43. E.g., R. Kearney, *Radioactive Waste Compacts: States Move Ahead*, in, *State Government: CQ's Guide to Current Issues and Activities 1988-1989* 232 (T. Beyle ed., 1988); R. Riggs, *Radioactive Waste Compacts for the Northeast States*, 63 J. State Gov't 80 (July/Sept. 1990).

44. Low-Level Radioactive Waste Policy Amendments Act, Pub. L. No. 99-240, Title I, § 102, 99 Stat. 1842 (1986), 42 U.S.C. §§ 2021b-2021j (1988).

45. 42 U.S.C. § 2021e(e)(1), (f)(1).

46. *Id.* § 2021e(f)(1). See also Dart, *Radioactive Waste Disposal Diluted*, S.F. Chronicle, June 20, 1992, at A1.

47. 42 U.S.C. § 2021e(e)(1), (f)(1).

48. *Id.* § 2021e(d)(2)(C)(ii).

Part of Congress's purpose in the LLWPAA was to set clear milestones and penalties to encourage compact membership. Several states without LLW facilities charged that the TTP placed the burden of finding new LLW sites on the states rather than on the power industry and its shareholders.⁴⁹ In 1990, the State of New York filed suit in federal district court challenging three provisions of the LLWPAA, a financial-incentive provision, denial-of-access provision, and the TTP.⁵⁰ After both district court and the Court of Appeals upheld all three provisions,⁵¹ the State filed a writ of certiorari with the United States Supreme Court. The Court upheld the financial-incentive and denial-of-access provisions, and, by a 6-3 vote, struck down the TTP, holding that the TTP violated the Tenth Amendment.⁵² Justice O'Connor, writing for the majority, argued that the TTP was not merely a congressional incentive, but "crossed the line distinguishing encouragement from coercion."⁵³

The perceived implications of *New York v. U.S.* are mixed. Participants in the LLW Forum (a group made up of key bureaucrats and industry representatives) have varying views. Members from Connecticut and Maine, for instance, believe that a national policy for LLW is required. California's members feel that the Court's decision will have little impact on the southwest compact administration. Several members believe the responsibility will be passed to the waste generators (e.g., utility owners and shareholders), while others believe that the Court decision applies only to non-compact states, like New York. Some states are thinking about withdrawing from compacts and repealing existing state laws regulating LLW siting and storage. Other members maintain that states are "off the hook" and no longer responsible for siting LLW.⁵⁴

Despite the fact that the Court decision eases the potential liability of states, LLW compacts and unaffiliated states continue to face problems in agreeing on alternative repositories.⁵⁵ As Richard Kearney states:

New York provides fresh ammunition to NIMBies and other opponents of LLW facility siting . . . The tendency now may be for hard pressed officials to dig in their heels and do

49. English, *supra* note 2, at 26.

50. *New York v. United States*, 757 F.Supp. 10 (N.D.N.Y. 1990).

51. *Id.*; *New York v. United States*, 942 F.2d 114 (2nd Cir. 1991).

52. *New York v. United States*, 112 S. Ct. 2408, 2427-29 (1992).

53. *Id.* at 2428.

54. U.S. Nuclear Regulatory Commission, Memo for Carlton Kammerer, Director Office of State Programs, *Policy Highlights of Low-Level Waste Forum Meeting*, July 22-24, 1992 (Aug. 20, 1992).

55. Kearney, *supra* note 13, at 68-70.

nothing, hoping that an agreeable host state will finally relieve nonsited states of their radioactive waste, or that Congress will intervene to force states with operating disposal facilities to accept out-of-region LLW indefinitely.⁵⁶

Non-sited states will have to find alternative facilities or continue to store wastes at reactor sites. Waste generators will be pressured to help states develop sites.⁵⁷ Non-sited states will continue to face political and ethical dilemmas associated with the collective bad represented by LLW.

AN ANALYSIS OF THE POLITICAL PROCESS

In general, cooperation between compact participants and the public is a pre-requisite for compact siting. The problems compacts face are directly related to the issue of "regionalism" envisioned in the LLWPAA. One analytical approach relevant to addressing the cooperative capacity of compacts is found in Elinor Ostrom's *Governing the Commons*.⁵⁸ Ostrom encourages the adoption of a model based on institutional-rational-choice (IRC) for policy analysis. She believes that collective action is predicated on the actors' choices and beliefs, institutional rules, and the environment relevant to the particular "decision situation". An attempt to understand decision-making rests in understanding preferences and beliefs which are shaped by institutional rules and incentives.⁵⁹ IRC is employed by Ostrom and others as a criteria to analyze self-governing organizations contending with "multiple-use" conflict over "common pool resources", such as fisheries, groundwater basins, and irrigation systems.⁶⁰ This model can also be used to evaluate arrangements dealing with collective bads.

Ostrom reviews how self-governing organizations made up of competing users and stakeholders have successfully cooperated to achieve "sustained use" over time. In her analysis, Ostrom asserts that individuals are rational and self-interested participants in a decisionmaking situation which embodies institutional rules and community characteris-

56. *Id.* at 69.

57. L. Greenhouse, *High Court Eases States' Obligation over Toxic Waste*, N.Y. Times, June 20, 1992, at 1, 10; Schneider, *Decision is Expected to Ease the Pressure on States*, N.Y. Times, June 20, 1992, at 10.

58. E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1991).

59. *Id.* at ch. 2.

60. F. Martin, *Common Pool Resources and Collective Action: A Bibliography* (1989); *Making the Commons Work: Theory, Practice, and Policy* (D. Bromley ed., 1992); S. Tang, *Institutional Arrangements and the Management of Common-Pool Resources*, 51 Public Admin. Rev. 42 (1991).

tics.⁶¹ Individual choices are byproducts of preferences shaped by the institutional design and rules, available resources, values placed on outcomes, levels of available information, incentives and constraints imposed by the decision-making situation, and demands made by various interests outside of the organization.

Analytical Approach

With the above model in mind, this paper proposes an analytical approach which builds on the earlier work of Martha Derthick, *Between State and Nation*.⁶² In her analysis of regional arrangements in the United States, Derthick found that two factors influence effective regional policy-making: (1) the amount of federal authority granted to the regional arrangement; and (2) the openness of the decision-making process to the public.⁶³ Building on Derthick's findings, the study on which this paper is based concludes that strong cooperative behavior among LLW compact participants is also a function of the following key variables: 1) the amount of federal authority granted to the compact by Congress; 2) the level of regional efficacy and trust between stakeholders; 3) the degree of diffusion of costs and benefits; 4) and the extent to which there is an allegiance to an ecocentric world view in administration.

Proposition 1: A High Level of Regional Authority Increases the Probability of Interstate Cooperation

A regional compact requires regional authority. Cooperative behavior is an increasing function of authority. Authority, in turn, involves three potentially separate issues. First, authority is greater if the participants in regional compacts can make a final decision that cannot be appealed to another governmental level (e.g., the federal courts). Second, authority increases if the regional compact has the power to enforce its decisions. Third, authority increases if other actors are required by law to acknowledge the decisions reached in regional compacts, and these actors regard the decisions as binding.

61. L. Kiser & E. Ostrom, *Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches*, in *Strategies of Political Inquiry* (E. Ostrom ed., 1982).

62. M. Derthick, *Between State and Nation* (1974).

63. *Id.* at 13.

Proposition 2: A High Level of the Sense of Regional Efficacy Increases the Probability of Interstate Cooperation

The recognition that the diverse stakeholders in a region are interdependent on one another and live within a complex regional system is imperative. In an analysis of why states join interstate compacts, David Nice finds that interstate cooperation increases as the sense of interdependence increases. He defines interdependence as a function of geographic proximity.⁶⁴ Nice is primarily interested in analyzing why states joined compacts. Here, interdependence is defined as a sense of regional efficacy between participants and a trust between compact members (as well as between members and other participants) in the decision-making situation. In the study, the sense of regional efficacy was measured by adopting an index (similar to that found in public opinion research) incorporating three different scales in a survey questionnaire. The variables are: trust in one another; sense of interdependence and shared fate; and perceived ability to work together.

Proposition 3: The Diffusion of Costs and Benefits Increases the Probability of Interstate Cooperation

Regionalism requires the fair and equitable distribution of costs and allocation of benefits within the region. Differing costs and benefits arising from the substantive problems under consideration are likely to have an adverse impact on regional compacts.⁶⁵ As previously noted, siting decisions require consent on the part of those interests that are burdened by the costs. In the study, the allocation of costs and benefits were measured by analyzing documentary materials and public records.

Proposition 4: The Movement Away from an Allegiance to the Technocentric World View Increases the Probability of Interstate Cooperation

Technocentrism is a world view which shapes the relationship between human beings and the natural world. Technocentrists admire the power of technology and its ability to control events, rational action, managerial efficiency, growth and progress.⁶⁶ In this study, several technocentric indicators were considered: the view that science or technology can solve problems, the view that nature has merely economic

64. D. Nice, *State Participation in Interstate Compacts*, 17 *Publius* 69, 77 (Spring 1987).

65. This is consistent with a wide range of work on bureaucracy, see, e.g., J. Wilson, *The Politics of Regulation*, in *Social Responsibility and the Business Predicament* 135-168 (J. McKie ed., 1974).

66. O'Riordan, *supra* note 41, at 11.

use, the view that ecological concerns can be controlled, the view that natural values have no place in administration, and the view that human beings should dominate nature. In the survey questionnaire, scales were developed to reflect such technocentric preferences and values.

To assess the propositions, the author's study expands on Ostrom's work on non-hierarchical supply of public goods. Ostrom notes that the ideal research strategy would involve a combination of: a) data from survey questionnaires; b) interviews taken from a sample of the participants for the purpose of assessing preferences and beliefs; and c) strategies and documentary sources, such as public hearings and minutes to meetings that describe institutional arrangements and the decision-making situation. To evaluate the cooperative capacity of LLW compacts, a survey questionnaire was distributed to a sample of key participants involved in compact decision-making. From a list compiled by The Office of State Programs of the Nuclear Regulatory Commission, 227 surveys were sent out, and 90 were returned (representing a return rate of 39 percent). This data represents the most up-to-date material on participants involved in compact decision-making. An analysis of the data in terms of the above four propositions is depicted below.

LLW Compact Authority

The authority of any LLW compact rests on the acceptance of the compact's decisions by all key participants and other affected interests. Table 3 shows that survey respondents agreed that "The federal government has given the interstate compact enough authority to make the necessary decisions" and that "The compact has the power to enforce" decisions.

Two-thirds of the respondents (67 percent) believe compacts have a significant amount of authority. However, a deeper analysis of the factor of authority shows that the continued existence of compact authority is at the sufferance of federal and state governments.

L. David Condon states that Congress "created strong incentives for those regional compacts and states without disposal sites to locate, license, and construct disposal facilities."⁶⁷ The LLWPA implies that states that do not join a compact may have to receive wastes from other states.⁶⁸ If a state decides to "go-it-alone", that non-compact state,

67. Condon, *supra* note 10, at 71.

68. LLWPA provides that after 1993, congressionally ratified compacts can exclude the importation of wastes from outside the compact, 42 U.S.C. § 2021d(c), but the Act does not mention whether non-compact states have the same exclusionary authority. *See also* Condon, *supra* note 10, at 72 & n.38 for a pertinent discussion of the legislative history behind the LLWPA.

Table 3
Frequency Distributions for LLW Compacts on Regional Autonomy

a. The federal government has given the interstate compact enough authority to make the necessary decisions.

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
23	27	9	6	2	67
34%	40%	13%	9%	3%	

Mean = 2.21
Std Dev = .74

b. The interstate compact has the power to enforce decisions.

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
16	25	16	7	0	64
25%	39%	25%	11%	0%	

Mean = 2.22
Std Dev = .84

c. Generally speaking, how much authority do you believe your compact has in decision making?

	N	%
Extreme Amount of Authority	8	11%
A Significant Amount of Authority	40	56%
A Moderate Level of Authority	22	32%
No Authority	1	1%
Total	71	100%

Mean = 1.98
Std dev = .97

according to Condon "is not likely to be able to [legally] prohibit the importation of out-of-state low-level waste."⁶⁹ The authority to keep non-compact state wastes out of a future compact repository was upheld by the Court in *New York v. U.S.*⁷⁰ Nevertheless, the Court did not review the constitutionality of the LLWPA's "emergency access" provision. That provision allows the NRC to grant emergency access to a repository because of "an immediate and serious threat to the public health and safety or the common defense and security" needs of the United States.⁷¹ Opponents of nuclear energy have raised the specter of "emergency access" to mobilize local communities and environmental groups against proposed sites.

A proposed site near Ward Valley, California that was agreed on by southwest compact members provides an example of such opposition. The proposed 70-acre, \$40 million Ward Valley site is located some 24 miles west of Needles (13 miles west of the Colorado River) in the Mojave Desert.⁷² The repository's proposed 30 year life would be developed, operated, and monitored by United States Ecology.⁷³ The terms of the compact call for Arizona, the other significant LLW generator besides California, to develop a site that would succeed the Ward Valley site. California, the dominant member of the compact, has a stake in developing a repository because the amount of the LLW produced by its nuclear power plants is significant, and because it has no repository.⁷⁴ Environmentalists who organized a coalition called "Don't Waste California"⁷⁵ are concerned that the proposed Ward Valley site would become the next national repository, and that non-compact states could begin to use the repository.⁷⁶ Eighteen non-compact states (Washington, DC., northeast compact, midwest compact, Vermont,

69. Condon, *supra* note 10, at 85.

70. *New York*, 112 S.Ct. at 2427.

71. 42 U.S.C. § 2021f(a). The NRC Chairman in a letter dated August 2, 1991 emphasized that the NRC remains opposed to the implementation of the "emergency access provision" as an alternative to meeting milestones in the LLWPA.

72. L. Stammer, *Halt Sought in Licensing Nuclear Dump*, L.A. Times, June 26, 1991, at A25.

73. Minutes of the January 16, 1991 Meeting of the southwestern low-level Radioactive Waste Commission, Sacramento, Cal. (dated Sept. 6, 1991)

74. Office of State Programs, Nuclear Regulatory Commission, Status of States Providing Disposal of Low-Level Radioactive Waste 49-53 (Oct. 11, 1991).

75. "Don't Waste California" is part of the national network, "Don't Waste US" based in Washington, D.C., which is attempting to block disposal of wastes in other states nationwide. Don't Waste US is focusing its attention on the California proposed site. S. Hubler, *Only California is on Track for Nuclear Dump*, L.A. Times, Apr. 20, 1991, at A16.

76. Some of the groups opposed to the Ward Valley site are: Abalone Alliance, Alliance for Survival, Chemehuevi Tribe, Clean Water Action, Earth Island Institute, Greenpeace, Grey Panthers, Mojave Tribe, Physicians for Social Responsibility, Sane/freeze, Sierra Club, So. Cal. Federation of Scientists, and the Western States Legal Foundation.

Massachusetts, New York, Texas, Maine) which have not been able to find disposal sites have expressed interest in using the repository. Eventually, the compact commission formally denied access by non-compact states to the proposed Ward Valley site. The compact sent letters to all non-member states notifying them that the site is to be used only by the compact members. However, California continues to face problems in developing the proposed site.⁷⁷

The Lack of Regional Efficacy

As depicted in Table 4, survey respondents agreed that "It is important that participants in the interstate compact stick together because they share the same problems" and "share the same fate".

Despite the apparent belief in the importance of "regional efficacy" expressed by key participants, compacts have not developed around geographically suitable sites.⁷⁸ In Big brother/little brother compacts, large waste producing states, like California, have formed compacts with smaller states, such as North Dakota and South Dakota, to handle their own wastes and keep other states' LLW out.⁷⁹ Other "mini-compacts" or bi-state agreements have evolved.⁸⁰ The politics of the formation of LLW compacts and non-compacts is the key to understanding why regional forms have yet to develop. As English suggests:

In selecting a host state or host community for a LLW disposal facility, all sides tend to focus on the people that now live in the state or the community, with the state and the community defined by political boundaries.⁸¹

If one considers the complex concerns associated with transporting nuclear waste across state boundaries, regional efficacy is imperative. A compact which is not contiguous will find that transportation of hazardous material across states outside the compact a problem.⁸² Most compacts and go-it-alone states, as one survey participant notes, "do not fit the conceptual mold . . . and we are establishing a system which will eventually collapse as a result of the financial diseconomics."

77. McGinnis, *supra* note 22.

78. Condon, *supra* note 10, at 69-71.

79. English, *supra* note 2, at 128.

80. *Id.*

81. *Id.* at 140.

82. E. Gershey et al., *Low-Level Radioactive Waste: From Cradle to Grave* 121 (1992).

Table 4
Frequency Distributions for LLW Compacts on Regional Efficacy

a. It is important that participants in the interstate compact stick together because they share the same problems.

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
21	28	20	4	0	73
29%	38%	27%	5%	0%	

Mean = 2.09

Standard Deviation = 1.24

b. One significant reason the interstate members cooperate is because they face the same problem and share the same fate.

Strongly Agree				Strongly Disagree	
1	2	3	4	5	Total
21	35	6	3	3	68
31%	51%	9%	4%	4%	

Mean = 2.00

Std dev = .85

Deciding who will pay

Overall, some eighteen sites have been proposed. From a fiscal point of view, development of eighteen new waste repositories will prove inefficient, too costly, and endanger ecological systems and public health. One participant notes:

The regional compact strategy has failed thus far because, as it currently stands, too many facilities are being planned. This will have adverse economic and environmental impacts. Much of the problem originates from a basic mistrust amongst the states and the political fallout of having a facility in your jurisdiction.

A number of states have adopted laws which prevent the construction of new nuclear power plants until nuclear waste sites are found.⁸³

Liability for potential leaks is an additional concern. For example, United States Ecology, the contractor for the southwest compact, has an insurance plan for \$10 million, which will not cover potential contamination of the proposed Ward Valley site.⁸⁴ Two of the four United States Ecology LLW facilities, Illinois and New York, were closed "amid charges that radioactive materials leaked into the ground water."⁸⁵ Sheffield, Illinois is a Superfund site with cleanup costs estimated up to \$60 million. United States Ecology has agreed to pay \$9 million.⁸⁶ Opponents of nuclear energy argue that tax-payers may eventually be left with paying the costs related to cleanups within their states.⁸⁷ Because of such liability concerns, citizens and government officials have fought against development of LLW facilities in their states.

Technocentric Myths

The problem of siting for LLW lies not only in the political and ethical dilemmas associated with this particular collective bad, but also in the world view which has shaped policy-making. Faith and allegiance to the technocentric world view shows no sign of abating.⁸⁸ As depicted in Table 5, 60 percent of the survey respondents agreed with the

83. J. Thurber, *Congressional Oversight of High-Level Nuclear Waste Disposal: Yucca Mountain and the DOE Weapons Clean-Up* 8, Paper Presented at the American Political Science Association Annual Meeting, Washington, D.C. (Sept. 1991).

84. Hubler, *supra* note 75, at A17.

85. *Id.* at A16.

86. *Id.*

87. Personal communication with members of "Don't Waste California."

88. M. McGinnis, *Low-Level Radioactive Waste Compacts: Cases in the Illogic of Collective Action?*, in *Problems and Prospects for Nuclear Waste Disposal Policy* 31-45 (E. Herzik & A. Mushkatel eds., 1993).

Table 5
Frequency Distributions for LLW Compacts which show Technocentrism

a. Technology and science can offer solutions to environmental problems.

Strongly Agree					Strongly Disagree
1	2	3	4	5	Total
24 34%	20 28%	11 15%	12 17%	4 6%	71

Mean = 2.32

Std dev = 1.16

b. I have faith in bureaucratic expertise to solve environmental problems.

Strongly Agree					Strongly Disagree
1	2	3	4	5	Total
15 22%	33 51%	17 25%	1 1%	1 1%	67

Mean = 2.10

Std dev = .67

c. Citizen participation in compact decision making is important.

Strongly Agree					Strongly Disagree
1	2	3	4	5	Total
43 56%	24 32%	6 8%	2 3%	1 1%	76

Mean = 1.61

Std dev = 1.05

statement "Technology and science offer solutions to environmental problems" and 73 percent agreed with the statement "I have faith in bureaucratic expertise to solve environmental problems".

Such an allegiance to technocentrism will not suffice to resolve problems presented by collective bads. An allegiance to technocentrism is an acceptance of the mythical characteristics endemic to the bureaucratic ideal. The acceptance of myth as untrue 1x illusionary is 1x reflection of the old metaphysical hierarchy that developed in the late seventeenth and eighteenth centuries between the world of (true) Being and (mere) appearance.⁸⁹ This metaphysical distinction between what is accepted as real and mere appearance has been challenged. Claude Levi-Strauss identified an intermediate level between appearance and reality.⁹⁰ The battle between appearance and an individual's perceptions of what is real often contributes to the rise of myth. As the author of this paper has stated in another work:

Since we have no non-mythological access to facts, that is, no facts that come to us unfiltered by our worldviews, the problem becomes a judicious choice of the best myth. But this choice is, in environmental affairs, not simply a personal one. It is a collective choice, because the myth we choose fixes the bureaucracy that controls the myths that operationally control our access to nature . . . Our bureaucracies are the results of our choices and they dictate what choices we can make.⁹¹

What we have accepted as real or fact may merely be the dominant myth we have decided to live by. For the time being, it may appear to be real.

One such myth is the "myth of objectivity". Administration is perceived by technocentrism as an apolitical process. Decisions are based on facts, not values, and are made by specialists who are neutrally competent and experts in the field.⁹² There is no place for ethical

89. Hannah Arendt referred to this relationship as "the two world theory" in which one world overshadows the other or one world exists beneath the surface of the other world. *The Life of the Mind* 73 (1978). In such a metaphysical assumption, one world is the superficial and merely an illusory while the other world is the essential and the more relevant. See also, M. McGinnis, *Myth, Nature and the Bureaucratic Experience*, 16 *Envtl. Ethics* (Winter 1994).

90. C. Levi-Strauss, *Myth and Meaning* (1974).

91. McGinnis, *supra* note 89.

92. Martin Heidegger critically reviewed our acceptance of modern technology as objective or neutral. In a provocative essay entitled, *The Question Concerning Technology* 4 (W. Lovitt trans., Torchbooks 1977) he wrote:

Every where we remain unfree and chained to technology, whether we passionately affirm or deny. But we are delivered over it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly

consideration in administration according to the technocentric myth of objectivity. Another myth is the "myth of control". In LLW compact administration, there are significant barriers to control—primarily the unknown and the uncertainty of nature (as exemplified by our inability to predict earthquakes). There is a lack of predictive power in compact decision-making. Technological and political uncertainties lead to a decline in administrative control. Acceptance of such a technocentric administrative experience relegates ethical concerns to the margins.

One should not put the blame on science and modern technology *per se*. In LLW compact administration, technocentric myths of control and objectivity are presented as solutions to political and ethical dilemmas that are rooted in the "push" to find and operate LLW disposal facilities. As Table 5 shows, survey respondents feel an open decision-making approach is required to reconcile such fears and mistrust. Paradoxically, these LLW compact administrators interviewed also blame the public and political process for interrupting the siting process. As one participant urges, "Eliminate politics from the process, and allow decisions to be based on sound technical principles and reviewed by technical experts." Despite the preference for openness in the political process, a dysfunctional allegiance to technocentrism predominates. One indication of the technocentric bias in compact decisionmaking is the constant appealing of decisions to the courts. LLW compacts have failed to address the diverse values and preferences of the myriad participants involved in siting alternative repositories.

SUMMARY

The desirability and feasibility of LLW compacts to handle pressing concerns related to the collective bad represented by LLW is questionable. Without a sense of regional efficacy, LLW compacts have not been able to fulfill the hopes of Congress. Without providing for an equitable distribution of the costs and benefits of siting LLW repositories, the LLWPAA does not serve as a model to emulate in future trans-boundary concerns.⁹³ Compact and independent states could be cultivat-

blind to the essence of technology.

Heidegger argues that *technology* is a process of unfolding, and craft, similar to art. Technology is therefore not an end in itself. Like modern technology, bureaucratic administration may be something other than a means to an end, and it may blind us (through mythical experience) to the real essence of the relationship between man and nature.

Heidegger felt that the essential problem of domination and control rests in the emancipation of humanity from nature and the inability to "let beings be". The inability to "let beings be" (e.g., both human and non-human beings) increases as modern technological domination and control increases. The domination of bureaucracy over nature is analogous to the transformation of human beings into mere cogs in a machine.

93. Gershey et al., *supra* note 82, at 169-75.

ing the multifaceted NIMBY syndrome as a justification for challenging the federal LLWPAA. Some LLW compacts have attempted to satisfy local interests by offering compensation and developing citizen advisory committees, but NIMBY and the public fears have not successfully been reconciled. The lack of action by LLW compacts may eventually lead back to federal pre-emption of decisionmaking in regard to LLW siting. The future of LLW compacts remains in doubt. The issue may again become a federal responsibility. Meanwhile, the hope for a responsible national policy for the containment of LLW continues to recede like a mirage in the Arizona desert.