LOW-LEVEL RADIOACTIVE WASTE DISPOSAL POLICY IN VERMONT: AN ASSESSMENT OF ACT 296

INTRODUCTION

During its 1990 term, the Vermont General Assembly took a major step toward assuming the burden of regulating low-level radioactive waste,[1] as is its responsibility under the federal Low-Level Radioactive Waste Policy Act of 1980 (hereinafter "LLRWPA").[2] Through Act 296, the legislature attempted to ensure that Vermont will be in a position to provide for the proper disposal of all future low-level radioactive waste generated within the state, either by entering into an interstate disposal agreement or by siting and constructing a disposal facility within Vermont.[3] This well intentioned Act is aimed at ensuring the continued safe disposal of Vermont generated low-level radioactive waste.[4] A number of unresolved legal and practical problems, however, may hinder effective implementation of the Act.

Specifically, Act 296 provides for the segregation of low-level radioactive waste in a manner supplemental to that required by federal law. So-called "long-lived" wastes are to be separated from

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1. 1990 Vt. Laws 296. The Vermont General Assembly enacted a second low-level radioactive waste bill during its 1990 session. 1990 Vt. Laws 242. Act 242 was a direct response to a Nuclear Regulatory Commission (NRC) Policy Statement. NUCLEAR REGULATORY COMMISSION, BELOW REGULATORY CONCERN POLICY STATEMENT (1990). In effect, the new NRC policy statement would deregulate the disposal of certain radioactive waste, i.e., those "below regulatory concern." *Id.* The preemptive effect of this policy statement is unclear. Nevertheless, Act 242 attempts to reimpose, at the state level, those disposal restrictions that recently have been deregulated at the federal level. The Act states: "Waste . . . shall not be treated, recycled, stored or disposed of except at a facility with a specific license, whether or not that radioactive waste . . . since January 1, 1989, [has] been deregulated or declared exempt from regulatory control by the NRC or other federal agencies." VT. STAT. ANN. tit. 10, § 6507(b) (Supp. 1991).

2. 42 U.S.C. §§ 2021b-2021j (1988).

3. 1990 Vt. Laws 296 § 1(i), (j).

4. Safe disposal of low-level radioactive waste is necessary to protect public health. For a scientific study of the biological and physical effects of exposure to low-level radiation, see COMMITTEE ON THE BIOLOGICAL EFFECTS OF IONIZING RADIATION, DIV. OF MEDICAL SCIENCES, ASSEMBLY OF LIFE SCIENCES, NAT'L RESEARCH COUNCIL, THE EFFECTS ON POPULATIONS OF EXPOSURE TO LOW LEVELS OF IONIZING RADIATION (1980) (includes risk assessments of the somatic and genetic effects of radiation). *See also* NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS, REPORT NO. 76, RADIOLOGICAL ASSESSMENT: PREDICTING THE TRANSPORT, BIOACCUMULATION, AND UPTAKE BY MAN OF RADIONUCLIDES RELEASED TO THE ENVIRONMENT (1984).

"short-lived" wastes,[5] so that each class of waste can be isolated for its dangerous lifetime. The Act fails, however, to ensure that such long-lived waste in fact will be treated in a manner different from the short-lived waste. After separation of the wastes and study of the long-lived waste disposal options, it may be decided that supplemental isolation of the long-lived waste is not necessary or economically desirable. Thus, the Act could potentially result in the state incurring substantial cost to separate the wastes, but fail to realize any benefit from such separation.[6]

Furthermore, to solve Vermont's low-level radioactive waste problem in an effective manner, any facility constructed in the state must be legally able to exclude waste from other states.[7] Although Act 296 provides two possible means by which out-of-state waste might be excluded from a Vermont facility, both methods of exclusion have complications. First, Vermont could join a regional compact under federal law and thereby exclude waste from outside the region. Vermont's past efforts in that regard, however, indicate that joining a compact is a politically complicated task.[8] Alternatively, the Vermont facility could simply exclude out-of-state waste. If excluding such waste were challenged legally, Vermont could assert the market participant exception to the Commerce Clause. However, the limits of the market participant exception are not well defined, and such action is legally uncertain.[9]

This note will examine how Act 296 fits within the overall framework of federal and state low-level radioactive waste regulation and will analyze the extent to which the Act can realistically be expected to fulfill its purposes. Attention below is first directed to the federal regulation of low-level radioactive waste which served as the underlying motivation for the recent Vermont action. Thereafter, Act 296 is described in detail. Finally, the problems

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5. Act 296 provides no definition of "long-lived" or "short-lived" wastes. The precise definitions are to be developed by the Vermont Agency of Natural Resources. VT. STAT. ANN. tit. 10, § 7023(a)(2) (Supp. 1991). "Long-lived" wastes, however, have been defined elsewhere as those with half-lives greater than 30 years. "Short-lived" wastes then would be those with half-lives of 30 years or less. The basis for this distinction is that radionuclides with half-lives of 30 years or less will "decay to insignificant levels in 300 years." ACRES INT'L CORP., A STUDY OF RISKS ASSOCIATED WITH LOW-LEVEL RADIOACTIVE WASTE DISPOSAL IN VERMONT 3-1 (1990) (prepared for the Vermont Advisory Comm'n on Low-Level Radioactive Waste) [hereinafter ACRES STUDY].

6. *See infra* part III.A.

7. *See infra* part III.B.

8. *See infra* part III.B.1.

9. *See infra* part III.B.2.

associated with separating radioactive waste and with excluding out-of-state waste are examined.

I. Federal Regulation of Low-Level Radioactive Waste[10]

In LLRWPA, Congress set forth the national low-level radioactive waste[11] disposal policy.[12] Each state was granted the responsibility of providing for the disposal of low-level radioactive waste generated within its borders.[13] Further, LLRWPA promoted disposal on a regional basis as the safest and most effective means of disposal.[14] States were authorized, but not required, to enter into compacts in order to establish and operate regional disposal facilities.[15] Effective January 1, 1986, an established and congressionally approved regional compact could exclude from its disposal facility low-level radioactive waste produced outside the compact region.[16]

In 1985, Congress amended LLRWPA (hereinafter "Amendments") to facilitate the creation of regional compacts for low-level radioactive waste disposal.[17] The Amendments were a compromise

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10. This section defines the scope of federal low-level radioactive waste regulation and describes it briefly, in order to provide the context for the Vermont regulatory scheme. For a detailed discussion of federal radioactive waste regulation in general, see Charles H. Montange, *Federal Nuclear Waste Disposal Policy*, 27 Nat. Resources J. 309 (1987). Other articles related to this topic include: Deborah M. Mostaghel, Comment, *Who Regulates the Disposal of Low-Level Radioactive Waste Under the Low-Level Radioactive Waste Policy Act?*, 9 J. Energy L. & Pol'y 73 (1988); Dan M. Berkovitz, *Waste Wars: Did Congress "Nuke" State Sovereignty in the Low-Level Radioactive Waste Policy Amendments Act of 1985?*, 11 Harv. Envtl. L. Rev. 437 (1987); Joseph R. Prochaska, *Low-Level Radioactive Waste Disposal Compacts*, 5 Va. J. Nat. Resources L. 383 (1986). Also, for a collection of articles on the subject, see Michael Burns, Low Level Radioactive Waste Regulation: Science, Politics, and Fear (1988).

11. Low-level radioactive waste is statutorily defined in 42 U.S.C. § 2021b(9) (1988). The definition therein states that low-level radioactive waste is "radioactive material that — (A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material . . .; and (B) the Nuclear Regulatory Commission . . . classifies as low-level radioactive waste." 42 U.S.C. § 2021b(9) (1988). The NRC classifies low-level radioactive waste into three classes (A, B and C), depending upon the concentration of long-lived and short-lived radionuclides. 10 C.F.R. § 61.55 (1991).

12. 42 U.S.C. §§ 2021c(a)(1), 2021d(a)(1) (1988) (corresponds to Pub. L. No. 96-573, § 4(a)(1), 94 Stat. 3347, 3348 (1980)).

13. *Id.* § 2021c(a)(1).

14. *Id.* § 2021d(a)(1).

15. 42 U.S.C. § 2021d(a)(2) (1988) (corresponds to Pub. L. No. 96-573, § 4(a)(2)(A), 94 Stat. 3347, 3348 (1980)).

16. 42 U.S.C. § 2021d(c) (1988) (corresponds to Pub. L. No. 96-573, § 4(a)(2)(B), 94 Stat. 3347, 3348 (1980)).

17. 42 U.S.C. §§ 2021b-2021j (1988) (corresponds to Pub. L. No. 99-240, 99 Stat. 1842 (1986)).

between states with existing disposal facilities that desired to form compacts immediately and thereby exclude waste from outside their region, and states without such facilities that sought to avoid exclusion from their continued use of existing out-of-state disposal facilities.[18] The Amendments extended the period during which the existing disposal sites[19] would remain open to low-level radioactive waste generated outside those particular regions. Subject to certain capacity restrictions[20] and access limitations,[21] the existing sites will remain open to waste generated outside their regions until December 31, 1992.[22]

The access limitations, or "milestones," imposed by the Amendments provide great incentive for non-sited states to join compacts and to develop disposal sites, or otherwise to provide for disposal of their low-level radioactive waste.[23] The first milestone required that, by July 1986, each non-member state join a compact or, by legislative or gubernatorial act, indicate an intent to develop an in-state facility.[24] The second milestone required that each non-sited compact and each non-member state complete a comprehensive siting plan for the requisite new facility by January 1988.[25] The third milestone required that, by January 1990, each non-sited compact and each non-member state file a complete application with the Nuclear Regulatory Commission (hereinafter "NRC") for a license to operate a low-level radioactive waste disposal facility or indicate by gubernatorial certification that proper disposal for its low-level radioactive waste will exist by 1993.[26] The fourth mile-

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18. *See generally* Timothy L. Peckinpaugh, *The Politics of Low-Level Radioactive Waste Disposal*, *in* BURNS, *supra* note 10, at 49-57.

19. At the time of passage of the Amendments, only three disposal sites were operational: Barnwell, South Carolina; Richland, Washington; and Beatty, Nevada. These sites are specifically identified in the Amendments. *See* 42 U.S.C. § 2021e(b) (1988) (corresponds to Pub. L. No. 99-240, § 5(b), 99 Stat. 1842, 1847 (1986)).

20. 42 U.S.C. § 2021e(b) (1988) (corresponds to Pub. L. No. 99-240, § 5(b), 99 Stat. 1842, 1847 (1986)). The volume of low-level radioactive waste to be accepted by each existing facility during the transition period (1986 to 1992) was limited expressly by the statute. *Id. See also* Berkovitz, *supra* note 10, at 451.

21. 42 U.S.C. § 2021e(e) (1988) (corresponds to Pub. L. No. 99-240, § 5(e), 99 Stat. 1842, 1852 (1986)). For a more comprehensive treatment of the access limitations, see Montange, *supra* note 10, at 371-73; Berkovitz, *supra* note 10, at 452-59; Peckinpaugh, *supra* note 18, at 51-52.

22. 42 U.S.C. § 2021e(a) (1988) (corresponds to Pub. L. No. 99-240, § 5(a), 99 Stat. 1842, 1846 (1986)).

23. Peckinpaugh, *supra* note 18, at 52.

24. 42 U.S.C. § 2021e(e)(1)(A) (1988).

25. *Id.* § 2021e(e)(1)(B).

26. *Id.* § 2021e(e)(1)(C).

stone required that all non-sited regions and non-sited states file complete applications with the NRC by January 1992.[27]

Failure to comply with these milestones triggers a number of penalties.[28] Non-compliance with the first milestone doubles the standard surcharge[29] for six months beyond the milestone.[30] If, after the six months, the state is still out of compliance, then access to existing disposal facilities may be denied until compliance is achieved.[31] Failure to comply with the second milestone doubles the standard surcharge for the first six months of non-compliance, quadruples the standard surcharge for the second six months of non-compliance, and allows denial of access to existing facilities thereafter.[32] Failure to comply with the third milestone permits existing facilities to deny access.[33] Non-compliance with the fourth milestone triples the standard surcharge.[34]

The system of milestones and penalties created by the Amendments was designed to encourage non-sited compacts and non-member states to develop a means for disposing their low-level radioactive waste by the end of the transition period.[35] Failure to meet this overall goal can subject a state to substantial penalty. If, by January 1993, a state or compact is unable to provide for the disposal of all low-level radioactive waste generated within its borders, the state (or each state in the compact), upon request of the generator, must either: (1) take title to, take possession of, and assume liability for the waste generated within its borders, or (2) repay each generator twenty-five percent of any surcharges paid by

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27. *Id.* § 2021e(e)(1)(D).

28. *Id.* § 2021e(e)(2).

29. Further incentive for non-sited states to join compacts and to develop disposal sites was provided by the surcharge system of the Amendments. During the transition period from 1986 to 1992, the three states with operating facilities are permitted to impose surcharges, above any regular disposal fees, on low-level waste generators for waste generated outside the three regions. The allowable surcharges escalate during the transition period, thereby increasing the incentive over time. 42 U.S.C. § 2021e(d)(1) (1988). *See also* Peckinpaugh, *supra* note 18, at 52. Failure to comply with the milestones causes, among other things, these standard surcharges to be doubled, tripled or quadrupled. 42 U.S.C. § 2021e(e)(2) (1988). However, timely compliance with the milestones entitles a region or state to a partial rebate of the surcharges paid. 42 U.S.C. § 2021e(d)(2) (1988).

30. 42 U.S.C. § 2021e(e)(2)(A)(i) (1988).

31. *Id.* § 2021e(e)(2)(A)(ii).

32. *Id.* § 2021e(e)(2)(B).

33. *Id.* § 2021e(e)(2)(C).

34. *Id.* § 2021e(e)(2)(D).

35. H.R. REP. No. 314, 99th Cong., 1st Sess., pt. 2, at 20 (1985), *reprinted in* 1985 U.S.C.C.A.N. 2975, 3009.

the generator between January 1990 and January 1992.[36] If, by January 1996, a state or compact region is unable to provide for the disposal of all low-level radioactive waste generated within its borders, the state (or each state within the compact), upon request of the generator, must take title to, take possession of, and assume liability for the waste generated within its borders.[37]

II. VERMONT'S ACT 296

A. Background to Passage

In response to LLRWPA and its Amendments, Vermont's governor, Madeline Kunin, created a Low-Level Radioactive Waste Advisory Commission, which was authorized subsequently by the legislature.[38] The Commission's duties included advising the governor and legislature on matters relating to low-level radioactive waste disposal and spearheading efforts to develop a low-level radioactive waste management plan.[39] For a variety of reasons, however, the plan was never completed.[40] Efforts to join a compact were unsuccessful as well, primarily because of the risk to Vermont of receiving large volumes of low-level radioactive waste generated out-of-state.[41] The failure of these efforts caused Vermont to miss the January 1, 1988 milestone set by the Amendments.[42] Consequently, the three existing disposal facilities denied access to Vermont generated low-level radioactive waste beginning in January 1989.[43] Since then, such waste has been stored by each generator[44]

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36. 42 U.S.C. § 2021e(d)(2)(C) (1988). Recall, as well, that December 31, 1992 is the date upon which sited states can begin to exclude waste from outside their compacts. *Id.* § 2021e(a). Consequently, after that date, waste produced in a non-sited compact or a non-sited state must be stored. The state may either store the waste itself or pay the generator to do so. *Id.* § 2021e(d)(2)(C). If a state chooses the repayment option, the payments are to be made on a monthly basis in an amount equal to 1/36th of the total amount due. Such payments will continue until the state (or compact) is able to provide for disposal or until January 1996, whichever is earlier. *Id.*

37. *Id.* § 2021e(d)(2)(C).

38. ACRES STUDY, *supra* note 5, at 1-3.

39. *Id.* at 1-5.

40. *Id.*

41. *Id.* at 1-3.

42. *Id.* at 1-5.

43. *Id.* at 1-1.

44. Vermont Yankee nuclear power plant in Vernon generates in excess of 95% of the low-level radioactive waste generated in Vermont on an annual basis. The University of Vermont in Burlington generates approximately 4% of such waste. Medical and industrial facilities account for the remaining 1% or less. *Id.* at 2-1 to 2-7 (provides a comprehensive breakdown of the volume and nature of the waste generated by each source).

in temporary facilities without state oversight.[45]

To correct its non-compliance status and to provide for proper disposal of Vermont-generated low-level radioactive waste by the January 1996 deadline, the Vermont General Assembly enacted Act 296.[46] There was opposition to Act 296 in certain political quarters, based upon a belief that the Act was an effort to site a facility in Vermont prematurely.[47] For instance, Vermont Public Interest Research Group advocated mounting a constitutional challenge to LLRWPA and its Amendments.[48] However, the risks posed by an adverse judgment in such a legal challenge, and by the state's failure to take legislative action, were great: the state would be forced to take title to, to take possession of, and to assume liability for in-state generated low-level radioactive waste.[49] A majority of legislators believed that the state, being responsible for the health and safety of its citizens, was obligated to devise a plan for safe disposal of Vermont generated low-level radioactive waste.[50]

B. *Legislative Objectives*

Act 296 addresses both the short-term and long-term concerns of low-level radioactive waste disposal in Vermont. First, the Act attempts to bring Vermont back into compliance with LLRWPA and its Amendments and thereby regain short-term access to existing disposal facilities.[51] The Act expressly acknowledges that "Vermont could regain a right to access to out-of-state disposal facilities through December 31, 1992 by complying with the [federal] Act's milestones."[52] Further, the Act expressly notes that "it is the

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45. 1990 Vt. Laws 296 § 1(g).

46. *Id.* § 1(d), (e).

47. *See* Vermont Public Interest Research Group, *Siting Starts for Nuke Waste in Vermont*, VERMONT PUBLIC INTEREST RESEARCH GROUP UPDATE, Summer 1990, at 7.

48. *Id.* Such a constitutional attack could be based on the principles of federalism embodied in the United States Constitution; the "take title" provision of the Amendments seems most suspect. *Id.* At least one state, New York, mounted such a constitutional challenge, claiming violations of the Tenth Amendment, the Eleventh Amendment and Article IV, Section 4 of the United States Constitution. However, the United States District Court for the Northern District of New York denied the claim. New York v. United States, 757 F. Supp. 10 (N.D.N.Y. 1990). The matter is now on appeal to the United States Court of Appeals for the Second Circuit.

49. 42 U.S.C. § 2021e(d)(2)(C) (1988).

50. Interview with Jonathan Lash, former Director of the Vermont Agency of Natural Resources, in South Royalton, Vt. (Oct. 4, 1990).

51. 1990 Vt. Laws 296 § 1(d).

52. *Id.*

intent of the legislature that this act would achieve compliance and will allow the governor to meet the 1990 milestone by written certification of compliance."[53]

Second, Act 296 seeks to encourage a long-term solution to Vermont's low-level radioactive waste disposal problem, either by signing an interstate agreement or joining an interstate compact, or by siting and constructing a disposal facility in Vermont.[54] The Act expressly prefers an interstate solution which would allow out-of-state disposal for some or all of the low-level radioactive waste generated in Vermont.[55] Nevertheless, in recognition that past efforts in that regard have not been successful and that there is no guarantee of any such future agreement, the Act acknowledges that it may be in "the best interests of the state to carry out its responsibilities under the present federal law and its responsibilities to the present and future inhabitants of this area by siting and constructing a facility" in Vermont.[56]

Finally, Act 296 recognizes that any facility constructed in Vermont should not have capacity in excess of that necessary for all "reasonably expected" waste[57] because a larger facility "would present avoidable risks to the environment and public safety."[58] By linking the capacity of the facility to the expected level of Vermont low-level radioactive waste generation, the legislature indicated, albeit implicitly, an intent to exclude out-of-state waste. Such an intent is further suggested by the Act's acknowledgement that "exhaustion of disposal capacity at an early . . . date, because of the acceptance . . . of waste in excess of the reasonably expected amount, would burden the resources of the state, risk disruption of the economy . . . and would add avoidable risks of harm to the

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53. *Id.*

54. *Id.* § 1(i), (j).

55. *Id.* § 1(i).

56. *Id.* § 1(j).

57. *Id.* § 1(k).

> [R]easonably expected waste includes only waste from the normal operation of the Vermont Yankee facility, during its licensed operating life, and including decommissioning waste, and from the normal operations of the currently licensed low-level radioactive waste generators in Vermont through the expected date for completing the decommissioning of Vermont Yankee plus a small emergency contingency reserve.

Id. It is estimated that decommissioning wastes will account for 70% of the total low-level radioactive waste generated in Vermont during the life of such a facility. ACRES STUDY, *supra* note 5, at 2-8.

58. 1990 Vt. Laws 296 § 1(k).

environment and to public health and welfare."[59]

C. *Implementation of the Objectives*

Consistent with its legislative findings and long-term objectives, Act 296 takes a two-pronged approach to solving Vermont's low-level radioactive waste disposal problem. The Act requires that the Secretary of the Vermont Agency of Natural Resources "vigorously pursue all opportunities to join an interstate compact . . ., or to sign an agreement with a state or compact, for the disposal of some or all of Vermont's low-level radioactive waste."[60] This mandate, although straightforward on its face, is likely to prove difficult to fulfill because the Act requires that the terms of any such agreement seek "to minimize the future possibility of the disposal of any low-level radioactive waste in Vermont."[61]

Recognizing the difficulties associated with convincing another state to accept low-level radioactive waste generated in Vermont, the legislature, as an alternative to the compact approach, provided a framework[62] and timetable[63] for siting, constructing and operating a disposal facility in Vermont. The newly-created Vermont Low-Level Radioactive Waste Authority (hereinafter "Authority") is responsible for implementing and managing this framework.[64] The Authority is required to take the actions necessary to adhere to the Act's timetable,[65] which provides fixed deadlines for completion of each aspect of the siting process.[66] Additionally, the Authority is directed to oversee the construction and the operation of the facility.[67] In the following sections, each aspect of this process—siting, constructing and operating—is described.

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59. *Id.*

60. *Id.* § 2(a).

61. *Id.*

62. VT. STAT. ANN. tit. 10, §§ 7010-7015 (Supp. 1991).

63. *Id.* § 7002.

64. *Id.* § 7010. The Authority is to consist of three members appointed by the governor, subject to Senate confirmation. *Id.* § 7010(b). The members are to serve six-year terms and may be removed "only for cause." *Id.* § 7010(c). The chairperson is to be a full-time state employee, while the other two members are to be part-time state employees. *Id.* § 7010(d).

65. *Id.* § 7012(a).

66. *See generally id.* § 7002.

67. *Id.* § 7002(a)(18), (19).

1. Siting the Facility

As soon as practicable, the Authority is to begin the site characterization of the proposed Vermont Yankee disposal site.[68] At the same time, the Authority, based upon procedures and criteria adopted by the Vermont Agency of Natural Resources (hereinafter "Agency"),[69] is to begin statewide screening in order to identify potential alternative disposal sites.[70]

By November 1, 1991, the Authority must complete the Vermont Yankee site characterization and select at least three potential alternative sites.[71] Soon thereafter, the Authority must request certification of an alternative site by the Agency.[72] The Authority also must evaluate the strengths and weaknesses of the characterized site, comparing it with the best potential alternative.[73] As a part of this evaluation, the Authority must consider the social and economic impact of the proposed disposal facility on the host and adjacent municipalities.[74] Further, the Authority must hold a public meeting near the municipality where the proposed site is to be located, and obtain the consent of a majority of those municipal voters present.[75]

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68. *Id.* § 7002(a)(3).

69. *Id.* § 7022. The Agency is required to adopt rules establishing criteria and procedures for screening potential sites and for certifying such sites. *Id.* The Agency also is required to adopt siting requirements for the low-level radioactive waste disposal facility, subject to minimum standards provided by the Act. *Id.* § 7021. These minimum standards account for social and environmental factors such as population growth, natural resource conservation, and geologic and hydrogeologic concerns. *Id.*

70. *Id.* § 7002(a)(4).

71. *Id.* § 7002(a)(6). The Act requires that one of the alternative sites be in the town of Vernon. *Id.*

72. *Id.* § 7002(7).

73. *Id.* § 7012(f)(2).

74. *Id.* § 7012(f)(1).

75. *Id.* § 7012(f)(4), (5). Initial indications are that this provision should not prove to be a major stumbling block. At its 1990 town meeting, the town of Vernon passed a non-binding resolution to site a facility in the town. Interview with Jonathan Lash, *supra* note 50. In addition to this provision, the Act expressly provides for other public input. "[W]hile informing and consulting the public," the Authority is required to "carry out the actions necessary to fulfill the requirements of the timetable." VT. STAT. ANN. tit. 10, § 7012(a) (Supp. 1991). More specifically, the Authority's decision of whether to characterize certified sites may be made only after public comment. *Id.* § 7002(a)(8). Draft license applications must be made available for public comment prior to submission to the legislature for approval. *Id.* § 7002(a)(11). In addition, the Agency may adopt siting, screening and certification rules only after public comment thereon. *Id.* § 7002(a)(5). Under the Act, " 'public comment' means ample opportunities for public input, including at least prior availability of a draft decision, policy or rule, two public hearings . . ., and preparation and distribution of a response sum-

No later than December 15, 1991, the Authority must decide either to characterize the alternative site or to prepare a draft license application for the Vermont Yankee site.[76] Then, within thirty days of that time, the Authority must petition the legislature for approval of its decision.[77] Once the alternative site is approved, or if the legislature directs the characterization of a third site, the Authority must complete such characterization within eighteen months.[78] Then, the Authority must evaluate the newly characterized site, and decide whether to go forward with draft license requirements or to characterize another alternative site.[79]

If the legislature approves an Authority decision to prepare a draft license, then the Authority must submit the draft license to the Agency within six months.[80] Following Agency review of the application, the Authority must file the license application with the NRC.[81] At the same time, the Authority must apply for a state land use permit.[82]

2. Constructing the Facility

Construction of the facility, under the direction of the Authority, is to begin within 180 days of obtaining an NRC license and a state land use permit.[83] In preparation for construction, the Authority, by December 29, 1991, is required to make recommendations to the Agency for rules on design standards for the facility.[84] Within six months thereafter, the Agency must promulgate design specifications for the facility, which must address among other criteria, the structural integrity of the facility, the long-term isolation of waste from the environment, and adequate monitoring of the system.[85]

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mary to all comments received." *Id.* § 7001(10). In addition, the Act provides for grants to municipalities with sites undergoing characterization in order to assist effective public participation. *Id.* § 7012(o).

76. VT. STAT. ANN. tit. 10, § 7002(a)(9) (Supp. 1991).

77. *Id.*

78. *Id.* § 7002(a)(10).

79. *Id.*

80. *Id.* § 7002(a)(11). The six month time limit under this section may be lengthened by Agency action pursuant to its rule-making authority under the Act. *Id.* The Agency is required to adopt rules specifying standards for draft license applications. *Id.* § 7024.

81. *Id.* § 7002(a)(16).

82. *Id.* § 7002(a)(17).

83. *Id.* § 7002(a)(18).

84. *Id.* § 7002(a)(12)(B).

85. *Id.* § 7023(a). In general, there are three design possibilities: aboveground vaults,

The facility, however, will not be designed to house all types of low-level radioactive waste. Rather, the Act requires separation and storage of long-lived isotopes until suitable permanent disposal options are available.[86] The Authority must "initiate a study to determine the maximum appropriate separation of long-lived waste, the appropriate level of recoverability of such waste, and the appropriate permanent disposal technology" for such waste.[87] Based on the findings of the study, the Agency must develop a specific plan for the permanent disposal of the long-lived waste.[88] The plan might recommend leaving the long-lived waste at the disposal facility, but that option is not to be given undue weight.[89]

In order to finance construction of the facility, the Authority may solicit offers to purchase disposal capacity at the facility, and may allocate such capacity in advance of construction.[90] "No offer may be accepted unless the terms of all such commitments or contracts, taken together, provide for the complete prepayment of all construction costs, exhaust the proposed capacity, . . . and are otherwise in the best interest of the state."[91] If made, such allocation agreements are nontransferable without approval of the Authority.[92] However, the Authority has discretion to reject all offers and may pursue an alternative method of financing.[93]

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below ground vaults, and earth-mounded aboveground vaults. ACRES STUDY, *supra* note 5, at 4-16 to 4-29.

86. VT. STAT. ANN. tit. 10, § 7023(b) (Supp. 1991). Under NRC regulations, low-level radioactive waste is separated into classes A, B and C. *See supra* note 11. Class A waste is generally segregated from the other waste at the disposal site. 10 C.F.R. § 61.55 (1991). Act 296 may require additional segregation of waste to ensure that the hazardous life of any waste permanently disposed of at the facility is less than the institutional control period of the facility. VT. STAT. ANN. tit. 10, § 7023(b) (Supp. 1991). This provision of the Act is unique; the author knows of no other state with a law requiring separation supplemental to the federal regulations.

87. VT. STAT. ANN. tit. 10, § 7002(a)(2) (Supp. 1991). As a part of the study to determine the appropriate disposal technology for long-lived waste, the Authority must consider "a deep-mined facility in-state, technologies not normally examined in the United States . . ., and all other technologies reasonably available." *Id.* § 7012(d).

88. *Id.* § 7002(a)(20). In forming the specific disposal plan for long-lived waste, the Authority must thoroughly examine all reasonable alternatives. *Id.* § 7012(j).

89. *Id.* § 7012(j).

90. *Id.* § 7015(a).

91. *Id.* § 7015(b).

92. *Id.* § 7015(c).

93. *Id.* § 7015(e). If the Authority chooses not to pre-allocate disposal capacity, its financing plan must be approved by the legislature. *Id.* § 7012(i).

3. Operating the Facility

If a low-level radioactive waste disposal facility is constructed under Act 296, the Authority "shall provide for the operation, maintenance and closure of the facility and shall provide for all necessary actions during the institutional control period."[94] Operating expenses will be covered by service fees levied on all low-level radioactive waste generators in Vermont.[95] The disposal facility is to be closed after the decommissioning of the Vermont Yankee nuclear power plant.[96]

III. Potential Problems with Act 296

Act 296 is an ambitious attempt on Vermont's part to bring the state back into compliance with federal law and to ensure the continued safe disposal of the state's low-level radioactive waste. It should not be expected, however, that the plan will proceed without difficulty. Many problems may arise during the process of siting and constructing a facility, and during the operational life of such a facility. In this regard, two essential areas of concern will be discussed: (1) problems associated with the separation and storage of long-lived isotopes, and (2) problems associated with excluding out-of-state waste from the disposal facility.

A. Problems Associated with Separating Long-Lived Isotopes

Act 296 recognizes that the federal definition of low-level radioactive waste includes a wide spectrum of radioactive materials.[97] The Act seeks to dispose of only those wastes whose radioactive life will expire during the institutional control period of the facility, and to contain any longer-lived wastes "in a manner that would allow recovery after an evaluation and decision on alternatives for permanent disposal of those wastes."[98] Segregation of

94. *Id.* § 7012(c).

95. *Id.* § 7013(e). The service fee shall be set by the Authority and approved by the Vermont Public Service Board. *Id.*

96. *Id.* § 7002(a)(21). The Act, however, does not provide for the disposal of in-state waste that was not generated at Vermont Yankee once the facility closes. *See supra* note 44.

97. 1990 Vt. Laws 296 § 1(f). Specifically, the Act draws attention to the fact that some of the radioactive wastes classified as low-level by the federal government may remain radioactive for millions of years. In addition, the Act notes the wide divergence in radioactive concentration among members of the low-level radioactive class. *Id.*

98. *Id.* § 1(j). In this manner, the Act contemplates segregation of wastes, and disposal of some wastes, in a manner supplemental to that required under federal law. *Id.*

long-lived waste from short-lived waste, so as to allow containment of the former and disposal of the latter, will necessarily entail increased risk to waste handlers and others.[99]

By determining what wastes deserve different treatment, on what basis, and by what means,[100] the Agency will define the increased risk to waste handlers and others. The fundamental problem with the Act is not that these risks are increased,[101] but rather that these risks are increased without the assurance of any benefit. Although the Act contains broadly phrased legislative findings indicating a desire to isolate the long-lived waste "for as long as reasonably necessary,"[102] it sets no mandatory requirements for the disposal of such waste. The Act proceeds upon the assumption that real benefits will materialize, but it provides no justification to warrant this assumption or to warrant the expenditure of funds and the assumption of risk necessary to separate the waste.

The question of what wastes deserve separation is left to agency discretion. After studying the issue, the Authority is to make recommendations to the Agency on rules for separation and recoverability of long-lived waste. The Agency must then consider and adopt the Authority's rules.[103] There are at least three factors which differentiate various materials along the radioactive spectrum: radioactive life, radioactive concentration, and radioactive mobility.[104] Ideally, the Agency will consider each of these factors in determining what wastes deserve separation. The Authority also must consider "the various techniques [for separation] potentially available, their costs and incremental risks."[105]

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99. ACRES STUDY, *supra* note 5, at 3-4 to 3-6.

100. VT. STAT. ANN. tit. 10, § 7002(a)(13) (Supp. 1991).

101. Nevertheless, it might well be argued that the increased risks associated with waste separation are unnecessary. Technologies employed in several European countries demonstrate that enhanced safety can be obtained without the increased risks associated with separation. Sweden, Germany and Switzerland dispose of *all* their low-level radioactive waste in mined caverns, not by use of shallow surface technologies. ACRES STUDY, *supra* note 5, at 3-4. Such an approach increases the safety associated with low-level radioactive waste disposal by providing for longer isolation of the waste, but it does so without the increased risk of radiation exposure attendant to waste separation.

102. 1990 Vt. Laws 296 § 1(j). The legislative findings indicate a desire to contain the short-lived wastes "for at least their hazardous life" and the long-lived wastes only "for as long as reasonably necessary." *Id.*

103. VT. STAT. ANN. tit. 10, § 7002(a)(2), (a)(12)(A), (a)(13) (Supp. 1991).

104. *See generally* ACRES STUDY, *supra* note 5, at 3-1 to 3-4.

105. VT. STAT. ANN. tit. 10, § 7012(e) (Supp. 1991). The Act specifically identifies the risks to be considered: "The risks to be considered should include radiological and other risks to workers, the public and the environment from the separation process and from the

The two basic means of separation are physical separation and chemical separation. Physical separation involves the manual sorting of waste materials, using monitoring equipment to allow separation on the basis of radioactivity.[106] A significant portion of the long-lived radionuclides could be separated using this process, but such manual separation substantially increases the radiation dose to a typical worker.[107] Chemical separation could be used as a supplement to physical separation. Most, but not all, of the remaining long-lived radionuclides could be separated by chemical processes, but only at a significant cost.[108]

Assuming for the sake of argument that the costs of separation cited herein (monetary cost plus increased radiation risk) are accurate, or that the Agency will be able to define a more accurate cost profile, Act 296 does not provide an adequate process for weighing the costs against the benefits. In fact, at the time the costs are to be determined, the benefits will not yet be known. It is unclear that any benefit will be realized at all.

Under the Act, the Authority is to perform a study to determine the appropriate permanent disposal technology for long-lived waste.[109] Subsequently, the Authority must recommend rules for separation and recovery of wastes, and at the same time, it must provide the legislature with an initial report on "the possible appropriate technologies, and their costs, for the permanent disposal of the long-lived waste."[110] Thereafter, the Authority must annually report its recommendations to the legislature for the permanent disposal of the long-lived waste, and, by the beginning of operations of the disposal facility, the Authority must propose a

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disposal of the separate wastes . . . ." *Id.*

106. ACRES STUDY, *supra* note 5, at 3-5.

107. *Id.* The Acres Study estimated that about 90% of the long-lived radionuclides could be separated by physical means, but that such a procedure would double the radiation dose to a typical worker. The estimated capital cost for such a program ranged between $200,000 and $1,000,000. *Id.*

108. *Id.* at 3-5 to 3-6. The estimated capital cost for a chemical separation facility exceeds several million dollars. *Id.* at 3-5. In addition, chemical separation results in the generation of mixed wastes (those that are both radioactive and hazardous), some of which could exceed the federal low-level radioactive waste definition. *Id.* at 3-6. Furthermore, the Acres Study concludes that chemical separation is a "complex process" because the "chemical properties of the long-lived nuclides are dissimilar . . . [and] these radionuclides are dispersed throughout a variety of wastes in chemically different forms." *Id.*

109. *See supra* note 87.

110. VT. STAT. ANN. tit. 10, § 7002(a)(12)(C) (Supp. 1991).

specific plan for the permanent disposal of such waste.[111]

Thus, the decision regarding the appropriate disposal technology for the long-lived waste will not be made until after the rules for separation of the waste have been adopted and implemented. Before the benefits of separation are defined and assured, the costs and risks of separation will have been borne. Moreover, it is conceivable that, after diligent study of the alternatives, the legislature may decide to leave the long-lived waste with the short-lived waste, thereby realizing no true benefit to compensate for the costs incurred and risks taken.[112]

The process of separation and disposal created by Act 296 is flawed insofar as it requires the separation of wastes prior to determining the appropriate disposal technology. Correction of this flaw requires legislative action. The Act should be amended to require the Authority to conduct or commission a study on the various disposal options for long-lived waste and to propose a specific disposal plan for legislative approval *prior* to the adoption and implementation of rules for waste separation. This alteration of procedural timing would ensure that the costs associated with waste separation and the benefits of separate disposal are fully recognized. The legislature also should require that the costs of separation be justified by the tangible benefits of the disposal option chosen. By linking the rules for waste separation to the means of disposal, the risks and costs associated with separation will not be borne without the assurance of a benefit from separate disposal.

B. Problems with Excluding Out-of-State Waste

The success of any low-level radioactive waste disposal facility sited and constructed in Vermont hinges on the exclusion of waste generated outside the state.[113] Act 296 expressly links the capacity of such a facility to the "reasonably expected" level of low-level radioactive waste generated in Vermont.[114] By creating this linkage, the legislature clearly intended to solve Vermont's low-

111. *Id.* § 7002(a)(20).

112. Admittedly, Act 296 does attempt to guard against inaction, but its attempt is insufficient in light of the costs associated with separation. The Authority, in deciding on its recommended specific disposal plan, must "thoroughly examine all reasonable alternatives to leaving the waste at the disposal facility . . . and the option of leaving it there shall not be given undue weight." VT. STAT. ANN. tit. 10, § 7012(j) (Supp. 1991).

113. *See supra* Part II.B.

114. 1990 Vt. Laws 296 § 1(k).

level radioactive waste disposal problems, but not those of other states. Acceptance of waste "in excess of the reasonably expected amount [i.e., acceptance of out-of-state waste], would burden the resources of the state, risk disruption of the economy of the state and would add avoidable risks of harm to the environment and to public health and welfare."[115]

There are two primary means by which Vermont can attempt to exclude out-of-state waste from its facility. First, Vermont could join a compact and, under LLRWPA and its Amendments, exclude waste from outside the compact. This approach, although legally sound, is hindered by political complications and by Act 296 itself. Second, Vermont simply could choose to accept only waste generated in the state. If such action is taken by the state as the proprietor of the facility, and not as a regulator of the facility, the state might avail itself of the market participant exception to traditional Commerce Clause doctrine. This second approach, although easily implemented, is subject to legal uncertainty.

1. The Compact Approach

One means by which Vermont could exclude out-of-state waste is to join a regional compact as provided under LLRWPA and its Amendments. Established compacts, with congressional consent, are authorized to exclude low-level radioactive waste from outside their regions.[116] Act 296 expressly notes that it "is in the best interests of the state to vigorously pursue opportunities to join an interstate compact."[117] To some extent, however, Act 296 indicates that joining a compact is mutually exclusive of constructing a disposal facility.[118] This view ignores the fact that Vermont will benefit from joining a compact, regardless of whether a facility is constructed in the state. If a facility is constructed in Vermont, the state should pursue opportunities to join a compact solely for the sake of the legal security necessary to exclude out-of-state

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115. *Id.* By the express terms of the Act, "waste in excess of the reasonably expected amount" includes waste generated unexpectedly in Vermont, as well as waste generated outside the state. However, in light of the context in which the Act was passed, it is reasonable to assume that the legislature was concerned primarily with waste generated outside Vermont.

116. 42 U.S.C. § 2021d(c) (1988). *See supra* Part I.

117. 1990 Vt. Laws 296 § 1(i).

118. The Act states that compact negotiations are to discontinue upon the issuance of a license to construct a facility. *Id.* § 2(b).

waste.

Creating a mutually beneficial compact agreement with a compatible partner(s), however, is a politically complicated task. In forming a compact, one member generally agrees to accept waste from the other(s) in exchange for monetary compensation. But, by limiting Vermont to only those interstate agreements that "minimize the future possibility of the disposal of any low-level radioactive waste in Vermont,"[119] Act 296 effectively forestalls exploration of compact plans that might require Vermont to accept any out-of-state waste.[120] And, as might be expected, other states are as leery of Vermont's low-level radioactive waste as Vermont is of theirs.[121] Consequently, the negotiating parties possess only one true bargaining chip: the collective security of a compact.

To gain the desired compact security, Vermont must join an existing compact, convince an already aligned state to withdraw from its compact and form another, or form a compact with a non-aligned state. To date, Congress has approved a total of nine compacts consisting of forty-three states,[122] leaving only a small pool of non-aligned states.[123] Nevertheless, it is this small pool of non-

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119. *Id.* § 1(i).

120. Strictly construed, the language of section 1(i) precludes Vermont's acceptance of any out-of-state low-level radioactive waste. Granted, it is not in the best interests of the state to agree to accept large volumes of waste, but the acceptance of nominal amounts from a small-generating state might be worth the security of a compact agreement (i.e., the ability to exclude waste from all other states).

121. Interview with Jonathan Lash, *supra* note 50. Community paranoia concerning disposal sites is of such magnitude that some participants in compact negotiations with Vermont refuse even to acknowledge that negotiations are being conducted. *Id.*

122. The compacts, with host states indicated by an asterisk, are as follows: The Appalachian Compact (Delaware, Maryland, Pennsylvania*, West Virginia); The Central Midwest Compact (Illinois*, Kentucky); The Central States Compact (Arkansas, Kansas, Louisiana, Nebraska*, Oklahoma); The Midwest Compact (Indiana, Iowa, Michigan*, Minnesota, Missouri, Ohio, Wisconsin); The Northeast Compact (Connecticut*, New Jersey*); The Northwest Compact (Alaska, Hawaii, Idaho, Montana, Oregon, Utah, Washington*); The Rocky Mountain Compact (Colorado*, Nevada*, New Mexico, Wyoming); The Southeast Compact (Alabama, Florida, Georgia, Mississippi, North Carolina*, South Carolina*, Tennessee, Virginia); The Southwest Compact (Arizona, California*, North Dakota, South Dakota). Mary R. English, Summary of Low-Level Radioactive Waste Disposal Facility Siting Laws (Nov. 1988) (available through the Waste Management Research and Education Institute at the University of Tennessee). *See also* Memorandum from the U.S. Nuclear Regulatory Comm'n, Office of Governmental and Public Affairs: Current Status of Each State in Providing Disposal of Low-Level Radioactive Waste (May 1989) [hereinafter NRC Status Memo]; L. Cheryl Runyon, *Update on Low-Level Waste Compact Activities*, 15 STATE LEGIS. REP. No. 17 (National Conference of State Legislatures, Denver, Colo.), Nov. 1990.

123. The non-aligned states include Maine, Massachusetts, New Hampshire, New York,

aligned states that provides the best opportunity for Vermont. Because Act 296 effectively precludes importation of waste into the state, states within existing compacts have little incentive to take Vermont as a compact partner. These states already enjoy the security of a compact, and Vermont has little else to offer.

Given the mutual and overriding need for compact security, Vermont should be able to locate a compatible non-aligned state. Compatibility, to a large degree, is a function of the low-level radioactive waste volume generated by each state.[124] Compatibility, in this instance, also is a function of the other states' progress in siting a facility. Because Vermont is unwilling to accept out-of-state waste, and other states are presumably unwilling to accept Vermont's waste, the negotiating parties must fashion a compact agreement which allows the sharing of disposal responsibility similar to that of the Northeast Compact.[125]

An examination of the non-aligned states, illustrates that some, but not all, are compatible with Vermont. New York, Massachusetts and Texas all generate in excess of five times the volume of low-level radioactive waste generated by Vermont.[126] Although joining a compact would enable Vermont to exclude waste from outside the compact, it would not enable Vermont to exclude waste from other members within its compact.[127] Even if the compact partners agree to dispose of their own waste, there is always the risk that the other state will breach the agreement; in such a case, Vermont's borders would be open to waste from the breaching state. Therefore, due to the disparity in volume generation, and the risk associated therewith, large volume states such as New

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Rhode Island, Texas, and Vermont, as well as the District of Columbia and Puerto Rico. English, *supra* note 122.

124. The volume (in cubic feet) of low-level radioactive waste disposed of by each non-aligned state in 1987 is as follows: New York, 70,675; Texas, 61,961; Massachusetts, 55,094; Vermont, 8,263; Maine, 2,908; New Hampshire, 1,815; Rhode Island, 1,045; the District of Columbia, 135; Puerto Rico, 0. *Id.* Another source lists Maine's 1987 volume of low-level radioactive waste generation as 5,013 cubic feet. Brian Farrell et al., *Low-Level Waste Compact Status Report*, 1990 EDISON ELEC. INST. 4-3 [hereinafter EDISON REPORT]. Additionally, the 1987 figures for New Hampshire do not reflect the operation of Seabrook nuclear power plant.

125. The Northeast Compact has adopted a dual host approach with Connecticut and New Jersey sharing the responsibility for disposal. English, *supra* note 122.

126. *See supra* note 124.

127. The exclusionary powers pursuant to LLRWPA and its Amendments do not extend to intra-compact borders. Absent such congressional authorization, the Commerce Clause prohibits such protectionist measures. *See infra* notes 135, 139-49 and accompanying text.

York, Massachusetts and Texas are not compatible with Vermont.

Rhode Island and New Hampshire are also not compatible with Vermont, but for a different reason. Neither New Hampshire nor Rhode Island has indicated a serious intent to site a facility in-state.[128] Without such an indication, Vermont cannot rely upon either states' ability to dispose of their own waste, and Vermont may be required to accept out-of-state waste. Therefore, neither state is compatible with Vermont.

The District of Columbia and Puerto Rico also have not indicated an intent to site a facility within their borders.[129] In light of the nominal volume of low-level radioactive waste generated in those areas,[130] however, both are compatible with Vermont.[131] It is unclear, though, whether Vermont could entice either region to join a compact. In the past, these areas have gained access to disposal facilities by contract, and it is reasonable to assume that the contract option will remain a viable solution to the disposal problem for areas that generate such nominal amounts of waste.[132]

The final non-aligned state, and the best potential compact partner for Vermont, is Maine. Maine's volume of low-level radioactive waste generation is comparable to Vermont's.[133] Furthermore, Maine is well along in the facility siting process. It has established a Low-Level Radioactive Waste Authority and is conducting site characterization and selection procedures with the goal of having a licensed, operational facility by 1995.[134] Maine's moderate volume of generated waste and clear progress in siting a disposal facility make it Vermont's most compatible partner. The two states are similarly positioned and intentioned. Each could gain the collective security of a compact by fashioning an agreement which allows for the sharing of disposal responsibility. Vermont, under the authority of Act 296, should pursue this opportunity with vigor.

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128. EDISON REPORT, *supra* note 124, at 5-3, 5-4.

129. NRC Status Memo, *supra* note 122, at 52.

130. *See supra* note 124.

131. Vermont should be willing to accept minor amounts of low-level radioactive waste in exchange for the security of a compact.

132. For instance, the District of Columbia retains access by contract to disposal facilities until 1993. EDISON REPORT, *supra* note 124, at 5-2.

133. *See supra* note 124.

134. NRC Status Memo, *supra* note 122, at 47-49.

2. Pre-Allocation of Capacity and Market Participation

A second means by which Vermont could exclude out-of-state waste is to allocate all of the disposal capacity to in-state generators in advance of opening the facility, and, if challenged in court, to assert the market participant exception to the Dormant Commerce Clause. Generally, the Dormant Commerce Clause prohibits states from unduly burdening the flow of interstate commerce and from isolating themselves economically.[135] When a state acts as a market participant, however, and not as a regulating body, the proscriptions of the Dormant Commerce Clause are inapplicable.[136] Pursuant to this exception, a Vermont disposal facility could choose to deal solely with in-state generators. Act 296 expressly acknowledges that the state shall remain the proprietor and operator of the disposal facility.[137] Further, the Act empowers the Authority to solicit offers to purchase disposal capacity.[138] Acting under this statutory authorization and as the operator of the facility, the Authority might allocate disposal capacity to Vermont generators and avail itself of the market participant exception. Reliance upon this approach is not without complication. The limits to the market participant exception are not well defined and its application to the present situation is uncertain. The remainder of this note evaluates the market participant exception of the Commerce Clause in light of the present situation.

Traditionally, the Commerce Clause has been interpreted to limit state interference with interstate commerce even when Congress has not preempted such interference.[139] Where a state regula-

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135. *See generally* LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW §§ 6-1 to 6-14 (2d ed. 1988). The Commerce Clause states only that Congress is empowered "to regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes . . . ." U.S. CONST. art. I, § 8, cl. 3. The Commerce Clause makes no express mention of any limitation on state power absent congressional action. Nevertheless, such limitations have been implied under the "Dormant" Commerce Clause. *See* LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW § 6-2 (2d ed. 1988).

136. TRIBE, *supra* note 135, § 6-11.

137. VT. STAT. ANN. tit. 10, § 7012(c) (Supp. 1991).

138. *Id.* § 7015(a).

139. It could be argued that Congress, through LLRWPA and its Amendments, has preempted individual state exclusionary action. It also could be argued that Congress, through LLRWPA and its Amendments, specifically authorized such state action. *See* Deborah M. Mostaghel, Comment, *Who Regulates the Disposal of Low-Level Radioactive Waste Under the Low-Level Radioactive Waste Policy Act?*, 9 J. ENERGY L. & POL'Y 73, 90 (1988). Under either interpretation, there is no need to reach the Dormant Commerce Clause issues. For purposes of this note, it is assumed that Congress neither preempted nor

tion pursues a legitimate local interest and affects interstate commerce in only an incidental manner, the United States Supreme Court has adopted a flexible balancing approach to determine the constitutionality of the state action.[140] Where state regulation is simple economic protectionism, however, the regulation is virtually invalid per se.[141] In *City of Philadelphia v. New Jersey*, the Court held that a New Jersey statute prohibiting the importation of solid and liquid waste collected outside New Jersey violated the Dormant Commerce Clause.[142] Several aspects of the decision in *Philadelphia* have a direct bearing on the present situation.

First, the Court in *Philadelphia* unambiguously stated that waste is "commerce" within the meaning of the Commerce Clause: "All objects of interstate trade merit Commerce Clause protection; none is excluded by definition at the outset. . . . Hence, we reject the . . . suggestion that the banning of 'valueless' out-of-state wastes . . . implicates no constitutional protection."[143] Low-level radioactive waste should logically be afforded similar Commerce Clause protection.[144]

Second, a state regulation need not have a protectionist purpose; it is the protectionist effect itself that has constitutional import. The Court in *Philadelphia* stated, "Whatever New Jersey's ultimate purpose, it may not be accomplished by discriminating against articles of commerce coming from outside the State unless there is some reason, apart from their origin, to treat them differently."[145] Therefore, any state regulation that discriminated against low-level radioactive waste generated outside its borders would be suspect, regardless of its purpose.

Third, the Court in *Philadelphia* rejected the argument that the New Jersey statute was a health-protective measure deserving

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authorized such action. The discussion of the Commerce Clause issues is not intended to reflect upon the validity of either of the above mentioned arguments. Should the matter ever be litigated, the author would expect both issues to be raised in earnest.

140. Pike v. Bruce Church, Inc., 397 U.S. 137, 142 (1970).

141. City of Philadelphia v. New Jersey, 437 U.S. 617, 624 (1978).

142. *Id.* at 622.

143. *Id.*

144. The United States Court of Appeals for the Ninth Circuit so held in *Washington State Building and Construction Trades Council v. Spellman*, 684 F.2d 627, 630 (9th Cir. 1982). The court invalidated a Washington statute which prohibited the transportation and storage within the state of radioactive waste produced outside the state. *Id.*

145. City of Philadelphia v. New Jersey, 437 U.S. 617, 626-27 (1978).

special constitutional treatment as a quarantine law.[146] In previous cases, the Court upheld quarantine laws "even though they appear[ed] to single out interstate commerce for special treatment."[147] The New Jersey statute, however, was not a quarantine law because there was "no claim here that the very movement of waste into or through New Jersey endangers health, or that waste must be disposed of as soon and as close to its point of generation as possible."[148] Although the movement of low-level radioactive waste arguably endangers health, the court in *Washington State Building and Construction Trades Council v. Spellman* refused to treat such waste differently from the solid and liquid wastes involved in *Philadelphia*.[149] Therefore, at least one federal appeals court has found that restricting the importation of low-level radioactive waste does not invoke the special constitutional analysis applied to necessary health-protective measures.

The traditional Dormant Commerce Clause doctrine, as highlighted in *Philadelphia* and *Spellman*, precludes Vermont from regulating low-level radioactive waste disposal in a manner that discriminates against waste generated out-of-state. The Court, however, has not addressed the specific issue of whether a state, acting as a proprietor, could accomplish the same objective. In *Philadelphia*, the Court expressly reserved that point: "We express no opinion about New Jersey's power, consistent with the Commerce Clause, to restrict to state residents access to state-owned resources . . . or . . . to spend state funds solely on behalf of state residents and businesses . . . ."[150] The New Jersey exclusionary action did not involve market participation, and the Court refused to speculate on the applicability of the exception to waste disposal cases.

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146. *Id.* at 628-29.

147. *Id.* at 628.

148. *Id.* at 629. In dissent, Justice Rehnquist disagreed with the Court's narrow interpretation of the quarantine exception to the Dormant Commerce Clause:

> I do not see why a State may ban the importation of items whose movement risks contagion, but cannot ban the importation of items which, although they may be transported into the State without undue hazard, will then simply pile up in an ever increasing danger to the public's health and safety. The Commerce Clause was not drawn with a view to having the validity of state laws turn on such pointless distinctions.

Id. at 632-33 (Rehnquist, J., dissenting).

149. Washington State Bldg. and Constr. Trades Council v. Spellman, 684 F.2d 627, 631 (9th Cir. 1982).

150. City of Philadelphia v. New Jersey, 437 U.S. 617, 627 n.6 (1978).

The market participant exception[151] was first enunciated in *Hughes v. Alexandria Scrap Corp.*, in which the Court upheld a Maryland statute granting a preference to the purchase of crushed automobile hulks from in-state scrap processors.[152] The Court held that "[n]othing in the purposes animating the Commerce Clause prohibits a State, in the absence of congressional action, from participating in the market and exercising the right to favor its own citizens over others."[153] In *Reeves, Inc. v. Stake*, the Court reaffirmed the market participant exception: "The basic distinction drawn in *Alexandria Scrap* between States as market participants and States as market regulators makes good sense and sound law."[154] The Court reasoned that fairness requires that states, when acting as private economic actors, deserve the same freedom from federal constraint as that enjoyed by private individuals and businesses.[155]

The Court in *Reeves*, however, suggested that the market participant exception might not apply to cases involving natural resources.[156] The Court recognized that state hoarding of natural resources raises valid Commerce Clause objections. But, by finding that cement was not a natural resource, but rather an end product,[157] the Court did not answer the question definitively. The

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151. For a comprehensive examination of market participant doctrine, see Dan T. Coenen, *Untangling the Market-Participant Exemption to the Dormant Commerce Clause*, 88 MICH. L. REV. 395 (1989).

152. Hughes v. Alexandria Scrap Corp., 426 U.S. 794 (1976).

153. *Id.* at 810.

154. Reeves, Inc. v. Stake, 447 U.S. 429, 436 (1980). The Court in *Reeves* upheld a South Dakota resident-preference program for the sale of cement from a state-owned facility. *Id.* at 446-47.

155. *Id.* at 439. In dissent, however, Justice Powell thought it a "pretense to equate the State with a private economic actor." A state, he argued, "frequently will respond to market conditions on the basis of political rather than economic concerns." *Id.* at 450 (Powell, J., dissenting).

156. *See* Coenen, *supra* note 151, at 453. The plurality decision in *South-Central Timber Development, Inc. v. Wunnicke*, 467 U.S. 82 (1984), imposed another limit on the market participant exception:

> The limit of the market-participant doctrine must be that it allows a State to impose burdens on commerce within the market in which it is a participant, but allows it to go no further. The State may not impose conditions, whether by statute, regulation, or contract, that have a substantial regulatory effect outside of that particular market.

Id. at 97.

157. Reeves, Inc. v. Stake, 447 U.S. 429, 443-44 (1980). "Cement is not a natural resource, like coal, timber, wild game, or minerals. . . . It is the end product of a complex process whereby a costly physical plant and human labor act on raw materials." *Id.* The Court provided further examples of natural resources, based upon previous Commerce

Court stated, "Whatever limits might exist on a State's ability to invoke the [market participant exception] to hoard resources which by happenstance are found there, those limits do not apply here."[158]

Although the Supreme Court has yet to decide a case involving the exclusion of out-of-state low-level radioactive waste from a state-owned disposal facility, at least five other courts have decided closely analogous cases.[159] Each of these cases involved either the exclusion of out-of-state solid waste from a state-owned landfill or the preferential treatment of residents in the use of such a landfill. In each case, the court upheld the state action based upon the market participant exception. In *Swin Resource Systems, Inc. v. Lycoming County*, for instance, the United States Court of Appeals for the Third Circuit upheld the county's landfill fee system, which charged a lower rate for residents.[160] The court found that Lycoming County was a market participant in the market for "disposal services."[161] The court noted that disposal services require the expenditure of capital and labor to improve the natural resource, land. Consequently, the court found that the Lycoming landfill, like the cement plant in *Reeves*, was not a product of happenstance, but rather of hard work.[162] By defining the market in that manner, the court avoided resolving the natural resource issue: "Whether there is a natural resource exception to the market participation doctrine is a difficult question, but, fortunately, one which we need not answer . . . ."[163]

Similarly, a federal district court in *Lefrancois v. Rhode Island* noted the essential distinction between the market for landfill services, which are not natural resources, and the market for landfill sites, which, presumably, are natural resources. Exclusion from the market for landfill services deprives parties of their ability to

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Clause cases: minnows, natural gas and landfill sites. *Id.* at 443.

158. *Id.* at 444.

159. Swin Resource Sys., Inc. v. Lycoming Cty., 883 F.2d 245 (3d Cir. 1989); Lefrancois v. Rhode Island, 669 F. Supp. 1204 (D.R.I. 1987); Evergreen Waste Sys., Inc. v. Metropolitan Serv. Dist., 643 F. Supp. 127 (D. Or. 1986), *aff'd on other grounds*, 820 F.2d 1482 (9th Cir. 1987); Shayne Bros., Inc. v. District of Columbia, 592 F. Supp. 1128 (D.D.C. 1984); Charles Cty. v. Stevens, 473 A.2d 12 (1984). *See also* Coenen, *supra* note 151, at 460-61 (discussing these five cases).

160. Swin Resource Sys., Inc. v. Lycoming Cty., 883 F.2d 245, 249 (3d Cir. 1989).

161. *Id.* at 250.

162. *Id.*

163. *Id.* at 252.

use one particular disposal site, whereas exclusion from the market for landfill sites deprives parties of their ability to develop new sites within the state.[164] Because *Lefrancois* involved only a deprivation of the plaintiff's access to one particular site in Rhode Island, the court found the Dormant Commerce Clause inapplicable.[165]

In light of these cases, Vermont must satisfy two basic criteria to qualify for the market participant exception in the present circumstance. First, Vermont must participate in the market for low-level radioactive waste disposal services as the owner and operator of the disposal facility and must confine its regulatory impact to that market. Second, Vermont must not preclude the development of private competition in the market for low-level radioactive waste disposal services. The first criterion is satisfied easily. Vermont would own, operate and maintain the low-level radioactive waste facility constructed pursuant to Act 296.[166] Further, there is no reason to expect that Vermont will regulate beyond the confines of the disposal services market.[167]

The second criterion, however, may be more problematic. Although there is no language in the Act expressly forbidding the private development of low-level radioactive waste disposal facilities, it is clear that the Act, viewed from the context of its passage, did not anticipate the issue.[168] Nevertheless, even if private development of low-level radioactive waste disposal facilities (in excess of a state owned and operated facility) is not precluded by the Act itself,[169] such development surely would meet resistance under Vermont's land use and development law.[170] After a state owned

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164. Lefrancois v. Rhode Island, 669 F. Supp. 1204, 1211 (D.R.I. 1987).

165. *Id.* at 1211-12.

166. VT. STAT. ANN. tit. 10, § 7012(c) (Supp. 1991). *See also supra* Part II.C.

167. Unlike in *South-Central Timber Development, Inc. v. Wunnicke*, 467 U.S. 82 (1984), there is no downstream market here. In *Wunnicke*, the state, as the seller of timber, attempted to influence the behavior of its customers. Here, the state is the final consumer of the "product" and has no downstream participants to influence.

168. Indeed, if private parties were participants in the market for low-level radioactive waste disposal services in Vermont, there would have been little need for the Act. The Act was a direct response to a lack of disposal options.

169. The issue of whether privately developed low-level radioactive waste facilities are covered by the Act is not fully addressed here. Intuitively, it would seem that such development would fall within the scope of the Act; yet, there is no express language indicating that private facilities are covered. Moreover, the Act was designed for the opposite reason—to fill a void in the low-level radioactive waste disposal services market, not to limit entry to the market.

170. VT. STAT. ANN. tit. 10, §§ 6001-6092 (1984 & Supp. 1991). The Act amended the

and operated disposal facility is constructed, subsequent entrants into the market for disposal services might meet stiffer development resistance than originally faced by the state facility. Although much of this resistance might be political in nature, some undoubtedly would have a sound basis in law.[171]

It might be argued that stiffer resistance to the development of private facilities constitutes exclusion from the market sufficient to remove the case from the market participant exception.[172] What constitutes exclusion from a market, however, is not a settled point of law.[173] The distinction between the markets for landfill services and for landfill sites presented in *Swin Resource* and *Lefrancois* indicates a favorable judicial response to state legislative attempts to enter markets to favor local citizens.[174] The Supreme Court, however, has not heard or decided the issue. As a result, the second criterion that Vermont must meet is subject to uncertainty.

Moreover, if Vermont fails to qualify for the market participant exception, any attempt to exclude out-of-state waste would

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land use and development law to ensure that any low-level radioactive waste disposal facility proposed for construction under the Act would be subject to the land use and development permit requirements. *Id.* § 6001b. But, if the private development of low-level radioactive waste disposal facilities is not covered by the Act, such development presumably would not automatically be subject to these permit requirements. *See supra* note 169. Absent the automatic coverage instituted by the Act, permits are required for "developments," as defined in Vermont's land use development law. VT. STAT. ANN. tit. 10, § 6001(3) (1984 & Supp. 1991). In addition, the development of a low-level radioactive waste disposal facility would be subject to federal regulation.

171. For instance, a land use and development permit "will not be granted if it is demonstrated . . . that a development . . . will destroy or significantly imperil necessary wildlife habitat . . ., and . . . the economic, social . . . or other benefit to the public from the development . . . will not outweigh the . . . loss to the public from the destruction or imperilment of the habitat . . . ." VT. STAT. ANN. tit. 10, § 6086(a)(8)(A) (1984). Clearly, the fact that a state facility is in existence would affect the analysis of benefit to the public from a second, private facility.

172. In *Reeves*, the Court noted that the state did not "restrict[] the ability of private firms or sister States to set up plants within its borders." Reeves, Inc. v. Stake, 447 U.S. 429, 444 (1980). If it were found that access to the market for low-level radioactive waste disposal services was limited, the situation would be distinguishable from *Reeves*.

173. The mere absence of competition, however, would not appear to be a sufficient indication of limited access to the market. The landfill cases cited, *supra* note 159, all involved the disfavor of waste from outside a region, where no private competition existed within the region to accommodate the waste.

174. For instance, in *Swin Resource*, the court avoided the question of whether there was a natural resource exception to the market participant doctrine because "land, the natural resource at issue . . ., cannot be used for a landfill without the expenditure of at least some money to prepare it for that purpose." Swin Resource Sys., Inc. v. Lycoming Cty., 883 F.2d 245, 252 (3d Cir. 1989). The expenditure of "*some* money" is certainly not a difficult threshold to attain.

be virtually invalid per se. In light of the legal uncertainty surrounding the scope of the market participant exception and the clear proscriptions of traditional Dormant Commerce Clause doctrine, Vermont would be wise not to rely upon market participation as its sole line of defense for excluding out-of-state waste. Offense, in the form of a regional compact, is a better defense.

CONCLUSION

Vermont's Act 296 is designed to bring Vermont into compliance with LLRWPA and its Amendments, and to provide for the safe disposal of all future low-level radioactive waste generated in the state. By establishing a framework and a timetable for siting and constructing a disposal facility in the state, and by recognizing the need to exclude out-of-state waste from the facility, the legislature has taken two large steps toward the realization of its goals. The Act, however, is not without its problems. The procedures for separating long-lived wastes from short-lived wastes fail to properly account for the costs associated with separation and fail to ensure the realization of any true benefit from separation. Further, the means for excluding out-of-state waste from the Vermont facility are uncertain from practical and legal standpoints.

Resolution of these problems requires legislative action and political persistence. Vermont should amend the waste separation procedures in Act 296 to ensure that the benefits to be derived from waste separation are properly taken into account before the costs of separation are borne. At the same time, Vermont should continue negotiations with compatible partners and seek to join a disposal compact to gain legal authority to exclude out-of-state waste from the Vermont disposal facility. Such legislative and political action will help Vermont achieve its goal of safe and efficient disposal of its low-level radioactive waste.

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