Report of the

South Carolina Nuclear Waste Task Force

Volume 1: Report of the Task Force

December 15, 1999

Prepared pursuant to
Governor's Executive Order 99-26
June 10, 1999

SOUTH CAROLINA NUCLEAR WASTE TASK FORCE

December 15, 1999

The Honorable Jim Hodges
Governor of South Carolina
Columbia, South Carolina

Dear Governor Hodges:

On behalf of the South Carolina Nuclear Waste Task Force, it is my pleasure to submit to you and to the General Assembly our recommendations and report on state policy options for low-level radioactive waste disposal.

The Task Force recommends that you immediately enter into negotiations with the Atlantic Low-Level Radioactive Waste Compact, which currently consists of Connecticut and New Jersey, to define the terms and conditions for South Carolina's membership in the Compact. We recommend that such an agreement achieve certain objectives critical to the well being of the State and its citizens. When you conclude that the terms and conditions for South Carolina's membership in the Atlantic Compact are favorable, you should pursue all means available to effectuate the state's membership as early as possible. The entire text of our recommendation is attached.

The Task Force's report comes about as the result of six months of diligent research and discussion among Task Force members, their colleagues, interest groups and the general public. Critical to our recommendation is the conclusion that the framework of the Atlantic Compact, which was approved by Congress in 1987, will give South Carolina the authority necessary to exercise control in matters related to disposal economics, environmental protection, and long-term planning.

None of the policy options we examined was flawless and totally without risk. In the end, our recommendation is a pragmatic one. The Task Force believes that if the various state objectives are taken into account during your negotiations with the Atlantic Compact representatives, a compact arrangement can be put into place that will provide significant benefits to the State of South Carolina for years to come.

It has been my honor and pleasure to serve on the South Carolina Nuclear Waste Task Force and to contribute to the resolution of this important issue.

Respectfully submitted,

signed on original

Butler Derrick
Chairman
South Carolina Nuclear Waste Task Force

Copies:

The Honorable Robert L. Peeler
President of the South Carolina Senate

The Honorable David H. Wilkins
Speaker of the South Carolina House of Representatives

Task Force Recommendations to the Governor and General Assembly

At its meeting on December 9, 1999, the South Carolina Nuclear Waste Task Force unanimously adopted the following resolution:

WHEREAS, South Carolina for many years has shouldered responsibility for burial of the nation's low-level radioactive waste; and

WHEREAS, South Carolina's own nuclear waste generators are likely to have waste disposal needs far into the future; and

WHEREAS, if waste volumes received at the Barnwell facility continue at current levels, South Carolina's nuclear power reactors will have no place to dispose of their waste when they decommission in thirty years; and

WHEREAS, joining a small, interstate compact that has already been approved by Congress to exclude waste from outside the region can provide many of the same benefits as operating the disposal facility for in-state generators only, including: discontinuing South Carolina's role as the nation's nuclear dumping ground; improving regulatory oversight by reducing the number of generators using the site; retaining full discretion to regulate the disposal facility in the safest manner possible; reducing the total amount of waste accepted, both in volume and radioactivity; ensuring disposal capacity for the state's needs; and providing the flexibility to take advantage of any new disposal options that may come about in the future,

THEREFORE BE IT RESOLVED THAT, the South Carolina Nuclear Waste Task Force recommends:

The Governor should immediately enter into negotiations with the Atlantic Compact, which currently consists of Connecticut and New Jersey, to define the terms and conditions for South Carolina's membership in the Compact. Such an agreement should:

- Preserve the full authority of South Carolina to regulate low-level radioactive waste disposal in any appropriate manner, including the imposition of reasonable requirements to ensure compliance with waste acceptance criteria.

- Preserve the authority of South Carolina to prohibit near-surface disposal should safer long-term options such as entombment, monitored storage, or assured isolation become technologically, economically and legally viable.

- Give the state a legal means to accept waste from only three states, instead of continuing to open the disposal site to every state in the nation.

- Have a strong potential for reducing the overall volume and total radioactivity of waste that might otherwise be accepted for disposal at the Barnwell facility.

- Ensure that the aggregate amount of waste disposed of by waste generators in Connecticut and New Jersey is limited to 800,000 cubic feet, in order to reserve the remaining capacity for decommissioning waste and other waste generated by the three investor-owned utilities serving customers in South Carolina.

- Seek financial incentives from the other Compact states as compensation for the exclusive use of the South Carolina disposal facility.

- Allow the state to gradually reduce its reliance on money for nuclear waste burial to fund critical state needs.

- Ensure that South Carolina maintains veto authority over decisions involving the entry of new member states into the Compact and disposal of waste from outside the region at the Barnwell facility.

- Through the application of cost of service regulation, rate differentials, or other means, ensure that disposal rates passed along to South Carolina consumers are lower than the overall rates paid by South Carolinians today.

- Allow waste generators within the compact region to export waste to facilities outside the region for purposes of waste processing or disposal.

- Ensure that operation of the disposal site under a compact arrangement provides significant economic benefits to the Barnwell community.

When the Governor concludes that the terms and conditions for South Carolina's membership are favorable, he should pursue all means available to effectuate the state's membership in the Atlantic Low-Level Radioactive Waste Compact as early as possible.

Report of the

SOUTH CAROLINA NUCLEAR WASTE TASK FORCE

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Introduction

In an Executive Order dated June 10, 1999, Governor Jim Hodges established the South Carolina Nuclear Waste Task Force and charged it with the following responsibilities:[1]

- To provide the people of South Carolina and the South Carolina General Assembly with a road map to discontinuance of South Carolina's role as the nation's nuclear dumping ground; and

- To recommend actions to ensure that future needs of South Carolina low-level radioactive waste generators are met.

The state-owned low-level radioactive waste disposal site in Barnwell County has accepted far more commercial nuclear waste than any other facility in the nation. Originally proposed as a modest 10 to 20 acre landfill, the facility now has over 27 million cubic feet of waste buried under 100 acres.[2] Disposal capacity remains for only 3.2 million cubic feet of waste.[3]

The waste taken at the disposal facility today is far more radioactive than ever before. According to shipping manifests, each cubic foot of waste accepted at the Barnwell facility in 1998 was, on average, seven times as radioactive as waste accepted just 10 years earlier.[4] With a new facility in Utah licensed to accept large volumes of the least radioactive waste,[5] the Barnwell facility will, from now on, play host only to waste with the highest concentrations of radioactivity -- including nuclear power reactor resins, contaminated hardware, and concentrated residues from the processing of dry active waste. As the remaining disposal capacity diminishes, waste shippers find more creative ways of concentrating the same radioactive constituents into smaller and smaller volumes. Today, hundreds of organizations, large and small, from across the nation ship radioactive waste to the state's disposal facility. Ninety-five percent of the waste accepted at the South Carolina facility comes from outside the state.[6] Waste generators need only certify that their waste packages meet the site's waste acceptance criteria.

Planning for the management and disposal of nuclear waste remains important to South Carolina's economy. Only two other states generate a higher per capita share of their electricity from nuclear power plants than South Carolina. Each of South Carolina's seven nuclear power stations will undergo decommissioning during the first half of the next century. These giant projects will require significant amounts of disposal capacity. Without planning for the future, the state-owned facility will be full and no longer available when the State of South Carolina might need it most.

The South Carolina Nuclear Waste Task Force was appointed by Governor Hodges to make recommendations on ways to address the objectives noted above. The Task Force is Chaired by former U.S. Congressman Butler Derrick of Charleston. The other members are: Senator John Courson of Columbia; Dr. Steven Glassman of Columbia; Representative Lonnie Hosey of Barnwell; Senator Bradley Hutto of Orangeburg; Mr. Ben Johnson of Rock Hill; Ms. Harriet Keyserling of Beaufort; Senator Phil Leventis of Sumter; Representative Joel Lourie of Columbia; Representative Joseph Neal of Hopkins; Senator Thomas Moore of Clearwater; Representative Lynn Seithel of Charleston; Mr. Belton Zeigler of Columbia.

This volume of the report, Volume 1, provides the findings and recommendations of the South Carolina Nuclear Waste Task Force. Volume 2, which is separately bound, provides records from the proceedings of the Task Force, along with supplementary materials.

Background and History of South Carolina Policy on Low-Level Radioactive Waste Disposal

The backdrop for nuclear waste disposal in South Carolina

In the late 1950's, the Atomic Energy Commission (AEC) called for the establishment of a network of "regional" land disposal facilities for radioactive waste. The new policy followed from the "Atoms for Peace" program, an initiative to encourage the peaceful applications of nuclear technology by the private sector. Cheap disposal of radioactive waste byproducts was a key ingredient in the plan to expand nuclear technologies. In 1960, after the AEC was assured that disposal fees would be reasonable, it gave the green light to states and developers to build the network of new regional disposal sites.[7]

The AEC envisioned that these new disposal sites would either be operated by the federal or state governments, or by private contractors under strict government controls. In all cases, however, the AEC specified that the new facilities be located on land owned by federal or state governments. This would be necessary to ensure adequate institutional controls for the long periods of time it would take for the buried waste to decay to safe levels.[8]

The new AEC policy launched an era of joint state/private sector responsibility for radioactive waste disposal. With the blessing of state development agencies, private companies built six new disposal facilities in different regions of the nation. They were located, in order of development, in Nevada, Kentucky, New York, Washington, Illinois, and South Carolina.[9]

Many states viewed radioactive waste disposal facilities as magnets to attract exciting high-tech industries. Four of the six disposal sites were located adjacent to existing or planned large-scale nuclear facilities. Ultimately, private companies selected site locations and underwrote the costs of development. But then, as now, state governments had the final say in whether or not the facilities were ever built. Before any private initiative could succeed, it had to persuade the state to take title to the land and to assume long-term responsibility once the burial site was closed and the private developer was out of the picture.

South Carolina was among states competing for new nuclear industries. In 1967, the General Assembly enacted legislation (Act 223) creating the State Development Board. Among other things, the Board was responsible for the promotion and development of atomic energy resources within the state. The same law also

authorized the Governor and the Department of Health and Environmental Control to enter into an agreement with the U.S. Nuclear Regulatory Commission to assume responsibilities for the regulation of certain radioactive materials within the state. That process culminated in "agreement state" status for South Carolina in 1969.

A proposal for South Carolina

It was within this context that a company called Intercontinental Nuclear, Inc. proposed to the State of South Carolina that it build a radioactive waste burial facility within the state. According to one published report, two entrepreneurs were principally responsible for developing five of the six state-owned, commercially-operated radioactive waste landfills in the U.S. in the decades following the AEC policy.[10] One of these entrepreneurs, Fred Bierle, was the principal behind Intercontinental's proposal to South Carolina. As an official with California Nuclear, Inc., Bierle had previously led the development of new radioactive waste disposal facilities in Richland, Washington and Sheffield, Illinois.

Intercontinental's proposal, dated November 1, 1968, suggested that 10 to 20 acres should be sufficient for the facility.[11] The site now spans 235 acres (see "The lease agreement," p.17). At the time of the proposal, disposal facilities were up and running in all parts of the nation except the Southeast. Intercontinental told the state that,

> "A radioactive burial site facility acts as a stimulant to nuclear industries which produce radioactive waste in amounts large enough that these wastes become an appreciable item in their operations. Other smaller nuclear industries may set up operations near the site... As a result a waste burial site tends to become the center of a group of nuclear industries."[12]

For the stimulant to work, disposal prices had to be cheap. Intercontinental provided the state the necessary assurances. "We believe the South Carolina Waste Burial Facility will return a reasonable profit at the suggested rates and, in addition, will in fact result in a reduction in waste disposal charges to the nuclear industry."[13] The schedule of rates and charges for waste disposal was incorporated into the original 1971 agreement between the State of South Carolina and Intercontinental. It could only be changed in accordance with the cost of living index.[14] (See "The lease agreement," p.18.)

By the time a deal was struck, Intercontinental Nuclear, Inc. became Chem-Nuclear Services, Inc. On April 21, 1971, the Budget and Control Board leased back to

Chem-Nuclear 17.2 acres of land near the community of Snelling that the company had purchased from W.W. Moore, and deeded over to the state earlier the same day.[15]

The waste burden[16]

During the 1970s, the radioactive waste burial sites in Illinois, Kentucky, and New York closed. They remain expensive remediation projects today.[17] This left the Barnwell facility in South Carolina as the only disposal facility in the industrial East. The other remaining disposal sites were at a state-leased tract on the Department of Energy's Hanford reservation in Washington State, and on state-owned land in Beatty, Nevada.

With a lengthy list of new power reactors on order, radioactive waste projections mushroomed by the end of the decade. A February 1978 report by the Department of Energy (DOE) Task Force for Review of Nuclear Waste Management projected that between 4 million and 21 million cubic feet of commercial low-level radioactive waste would be generated annually by the year 2000.[18] An August, 1980, report by the National Governors' Association's Task Force on Low-Level Radioactive Waste Disposal projected that annual waste volumes would triple to over 10 million cubic feet between 1980 and 1990.[19] The Southern States' Energy Board reported in July 1981,

> "There are widely disparate projections of future volume contained in published reports and they highlight the inability to accurately predict true volume generation figures. For example, North Carolina expects waste generated in the state to increase at a rate of 10 to 15 percent per year. But a Texas report estimates a growth rate for the rest of the nation at 4.5 to 12 percent per year. Even the 4.5 percent rate of growth, when compounded over 20 years, would be more than double the current annual rate."[20]

Another report, issued to Congress by the DOE Office of Nuclear Energy in July 1981, projected that 7.8 million cubic feet of low-level radioactive waste would be generated by the year 2000.[21]

By early 1979, the South Carolina disposal site was receiving waste at an annual rate of nearly 2.4 million cubic feet, well in excess of what state officials considered a prudent operating limit. On March 28, 1979, the nation was stunned by the accident at Pennsylvania's Three Mile Island (TMI) nuclear power plant. Within days, published reports indicated that waste from the failed reactor also would be shipped to South Carolina for disposal. Immediately, Governor Richard Riley announced a ban on TMI waste, to be enforced by the Department of Health and Environmental Control. In December 1979 the governor issued an executive order that directed the

disposal facility to implement a program to reduce the amount of waste received at the disposal site to 1.2 million cubic feet per year over a three-year period.[22]

Adding insult to injury, the three states with operating disposal sites perceived a lack of interest on the part of other states and the federal government in enforcing transportation and packaging requirements. Following the discovery of transportation and shipping violations for waste arriving at the Richland, Washington, facility, Governor Dixy Lee Ray ordered the disposal facility closed while the three sited states developed a coordinated plan to ensure regulatory compliance. Between 1976 and 1979, the Beatty, Nevada, site was closed several times in response to improper handling and packaging of waste shipments.[23] For a short period of time, the South Carolina disposal facility was the only disposal facility in the nation accepting low-level radioactive waste.[24]

On July 1, 1980, South Carolina enacted a law that imposed strict new requirements for persons who shipped waste into the state for disposal. For the first time, persons transporting waste were required to secure a transport permit, provide financial assurance against liability, and provide three days' notice for each shipment. The law also authorized the state to impose civil penalties and to suspend permits for noncompliance with federal and state regulations.[25]

The collapse of the orderly regional distribution of disposal sites introduced the concept of "equity" into the political lexicon surrounding radioactive waste disposal. As public attitudes changed and as regulatory problems came to light, the idea of a disposal facility as a magnet for industry was replaced by the notion of waste disposal as a burden to be shared.

Regional responsibility for LLRW disposal

It was now apparent that no new disposal sites would be developed in a reasonable timeframe without state leadership and direct involvement. South Carolina, Washington, and Nevada pressed Congress to restore the regional nature of the disposal sites through the formation of interstate compacts that could limit waste disposal to waste generated within the region. In short, the states hoped to change from de facto to de jure the regional approach to disposal that had come about in the 1960's and 1970's. Through the escalating rhetoric, South Carolina's objective in pressing for compact regions remained modest: to restore the regional nature of the Barnwell disposal facility that had been licensed to operate in the state 10 years earlier.

A flurry of activity in 1980 ended in enactment of the Low-Level Radioactive Waste Policy Act, which was supported by the National Governors' Association[26] and the National Conference of State Legislatures.[27]

Under pressure from elected officials in South Carolina, Congress enacted legislation that addressed low-level radioactive waste in the waning days of the 1980 session.[28] Though there were several competing bills, the Low-Level Radioactive Waste Policy Act that emerged was short and direct. It included a policy declaration that,

> "each State is responsible for providing for the availability of capacity either within or outside the State for the disposal of low-level radioactive waste generated within its borders..." (except for certain wastes generated as a result of defense activities).

The law also encouraged states to form regional compacts. It did this by promising that, after 1986, any such compact approved by Congress would be able to limit use of its disposal facility to waste generated within the region.

Following enactment of the 1980 law, South Carolina advocated the formation of a Southeast compact region that corresponded to the size and configuration of the region that had been envisioned when the state first supported the proposed Barnwell facility ten years earlier. By 1982, seven of the eight states eligible to join the Southeast Compact, including South Carolina, had enacted the compact legislation.[29]

The original Southeast Compact language that was enacted by South Carolina and the other states in 1982 spelled out a process for selecting another compact state to some day replace South Carolina as host state for the region's disposal facility. But the law did not contain any timetable for implementing such a process. Concerned that political inertia might prevent such a controversial process from ever being launched, the South Carolina General Assembly enacted a slightly revised version of the compact during the 1983 session. The new Compact law provided that, "in no event shall (the Barnwell facility) serve as a regional facility beyond December 31, 1992."[30] (1983 Act No. 91) The other seven states enacted the revised language soon thereafter, and the Southeast Compact, as amended, was submitted to Congress for approval before year's end.

The impasse over compact approval

The 1980 law had promised that compacts ratified by Congress could begin excluding waste from outside their respective borders beginning on January 1, 1986. But because it had taken so long to negotiate compact provisions acceptable to all the party states, it had become clear that there would not be time for the compacts to

establish new disposal facilities by 1986. Because of this, Congress declined to approve the Southeast Compact in the 1983 and 1984 legislative sessions. Nor did it appear that Congress had any intention of approving the Compact in the 1985 session.

With Congress's failure to ratify the proposed compacts, the stage was set in 1985 for a year of political brinksmanship that involved the governors of the three states with disposal sites: Richard Riley of South Carolina, Booth Gardner of Washington, and Richard Bryan of Nevada. Acting in concert, the governors threatened to shut down the sites completely by year's end if Congress did not grant consent to their proposed compacts. They dismissed concern about the 1986 exclusionary date, assuring Congress that the sited regions—once they were granted compact status—would negotiate in good faith with the non-sited regions to extend access to the operating facilities until new sites could be developed. Congress, however, was reluctant to entrust the sited regions with this kind of unrestricted bargaining power.

On April 20, 1985, following extensive discussions among state and compact officials, congressional staff, and nuclear utilities, the three sited regions delivered to the House Interior Committee the outlines of a proposed compromise.[31] The sited states would agree to extend access through 1992, in return for certain concessions. To retain access, the non-sited regions would have to meet "tough-but-doable" site development milestones, and would have to pay disposal surcharges over and above the regular fees. Each disposal site would be able to limit the amount of waste accepted each year, and each nuclear power reactor would be given a specific volume allocation that could not be exceeded during the 1986-1992 "interim access period."

With widespread endorsement for the compromise, and intense lobbying, the Omnibus Low-Level Radioactive Waste Compact Consent Act[32] and the companion Low-Level Radioactive Waste Policy Amendments Act of 1985[33] were passed by Congress on the final night of the congressional session. The Omnibus Act granted congressional consent to the Central, Central Midwest, Midwest, Northeast, Northwest, Rocky Mountain, and Southeast low-level radioactive waste compacts. The Amendments Act embodied the terms of the compromise between the sited and the non-sited regions.

Continuity and change in South Carolina policy

Carroll A. Campbell, Jr.'s election as Governor in November 1986 was greeted with speculation across the nation that South Carolina's low-level radioactive waste policies might soon change. In April 1987, a Connecticut official notified Governor Campbell's office that a Chem-Nuclear representative had just testified before a Connecticut joint legislative committee that was considering a bill to launch a program to build a nuclear waste disposal facility in that state. Chem-Nuclear

testified that Connecticut would not need to enact the legislation because South Carolina's new Governor was likely to reverse earlier policy and keep the Barnwell site available indefinitely.[34] In response to this and other similar reports, the Governor wrote:

> "In 1983, the South Carolina legislature enacted a law which prohibits the state-owned disposal facility in Barnwell County from being the region's disposal facility after 1992. This is not only a provision of South Carolina law, but is also a provision of the Southeast Compact, which was enacted into law in seven other states and ratified by the Congress of the United States. In 1986, South Carolina enacted another law prohibiting the site from accepting any waste from outside the state after 1992...
>
> "These laws enjoy wide support among citizens and state officials. I support these policies, see no significant movement away from them, and foresee no change to the laws upon which these policies are based. Any suggestion that South Carolina inevitably will amend its laws to allow continued operation of the disposal facility is speculation and should not be used as the basis for any state's plans to fulfill its disposal responsibilities."[35]

From the outset, South Carolina's success in freeing itself from responsibility for regional waste disposal was directly tied to the success of another state in the Southeast Compact region in establishing a new disposal facility to replace Barnwell. North Carolina had been designated by the Compact Commission in 1986 to succeed South Carolina as host state for the regional disposal facility.

As Governor Campbell's second term began in January 1991, it became clear that a new Southeastern disposal facility would not be ready by December 31, 1992, the date Barnwell was scheduled to close. Therefore, the Governor and the Department of Health and Environmental Control recommended that the Barnwell facility remain open for a limited period of time after the scheduled closure date. On June 4, 1992, the General Assembly enacted legislation extending the role of the Barnwell facility as the regional disposal site for the Southeast region through December 31, 1995, subject to several conditions. The law also imposed a fee of $160 per cubic foot for disposal of waste generated outside the Southeast region.[36]

While extending the role of the Barnwell site as the Southeast's regional disposal facility, the law also granted conditional access to non-regional generators through June 1994, after which out-of-compact waste would be banned. During this extended 18-month period (January 1993 through June 1994), states outside the Southeast compact region had to demonstrate progress in developing their own disposal sites in order to retain access to the Barnwell facility.

By 1995, with continued delays in the North Carolina project to build a new regional disposal site, South Carolina was once again faced with the prospect of closing the Barnwell facility at year's end without a replacement facility on the horizon. Frustrated by the delays in North Carolina that he attributed to the state's "irresponsibility," Governor David M. Beasley asked the Southeast Compact to sanction North Carolina.[37]

After the Southeast Compact Commission rejected his motion to sanction North Carolina, Governor Beasley proposed legislation to withdraw the state from the Southeast Compact and to make the Barnwell facility available to waste generators in all states except North Carolina.[38] In June 1995, the South Carolina General Assembly enacted the legislation. As part of the withdrawal legislation, South Carolina imposed a disposal surcharge of $235 per cubic foot, and banned waste generated in North Carolina from the Barnwell facility.

In promoting the new policy, the Governor estimated that the new tax would raise $140 million a year for the state until the site reached its capacity in 10 years.[39] For a variety of reasons, actual revenues from low-level radioactive waste disposal in South Carolina have fallen well short of that estimate. In fiscal years 1996, 1997, 1998 and 1999, respectively, the state received $72.7 million, $77.3 million, $58.9 million, and $53.8 million for disposal of nuclear waste. The state estimates that this fiscal year, it will receive $45 million. Members of the Task Force recognize that if changes in state policy entail reductions in revenue from disposal of nuclear waste, the Barnwell revenues previously earmarked for educational purposes must be replaced in the state budget.

The National Context of Low-Level Radioactive Waste Disposal Policy[40]

States move to develop new disposal sites

The Low-Level Radioactive Waste Policy Act of 1980 triggered a rush of activity on a national scale to form interstate compacts. Forty-three states currently comprise 10 interstate low-level radioactive waste compacts. Table 1 shows the current low-level radioactive waste compact affiliations. Within the newly formed compacts, states wrestled with the contentious issue of naming host states from among their members, and establishing programs intended to lead to the development of new disposal facilities.

Table 1: Low-Level Radioactive Waste Compact Affiliations

Appalachian Delaware Maryland Pennsylvania West Virginia	***Central*** Arkansas Kansas Louisiana Nebraska* Oklahoma	***Central Midwest*** Illinois Kentucky	***Midwest*** Iowa Indiana Minnesota Missouri Ohio Wisconsin	***Northeast*** Connecticut New Jersey
Northwestern Alaska Hawaii Idaho Montana Oregon Utah Washington Wyoming	***Rocky Mountain*** Colorado Nevada New Mexico	***Southeast*** Alabama Florida Georgia Mississippi Tennessee Virginia	***Southwestern*** Arizona California North Dakota South Dakota	***Texas Compact*** Maine Texas Vermont

**Nebraska has enacted legislation providing notice of its withdrawal from the Central Compact.*

In response to the federal law, the states adopted a range of approaches for developing new disposal facilities. California essentially granted market rights to a private disposal facility developer/operator and let the company use its own resources and methods to develop the regional disposal site. The opposite approach was taken by Texas, which established a state waste authority that would build and operate the site using state employees. Most other states took a middle ground, assigning development responsibilities to state agencies but expecting the agencies to delegate

broad areas of responsibility to private sector companies. States and compacts also devised a range of mechanisms to assess waste generators to cover the costs of site development.

By early 1992, states were under substantial pressure to succeed in developing new disposal sites. Two events soon provided a reprieve.

On June 19, 1992, the U.S. Supreme Court issued a far-reaching opinion on several key provisions of the Low-Level Radioactive Waste Policy Act, as amended in 1985.[41] The Court upheld the federal site development "milestones" and the incentives and penalties that accompanied them. Because states could choose whether or not to meet the milestones, the milestones were seen as elective and, therefore, non-coercive. More significantly, the Court found the "take title" provision of the federal law unconstitutional and struck it from the law,[42] removing what many believed was the ultimate tool to compel state progress. The Court also evaluated the more general and potentially far-reaching provision in the federal law that declared states "responsible" for providing for disposal of low-level radioactive waste. The Court decided not to strike the provision from the law, but declined to construe it, "alone and in isolation, as a command to the States independent of the remainder of the act." Following the Court's decision, the states were no longer subject to a general federal mandate to provide for disposal of radioactive waste.

At the time of the decision, the Court's majority believed that their ruling would not defeat the fundamental objectives of the federal law. This was because the sited states – South Carolina, Nevada, and Washington State – were expected to deny or restrict access to their disposal facilities by year's end, leaving little alternative for states but to continue their siting efforts. This circumstance would soon change. In June 1992, South Carolina enacted legislation that allowed the disposal facility in Barnwell County to remain available to out-of-region waste for an additional 18 months following the January 1, 1993, termination date.

The collapse of state disposal projects

In April 1990, following public demonstrations against candidate site locations in New York, Governor Mario Cuomo issued a "temporary" suspension of siting activities.[43] The siting process in New York never was resumed. Since then, disposal site development efforts in all the other states have run into procedural obstacles or have changed direction in the face of shifting circumstances. In addition to New York, site development programs have been halted, suspended, postponed, or otherwise rendered dormant in California, Connecticut, Illinois, Massachusetts, Michigan, Nebraska, New Jersey, North Carolina, Ohio, Pennsylvania and Texas.

In a memo to Midwest Compact commissioners, the compact's executive director summarized that organization's June 1997 decision to discontinue its support of the siting program in host state Ohio.[44] He noted that while none of the reasons considered alone might constitute justification for halting the effort, the sum total of arguments dictated in favor of the decision. Among the reasons cited by the Midwest Compact was continued access to disposal facilities outside the compact region (i.e., Barnwell and the Utah site), which made it unnecessary to build a new disposal facility in the Midwest region. In addition, the letter noted an earlier decision by Illinois to suspend its siting program, declining waste volumes, escalating development costs and funding constraints, as well as the improved ability of waste generators to weather disruptions in disposal access by providing on-site storage.

Private sector efforts to develop new disposal capacity

Companies in the private sector continue to show interest in establishing new disposal sites outside the traditional compact system. The trade press has reported on efforts of Waste Control Specialists, L.L.C. in New Mexico to build a disposal facility that would accept waste types comparable to those accepted at the Barnwell facility. Because New Mexico is in the three-state Rocky Mountain Compact region, the Compact Board would have to authorize the importation of waste at the facility. Laidlaw Environmental, now Safety-Kleen Corporation, has been working for the past several years to win political approval to build a facility near the Envirocare of Utah disposal site to accept waste similar in type to waste accepted at that facility.[45] Another company, Envirocare of Texas, is currently evaluating candidate sites in that state for construction of an "assured isolation" facility to house waste generated within the Texas compact region. On November 1, 1999, Envirocare of Utah , which currently operates a disposal facility for Class A low-level radioactive waste only, submitted an application to amend its license to allow acceptance of the full range of low-level radioactive waste.

South Carolina's Framework for Governing Low-Level Radioactive Waste Disposal

Under a 1959 amendment to the Atomic Energy Act of 1954, qualified states can take over responsibility for licensing and regulating the possession of certain radioactive materials, which generally includes near-surface facilities for radioactive waste disposal. South Carolina became an NRC agreement state in 1969. South Carolina's framework for governing low-level radioactive waste disposal includes statutes, regulations, the operating license, and the lease agreement between the State Budget and Control Board and Chem-Nuclear.

Principal state laws pertaining to LLRW disposal

Section 13-7-110 to 13-7-200. This law, the South Carolina Radioactive Waste Transportation and Disposal Act, Act 429, was enacted in 1980. It gives the Department of Health and Environmental Control broad powers to regulate the transportation and disposal of radioactive waste within the state. It requires persons who intend to ship waste into the state to purchase a permit from DHEC and to deposit sureties adequate to protect the state from liabilities. The law also gave DHEC authority to enforce violations through civil penalties or revocation of shipping permits.

Section 48-48-140. This section of the South Carolina Code assesses a tax of $235 per cubic foot on low-level radioactive waste disposed of within the state. Of this amount, $6 per cubic foot is earmarked for the Education Finance Act. Of the remainder, 95 percent is deposited in the South Carolina Educational Assistance Endowment Fund, and 5 percent is remitted to Barnwell County.

In 1995, this section of the code was amended to add the "contingent annual license tax" on any company which operates a licensed disposal facility for low-level radioactive waste. Under Section 59-143-10 of the South Carolina Code, 30 percent of all funds deposited into the Educational Assistance Endowment Fund must go to Higher Education Scholarship Grants. The contingent annual license tax provides that in any year in which deposits from low-level radioactive waste disposal do not amount to $24 million, the disposal facility operator must make up the difference.

Principal regulations pertaining to LLRW disposal

Federal Regulation 10 CFR Part 61. Because South Carolina is a Nuclear Regulatory Commission agreement state, federal regulations governing low-level radioactive waste disposal are not directly applicable to state licensees. The NRC requires, however, that states have their own regulations that are equivalent to or

more stringent than the federal regulations. 10 CFR Part 61 ("Part 61") is the federal regulation governing disposal of radioactive waste in the upper 30 meters of the earth's surface. It was issued in December 1982, along with an environmental impact statement (EIS)(NUREG-0945) providing technical documentation for its directives.

Technical analysis for the EIS for Part 61 was based on shallow land burial. At the Barnwell site waste trenches for Class A waste are typically 1,000 feet long, 200 feet wide and 25 feet deep. Trenches for B/C waste and slit trenches for high activity waste are generally much smaller. Class A trenches are excavated by removing the top layer of sand from the general area. A compacted clay backfill is then installed forming trench barrier walls. The trench area is then excavated to the desired length and depth. Upon completion of the trench, a ramp is constructed at the low end to allow access for transport vehicles. In addition, the trench bottom is sloped and a drainage and sump system is installed that allows for environmental monitoring of any accumulation of water through the use of standpipes.[46]

All states that developed plans to build new disposal facilities for radioactive waste, except California, enacted laws or issued regulations that either ban traditional shallow land disposal or specify that additional human-made engineered barriers be used. In addition, all the states that planned to build new facilities, other than California and Texas (which are in desert locations where the natural water table is far below the earth's surface), planned to build above grade facilities. The NRC has not raised objections to state laws or regulations prescribing covered, above-grade designs or the use of engineered barriers.[47] No new facility using these new technologies was ever built.

In 1993, the NRC amended Part 61 to clarify that "near-surface disposal includes disposal in engineered facilities which may be built totally or partially above-grade provided that such facilities have protective earthen covers."[48] In 1995, DHEC amended state regulation 61-63 (see below) and the disposal facility operating license to require that all waste be disposed of in engineered barriers including concrete overpacks, containers, or vaults. The regulations require the engineered barriers to be designed and constructed of materials having physical and chemical properties that provide reasonable assurance that they will maintain their functional integrity for a least the institutional control period (i.e., 100 years following site closure).

Task Force members recommended that DHEC consider the changing nature of the waste stream accepted at the Barnwell facility, as well as changing disposal standards and new technologies, when it evaluates Chem-Nuclear's application for renewal of its operating license in the year 2000.

South Carolina Regulation No. 61-63. Radioactive Material. This is the main body of regulations under which South Carolina administers its responsibilities as an NRC agreement state to regulate the possession of radioactive materials. Part VII, "Licensing Requirements for Land Disposal of Radioactive Waste," are the regulations that provide the framework for disposal at the Barnwell facility. These regulations are compatible with, and in many respects identical to, federal regulations at Title 10, Part 61, of the Code of Federal Regulations.

South Carolina Regulation No. 61-83. Transportation of Radioactive Waste into or within South Carolina. This regulation, effective May 22, 1981, was promulgated in response to the South Carolina Radioactive Waste Transportation and Disposal Act (see above). The regulation reformed and strengthened requirements for transporting radioactive waste into the state.

Materials license 097 (the Chem-Nuclear operating license)

South Carolina Radioactive Materials License 097 describes the general requirements governing technical and institutional matters related to the radiological health and safety of the radioactive waste disposal facility in Barnwell County. The license is generally issued for a five-year period and is next up for comprehensive review July 31, 2000.

The license addresses qualifications of personnel; requirements for waste acceptance; technical specifications for waste form and characteristics; limits on contamination; packaging requirements; site design and maintenance conditions; waste burial operational requirements; and requirements for environmental surveillance and monitoring. The license incorporates, by reference, Chem-Nuclear's standard operating procedures, a much more detailed catalog of specific requirements across a wide range of areas.

The lease agreement

The lease agreement between the South Carolina Budget and Control Board and Chem-Nuclear Systems, L.L.C., defines the contractual relationship between the state and the private company. Because federal and state regulations require that disposal of Classes A, B and C radioactive waste be performed only on land owned by the federal or state governments,[49] it was necessary for Chem-Nuclear to convey the land to the state before the Department of Health and Environmental Control could issue the company a license to operate a disposal facility. The state, in turn, returned control of the site to Chem-Nuclear through the lease agreement.

The first lease agreement between the Budget and Control Board and Chem-Nuclear was signed April 21, 1971. Under the 99-year lease agreement, Chem-Nuclear committed to use the property in a manner consistent with its application for a radioactive waste disposal license and its original proposal. The lease gave the state the right to terminate the lease if the lessee violated its terms and conditions. However, it was otherwise not explicit about the rights of either party to terminate in light of changing circumstances and conditions related to state policies or the radioactive waste disposal market. Incorporating Intercontinental's (Chem-Nuclear's) original proposal by reference, the lease also included a schedule of disposal rates that could only be escalated with the cost of living index.

On April 6, 1976, a new lease was signed by the state and Chem-Nuclear.[50] The 1976 lease replaced the original lease in its entirety, expanded the amount of land conveyed to 235 acres, and restarted the 99-year lease period. The new lease did not incorporate by reference Intercontinental's original proposal to the state. This removed the commitments that were related to operational details that had since been addressed in the operating license issued by the Department of Health and Environmental Control. It also removed provisions related to state oversight over disposal rates.

The 1976 lease also added a significant new provision to clarify the rights of the parties to terminate the lease:

> "In the event of changes of laws or regulations applicable to the Site for disposal of radioactive waste which makes such continued operation by Lessee impossible or economically unfeasible, ceasing to use the Site for its present purpose *and using the Site for another reasonable purpose shall not be considered a violation, misuse or noncompliance with this Lease.*" (emphasis added)

Governor Richard W. Riley**,** who was elected in 1978, took a number of steps to change the state's policies on nuclear waste disposal. In late 1979, the Governor's Office retained the services of a Columbia attorney, Elliot D. Thompson, to renegotiate certain provisions of the lease that the Governor believed did not sufficiently protect the state's interests.[51] Key among them was the provision defining the rights of the parties to terminate the lease.

Thompson negotiated a new termination clause that represented a significant departure from the earlier provision quoted above. This clause is still a part of the lease:

> "In the event of changes in the laws or regulations applicable to the Site for disposal of radioactive waste which makes such continued operation by Lessee impossible or economically unfeasible, *Lessee shall have the right to terminate this lease upon reasonable notice of not less than six (6) months to Lessor.* In the event of termination, nothing contained herein shall give rise to any claim by Lessee against Lessor under this lease..." (emphasis added)[52]

Under the earlier lease agreement, if state laws and regulations changed so that waste disposal was no longer feasible, Chem-Nuclear would still hold the land through the remainder of the 99-year lease term, and could use it for some other purpose. Under the current lease, if the company believes that disposal is no longer feasible, its only option is to terminate the lease agreement with the state. At that time, the company would also be required to petition the Department of Health and Environmental Control for termination of its radioactive materials license. This would invoke an exhaustive process to evaluate the adequacy of closure and institutional control arrangements to ensure that the state does not incur financial liabilities once the lease and the license are terminated.

Since the 1979 amendment to the lease, in fact, there have been several significant "changes in the laws or regulations applicable to the Site." For example, in late 1982 the Nuclear Regulatory Commission required the imposition of new disposal requirements; South Carolina joined the Southeast Compact and, for a time, limited access to the site to waste generators located within that seven-state region; and the State passed a law imposing substantial fees on radioactive waste disposal. None of these changes of laws or regulations triggered exercise by Chem-Nuclear of its right to terminate the lease, or invoked any challenge of the laws or regulations themselves.

Estimating Disposal Revenues and Operating Costs

Most scenarios considered by the Nuclear Waste Task Force to address the Task Force's primary objectives entail a potential reduction in the overall volume of waste accepted at the site, a significant reduction in the amount of waste accepted annually, and a change in the characteristics of the waste stream. This raises the question of whether the disposal facility could operate for smaller volumes of waste at affordable disposal rates.

Some costs of operating a disposal site are fixed regardless of how much waste is accepted. Therefore, all other things being equal, a smaller amount of waste would increase unit costs for disposal. In order to evaluate whether acceptance of waste at a reduced rate would be cost-prohibitive, it is important to determine:

- ***How much do customers currently pay for disposal?*** Information on current disposal charges at the South Carolina facility could provide a benchmark from which to assess potential future revenues under various scenarios involving reduced volumes of waste.

- ***How much does it cost to operate the South Carolina disposal facility?*** Information about how much it currently costs to cover all necessary operational expenses at the South Carolina disposal facility would be useful in assessing the costs to operate the facility at reduced volumes under different scenarios.

Estimating disposal revenues

Chem-Nuclear no longer publishes a standard price schedule applicable to all customers. Instead, each customer executes a contract that is customized to meet its individual disposal requirements. However, there is some information that can be useful in estimating how much waste generators pay for disposal of radioactive waste at the Barnwell site.

Houston Lighting & Power Company (HP&L) prepared detailed information to support testimony that they provided before the Texas legislature earlier in 1999. At the request of the Task Force, the company provided a further breakdown of the disposal cost data prepared for that hearing (included in Volume 2 of this report). Their figures show that their 1998 costs for disposal at Barnwell were *equivalent to* $509 per cubic foot. To prepare this information, the company converted disposal prices (now based on weight and density) for various waste shipments into an effective price per cubic foot. They excluded costs associated with waste processing and transportation.

Detailed information indicates that HP&L's 1998 disposal costs were not higher than usual, and may have been lower than average for that company. The Task Force should exercise caution in using the disposal rates for one generator to generalize about the disposal rates for other generators and for gross receipts as a whole. However, there appears to be nothing unusual about HP&L's waste stream that would make its disposal unusually expensive. For example, the shipments for 1998, contained no Class C "non-fuel-bearing" hardware components, which can be intensely radioactive and subject to very high handling surcharges. The 1,619 cubic feet of waste shipped by HP&L contained 507 curies of radioactivity, a ratio of 0.31 curies per cubic foot of waste. For the disposal facility as a whole in the same year, each cubic foot of waste contained an average of 1.71 curies. (For utility waste as a whole, each cubic foot of waste contained an average of 2.11 curies.) The HP&L waste, therefore, appears to be less radioactive, and perhaps, therefore, less expensive to dispose of than that of the average customer or the average utility customer.

The Northeast Compact Commission has informed the Task Force that it estimates its generators' 1999 disposal costs at Barnwell will average approximately $570 per cubic foot.[53] At the request of Task Force staff, an official with Florida Power Corporation reviewed the 1998 data provided by HP&L to determine whether or not the waste described appeared comparable to the kinds of waste shipped for disposal by the Crystal River, Florida, nuclear plant. He indicated that the waste appeared similar to the kinds of waste they might ship in a typical year.[54] The Chairman of the Midwest Compact Commission informed Task Force staff that one utility within his region had reported its annual costs for disposal at Barnwell to be $567 per cubic foot.[55]

The waste stream from nuclear utility customers may be subject to higher disposal rates than other customers because the waste tends to incur higher radioactivity and handling surcharges. However, in 1998 non-utility waste constituted only 30 percent of the total volume of waste buried at the Barnwell facility. This small percentage of waste could not be expected to offset the average disposal cost per unit of volume to a significant degree.

From this information, the Task Force staff concluded that waste generators paid, on average, an effective rate of at least $500 per cubic foot for disposal at the Barnwell facility. Of this, $235 per cubic foot is the state tax on low-level radioactive waste disposal, leaving $265 per cubic foot for the site operator. In fiscal year 1999, based on acceptance of 163,600 cubic feet of waste, this would have yielded total revenues of $81,800,000, with after-tax revenues of $43,354,000 for Chem-Nuclear.[56] [57]

Estimating operating costs

In the absence of actual information about the costs of operating the state-owned disposal facility, some information is available that can support reasonable inferences about the costs of operating a disposal facility of this type.

It costs $4.35 million per year to operate the low-level radioactive waste disposal facility in Washington State.

Because the Northwest regional facility operates as a monopoly, its disposal fees are regulated and its operating costs are audited by the state of Washington. According to information submitted in the Washington rate proceedings, it costs approximately $4.35 million per year to operate the facility.[58] The site accepted approximately 150,000 cubic feet of waste in 1998.
With a regulated operating margin (profit) of 29 percent for the site operator, this yields an annual revenue requirement of approximately $5.6 million. In settling upon this figure, the Washington Utilities and Transportation Commission goes through an exhaustive process, beginning with an audit of the disposal facility operator's records; preparation of a cost of service analysis; consideration of cost elements that should be allowed in the rate base; and determination of a fair operating margin or profit.

The Washington State facility is similar to the South Carolina facility in that both were developed decades ago and development costs have been long-since amortized as part of the disposal rates. The disposal sites are also different in some respects. The Washington facility is located in an arid climate, which should result in lower costs for surface water management. The Washington facility does not use concrete overpacks. In 1998, the facility accepted far less higher activity waste than did the South Carolina facility,[59] which may also contribute to lower operating costs.

Chem-Nuclear provided DHEC a formula indicating that its operational costs for fiscal year 1999 were approximately $18.4 million.

In early 1999, a state legislator asked the Department of Health and Environmental Control how much it costs to operate the South Carolina disposal facility. Because DHEC does not maintain such records, it asked Chem-Nuclear for the information. In March 1999 DHEC responded that estimated annual *fixed* costs (costs irrespective of waste volume) were $13.5 million, with *variable* costs of $30 per cubic foot. (See DHEC cost estimate in Volume 2 of this report.) Under this formula, with 200,000 cubic feet of waste in calendar year 1998, operational costs would have been $19.5 million. For fiscal year 1999, with 163,600 cubic feet of waste, total operating costs would have been $18.4 million.

No detailed breakdown was provided to support the Chem-Nuclear figures. The Chem-Nuclear estimate has not been subject to a cost of service review process similar to that imposed by the State of Washington. In the State of Washington, parties to the rate proceedings can evaluate and question each cost element, and provide testimony regarding which cost elements should legitimately be included in the rate base.

A national expert estimated that it would cost $7 million annually to operate the proposed Texas site, with a disposal technology similar to South Carolina's.

An analysis done by Robert D. Baird of Rogers & Associates Engineering Corp. for the state of Texas estimated that it would cost approximately $7 million per year to operate the disposal facility proposed for Hudspeth County. (See Briefing on Disposal Cost Model by R.D. Baird in Volume 2 of this report.) This figure assumes no amortization costs for development, licensing and construction of the facility. The proposed disposal site was to use technology similar to that used in South Carolina's disposal facility, earthen trenches with concrete vaults. (Texas' concrete vault technology was designed to withstand earthquakes of magnitude 6 on the Richter scale, and also to eliminate any void spaces in the vaults by pouring grout or another inert material between the top of the waste and the vault ceilings.) In the early years of operation, the Texas facility projected 84,000 cubic feet of waste per year, about half of which would have come from the decommissioning of the Maine Yankee nuclear plant. Texas estimated that disposal charges of approximately $170 per cubic foot would be needed to cover all operating and monitoring expenses, and contributions to the long-term care escrow fund.

The information available to the Task Force suggests the cost of operating the Barnwell facility is not less than $4.35 million per year and not more than $18.4 million.

Conclusions

In general, the charges assessed for disposal of low-level radioactive waste at the South Carolina disposal facility depend on a combination of factors, including but not limited to:

- the cost elements related to fixed operating costs that do not vary in response to fluctuations in waste volume;
- cost elements that vary in response to the amount of waste accepted;
- taxes and fees assessed by state and county governments; and
- profits realized by the site operator (revenues in excess of operating costs, taxes and fees).

The data summarized above indicates that gross revenues for low-level radioactive waste disposal at the South Carolina facility (estimated to be $81.8 million in fiscal year 1999) far exceed the costs of operating the facility (estimated at $4.2 million to $18.4 million). Depending on the factors listed above, it appears that the facility could be operated economically for much smaller volumes of waste from a smaller number of generators at disposal charges equal to or less than the disposal charges they are now paying.

Options for South Carolina Policy on Low-Level Radioactive Waste Disposal

Since 1971, over 27.5 million cubic feet of low-level radioactive waste from across the U.S. has been buried at the state-owned disposal facility in Barnwell County, South Carolina. The Department of Health and Environmental Control estimates that up to 3 million cubic feet of suitable disposal capacity will remain after June 2000. How this remaining disposal capacity might be used, or not used, in the best interest of the State has been a subject of primary concern to the Task Force.

The Task Force considered several proposals that address, in differing degrees, the Task Force's twin objectives of ending South Carolina's role as the nation's radioactive waste dumping ground and meeting the needs of South Carolina businesses and organizations that generate such waste. These included:

- South Carolina would join an existing low-level radioactive waste disposal compact. Proposals from two such compacts are under consideration: the "Atlantic Compact" and the Southeast Compact.

- A consortium of waste generators would manage the site; disposal capacity would be preserved for decommissioning nuclear power reactors.

- South Carolina would ban longer-lived wastes from the site, and would build a storage facility for shorter-lived waste.

The sections that follow describe each of these proposals.

1. South Carolina should join a regional compact.

South Carolina should join an existing, Congressionally-approved interstate compact in order to obtain clear legal authority from the Federal government to exclude waste from most of the nation.

South Carolina should join a compact subject to the following terms:

- Under a compact arrangement, South Carolina should be able to limit the amount of waste accepted from other compact states, in order to:
  - Preserve ample disposal capacity in case it is needed for waste generated during the decommissioning of South Carolina's nuclear power reactors;
  - Reduce the overall amount of additional radioactivity (as measured in curies) that will be buried in the trenches at Barnwell.
- The voting power of South Carolina within the Compact Commission should allow the state to exercise control on critical issues.
- South Carolina should be able to regulate or control disposal costs that are passed along to the state's consumers and rate payers.
- South Carolina may obtain revenues for allowing waste generators outside the state access to the disposal facility.
- The small number of waste shippers under a compact agreement should allow the state to implement better methods for verifying strict compliance with waste acceptance criteria. Better verification of container contents should reduce the likelihood of further tritium leaks and other compliance problems.
- South Carolina should not be prohibited from changing and improving the regulatory requirements governing the disposal facility. For example:
  - The state should have authority to impose reasonable safety requirements upon permittees for shipping waste to the site;
  - The state should be allowed to limit or eliminate shallow land burial of radioactive waste in the future if alternatives such as entombment or assured isolation become regulatorily and economically viable.

Proposals from two compact regions are currently under consideration. Following is pertinent information from these proposals:

The Atlantic Compact

a. Upon South Carolina's membership, the Northeast Compact would become known as the "Atlantic Compact." Its other member states are Connecticut and New Jersey. The Compact headquarters would be moved to Columbia.

b. As host state for the compact, South Carolina would have two commissioners and Connecticut and New Jersey one commissioner each. South Carolina would have veto power over any decisions pertaining to the addition of new member states and to the importation of waste from outside the three-state region.

c. Upon South Carolina's admission to the Atlantic Compact, the Compact Commission would provide a payment of $12 million to South Carolina.

d. Waste generators in Connecticut and New Jersey would agree to pay up to an effective rate of $570 per cubic foot for waste that they choose to send to the Barnwell facility.

e. South Carolina would regulate the profits earned by the disposal facility operator, so that any revenues that exceed operating costs and fair profits would accrue to the state. These revenues could be used for education and other purposes.

f. Waste generators in Connecticut and New Jersey would dispose of not more than 800,000 cubic feet of waste at the Barnwell facility over the life of the site.

g. South Carolina could withdraw from the Compact upon five years' notice. South Carolina would not be prohibited from closing the Barnwell site or imposing greater safety standards at any time.

<u>Legal issues identified by the Task Force</u>

Some members of the Task Force expressed concern over two legal issues associated with South Carolina's possible membership in the Atlantic Compact. The first legal issue is whether South Carolina can limit Connecticut and New Jersey to disposal of no more than 800,000 cubic feet of waste at the Barnwell facility, as proposed by the Atlantic Compact Commission. The second legal issue is whether additional states might be able to join the Atlantic Compact without South Carolina's approval. The Task Force staff and the Atlantic Compact Commission believe there is a strong basis within the provisions of the Compact law for concluding that the Commission can

limit the amount of disposal capacity available to waste generators in Connecticut and New Jersey. The staff of the Task Force and the Compact Commission also believe that, under the provisions of the Compact pertaining to the additional of new member states, additional states would not be able to join the Atlantic Compact without the approval of host state South Carolina. At its final meeting, the Task Force urged the Governor to give special consideration to these legal issues as he takes steps to execute the Task Force's recommendations.

The Southeast Compact

a. The Southeast Compact currently consists of Alabama, Florida, Georgia, Mississippi, Tennessee, and Virginia.

b. South Carolina, along with each of the other states, would have two voting Commissioners, for a total of 14 voting members. Any vote to admit new member states or allow importation of waste from outside the compact would require the affirmative vote of both commissioners from South Carolina, as long as Barnwell remains the regional disposal facility.

c. The Southeast Compact would agree to allocate a specific volume of waste at the Barnwell site for South Carolina waste, and a specific volume to be used by the rest of the compact states. If the other states used their volume first, then South Carolina could continue to operate the site indefinitely for in-state waste only.

d. South Carolina could regulate the profits earned by the disposal facility operator, so that any excess revenues that exceed operating costs and fair profits would accrue to the state. These revenues could be used for education and other purposes.

e. If South Carolina chose to withdraw from the Compact, it could do so at any time but would have to continue making the Barnwell facility available for compact states' waste for four years.

2. A consortium of waste generators should operate the disposal site on a not-for-profit basis.

Under this proposal, a consortium of organizations that generate low-level radioactive waste in South Carolina would operate the state-owned disposal facility in Barnwell County under a lease arrangement with the State of South Carolina.

- Disposal activities at the Barnwell site would be suspended for approximately 30 years, to coincide until the onset of reactor decommissioning within the state. If reactor entombment or other alternatives did not become available during that time, the Barnwell site would be re-opened at that time to accept decommissioning waste.

- As of July 1, 2000, the Barnwell facility will have up to 3 million cubic feet of disposal capacity remaining. The 12 nuclear power plants in the South Carolina rate base are estimated to require approximately 2,200,000 cubic feet of disposal capacity for low-level radioactive waste generated during the decommissioning process, which is currently estimated to end in year 2051. In addition, the reactors are expected to generate some 400,000 cubic feet of waste during operations up until the onset of decommissioning.

- By operating the disposal facility on a not-for-profit basis, the utilities could achieve substantial savings in the amount of money they are required to set aside for future decommissioning of the power plants.

- The much smaller number of waste shippers under the consortium proposal would allow the state to implement better methods for verifying strict compliance with waste acceptance criteria. Better verification of container contents should reduce the likelihood of further tritium leaks and other compliance problems.

- In order to operate only for South Carolina waste generators, or generators in the South Carolina rate base, Interstate Commerce Clause and anti-trust legal issues would have to be addressed.

3. South Carolina should declare a 30-year moratorium on shallow land burial within the state, and build an above-grade retrievable storage facility at the Barnwell site for shorter-lived waste.

Declaring a 30-year moratorium on shallow land burial, and storing radioactive waste in the interim, would allow for the possible development of other alternatives and might result in permanent cessation of waste burial within the state.

- The State of South Carolina would impose a 30-year moratorium on shallow land burial in South Carolina.
  - During that time, nuclear utilities would store waste on site with greater than a 50-year "hazardous life."
  - Should entombment of nuclear reactor waste in the reactor containment building become a regulatory option, South Carolina could eventually pursue that option, in lieu of reopening the Barnwell facility for shallow land burial.
  - In order to re-open the shallow land burial site after 30 years to operate only for South Carolina waste generators only, Interstate Commerce Clause and anti-trust legal issues would have to be addressed.
- The state would also construct a state-of-the-art retrievable storage facility for shorter-lived waste at the Barnwell site. (Alternatively, the state could consider adapting the mothballed Allied General facility or other suitable existing facilities for radioactive waste storage.)
  - The storage facility would accept waste with less than a 50-year "hazardous life" from across the nation.
  - If the storage facility could be built and operated cheaply enough to compete with the surface disposal facility in Utah, then waste currently going to Utah could be sent to the Barnwell storage facility. This would effectively end near surface disposal of radioactive waste in the United States.
  - Once waste decayed to safe levels, it would be removed from the site and buried in solid waste landfills in the Barnwell area. Storage capacity at the radioactive waste storage facility freed up in this manner could be reused.
  - Fees assessed on stored waste could provide incentives for the local community.

Task Force Recommendations to the Governor and General Assembly

At its meeting on December 9, 1999, the South Carolina Nuclear Waste Task Force unanimously adopted the following resolution:

WHEREAS, South Carolina for many years has shouldered responsibility for burial of the nation's low-level radioactive waste; and

WHEREAS, South Carolina's own nuclear waste generators are likely to have waste disposal needs far into the future; and

WHEREAS, if waste volumes received at the Barnwell facility continue at current levels, South Carolina's nuclear power reactors will have no place to dispose of their waste when they decommission in thirty years; and

WHEREAS, joining a small, interstate compact that has already been approved by Congress to exclude waste from outside the region can provide many of the same benefits as operating the disposal facility for in-state generators only, including: discontinuing South Carolina's role as the nation's nuclear dumping ground; improving regulatory oversight by reducing the number of generators using the site; retaining full discretion to regulate the disposal facility in the safest manner possible; reducing the total amount of waste accepted, both in volume and radioactivity; ensuring disposal capacity for the state's needs; and providing the flexibility to take advantage of any new disposal options that may come about in the future,

THEREFORE BE IT RESOLVED THAT, the South Carolina Nuclear Waste Task Force recommends:

The Governor should immediately enter into negotiations with the Atlantic Compact, which currently consists of Connecticut and New Jersey, to define the terms and conditions for South Carolina's membership in the Compact. Such an agreement should:

- Preserve the full authority of South Carolina to regulate low-level radioactive waste disposal in any appropriate manner, including the imposition of reasonable requirements to ensure compliance with waste acceptance criteria.

- Preserve the authority of South Carolina to prohibit near-surface disposal should safer long-term options such as entombment, monitored storage, or assured isolation become technologically, economically and legally viable.

- Give the state a legal means to accept waste from only three states, instead of continuing to open the disposal site to every state in the nation.

- Have a strong potential for reducing the overall volume and total radioactivity of waste that might otherwise be accepted for disposal at the Barnwell facility.

- Ensure that the aggregate amount of waste disposed of by waste generators in Connecticut and New Jersey is limited to 800,000 cubic feet, in order to reserve the remaining capacity for decommissioning waste and other waste generated by the three investor-owned utilities serving customers in South Carolina.

- Seek financial incentives from the other Compact states as compensation for the exclusive use of the South Carolina disposal facility.

- Allow the state to gradually reduce its reliance on money for nuclear waste burial to fund critical state needs.

- Ensure that South Carolina maintains veto authority over decisions involving the entry of new member states into the Compact and disposal of waste from outside the region at the Barnwell facility.

- Through the application of cost of service regulation, rate differentials, or other means, ensure that disposal rates passed along to South Carolina consumers are lower than the overall rates paid by South Carolinians today.

- Allow waste generators within the compact region to export waste to facilities outside the region for purposes of waste processing or disposal.

- Ensure that operation of the disposal site under a compact arrangement provides significant economic benefits to the Barnwell community.

When the Governor concludes that the terms and conditions for South Carolina's membership are favorable, he should pursue all means available to effectuate the state's membership in the Atlantic Low-Level Radioactive Waste Compact as early as possible.

Notes and References

[1] Executive Order No. 99-26, June 10, 1999.

[2] S.C. Department of Health and Environmental Control, Commercial Low-Level Radioactive Waste Disposal in South Carolina, no date, p.2.

[3] S.C. Department of Health and Environmental Control, Evaluation of Remaining Disposal Capacity at the Barnwell Low Level Radioactive Waste Management Facility, June 1999.

[4] According to data in the MIMS system (see Note 6), radioactive waste disposed at the Barnwell facility in 1988 contained an average of 0.23 curies per cubic foot. In 1998, waste contained an average of 1.71 curies per cubic foot. The average number of curies per cubic foot varies significantly year to year, but the general trend is toward higher concentrations.

[5] Letter, Kenneth L. Alkema, Senior Vice President, Envirocare of Utah, Inc., to John F. Clark, September 7, 1999. The letter explains that the Envirocare facility can accept 90 percent of Class A low-level radioactive waste.

[6] Data in this report on low-level radioactive waste disposed of at the Barnwell, South Carolina, facility is from the National Low-Level Waste Management Program's Manifest Information Manifest System (MIMS). The data is purchased by the National Program from the companies that operate the three disposal facilities in the U.S. The data base can be accessed and searched on the Internet at: http://www.inel.gov/national/national.html.

[7] U.S. Atomic Energy Commission, Press Release No. C-12, "AEC Formulates Policy for Land Disposal of Radioactive Wastes...", January 28, 1960.

[8] Ibid.

[9] National Low-Level Waste Management Program, A Brief History of Commercial Low-Level Radioactive Waste Disposal, DOE/LLW-103, Rev. 1, August 1994.

[10] Catherine Thiel Quigg, "The Dump and Run Gang is on the Prowl Again. Is Your Backyard Available?" The Progressive (Madison, WI), December 1981, p.34.

[11] Intercontinental Nuclear, Inc., Proposal to the State of South Carolina State Development Board to Build and Operate a Radioactive Waste Burial Facility, November 1, 1968, pp.23 and 27.

[12] Ibid.

[13] Ibid, at p.28.

[14] Ibid, at p.23.

[15] Lease between South Carolina Budget and Control Board and Chem-Nuclear Services, Inc., April 21, 1971, p.2.

[16] This section of the report is adapted from: W.F. Newberry, "Responsibility for the Disposal of Low-level Commercial Low-Level Radioactive Waste," a background paper prepared for National Conference of State Legislatures' National Summit on Low-Level Radioactive Waste Policy, April 9, 1999.

[17] Supra, at reference 9 ("A Brief History...").

[18] U.S. Department of Energy, Report of Task Force for Review of Nuclear Waste Management, Draft, DOE/ER-0004/D, February 1978.

[19] National Governors' Association Task Force on Low-Level Radioactive Waste Disposal, Final Report, August 1980.

[20] Southern States Energy Board (prepared for the State Planning Council on Radioactive Waste Management), Technical Paper: Low-Level Radioactive Waste Management, An Economic Assessment, July 1981.

[21] U.S. Department of Energy, Low-Level Radioactive Waste Policy Act Report: Response to Public Law 96-573, July 1981.

[22] Virgil Autry, License Restrictions at Barnwell, presented at Nuclear Regulatory Commission All Agreement States Meeting, Bethesda, MD, October 1993.

[23] Supra, at reference 9 ("A Brief History...").

[24] State Planning Council on Radioactive Waste Management, Technical Paper, Low-Level Radioactive Waste Management: Charting State Issues and Responsibilities, July 1981.

[25] Supra, at reference 22 (Virgil Autry).

[26] National Governors' Assocation Task Force on Low-Level Radioactive Waste Disposal, Final Report, August 1980.

[27] National Conference of State Legislatures, Goals for State-Federal Action; Policy resolutions of the National Conference of State Legislatures, 1980-1981, Radioactive Waste Management, July 1980, p.30.

[28] "The Low-Level Radioactive Waste Policy Act," Public Law 96-573.

[29] 1982 Act No. 452.

[30] 1983 Act No. 91.

[31] Original proposal and various supporting materials on file with W.F. Newberry; J.J. Stucker; and Elizabeth Langworthy, Sutherland, Asbill & Brennan (former counsel to Southeast Compact Commission), Washington DC.

[32] "Omnibus Low-Level Radioactive Waste Interstate Compact Consent Act," Public Law 99-240, Title II.

[33] "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, Title I.

[35] Personal communication with Kevin McCarthy, formerly Director, Connecticut Division of Radiation Protection, September 1999. (On that day, Mr. McCarthy phoned W.F. Newberry of the South Carolina Governor's office, who assisted in preparing the response noted in the report.)

[35] Letter, Governor Carroll A. Campbell, Jr., to Members of the Low-level Radioactive Waste Forum, April 22, 1987.

[36] U.S. Department of Energy, Annual Report to Congress on Low-Level Radioactive Waste Management Progress, 1992, November 1993, pp. 12-13.

[37] Remarks by Governor David M. Beasley, News Conference, April 13, 1995.

[38] Ibid.

[39] Ibid.

[40] Supra, at reference 16 (NCSL report).

[41] New York v. U.S., 112 S. Ct. 2408, 488 U.S. 1041 (1992).

[42] According to the Court, "The take title provision is of a different character. This third so called "incentive" offers States, as an alternative to regulating pursuant to Congress' direction, the option of taking title to and possession of the low level radioactive waste generated within their borders and becoming liable for all damages waste generators suffer as a result of the States' failure to do so promptly. In this provision, Congress has crossed the line distinguishing encouragement from coercion."

[43] Supra, at reference 36 (1992 DOE Annual Report), p.40.

[44] Gregg Larson, Executive Director, Midwest Compact Commission, letter to Commissioners, June 19, 1997.

[45] U.S. Department of Energy, Annual Report to Congress on Low-Level Radioactive Waste Management Progress, 1998, July 1999, p.3.

[46] Supra, at reference 2 (Commercial LLRW Disposal), p.8.

[47] Personal communication with James Kennedy, Nuclear Regulatory Commission, December 15, 1999.

[48] 10 CFR Part 61.7. See Federal Register, Vol. 58, p. 33891, June 22, 1993.

[49] Title 10, Code of Federal Regulations, Part 61.59(a).

[50] Lease between South Carolina Budget and Control Board and Chem-Nuclear Services, Inc., April 6, 1976.

[51] Personal communication with John J. Stucker and David Reid, former advisors to Governor Richard W. Riley, August 1999.

[52] Amendment to the 1976 lease between South Carolina Budget and Control Board and Chem-Nuclear Services, Inc., September 11, 1979. Amending sections 7 and 8 of the 1976 lease.

[53] Letter, Kevin McCarthy and Richard J. Sullivan, Northeast Compact Commission, to Chairman Derrick and the members of the South Carolina Compact Delegation, September 7, 1999.

[54] Personal communication with Steven Garry, Florida Power Corporation, July 22, 1999.

[55] Personal communication, Stanley York, Chairman, Midwest Compact Commission, August 26, 1999.

[56] The actual revenue amount received by the state for the fiscal year differs due to an offset between the time the waste was disposed and the time the money was remitted to the state.

[57] In addition to the $235 per cubic foot tax, state law requires that the portion of the tax earmarked for the higher education scholarship fund equal $24 million annually. Under a "true-up" formula developed by the Nuclear Energy Institute (NEI) in cooperation with Chem-Nuclear and the waste generators, the waste generators pay retroactively approximately 75 percent of any shortfall in the target amount for the scholarship fund. Chem-Nuclear pays approximately 25 percent.

[58] Oral remarks provided by Eugene Eckhardt, Washington Utility and Transportation Commission, in a panel discussion on disposal facility economics during the August 2, 1999, meeting of the Task Force.

[59] In 1998, low-level radioactive waste buried at the Richland, Washington contained 1,656 curies of radioactivity.