Low-Level Radioactive Waste Disposal Options For Maine

Report of the Maine Low-Level Radioactive Waste Siting Commission

February 1984

LOW LEVEL
RADIOACTIVE WASTE DISPOSAL
OPTIONS FOR MAINE

Report of the Maine
LOW LEVEL RADIOACTIVE WASTE SITING COMMISSION
to the
GOVERNOR & THE LEGISLATURE
February, 1984

Sen. Judy C. Kany, Chair
Commr. Henry E. Warren, Vice Chair

SENATOR JUDY C. KANY
DISTRICT 18

State of Maine
Senate Chamber
Augusta, Maine 04333

February 7, 1984

Dear Members of the Legislature:

Enclosed is a copy of the most recent report of Maine's Low-Level Radioactive Waste Siting Commission. The Commission previously reported to the Governor and the Legislature in June of 1982 and updated that report in December of 1982.

The findings and recommendations of the Commission are presented to you under the requirement of law for periodic reports, (38 MRSA, Chapter 14-A, Subsection III) and because the Commission believes major policy decisions are most appropriately made by the Legislature. We hope you will approve of our findings and recommendations.

The Commission was formed by Maine Statute to recommend public policy for Maine under the federal mandate of the Low-Level Radioactive Waste Policy Act of 1980.

We had hoped to offer you both specific and final recommendations now, but national policy is in a state of flux. The Nuclear Regulatory Commission is investigating alternatives to shallow land burial facilities for low-level nuclear waste and the N.R.C. is in the process of developing amendments to its regulations which may be more appropriate for above ground engineered facilities. And those most involved in the low-level nuclear waste issue in Massachusetts and New York are considering recommending amending the existing Northeast Compact to make it more palable both to the large states and small volume states such as Maine.

Consequently, the Commission believes it is premature to make a final specific single recommendation which could exclude us from eligibility from a solution most desirable to most Maine citizens.

Please contact me or the other members of the Commission if you have any questions or if we can be of assistance to you or your constituents. More copies of either the entire report or only the recommendations which are contained on yellow pages are available.

Sincerely,

Judy

Senator Judy Kany
Chair, Low-Level Waste Commission

JK/hlm

Enclosure

LOW LEVEL RADIOACTIVE WASTE DISPOSAL

OPTIONS FOR MAINE

REPORT OF THE MAINE

LOW LEVEL RADIOACTIVE WASTE SITING COMMISSION

TO THE

GOVERNOR & THE LEGISLATURE

February, 1984

Commission Members:

Sen. Judy C. Kany, Chair
Commr. Henry E. Warren, DEP, Vice Chair
Sen. Samuel W. Collins, Jr.
Sen. Carroll E. Minkowsky
Rep. Donald M. Hall
Rep. James Mitchell
Rep. Laurence L. Kiesman
Walter Anderson, State Geologist
Donald Hoxie, Director of Health Engineering
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In addition to the work done by the Low-Level Radioactive Waste Commission members and staff, technical assistance for this study was provided to the Commission by:

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INTRODUCTION

The State of Maine along with the other 49 states has been given the responsibility by the U.S. Congress to provide for the safe disposal of the commercial low-level radioactive waste generated within its borders. The purpose of this report is to outline the efforts of the past two years of the Maine Low-Level Radioactive Waste Siting Commission toward that goal and to present the Commission's findings and recommendations.

As background it may be useful first to summarize how this became a problem and a Maine responsibility. Low-level radioactive waste is not a new waste, but a waste largely ignored until relatively recently. It has been generated in Maine since nuclear power, nuclear medicine, advanced medical and biological research, and industrial processes using radioactive devices came to Maine.

Maine's economy in recent years has generated 6,000 to 17,000 cubic feet of low-level radioactive waste (LLW) annually that has been and is presently being transported out-of-state to two of the three currently licensed, commercial disposal facilities. These are located in Barnwell, South Carolina and Hanford, Washington. The third facility is in Beatty, Nevada. In 1971 there

were six such shallow land burial disposal facilities. However, due to technical problems, sites in Kentucky, New York and Illinois discontinued operation. At the same time, the volume of LLW generated in the U.S. was increasing. By 1979, the three remaining sites were left to handle all of the nation's LLW, including Maine's. At one point in 1979, only the South Carolina site was receiving waste. The situation became critical and generators such as universities and medical facilities with limited storage capacity for their wastes were most threatened.

The Nevada and Washington sites reopened. However, the crisis nature of the problem was brought to the forefront nationally and in turn to the attention of the U.S. Congress.

On December 22, 1980, Congress enacted the Federal Low-Level Radioactive Waste Policy Act (P.L. 96-573) which made this waste disposal problem a state responsibility (See Appendix A). The law is clear and states "It is the policy of the Federal Government 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 . . ." Rather than the waste generator being responsible as is the usual case for industrial solid wastes, and hazardous wastes, the states are responsible.

It is the Federal law that also provides the dimensions of Maine's responsibility as well as giving guidance on what Congress saw as the most suitable means of dealing with the problem. These include:

1. Maine being responsible for all commercially generated LLW from within its borders. This may include wastes from Federal facilities.

2. Maine and other states may enter into contractual agreements or "compacts" to establish and operate regional disposal facilities.

3. Compacts must be reviewed and approved by Congress.

4. After January 1, 1986, regional disposal facilities operated under compacts may refuse to accept wastes from non-compact states.

After January 1, 1986, the Barnwell, South Carolina and Hanford, Washington disposal sites may not accept LLW from Maine. It is in this time-frame that Maine must make other arrangements for the management of its LLW.

Maine's low-level radioactive waste problem distilled to its essence is one of finding a disposal means that is safe and environmentally sound. As with other public safety and environmental problems, its resolution has inter-related technical and political dimensions. In recognition of this fact, the Maine Low-Level Radioactive Waste Siting Commission has undertaken a number of technical investigations to determine the range of feasible options for Maine managing its LLW. This report will: 1) outline the technical studies and

their findings; 2) summarize the public comments received; and 3) evaluate the 11-state Northeast Regional Compact and the availability of other institutional options, such as a northern New England compact (Maine, New Hampshire, and Vermont), Maine going it alone, a staged or phased response, or contracting with a disposal site elsewhere out-of-state. Since eligibility to join the Northeastern Compact in its present version ends June 30, 1984, emphasis will be placed on whether the State of Maine should join the 11-state, Northeast Regional Compact in its present form.

TECHNICAL INVESTIGATIONS

A number of technical studies have been undertaken to provide an information base for the Siting Commission's deliberations. Through the staff and technical working committee of the Council of Northeastern Governors (CONEG) considerable technical information already was developed and made available to the Siting Commission on the Northeast Compact. A similar technical information base had to be developed for the other options before objective comparisons could be made.

The following technical investigations have been undertaken following a work plan adopted by the Siting Commission in June, 1983:

1. A survey of all Maine LLW Generators and the estimation and characterization of the quantities of LLW generated in 1982.

2. A review of the licensing and siting requirements for a shallow land burial facility[1].

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[1] This is the only disposal technique formally recognized by specific regulations of the U.S. Nuclear Regulatory Commission (NRC).

3. A preliminary geological screening to find out whether there are suitable soils for shallow land burial in Maine.

4. A socio-economic screening study of the unorganized townships of the state.

5. The conceptual engineering of generic shallow land burial facilities and their costs for Maine's waste alone and for the Northern New England compact.

6. The projection of the financial costs to generators and electrical rate payers of a shallow land burial disposal facility serving Maine or northern New England.

7. A review and identification of alternative disposal technologies to the shallow land burial of LLW.

8. An investigation of the procedures for and the costs of properly transporting LLW.

The actual investigations were conducted by staff of the Department of Human Services' Radiological Unit, the Maine Geological Survey in the Department of Conservation, the State Planning Office, the Department of Environmental Protection's Bureau of Oil and Hazardous Materials, and the Office of Legislative Assistants.

In addition to Maine's own investigations, some technical information was also developed through the Siting Commission's participation in the ad hoc Northern New England (NNE) Compact Committee and by staff from the states of Vermont and New Hampshire. This has included the sharing of waste volume projections and current disposal and transportation cost data, and investigation into the feasiblity of shallow land burial and alternatives to shallow land burial to meet the disposal needs of Maine, New Hampshire and Vermont.

These technical studies have been complemented by public input and comments received at the Siting Commission's meetings. Additional public comments were received at the four meetings of the ad hoc NNE Compact Committee meetings held in Augusta, Maine, Concord, New Hampshire, and Montpelier, Vermont.

To understand the LLW problem first requires a full understanding of the waste itself. Low-level radioactive waste is waste that has become contaminated with radioactive elements called radionuclides. The Federal Low-Level Radioacitve Policy Act and NRC regulations define LLW by what it is not. It is radioactive waste that is not high level radioactive waste (i.e., spent nuclear power plant reactor fuel or wastes from the reprocessing of spent reactor fuel); transuranic waste[1] or uranium mine and mill tailings.

Typically, LLW contains shorter lived radionuclides than high level waste and has less radioactivity (measured in the unit of "curies") per unit of volume.

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[1]Waste contaminated with radionuclides with an atomic number greater than that of uranium (92). These radionuclides would include such elements as plutonium and usually remain radioactive for very long periods of time.

However, it is important to understand that LLW does contain some long lived radionuclides with a longer "half-life[1]." Small amounts of the overall LLW waste stream can also have higher levels of radioactivity.

Low-level radioactive waste (LLW) is a very heterogeneous waste stream, that comes in a variety of forms. These include contaminated paper towels, plastic gloves and other protective garments, machinery parts, animal carcasses, organic and aqueous liquids, reactor plant sludges and filter resins, and eventually the reactor at a nuclear power plant when it is decommissioned at the end of its useful life.

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[1]The half-life of a radionuclide is the time in which half the atoms of a particular radioactive substance disintegrates to anothe nuclear form. Each radionuclide has a unique half-life. Measured half-lives vary from millionths of a second to billions of years.

Waste Volume Estimates and Characterization

Maine's LLW stream, its quantities, its sources of generation, its make-up, and its radioactivity were investigated by a mail and telephone survey conducted by the Department of Human Services. The Low-Level Radioactive Waste Management Survey utilized a questionnaire developed by the Conference of Radiation Control Program Directors, Inc. It was mailed to all U.S. Nuclear Regulatory Commission (NRC) licensees in Maine. This questionnaire asked if firms generated LLW in 1982, if so how much, what radionuclides it contained, how radioactive it was, and where and how it was shipped for disposal. Firms were also asked to project their future waste disposal needs until 1987.

Receiving a 100 percent response, eight (8) commercial generators of LLW were identified.[1] These generators included the Maine Yankee Atomic Power Company, Mount Desert Biological Research Laboratory, Jackson Laboratory, Atlantic Antibodies, Ventrex, the Foundation for Blood Research, Bowdoin College, and the University of Maine at Orono. A ninth generator of LLW, not licensed by the NRC, is the Portsmouth-Kittery Naval Shipyard's Nuclear Propulsion Program. Whether the State of Maine will ultimately be responsible for this defense program's waste is uncertain at this time.

Most users of radioactive materials and devices in Maine do not generate LLW which requires disposal. Partly in response to the 1979 crisis, Maine hospitals have eliminated their LLW requiring disposal. Hospitals

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[1]Includes firms and institutions that generated LLW and shipped it directly or through a brokage firm for disposal in 1982, or would generate in the future requiring disposal.

utilizing radioisotopes and having nuclear medicine departments, use relatively short-lived radioactive materials and store the resultant wastes on-site in special storage areas until the materials have decayed to safe "de minimus" levels established by the NRC that are near background levels. These wastes can be disposed of in a municipal sanitary landfill. Another radioactive waste not a part of the LLW that the state presently needs to be concerned about is the sealed sources, radioactive devices and equipment components used in radio-therapy and by Maine industry. After their useful life these devices are returned to the out-of-state manufacturers who in turn are responsible for their disposal. Five Maine firms shipped such radioactive devices back to the manufacturer in 1982.

The LLW Management Survey results show that in 1982 Maine generated 9,119 cubic feet of LLW which was shipped to the Barnwell, South Carolina, and Hanford, Washington disposal facilities. Table 1 presents a summary of the volumes, sources, and radioactivity of Maine's LLW for that year. Eighty-five (85) percent of the waste volume was generated by Maine Yankee and 11 percent by the Portsmouth-Kittery Naval Shipyard. The remaining four percent can be attributed to Maine's research laboratories. The largest source of radioactivity in Maine's LLW stream is also Maine Yankee, accounting for 96 percent of the total. In the next several years the total volume of LLW is expected to decline. Based on projections by Maine generators, the survey estimated waste volumes to decrease from 9,119 cubic feet in 1982 to 5,293 cubic feet in 1987. Most of this projected change would result from anticipated volume reductions by Maine Yankee. By 1987 Maine Yankee hopes through recycling and better waste compaction to reduce its LLW volume to 4,000 cubic feet.

TABLE 1
LOW-LEVEL RADIOACTIVE WASTE GENERATED IN MAINE
AND SENT TO A DISPOSAL FACILITY IN 1982

GENERATOR	VOLUME		RADIOACTIVITY	
	CUBIC FEET	PERCENT OF TOTAL	CURIES	PERCENT OF TOTAL
Maine Yankee[a]	7,786	85	30.05[c]	96
Portsmouth-Kittery Naval Shipyard[b]	1,000	11	1	3
Research Labs[a]	333	4	0.24	1
TOTALS	9,119	100	31.3	100

[a] 1982 figures from the Department of Human Services' LLW Management Survey.

[b] Approximate five year average.

[c] This may not be a typical annual radioactivity. The activity of LLW shipped from Maine Yankee was 4805 and 1666 Curies in 1980 and 1981, respectively.

Although no specific study has been undertaken to project LLW volumes beyond 1987 and over a 20 or 25 year planning period, it is expected annual volumes will not increase significantly over current levels and are not likely to return to the historic annual 15,000 cubic foot volume level. To what degree volumes can be reduced is unclear.

Maine's LLW is heterogenous in nature as shown in Table 2. On a volume basis it consists predominately of compacted trash and miscellaneous solids (approximately 60 percent). A substantial portion (28 percent) is made up of solidified evaporator bottoms from Maine Yankee. However, it also includes smaller volumes of absorbed liquids, scintillation vials and liquids, laboratory and biological wastes, animal carcasses, and ion exchange resins. The radionuclides found in Maine's waste include short lived radioisotopes like Iodine 131 and 125 which have half lives in the order of days, as well as such longer lived isotopes as Carbon-14 and Chlorine-36 with half-lives, respectively of 5,700 and 300,000 years. These long lived isotopes, fortunately, are found in minute quantities and are of low radioactivity. It is important to look at the longevity of the isotopes that are in the wastes, contributing the majority of the radioactivity, both in absolute and relative terms. Maine Yankee's waste contains Cobalt-58 and 60 and Cesium-137. These three isotopes accounted for 30 Curies in 1982, 96 percent of the total radioactivity. Cesium-137 has the longest half-life of the three, 33 years. Using a crude rule-of-thumb that an isotope in the quantities present in LLW will decay to background level in a time period 10 times its half-life, Cesium-137 would need to be safely managed for over three hundred thirty years. Most of Maine Yankee's LLW's radioactivity comes from the solidified evaporator bottoms and resins versus their compacted trash. It should be noted that in 1980 and 1981 Maine Yankee's

TABLE 2
CHARACTERIZATION OF LOW-LEVEL RADIOACTIVE WASTES
DISPOSED OF IN 1982 BY MAINE FIRMS[a]

GENERATORS NAME	TOTAL VOLUME DISPOSED CUBIC FEET[c]	WASTE FORM/VOLUME BREAKDOWN CUBIC FEET	RADIOISOTOPES PRESENT SPECIES	RADIOACTIVITY (CURIES)	HALF LIFE (YEARS)
Maine Yankee Atomic Power Co.	7,786	Compacted Trash/5264	Co-58	12.02	0.20
		Solidified Evaporator Bottoms and Resins/2522	Co-60	10.52	5.25
			Cs-137	7.51	33.00
Portsmouth Naval Shipyard[b]	1,000	Trash and Ion Exchange Resins/1000	Co-60	1	5.25
Mount Desert Laboratory	170	Animal Carcasses/35	C-14	0.0045	5,770
		Absorbed Liquids/40	H-3	0.029	12.26
		Lab or Biological Waste/140	I-125	0.0001	0.16
		Scintillation Liquid/50	Na-22		2.58
			S-35		0.24
			Cl-36	0.0045	300,000
			I-131		0.02
Jackson Laboratory	141	Lab or Biological Waste/140	C-14	0.0045	5,770
		Sealed Source/1	H-3	0.105	12.26
			I-125	0.010	0.16
Atlantic Antibodies	22	Compact Trash/15 Absorbed Liquids/7	I-125	0.074	0.16
TOTALS	9,119	--- --- ---	---	31.29	---

a Based on results of the 1983 Low-Level Radioactive Waste Management Survey by the Maine Department of Human Services.

b Five year annual average provided by Portsmouth Naval Shipyard.

c Low-Level Radioactive Waste generated and sent either directly or by way of a broker to a disposal facility.

LLW was of a significantly higher radioactivity, 4805 and 1666 Curies, respectively.

To place Maine's LLW stream in perspective it may be helpful to make some comparisons. The 11 northeastern states were estimated by CONEG to generate approximately 1.1 million cubic feet of LLW in 1982. Maine's 9,119 cubic feet is slightly less than one percent of the 11 state total. The information is not currently available to make a similar comparison on the basis of the radioactivity generated.

Based on the 1982 CONEG volume estimates, the three northern New England states produce about 40,000 cubic feet per year. Currently New Hampshire generates the least amount of LLW of the three states (12,000 cubic feet) with Maine's and Vermont's volumes fairly comparable, 15,000 and 16,000 cubic feet, respectively[1]. Extrapolating the CONEG estimates it appears Maine, New Hampshire and Vermont will be generating about 60,000 cubic feet annually (by the late 1980's). The increase is based largely on the assumption that both Seabrook I and II nuclear power plant will go into operation and will generate LLW. Northern New England's LLW would represent approximately five percent of the 11 northeastern state's total volume.

One last and extremely significant consideration in determining how much LLW Maine must provide for in the near future is the decommissioning of the Maine

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[1] Note that CONEG's estimate of 15,000 cubic feet for Maine is based on historical data and is less than the 9119 cubic feet of LLW shipped in 1982.

Yankee Atomic Power Plant. Early estimates were that the decommissioning of the reactor and irradiated components would generate about 500,000 cubic feet of LLW if upon the expiration of Maine Yankee's operating license from the NRC in the year 2008 the reactor facility is disassembled over a several year period of time[1]. This would constitute about two-thirds of the LLW generated in Maine from the late 1980's up until 2008. Although the above scenario is the most likely, it should be pointed out that there is some uncertainty as to when and how Maine Yankee would be decommissioned. Maine Yankee may refurbish the plant and renew its license. It could be decommissioned prior to license expiration. The reactor could be entombed generating little or no waste requiring disposal. Decommissioning could also be delayed for a time period following shut down to allow for the radioactive decay of some of the reactor's components.

In discussing the quantities of LLW generated by the three northern New England states it should not be ignored that Vermont Yankee's operating license expires in 2007, one year prior to Maine Yankee's. Many of the same uncertainties concerning the manner and timing of decommissioning exist as they do with the decommissioning of Maine Yankee. We have estimated the decommissioning of Vermont Yankee would generate in the order of 420,000 cubic feet of LLW.

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[1] A recent re-evaluation by Maine Yankee projects 209,000 cubic feet of decommissioning waste, based upon current volume reduction methods.

Licensing and Siting Requirements for a Shallow Land Burial Facility

The licensing of a LLW disposal facility requires Federal and State approvals. Local review may also be required. The licensing requirements and the siting process for a shallow land burial facility are predominantly determined by regulations of the U.S. Nuclear Regulatory Commission (10 CFR Part 61) (See Appendix B). Under these regulations a portion of the NRC's licensing authority under 10 CFR Part 61 may be delegated to a state through an agreement between the Governor and the NRC. Maine has no such agreement and therefore all licensing authority under 10 CFR Part 61 remains with the NRC.

The NRC regulations for licensing a land disposal facility emphasizes isolation of the radioactive waste. The following performance objectives of 10 CFR Part 61 must be met:

1. Concentrations of radioactive materials which may be released to the general environment in groundwater, surface water, air, soil, plants, or animals must not result in exposures to humans above specified safe dosages.

2. Buried LLW is to be isolated from accidental human intervention or contact after the site is no longer actively maintained (after the "active institutional control period").

3. Operations will be conducted to keep worker exposure levels within safe, established limits and as low as is reasonably achievable.

4. The disposal facility must be sited, designed, operated and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for on-going active maintenance following closure so that only surveillance, environmental monitoring, and minor custodial care are necessary.

To meet the above objectives, 10 CFR Part 61 outlines a number of technical criteria to be followed in the selection of a site for the shallow land burial of LLW. The most applicable criteria to Maine are:

1. The disposal site shall be capable of being characterized, modeled, analyzed, and monitored.

2. Within the region or state where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the above performance objectives.

3. The disposal site must be generally well drained and free of areas of flooding (100 year flood plain) or ponding.

4. Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate disposal trenches.

5. The disposal site must provide sufficient depth to the water table so that groundwater intrusion, perennial or otherwise, into the waste will not occur. The NRC will consider an exception to this requirement to allow disposal below the water table in the zone of saturation if it can be

conclusively shown that site characteristics are such that the predominant means of radionuclide movement will be molecular diffusion (versus transport with the flow of ground water) so that the rate of movement will be sufficiently slow for the performance objectives to be met.

6. The hydrogeological unit used for disposal shall not discharge ground water to the surface within the disposal site.

7. Areas of seismic activity and other geological processes such as erosion, slumping, landsliding or weathering do not occur to an extent that would mean failure to meet the performance standards or would preclude defensible modeling and prediction of long-term impacts.

Although all these criteria are important, in terms of being able to find an approvable land burial site in Maine, the exception allowing disposal below the ground water table is especially critical in light of the State's generally high water table. The technical criteria of 10 CFR Part 61 were a major consideration in the development of the geological and socio-economic screening studies described later in this report.

Because of the longevity of LLW, 10 CFR Part 61 requires certain financial assurances over the life of the facility. The purpose is to guarantee that a financially solvent party will properly site, operate, close, and maintain the disposal facility for at least 100 years after closure. One of these assurances is that the State or the Federal government must own the land and the facility. The operation may be private (by lease, contract, etc.) or public. This life cycle is shown in Figure 1.

In addition to Federal licensing, a LLW disposal facility will require the approval of the Maine Board of Environmental Protection (BEP) under Title 38, Chapter 14-A, Subchapter III (See Appendix C). If approved by the BEP, the facility must go before the Legislature for approval. The BEP must be given notice one year prior to the filing of the facility's application. If the disposal site is to be located in an organized municipality, the local legislative body (town meeting or council) of that town will appoint four persons to serve as voting members of the BEP during the consideration of the application. If located in an unorganized township or a plantation, the county commissioners will make the appointments and approval of the Maine Land Use Regulatory Commission may also be needed. This may include requesting a land use zone change.

FIGURE 1

FLOW CHART OF PROJECTED LIFE CYCLE SITING,

LICENSING, OPERATING, AND INSTITUTIONAL CONTROL PHASES

ASSESSMENT OF NEEDS AND REQUIRED APPROACH	1-2 years
SITE SCREENING & SELECTION	
SITE CHARACTERIZATION & DESIGN	2 years
LICENSING ACTIVITIES FEDERAL STATE	2 years
SITE CONSTRUCTION & SITE OPERATION	1-25 years
SITE CLOSURE & MAINTENANCE	1-2 years
OBSERVATION & MAINTENANCE	5-15 years
ACTIVE INSTITUTIONAL CONTROL PERIOD	100 years
(NRC Terminates License) PASSIVE INSTITUTIONAL CONTROL PERIOD	300 years

Geological Investigations

Before being able to decide whether a shallow land burial facility could be established in Maine, it must first be determined whether the proper geological setting for such a disposal facility exists within the State. The U.S. Nuclear Regulatory Commission has provided technical critieria (10 CFR Part 61) to use in evaluating the suitability of sites for the development of a shallow land burial facility. Several preliminary screening studies have been conducted by the Maine Geological Survey, making use of these criteria to determine whether suitable areas exist.

The general geologic setting of Maine is similar to other northeastern States. It is a glaciated terrane with relatively shallow (10-200 feet thick) deposits of heterogeneous glacial and glaciomarine deposits overlying crystalline rock with very low ground water permeability[1]. As a result, the water table in Maine is going to be high, and disposal of low-level radioactive waste in the unsaturated zone (as recommended in 10 CFR Part 61) is not, in general, going to be possible. Disposal below the water table is likely for a shallow land burial facility. Because of this, materials considered for a low-level waste facility must have very low ground water permeabilities, have long ground water travel times, and it must be possible to demonstrate that radionuclide migration, if it occurs, will occur predominately by molecular diffusion and not by mass transport along with ground water. Consideration of 10 CFR Part 61 led to the selection of two materials in Maine that are believed to be suitable

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[1] The Northeast states exclusive of New England have two geological settings which contain relatively thick surficial sedimentary cover: (1) glaciated and (2) coastal plain terrains. New England has no coastal plain sediments and glaciated sediments are thinner than the rest of the northern Appalachians.

soil types for a shallow land burial facility: glacial marine silts and clays and basal (or lodgement) till. Because of the relatively thin glacial sediment veneer in Maine, coupled with the humid climate, additional engineering criteria beyond those of 10 CFR Part 61 may be required for shallow land burial in Maine.

The marine silts and clays are composed of very fine grained materials with a very low intrinsic permeability which were deposited on the ocean floor as the glaciers retreated from Maine and prior to the crustal rebound which produced our present coastline. These deposits potentially have a high capacity to retard the diffusive transport of radionuclides. These silts and clays are relatively homogeneous, but lenses and beds of coarser material may be interstratified with the clay.

Basal till is a much more heterogeneous material formed by the scraping and compacting action of an ice sheet at the base of an active glacier. The material in a basal till has a wide variety of grain sizes ranging from clay sized to large stones, but the important feature of basal tills is that the matrix of the till is dense and clay rich, and therefore basal till has a permeability and sorptive capacity similar to the marine silt and clay deposits.

The two preliminary screening studies done by the Maine Geological Survey were undertaken in order to provide the Siting Commission with information it might need in order to choose among options available to the State. Neither of the studies was undertaken with the intent of locating a waste disposal site. This decision can only be made with detailed, site-specific data which is not available at this time and will be both costly and time-consuming to collect. These two studies have indicated, however, that there is a likelihood of acceptable sites meeting NRC technical requirements existing within Maine.

The marine clay study first compiled maps of known deposits of marine silt and clay, and eliminated those areas which were determined to be unsuitable based on technical criteria in 10 CFR Part 61. These criteria were: 1) location of the 100-year floodplain, 2) areas with less than 50 feet of overburden, 3) location of high yield sand and gravel aquifers, and 4) location of zones of high yield bedrock wells. After elimination of these unsuitable areas numerous sizable areas of marine silt and clay (called the Presumpscot Formation) remained. These are restricted to the southern third of the State (the only area the Presumpscot Formation was deposited). As a result, many of these potentially suitable areas are close to Maine's population and tourism centers (See Appendix D).

Deposits of basal till are not restricted to any one portion of the state, and the Commission asked the Maine Geological Survey to conduct a similar study to locate areas of potentially suitable basal till in the unorganized townships. This study was conducted by Robert G. Gerber, Inc., Consulting Engineers and Geologists, of South Harpswell, Maine, under the direction of the Maine Geological Survey. It was accompanied by a socio-economic screening study completed by the State Planning Office and discussed later.

Because of the lack of surficial geologic information and other information necessary to conduct a screening study similar to that done for marine clay, the basal till study was designed to locate areas with a high probability of containing thick sections of basal till. The study used existing geologic information combined with interpretation of topographic maps and aerial photographs to identify landforms characteristic of sections of basal till. Limited field checks were done to verify the criteria used in the map and air

photo analysis. Twenty-three (23) potential localities were located and divided into 4 groups based on the overall likelihood of containing thick sections of basal till (See Appendix E). Six localities were placed in the highest rank group.

Socio-Economic Screening Study

The purpose of this mapping study was to screen out those areas of the unorganized townships considered unsuitable for a shallow land burial site based on a number of social, economic and environmental criteria. A similar screening has not been done in the marine clay areas. Factors used in this first phase of this screening process to eliminate unsuitable areas were developed by the State Planning Office and the Department of Environmental Protection and approved by the Siting Commission. Areas eliminated included:

1. Areas with a population density greater than 100 households per square mile;

2. Areas having a density greater than 200 seasonal housing units per square mile;

3. Areas of high potential future residential, commercial, and industrial development;

4. State parks, wilderness areas, and areas within two miles of State parks and wilderness areas;

5. Areas within two miles of water bodies having an area greater than 200 acres;

6. Areas within five miles of the Canadian border;

7. Areas within 1,000 feet of Interstate 95, and U.S. Routes 1, 2, 201, and State routes 2, 6, 9, 11, 15, 27 and 201;

8. Areas farther than 25 miles from a major public or private road; and

9. Areas of prime farmland as defined by the U.S. Department of Agriculture.

These factors were mapped and overlaid on the mapped basal till localities mapped by the geological investigation. Six (6) of the previously identified basal till areas were thus determined to be unsuitable. Eighteen (18) basal till areas remained including six (6) in the highest geological rating group (See Appendix E).

A second screening phase using more detailed criteria is continuing. Screening factors that will be used in the second cut include:

1. Critical natural areas as identified by the State Planning Office;

2. Potential archeological sites as identified by the Maine State Museum;

3. Important recreational areas lacking formal state status (e.g., the Appalachian Trail);

4. Areas within two miles of schools, hospitals, or nursing homes; and

5. Deer wintering areas.

Areas not eliminated by the socio-economic screening study once completed, would be left for further study sometime in the future if necessary.

Design and Costing of a Generic Shallow Land Burial Disposal Facility

To assess the economic feasbility of a small shallow land burial disposal facility to serve Maine alone or a Maine-New Hampshire-Vermont compact, preliminary engineering designs were prepared by the Department of Environmental Protection (DEP). From these designs, DEP developed cost information.

A shallow land burial facility for LLW, in very general terms involves the disposal of steel drums and other types of containers of LLW in a series of trenches 20 to 30 feet deep and 100 to 300 feet in length. The bottom of a trench would be sloped slightly to a sump at its lowest end and is lined with permeable sand or gravel to allow for drainage. This allows for the testing of any water that may enter the trench and come into contact with waste. LLW containers are placed in the trench by a crane or heavy equipment. The waste is then covered with sand to fill the spaces between the waste containers and to minimize settling. Once a trench is filled in this manner, an impermeable clay cap is placed over the trench and graded to encourage runoff and minimize the infiltration of precipitation into the trench. Access to the facility is closely restricted by security fencing and 24-hour surveillance during its operational life. Once all of a facility's trenches are filled and covered, the site is closed.

As a cautionary note, it should be remembered that these are generic designs. Without a specific site in mind and with other uncertainties a number of assumptions had to be made in turn, making it difficult to develop accurate and precise cost estimates.

Generic facility designs and cost estimates are being developed for four scenarios:

1. Scenario I - a facility to receive 7,500 cubic feet per year of LLW and the decommmissioning wastes from Maine Yankee.

2. Scenario II - a facility to receive 15,000 cubic feet per year of LLW and the decommissioning wastes from Maine Yankee.

3. Scenario III - a facility to receive 30,000 cubic feet per year of LLW and the decommissioning wastes from the Maine Yankee and Vermont Yankee Atomic Power Plants.

4. Scenario IV - a facility to receive 60,000 cubic feet per year of LLW and the decommissioning wastes from the Maine Yankee and Vermont Yankee Atomic Power Plants.

Scenarios I and II would represent a Maine only facility while scenarios III and IV represent a three-state northern New England Compact facility serving Maine, New Hampshire and Vermont. Preliminary generic facility designs have been completed. These are undergoing a number of refinements based on peer review comments and the results of additional investigations by DEP. These are targeted at further minimizing the potential for ground or surface water contamination, maximizing the environmental soundness of the design, and insuring that such a design would meet the licensing criteria of the NRC outlined in 10 CFR Part 61.

Based on these designs, preliminary costs have been developed for all phases of the life of such a facility, including:

1. Pre-operational costs (site selection, environmental assessment and report, NRC licensing);

2. Site development costs (land, roads, buildings, security, utilities, capital equipment);

3. Annual operation (salaries, trench excavation, environmental monitoring, supplies, administration);

4. Site closure costs (building removal, site restoration, closure fund); and

5. Post closure costs (repairs, long-term environmental monitoring, inspections, third party liability insurance)[1].

In each case it was assumed the shallow land burial facility would be publicly owned and operated. The operation for most of its life would be part-time, receiving wastes only during the summer months to reduce the risk of water management problems and to reduce operational costs. According to the LLW Management Survey, Maine generators would be able to store their LLW on their sites for at least one year if necessary.

As previously indicated, final cost estimates are not yet available but preliminary estimates are. These estimates will change and care should be taken in their use.

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[1] NRC regulations require continued monitoring and care of any facility for at least 100 years after it ceases receiving LLW.

Preliminary estimates indicate that the upfront cost (pre-operational plus site development) for a disposal facility to serve only the needs of Maine LLW generators would be in the order of $5.4 million. For a northern New England compact shallow land burial disposal facility the cost would be in the area of $5.7 million[1]. In all four scenarios it is the pre-operational costs which dominate the overall capital outlays required. The capital costs are not especially sensitive to volume of LLW, thus it costs relatively little more to develop a three state site than a Maine-only site. This also appears to be the case with annual operating expenses as long as the operation under all four scenarios remains part-time. It should be noted that a major portion of the pre-operational cost would be the intensive geological and other investigations of a site to determine its suitability for shallow land burial under NRC licensing criteria. If such studies show a specific site not to be suitable, resulting in multiple sites having to be intensely studied, the pre-operational and therefore the total up-front cost would increase dramatically.

During the first 20 years of operation the facility would be operating part-time (summer months only) and only receiving the normal operation wastes from LLW generators. Total 20 year operating costs are estimated to vary from $9.9 to $12.5 million for the smallest and largest facility scenarios, respectively. In the last five years of the site's life, the operation would have to become full-time to handle the large volume of decommissioning wastes expected during those years. Annual operating costs increase accordingly. For the Maine only option, the total cost of operation for the five years while receiving the decommissioning wastes from Maine Yankee will be in the

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[1] All cost estimates are in 1983 dollars except where noted.

order of $4.6 million. For a Maine-New Hampshire-Vermont facility the operating costs for the five years costs while receiving decommissioning wastes from Maine Yankee and Vermont Yankee will be about $7.4 million.

Another major capital cost is incurred when the shallow land burial facility is closed after operations stop. This may include such preventive measures as capping the site with an impermeable cover and diverting lateral ground water movement around the site. Such closure techniques are more sophisticated and conservative than those in use at existing sites or proposed in most other similar studies of shallow land burial. Early estimates of the total closure costs range from $3.2 to $5.5 million, depending on the size of the site (a small Maine-only versus a larger three state facility).

After the facility is closed, NRC regulations require that it be actively monitored for 100 years. During this post-closure institutional care period, there will be operating costs for long-term environmental monitoring, repairs, and site inspections. These annual post closure costs total $9.3 to $9.6 million over the 100 year post-closure care period depending on the scenario.

Financial Projections of the Cost of Shallow Land Burial to Waste Generators and Electrical Rate Payers

The purpose of the financial analysis is to assess the economic feasibility of Maine either going it alone or joining a small compact with New Hampshire and Vermont. The analysis was begun with the prior knowledge that small sites are inherently expensive. Hence the issue really becomes are small sites prohibitively expensive, and this ultimately becomes a question involving more than economics.

Good cost estimates are very hard to come by primarily because of the many uncertainties. Many assumptions have to be made, some extending well over 100 years into the future. Among the unknowns are the future inflation rate, interest rates, waste volumes, technology, NRC regulations and the problems that would be encountered in site selection and licensing. Moreover, the scenarios chosen for investigation assume the site would be operated part-time and would be located in Maine soils below the water table. However, there just isn't any directly comparable prior experience to draw upon. Finally, a Maine site would be so small it would be unlike any other site that has been studied. Another consequence of small waste volume is that any major new expense impacts heavily upon unit cost, (i.e., the generator charge is very sensitive to changing cost assumptions).

Nevertheless, estimates of cost are needed. The numbers in Table 3 while imperfect reflect the best available estimates as of January 1984, and are based on facility cost data developed by the Maine Department of Environmental Protection and State Planning Office utilizing the U.S. Department of Energy's

National Low-Level Waste Management Program's economic model[1] for the actual calculations.

Table 4 summarizes what Maine Yankee has actually paid for waste disposal in the recent past. As such the data provides a basis against which to compare the cost of any of Maine's disposal alternatives.

An important question is what would be the impact upon Maine families and businesses of the alternative generator charge listed in Table 3. Table 5 tries to address this question by estimating what would happen to the monthly bill of "typical" Maine Yankee customers if the cost to Maine Yankee for transportation and burial of LLW were to increase sharply. For example, an increase from $30 to $150 per cubic foot would increase an average 500 kWhr residential bill by three cents per month, or a 700 megawatt hour industrial bill by about $100 per month.

Care must be taken where interpreting the estimates. In the first place they are expressed in constant 1983 dollars and must be adjusted to get future costs in current dollars, if it is assumed that inflation will continue.

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[1] The National Low-Level Waste Management Program is funded by the Department of Energy (DOE) and located at DOE's Idaho National Engineering Laboratory. EG&G, Inc. is the contractor that operates the laboratory for the government. The financial model (as revised in 1983) was reviewed by the Maine State Planning Office and found generally to be adequate.

TABLE 3
PRELIMINARY COST ESTIMATES FOR SHALLOW
LAND BURIAL OF LOW LEVEL WASTE[a]

Maine Yankee's Experience/Cost of a Large Site (Current $)

Date	Average Burial Charge ($/cu ft)	Annual Burial Cost ($000)
1980	10	158
1981	11	157
1982	15	116
1983	21	248

Maine Only without Decommissioning Wastes (1983 $)

Annual Waste Volume (cu ft/year)	Generator Charge ($/cu ft)	Annual Site Cost ($000)
7,500	153	1,148
15,000	80	1,200

Northern New England without Decommissioning Wastes (1983$)

Annual Waste Volume (cu ft/year)	Generator Charge ($/cu ft)	Maine's 1/3 Share of Annual Site Cost ($000)
30,000	44	440
60,000	24	480

Maine Only with 500,000 cu ft of Decommissioning Wastes (1983 $)

Annual Waste Volume Prior to Decommissioning (cu ft/year)	Generator Charge ($/cu ft)	Annual Site Cost Prior to Decommissioning ($000)
7,500	73	548
15,000	54	810

Northern New England with 920,000 cu ft of Decommissioning Wastes (1983 $)

Annual Waste Volume Prior to Decommissioning (cu ft/year)	Generator Charge ($/cu ft)	Maine's 1/3 Share of Annual Site Cost Prior to Decommissioning ($000)
30,000	30	300
60,000	21	420

[a] Preliminary estimates, still under review. Final estimates will be included in a forthcoming technical report.

TABLE 4

MAINE YANKEE'S COST OF LOW-LEVEL WASTE

DISPOSAL 1980 - 1983

(Current Dollars)

YEAR	WASTE VOLUME (CU FT)	ANNUAL BURIAL COST ($)	ANNUAL TRANS. COST ($)	ANNUAL STATE SURCHARGE ($)	ANNUAL PROCESSING COST ($)	ANNUAL TOTAL COST ($)
1980	16,215	158,336	374,548	0	167,930	700,814
1981	14,643	157,318	313,820	3,393	31,112	505,642
1982	7,785	116,039	114,379	7,786	219,764	457,950
1983	11,922	248,220	130,240	78,832	240,306	697,598

YEAR	AVERAGE BURIAL COST ($/CU FT)	AVERAGE TRANS. COST ($/CU FT)	AVERAGE STATE SURCHARGE ($/CU FT)	AVERAGE PROCESSING COST ($/CU FT)	AVERAGE TOTAL COST ($/CU FT)
1980	9.76	23.10	0	10.36	43.22
1981	10.74	21.43	.23	2.12	34.53
1982	14.91	14.69	1.00	28.23	58.82
1983	20.82	10.92	6.61	20.16	58.52

TABLE 5

THE IMPACT OF INCREASED LLW COSTS
UPON TYPICAL MONTHLY ELECTRIC BILLS[a]

SCENARIO	COST OF LLW DISPOSAL & TRANSPORTATION	TYPICAL CUSTOMER: RESIDENTIAL	COMMERCIAL	INDUSTRIAL	
		500 KWH	5 MWH	700 MWH	20000 MWH
		AVERAGE MONTHLY BILL			
Present[b]	$30/cu.ft.	$37	$410	$37000	$925000
Maine-Only[c]	$80-150	1-3¢	13-31¢	$28-67	$187-448
Northern New England (3-State)[c]	$25-50	0-1¢	0-8¢	$0-17	$0-112
Northeast (11-State)	$25	-	-	-	-

[a] Assumes an annual low level waste disposal requirement of 7500 cubic feet and annual electric generation of 4.8 billion kwhr.

[b] Approximate current cost in CMP service area. Does not include the $10 per cubic foot State of Maine Surcharge, or the cost of processing.

[c] Range depends on total site volume, and whether decommissioning waste is anticipated or not. Transportation assumed to drop to about half the present $11 per cubic foot.

SOURCE: Maine Yankee Atomic Power Company

The four decommissioning scenarios present a special cash flow problem. The prices are calculated to just pay for the sites over the entire 25 years operating lifetime. As a result the facility would have negative cash flows for the first 20 years, and positive cash flows only in years 21 to 25 when the decommissioning wastes are received. For example, for a 15,000 cubic foot facility, the cumulative negative total cash flow would reach $13 million in year 21, although the break-even point would finally be reached in year 25. A funding mechanism would be needed to solve this uneven cash flow problem.

Finally, the model used to estimate the generator charge ignore the effect of price upon volume. It makes no provision for waste generators to respond to increasing burial costs by reducing waste volume. For a small shallow land burial facility, the annual site cost would not decrease much despite the reduced volume, so the generator charge per cubic foot would have to be higher.

Alternative Methods of Disposal

Although shallow land burial is the only long-term means of LLW disposal currently in use in the U.S., there are alternative technologies. These include such methods as ocean dumping, mined cavities, bore holes, and above ground and below ground engineered structures. Based on initial investigations by the Department of Environmental Protection and a review of the technical literature evaluating these alternatives, it was decided to study the feasibility and costs of an above ground engineered structure further.

Engineered structures overcome a number of the disadvantages of shallow land burial in a humid climate such as Maine's with a high ground water table and a glacial geology. An above ground engineered structure would be a concrete bunker or some other similar structure providing adequate mass for shielding and containing the radionuclides within the structure. Wastes would be placed in such a structure to remain for a period of three to five hundred years to decay. Siting such a structure would have fewer geological restrictions, thereby opening the possibility of having a disposal facility on-site or in close proximity to Maine Yankee, Maine's major LLW generator. The wastes would be monitored and could be retrieved for repackaging if necessary.

Focussing on above ground engineered structures, the Department has been investigating the experience in North America with engineered structures for temporary (i.e. 5-50 years) storage of LLW and trying to adapt it to long-term disposal. Ontario Hydroelectric of Toronto, Canada, is currently using above and below ground engineered structures for temporary storage of wastes for 50 years.

Within the U.S., the Tennessee Valley Authority (TVA) has constructed above ground engineered structures for the temporary storage of their LLW. To grossly oversimplify the TVA design would be to describe it as a concrete shoe box where wastes are moved into the structure by an overhead crane, lifting the lid and lowering the wastes. These are constructed in cells and offer greater protection to operating personnel than other types of structures. Believing that the basic TVA design has merit worth further investigation, the Department of Environmental Protection is currently re-engineering it for Maine and for a capacity to accommodate the LLW volumes generated by Maine. Capital and operational costs will be estimated and generator charges ($/cubic foot) computed using the National Low-Level Waste Management Program's model as is being done for the generic shallow land burial facility. It is anticipated the per unit volume cost of the engineered structure will be higher than for land burial.

As with a shallow land burial facility for LLW disposal, an engineered structure would require NRC approval and licensing. Unlike land burial, the NRC has not promulgated regulations and performance guidelines specifically for this disposal technology. Because of increasing interest by a number of states in exploring alternatives to shallow land burial and the anticipation of such alternatives being proposed for licensing in the next two years, the NRC is in the process of establishing uniform criteria by which these facilities could be evaluated. The first step in this process was to determine which alternatives would be included and what parts of 10 CFR Part 61 were applicable. Five alternative disposal methods are to be included in the NRC evaluation: mine cavities, above-ground engineered vaults (i.e. above ground engineered structures), below-ground engineered vaults, augered holes, and concrete mound

bunkers. NRC guidelines for licensing alternative LLW disposal methods are expected to be available in the next year. If today a state applied to the NRC for an engineered structure, the NRC has said it would evaluate that application on its own merits, on a case-by-case basis and using what part might be applicable of 10 CFR Part 61 and its other regulations.

The licensing of an above ground engineered structure or some other alternative LLW disposal facility would also require State approval by the Board of Environmental Protection.

Transportation Studies

Investigations into LLW transportation have concentrated on the procedures used and estimating the costs of transportation. The Department of Environmental Protection has reviewed in detail the regulatory framework which outlines the transportation of LLW. The State Planning Office is currently studying the costs of transporting LLW.

The packaging and transportation procedures for LLW in use in Maine and nationwide are primarily controlled by the parameters established by the U.S. Department of Transportation (DOT) and the NRC. Under the Hazardous Materials Transportation Act of 1975 (P.L. 93-633), DOT was given the authority by the U.S. Congress to establish standards on any safety aspect of the transport of hazardous materials. Low-level radioactive waste is considered a hazardous material along with other radioactive materials for the purposes of this law and DOT regulations. The Atomic Energy Act of 1954 (P.L. 83-703) and the Energy Reorganization Act of 1974, granted the NRC the authority to regulate the receipt, possession, use, and transfer of radioactive materials.

This obviously presented a possibility for overlapping and conflicting regulations. DOT and NRC have attempted to prevent such problems by defining the responsibility of each in the area of radioactive materials transport in a memorandum of understanding dated June 8, 1979. DOT has responsibility for packaging and shipping standards for certain LLW, and the general requirements for labelling, handling, placarding, loading, unloading and routing of radioactive materials equipment. NRC has limited its standards to the packaging and containment of some higher concentration radioactive materials. These would include large quantities of LLW, special nuclear materials, and spent nuclear fuel (high level waste).

The DOT and NRC regulations only apply to radioactive materials which contain more than 0.002 microcuries per gram. A number of other categories of low-level materials are also exempted from NRC regulations. The NRC regulations have further attempted to limit conflict and overlap with DOT regulations by adopting by reference portions of the DOT regulation (e.g., labelling, placarding, accident reporting, shipping papers).

Packaging requirements are the cornerstone of the Federal transportation regulations that apply to LLW. It is the packaging that is primarily responsible for protecting handling and transporting personnel by limiting radiation emissions and for protecting the general public in the event of an accident during transport.

The State of Maine has limited direct regulatory control over transportation of low-level radioactive wastes. Because LLW is exempt from the Department of Environmental Protection's Hazardous Waste Management Rules, the shipping requirements for hazardous wastes do not apply. Unlike many states which have adopted all or parts of the U.S. DOT's regulations on the transportation and routing of LLW by road. Maine has not. The Maine Department of Transportation (MDOT) has no regulatory involvement in the transportation of LLW unless it is an "oversized load" requiring a State permit. Title 10, M.R.S.A., Section 151-A, gives the responsibility for coordinating the transportation of radioactive materials to the Department of Public Safety. Title 25, M.R.S.A., requires that the Department of Public Safety be notified 24 hours prior to the shipment of LLW. The notice is to include the shipment's contents and route. The statute allows the Department of Public Safety to promulgate regulations regarding notification, requiring additional information. No such regulations

have been adopted to date. Chapter 4 of the Department of Public Safety's regulations require that transporters of hazardous materials (including LLW) in the State of Maine comply with the regulations of the U.S. Department of Transportation. This regulation, administered and enforced by the Bureau of State Police, apply the U.S. DOT regulations to the intrastate transport of LLW by highway carriers for hire. This only leaves unregulated the situation where a generator uses its own vehicles to transport LLW. It is not believed that the transport of LLW is a serious problem in Maine.

A number of Maine municipalities have adopted ordinances in recent years related to the disposal of nuclear and hazardous wastes and the handling of hazardous materials, but it is uncertain how many are trying to regulate the transport of radioactive wastes (including LLW) within their boundaries. The City of Biddeford and the Town of Gray were the first to have hazardous material ordinances in Maine. The Biddeford and Gray Hazardous Waste Control Ordinances, adopted in 1979, classify liquid and gaseous low-level radioactive materials as a type of hazardous material. Both towns require a local permit for the handling, transportation, storage or disposal of these types of LLW. Neither town has restrictions on the routing of LLW shipments.

It is clear from the discussion above, it is the U.S. DOT regulations and the NRC regulations that presently determine the transportation procedures followed by Maine LLW generators and carriers. Under the present State regulatory framework, they would be the primary controls on any future shipments of LLW through Maine or from out-of-state into Maine for disposal.

Information collected by the Department of Human Services' survey of Maine generators of LLW gives some insight into how LLW is currently being transported in Maine. This survey asked licensed users of radioactive material whether they generated LLW in 1982, and if so, how did they package and transport their wastes.

Eight users of radioactive materials responded that they generated LLW and were shipping LLW. In addition, five respondent's wastes were radioactive equipment components that were shipped back to the manufacturers. Some preliminary results are presented here regarding the other seven respondents who shipped wastes for disposal (Portsmouth-Kittery Naval Shipyard is not included).

Maine generators package their wastes in DOT authorized "strong, tight" containers and DOT specification containers for Type A wastes. LSA (low specific activity) low-level wastes are packaged in metal boxes, metal dumpsters, metal 55 gallon drums, and metal tanks. The 55 gallon drum was most the commonly used container for LSA wastes (3 of 5 LSA generators). Type A wastes shipped in 1982 were packaged in DOT specification 17H Type A 55 gallon drums, casks and cardboard boxes. The specific 55 gallon drum was most often used (3 of 6 generators) for Type A wastes. One respondent indicated a shipment of bulk LLW was shipped unpackaged (this must have been an exclusive shipment). A number of generators used several package types depending on the wastes.

Generators of LLW either arranged for the transport of their wastes directly to a disposal site themselves, or did so through a LLW broker. In 1982 three brokerage firms serviced Maine generators, including Interex of Natick, Massachusetts; Jetline Recycling of South Portland, Maine; and Hittman Nuclear

of Columbia, Maryland. Five generators utilized brokers to transport all their waste to a disposal site. When using a broker, the generator is still responsible for packaging the waste and transporting it to the broker. Often the broker will provide the packages to the generators. One generator did not use a broker. Maine Yankee arranged for the transportation of most of its LLW (95 percent) to a disposal site, but also used the services of a broker for the transport of the remaining portion of their 1982 waste volume.

For those generators using a broker, no information is available from the survey regarding where that waste was eventually transported for disposal. However, it is clear that most of Maine's 1982 LLW volume was transported to Barnwell, South Carolina land burial site, since that is where 95 percent of Maine Yankee's waste was shipped. The remainder of Maine Yankee's waste was shipped to the Hanford, Washington disposal site, using Hittman Nuclear as a trasportation broker. In 1983, 34 percent of Maine Yankee's LLW went to Barnwell and 66 percent to Hanford. One other generator besides Maine Yankee shipped waste to Hanford, Washington in 1982.

The response to the survey does not provide a total number of LLW shipments that travel on Maine Highways on their way to a broker or a disposal site. Only information on Maine Yankee shipments is available. They make approximately 15 to 20 LLW shipments annually. It is probably fair to say that this represents the majority of LLW shipments in Maine in a given year.

Investigations estimating the costs of LLW transport are still underway and are not yet completed. However, some preliminary findings are available. Transportation costs currently make up a sizeable portion of the total cost of LLW disposal (i.e., burial fee, processing cost, and shipping cost). For example, transportation accounted for about 26 percent of Maine Yankee's total LLW disposal costs for 1980 to 1982. Much of the transportation cost is fixed

and is incurred getting the shipment ready (e.g. packaging, handling, loading and having the carrier come to the generator for pick-up of the shipment). Shorter shipping distance from the generator to the disposal facility would significantly reduce the cost of transportation, but would not reduce it proportionately. For example, a study done for CONEG projected that trasnporting 15,000 cubic feet of waste from Maine to a site within 40 miles, reducing the distance by a factor of eight compared to the 1,100 miles to Barnwell, South Carolina, would only reduce the cost by a factor of three.

LEGAL INVESTIGATION

Under the Federal Low-Level Radioactive Waste Policy Act, states which enter into compacts may exclude non-compact states from using their LLW disposal facility after January 1, 1986. If a state decided to go-it-alone, could it also limit use of its site to wastes generated from within the state? This is an important legal issue relating to the Maine only option.

The Attorney General studied this question and concluded, for reasons outlined below:

"It is the opinion of this Department that the denial of access to a state-owned facility for the disposal of low-level radioactive waste to waste generated out-of-state would not violate the Supremacy or Commerce Clause of the United States Constitution[1]."

Under the Supremacy Clause, state activity may be invalidated if Congress enacts legislation which clearly expresses its intention to preempt such activity, or legislation which is a pervasive statutory scheme whose purpose

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[1] See Appendix F for copy of Maine Attorney General's Opinion.

would be frustrated by the State actions. The operable statute is the Atomic Energy Act, and its amendements entitled the Low-Level Radioactive Waste Policy Act of 1980 (LLWPA). The Act authorizes states to ban importation of waste from outside the region, if they join a regional compact. By implication, states are not authorized to enact such a ban unless they join a regional compact.

But, Congress has not directly expressed itself on the question of whether a state may deny access by out-of-state radioactive waste to a disposal site operated by the state itself. And, development of a site by a state would actually contribute to the solution of the national LLW disposal problem. Rather than interfering with the statutory scheme of the LLWPA, development of a site for its own use could be construed as a positive response by a state to the responsibility placed on it by the Act to provide for availability of capacity for disposal of LLW generated within its borders. Therefore, it appears that such action on the part of a state would not be preempted by the Atomic Energy Act.

Under the Commerce Clause, there is a clear precedent in case law (Philadelphia v. New Jersey) for concluding that the State cannot constitutionally enact a statute prohibiting importation of radioactive waste.

However, the question here is whether the state as an operator could choose to establish a state-owned site just for the use of businesses operating within the state. It appears that this would be permissible because the state as a market participant would qualify for an exception to the Commerce Clause that applies when states are engaging in legitimate business activities.

Thus, it appears that under proper circumstances a Maine-only site would be legal. The Attorney General did note that these findings must be considered somewhat uncertain, since no Court has directly ruled on the question.

The Commission has also reviewed at least seven legal opinions from other sources. They all agree that a state cannot by statute ban the importation of radioactive waste. On the other hand, they provide considerable support for the legality of the state owning and operating a specific facility for in-state LLW generators only, although there has not been a clear test case, and several of the opinions do express some uncertainty. But, the most recent opinion comes from a New York State study which supports the opinion of Maine's Attorney General, finding that if a state owned and operated its own facility and denied access at the site to out-of-state generators "There would not likely be any conflict with the Commerce Clause (or the Supremcy Clause)."

PUBLIC COMMENTS

The Maine LLW Siting Commission has received considerable input from the public in the past two years. Most comments have come during public comment periods at Siting Commission meetings. The public release of the results of the geological studies has acted as a catalyst, generating public interest and comments from areas with marine silt and clay and basal till deposits.

A number of interested parties have presented extensive comments and recommendations to the Siting Commission. The Maine Yankee Atomic Power Company has stated its position as supporting the 11 state Northeast Compact, arguing that it would be less costly and would have a greater financial resource base for environmental and public safeguards. The Maine Nuclear Referendum Committee has testified and gone on record supporting the position that Maine should handle its own LLW here in Maine, on-site at the Maine Yankee Nuclear Power Plant in an engineered structure. The Maine State Nurse's Association has also gone on record as recommending that Maine's LLW be disposed on-site at Maine Yankee in an engineered structure. The League of Women Voters has taken an active role in educating the general public concerning the issues. The League has also encouraged the Siting Commission to

give preference to the protection of public health over economics in its deliberations and to fully study options other than the Northeast Compact. Recently the League has taken a position as being opposed to shallow land burial in Maine. Residents of western Maine, where suitable areas of basal till are believed to be located, have formed a grass roots organization called Friends Against Nuclear Garbage (FANG). It has recommended that Maine be responsible for its own wastes and dispose of it on-site at Maine Yankee in a engineered structure.

Among the general public that has attended the Siting Commission meetings the testimony has overwhelmingly supported Maine going-it-alone with disposal on-site at Maine Yankee. A second point that stands out is that shallow land burial is not seen as an appropriate means of LLW disposal in Maine. Testimony in favor of alternatives to shallow land burial has included the submission of conceptual engineering design plans for an engineered structure of an appropriate size to meet Maine's needs. The Department of Environmental Protection has estimated the construction cost of this structure at about $5.5 million. Although some "not in my backyard" sentiments have been expressed, most commenters agree that it is a Maine waste problem.

OPTIONS FOR DEALING WITH LOW-LEVEL RADIOACTIVE WASTE

Five options have been identified and described on the following pages, along with some PROS and CONS. Most of the options share several uncertainties: cost, type of facility (engineered or shallow burial), and licensing (since no new LLW facility has been licensed since 1969). In all options it is assumed the cost would be paid by user fees. Under Federal law the State has a statutory responsibility. And, as a state housing waste generators, the State has a natural responsibility to deal with their waste.

The options are:

1. Northeast Regional Compact (11-State)
2. Northern New England Compact (3-State)
3. Maine only - away from Maine Yankee (or at Maine Yankee)
4. Staged response - starting with on-site storage
5. Contracting with a site elsewhere

The Commission does not consider that doing nothing is not an acceptable long-term option, although it is acceptable to wait for a while to see how the options develop before selecting one. And, it is quite possible that new options, such as volunteer hosts may appear over the months ahead.

Northeast Regional Compact (11-State)

This was the first choice that needed to be considered. This region produces 1.1 million cubic feet of waste per year, about 40 percent of the U.S. total. Maine produces about one percent of the region's waste. Nationally, large regional compacts are preferred by most states.

A compact has been drafted under the auspices of the coalition of Northeastern Governors (CONEG) which provides for a regional facility (See Appendix G). The host state would be selected by a Regional Low-Level Waste Commission based on six broad criteria:

- health, safety & welfare
- environmental, economic & social effects
- economic benefits & costs
- volumes and types of waste generated
- minimization of transportation
- existence of regional facilities.

All states would be eligible to host. A threshold which would relieve small generation states had early support but was later rejected.

Siting and development would proceed under host state law. The host state would be responsible for 3rd party damages and cleanup liability, but could require bonds, insurance, special funds as necessary to cover those contingencies.

The Commission would be funded by a $70,000 initiation fee from each state, plus a surcharge on waste disposed. Any shortfall would be made up by all states. Maine's share would be about three percent based on a formula including waste volume generated and other factors.

Withdrawal requires five years notice and does not relieve the withdrawing state of any existing liability.

All state or local laws or regulation which are inconsistent with the compact are nullified. That is, the Compact governs in all cases of inconsistency.

The disposal technology is not specified. Shallow land burial is the leading candidate, since it is the present method, and the only one for which detailed NRC regulations exist. However, many states including Pennsylvania and Maine are studying engineered structures.

This compact has been ratified by Delaware, Maryland, New Jersey, and Connecticut. It appears they will wait for the big states, Pennsylvania and New York, before submitting it to Congress,but they have stated their intention to proceed without delay after the June 30, 1984, deadline. The New York State Energy Office will make a recommendation in April. Their draft report recommends amending the Northeast Regional Compact to exempt small generation states from hosting a facility, while the site rotates among the

larger states, to establish weighted voting based on waste volume, and to share excess liability proportionately.

Meanwhile, Rhode Island and New Hampshire adjourned without ratification. Vermont has introduced the bill for the 1984 session, but their Joint Energy Committee has recommended against the Northeast Compact in its present form. Massachusetts faces a dilemma. Due to a referendum in 1982, voter approval is required for any site or any compact. And, the CONEG policy working group considers that requirement as "inconsistent law."

Maine must make a decision before June 30, 1984, when initial eligibility for the Northeast Compact expires.

The following table (Table 6) summarizes some of the pros and cons of the Northeast Regional Compact.

TABLE 6
NORTHEAST COMPACT OPTION

PROS	CONS
- Matches Congressional expectations	- Unfair to require states that generate a small volume to host site for whole region
- Available year-round	
- Large Facility has economies of scale and larger economic base for safety and environmental programs	- Host state selection left to Regional Commission in absence of volunteers
- The compact has been drafted	- If problems should occur, then a large site could be a larger problem, requiring more effort to correct
- Provides an expanded geographical area to search for best site	- Host state bears the full liability for damages even if there is no negligence
- Can withdraw with 5 year notice	- Large site could have longer licensing delays
- 4 states have ratified	- Nullifies "inconsistent" state laws, including environmental protection laws
	- Only 4 states have joined so far of the 11 eligible
	- Large volumes may limit the method of disposal
	- Large Commission, with rulemaking power, and Maine unable to exert much control
	- Safety problem of increased transportation if selected as host
	- June 30, 1984 deadline
	- $70,000 initiation fee
	- Up front costs unknown (may require detailed site review)
	- Commission meetings can be closed too easily.
	- Judicial review procedures are weak (automatic affirmation of Regional Commission decisions after 90 days).

Northern New England (NNE) Compact (3-State)

The northern New England region is projected to produce about 50,000 cubic feet of waste per year. Assuming Seabrook I, but not Seabrook II, becomes operational, the three states Maine, New Hampshire, and Vermont will generate roughly equal amounts of waste as long as they each have a single nuclear power plant operating.

An ad hoc Steering Committee of legislators from the three states and represtatives of the Executive Branch from Maine and New Hampshire have been meeting since September, 1983 to study the possibility of joining together to carry out the responsibility of our states under federal law. The Governor of Vermont, who has favored the 11-State Northeast Compact, only sent observers.

One reason for pursuing this concept is that the proposed 11-State Northeast Compact provides no assurance that one of our states will not be the host for the entire region, although the three states generate a very small percentage (five percent) of the waste.

Technically, the problems would be similar to a Maine-only site, although per unit costs would be substantially reduced. The Steering Committee is supporting further technical analysis to estimate those costs and make sure that any small facility would satisfy public health and safety and environmental concerns.

Legally, if the Compact is ratified by Congress, there would be no doubt that the compact could ban waste from outside the three states, just as a larger compact could.

The Northern New England Steering Committee reached the concensus that:

1. The proposed Northeast Compact provides no assurance that one of our states will not be the host for the entire eleven state region.

2. In view of the primary concern for public health and safety as well as the concern for keeping costs reasonable, they have considered the available data on the technical, environmental and economic aspects of siting a small facility for the three state region, and are sufficiently encouraged to go forward with discussions of the political and institutional aspects as well as further technical analysis.

3. We find sufficient basis for an agreement in concept on a three state Northern New England Compact (See Appendix H). This concept would include:

   a. Every reasonable effort should be made to minimize the disposal problem within the region by volume reduction, on-site storage, and negotiation with potential host states outside the region.

   b. Choice of host state by volunteer, or if there is none by the drawing of a lot by the governors;

   c. Compliance with all siting and licensing requirements of the host state;

   d. The host state selection will be reviewed after 25 years and the initial site would be available for 35 years from the effective date;

e. Guaranteed access by all three states to the regional site;

f. Sharing of long-term liability;

g. The regional commission would be advisory.

The Northern New England Compact (and the Northeast Compact) have been introduced in the Vermont legislature for consideration in 1984. New Hampshire referred the Northeast Compact to study and is not in regular session until 1985, but New Hampshire has only a very small waste stream until Seabrook I comes on line in 1986 or 1987.

TABLE 7
Northern New England Compact Options

PROS	CONS
- Satisfies State's responsibility	- High likelihood of hosting small site
- Satisfies Congressional preference for regional solutions	- More costly than 11-State
- Cooperating with other states of similar size	- Requires willingness to accept NH and VT waste
- Satifies desire for fairness	- Congress may prefer larger compacts
- Avoids vulnerability to large site	- NH Legislature not in session in 1984
- More limited (advisory) Commission	- Smaller resource base than 11-State for safety and environmental programs
- Less costly than single-state	- More transportation than 1-state
- Larger resource base than 1-state for safety and environmental programs	- No state has agreed yet
- Less transportation than 11-state	- VT and NH governors have preference for 11-state compact instead
- No deadline to join compact	
- Makes out of region exclusion certain if Congress ratifies	
- Can be part of a rational, staged response.	

Maine-only Site

Maine was producing 15,000 cubic feet per year in 1978-1981. Volume reduction brought this down to 9,100 cubic feet in 1982. Texas and California are proceeding on the single-state option, and Wisconsin is considering it.

Maine has enacted a general framework of low-level waste siting laws (38 M.R.S.A., Chapter 14-A, Subchapter III). Under NRC regulations, the State would have to own the site. Economic and legal considerations may require the state to be the operator of the facility, although contractors could be hired for specific tasks. Enabling legislation would be required for state development of a LLW facility.

Technical/environmental and economic feasibility of a small facility is being studied. Previous federal studies have focussed on larger facilities. Maine has increased the assessment on generators to about $75,000 per year to support the work of its Low-Level Waste Siting Commission and continuing staff work by the Department of Environmental Protection. In addition a $162,000 U.S. Department of Energy grant has been received by the Department for technical studies. Preliminary indications from those studies are that:

- Areas have been identified within the State where a site may be found for shallow land burial, based on geological, environmental and socio-economic criteria, and satisfying NRC regulations in 10 CFR Part 61.

- A small facility is probably technically feasible.

- The cost of disposal of Maine's waste at a Maine-only facility would probably be considerably higher than at a large facility, although reduced transportation and seasonal operation could help reduce overall costs.

- For economic reasons, a guaranteed waste stream would be necessary before the facility was built.

The legal feasibility of going it alone is also being studied. There is no doubt that any state could develop a site. The only question is whether they could exclude out of state waste. As discussed earlier there are differing opinions on that question. Maine's Attorney General points out that although any law barring imports of waste would be unconstitutional, there is reason to believe that a particular facility could be restricted by contract to serving those (in-state) generators for whom it was built, especially if the facility is owned and operated by the State itself.

This option focuses on shallow land burial or engineered disposal at or away from the Maine Yankee site. Storage at Maine Yankee is discussed in option (4).

TABLE 8
MAINE-ONLY OPTION

PROS	CONS
- Straightforward way to satisfy the State's responsibility	- Probably more costly
- Doesn't require Congressional approval	- Small resource base for environment and safety programs
- Avoids vulnerability to hosting a large site	- Legal ability to exclude out of State waste is not certain
- No other state to coordinate with	- Doesn't show spirit of cooperation
- More complete state control	- Sure to have a site in Maine
- No regional commission to support	
- Low safety impact of transportation, if host	
- Supported by public testimony to the LLW Commission	
- Keeps other options open	

Staged Response Beginning With On-Site Storage At Maine Yankee

It would be possible for Maine Yankee to build a temporary storage facility to hold the waste while a permanent solution is being developed. Present NRC policy allows licensing of such a facility for five years' waste, and NRC has indicated it would be willing to license a longer-term storage facility if it were accompanied by a permanent disposal proposal. Permanent disposal could be accomplished by selecting one of the other options or possibly by converting the storage facility into a permanent disposal facility.

TABLE 9
STAGED RESPONSE OPTION

PROS	CONS
- Buys time while progress is made on the national scene	- Not a permanent solution
- Temporary storage will be needed anyway: it is already too late for a new site by 1986	- Temporary storage may be more costly if permenant disposal must also be developed
- Storage is at a site which already handles radioactive material	- Possible additional handling of the waste required: first for storage and again for disposal
- Minimizes tranportation exposure and expense	- Unclear what would be done with the waste from other generators
- Could take advantage of new options as they become available	
- Testimony received by the LLW Commission has favored a location on-site at Maine Yankee	

Contracting

Contracting with a site in another region may become an option at some future date, but there are no sites offering to accept waste now. Maine alone, or the 3-State NNE Compact could contract if the site were available.

Similarly, a large state may decide to volunteer to develop its own site and then invite some other small states to join it in a compact in order to gain protection against large quantities of out-of-state waste. Pennsylvania, New York or Massachusetts are worth watching because they have the largest disposal problems in the Northeast, and they have not decided what to do yet.

TABLE 10
CONTRACTING OPTION

PROS	CONS
- Avoids hosting a site	- No site is available on this basis at this time
- Uses a relatively inexpensive site	- In the absence of other options, the host could charge high access fees
- Probably acceptable to Congress	- A fall-back position would be necessary

FINDINGS AND RECOMMENDATIONS

Northeast Regional Compact (11-State)

The Commission finds that:

1. The only short-term deadline driving the LLW Commission's decision process at this point is the Northeast compact deadline of June 30, 1984, when initial eligibility to join expires.

2. There is little support for the Northeast Compact as presently drafted, although there are efforts underway to modify the compact that may change this finding.

3. The Coalition of Northeastern Governors (CONEG) Policy Working Group, which drafted the proposed Northeast Compact is continuing to meet to discuss specific problems such as implementation language, interim access to existing facilities, and disposal of federal wastes.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS AGAINST ADOPTION OF THE NORTHEAST INTERSTATE LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT COMPACT IN ITS PRESENT FORM.

2. THE COMMISSION RECOMMENDS NEGOTIATION WITH THE CONEG GROUP TO MODIFY THE COMPACT AND ANSWER THE CONCERNS WHICH WE HAVE IDENTIFIED, ESPECIALLY THE PROBLEM OF HOST STATE SELECTION, AND TO PROVIDE THE ASSURANCE THAT ALL ENVIRONMENTAL AND PUBLIC HEALTH SAFEGUARDS REQUIRED BY THE HOST STATE, ALTHOUGH COSTLY, ARE ALLOWABLE.

3. THE COMMISSION RECOMMENDS CONTINUED PARTICIPATION BY THE STATE IN THE DISCUSSIONS OF THE (CONEG) POLICY WORKING GROUP, WHATEVER THE OUTCOME OF THE NORTHEAST COMPACT NEGOTIATIONS, IN ORDER TO ADDRESS THE COMMON NATIONAL PROBLEMS OF INTERIM ACCESS, DEFENSE WASTES, AND THE SEARCH FOR BETTER OPTIONS.

Northern New England Compact (3-State)

The Commission finds that:

1. The Northern New England Compact language reflects more closely the interests of the people of Maine than does the Northeast Compact language. It strongly encourages minimizing the problem in the region by: volume reduction, on-site storage, and shipping to outside disposal facilities if possible. It specifies the host state selection clearly and fairly. And it does not establish a powerful, expensive, regional commission.

2. The degree of political support for the Northern New England Compact in all three states is uncertain.

3. There is no deadline in the Northern New England Compact.

4. The 3 northern New England states have a similarity and a community of interest that enhances the possibility of cooperative efforts on the LLW problem.

THE COMMISSION RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS CONTINUED DISCUSSIONS WITH THE NORTHERN NEW ENGLAND STEERING COMMITTEE IN ORDER TO REFINE THE COMPACT CONCEPT AND LANGUAGE AS A POSSIBLE FUTURE OPTION.

2. THE COMMISSION RECOMMENDS CONTINUED COOPERATION WITH THE NORTHERN NEW ENGLAND STATES ON THE TECHNICAL PROBLEMS OF SITING A SMALL FACILITY IN OUR AREA.

3. THE COMMISSION RECOMMENDS THAT THE NORTHERN NEW ENGLAND STEERING COMMITTEE HOLD EXPLORATORY DISCUSSIONS WITH POSSIBLE HOST STATES OUTSIDE THE 3-STATE REGION.

Maine Only (away from Maine Yankee, or at Maine Yankee)

The Commission finds that:

1. There is considerable support in Maine for a Maine-only facility.

2. An environmentally sound, Maine-only site may be feasible, consistent with public health and safety.

3. It is likely, but not absolutely certain, that a Maine-only site could legally be developed by the State itself for Maine generators only.

4. A Maine-only site is likely to be more costly for Maine generators than shipping the waste to a large, regional site.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS CONTINUED EXPLORATION OF THE OPTION OF GOING IT ALONE, INCLUDING COMPLETION OF THE PRELIMINARY ANALYSES WHICH ARE NOW UNDERWAY INCLUDING:

   a. SMALL SHALLOW LAND BURIAL FACILITY DESIGN
   b. FINANCIAL ANALYSIS OF A SMALL SHALLOW LAND BURIAL FACILITY
   c. ENGINEERED ALTERNATIVES TO SHALLOW LAND BURIAL
   d. FINANCIAL ANALYSIS OF A SMALL ENGINEERED LLW FACILITY
   e. TRANSPORTATION PROCEDURES AND COSTS

2. THE COMMISSION RECOMMENDS WORKING CLOSELY WITH THE MAINE CONGRESSIONAL DELEGATION TO KEEP THEM AWARE OF OUR INTEREST IN THIS OPTION AND TO MAKE SURE THAT IT REMAINS PERMISSIBLE UNDER ANY FUTURE CONGRESSIONAL ACTION.

Staged Response Starting with On-site Storage

The Commission finds:

1. There has been great benefit to taking a slow, careful approach to this problem. Some states which started faster have had to backtrack, and no compacts have yet been ratified by Congress, although several are currently before Congress.

2. Future changes in the available options are possible - even likely, as the larger states decide what to do, and as NRC, later in 1984, publishes its evaluations of technical alternatives to Shallow Land Burial.

3. There is little indication that the 1986 statutory deadline will be changed, but most states will need (and therefore probably support) a requirement for interim access to existing facilities for roughly 3 to 5 years after 1986.

4. The proposed Northern New England Compact calls for on-site storage as long as possible.

5. There is considerable support in Maine for on-site storage.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS FULL EXPLORATION OF ON-SITE STORAGE, WITH THE COOPERATION OF MAINE YANKEE, FOR TIME PERIODS RANGING FROM 5 YEARS TO THE LIFE OF THE PLANT.

2. THE COMMISSION RECOMMENDS WORKING CLOSELY WITH THE CONGRESSIONAL DELEGATION TO MAKE SURE THAT ADEQUATE PROVISION IS MADE FOR INTERIM ACCESS BEFORE ANY COMPACT IS RATIFIED FOR ANY REGION OF THE UNITED STATES.

Contracting with a Site Elsewhere

The Commission finds that:

1. No site has firmly expressed a willingness to contract to handle the LLW from outside their region over the long term.

2. Once the compact scheme goes into effect nationally, or perhaps sooner, there may be a site which is willing to contract with Maine or with the 3-State Northern New England region to dispose of our waste on acceptable terms.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS THAT CONTACT BE MAINTAINED WITH STATES THAT MIGHT EVENTUALLY BE WILLING TO RECEIVE OUR WASTE. THESE STATES WOULD INCLUDE THE EXISTING HOSTS: (SOUTH CAROLINA, WASHINGTON, AND NEVADA), THE STATES THAT ARE PLANNING THEIR OWN FACILITIES (TEXAS AND CALIFORNIA) AND SEVERAL OTHERS THAT ARE OFTEN MENTIONED AS POTENTIAL HOSTS: (MASSACHUSETTS, NEW YORK, PENNSYLVANIA, VIRGINIA, ILLINOIS, SOUTH DAKOTA, AND COLORADO).

Defense Wastes

The Commission finds that:

The Kittery-Portsmouth Naval Shipyard generates 1,000 cubic feet (1 curie) of LLW per year (11 percent of the total volume and three percent of the activity) and ships it to a commercial burial ground. The future responsibility of the State of Maine for that waste is unclear. Future quantities are uncertain, but could be larger.

THE COMMISSION'S RECOMMENDATION IS:

1. THE COMMISSION RECOMMENDS THAT THE STATE EXPRESS OUR CONCERN OVER THE PROBLEM OF DEFENSE WASTE TO OUR CONGRESSIONAL DELEGATATION, AND THAT THE STATE WORK COOPERATIVELY WITH THE OTHER STATES (THROUGH CONEG OR OTHERWISE) TO DEVELOP SOUND NATIONAL POLICY - INCLUDING CONSIDERATION OF DISPOSAL OF DEFENSE WASTE AT FEDERAL DOE SITES.

National Concerns

The Commission finds that:

1. Certain of the issues identified here are of national concern and can best be addressed by Congress.

2. NRC regulations are based on the assumption that there is a permanent disposal method but in the absence of long term experience it may be wise to approach any solution as a secure long term storage method, allowing for the possibility of modification or correction, if necessary.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS WORKING CLOSELY WITH THE MAINE CONGRESSIONAL DELEGATION TO:

A. MAKE SURE THAT THE OPTION OF GOING-IT-ALONE REMAINS PERMISSIBLE.

B. MAKE SURE THAT ADEQUATE PROVISION IS MADE FOR INTERIM ACCESS DURING THE POST-1986 PERIOD BEFORE ANY COMPACT IS RATIFIED.

C. REACH A SOUND, FAIR, NATIONAL POLICY ON DISPOSAL OF LOW-LEVEL WASTES FROM DEFENSE ACTIVITIES SUCH AS THE KITTERY-PORTSMOUTH SHIPYARD.

D. ENCOURAGE THE SEARCH FOR BETTER OPTIONS THAN THE TRADITIONAL SHALLOW LAND BURIAL.

Future Action by the LLW Commission

The Commission finds that:

1. There are many unanswered questions, both technical and political and new options may become available as other states address the LLW problem.

THE COMMISSION'S RECOMMENDATIONS ARE:

1. THE COMMISSION RECOMMENDS CONTINUED STUDY OF THE ISSUES AND ANALYSIS OF FURTHER DEVELOPMENTS IN OTHER STATES AS THEY COME ALONG, WITH PERIODIC REPORTS TO THE LEGISLATURE OVER THE NEXT 6 TO 12 MONTHS.

2. THE COMMISSION RECOMMENDS THAT THE LEGISLATURE ENACT A JOINT RESOLUTION SUPPORTING THE FINDINGS AND RECOMMENDATIONS OF THIS REPORT.

APPENDIX A

LOW-LEVEL RADIOACTIVE WASTE POLICY ACT OF 1980

Public Law 96-573
96th Congress

An Act

To set forth a Federal policy for the disposal of low-level radioactive wastes, and for other purposes.

Dec. 22, 1980
[S. 2189]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Low-Level Radioactive Waste Policy Act.

SHORT TITLE

SECTION 1. This Act may be cited as the "Low-Level Radioactive Waste Policy Act". 42 USC 2021b note.

DEFINITIONS

SEC. 2. As used in this Act— 42 USC 2021b.

(1) The term "disposal" means the isolation of low-level radioactive waste pursuant to requirements established by the Nuclear Regulatory Commission under applicable laws.

(2) The term "low-level radioactive waste" means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11 e. (2) of the Atomic Energy Act of 1954.

(3) The term "State" means any State of the United States, the District of Columbia, and, subject to the provisions of Public Law 96-205, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and any other territory or possession of the United States.

(4) For purposes of this Act the term "atomic energy defense activities of the Secretary" includes those activities and facilities of the Department of Energy carrying out the function of—

(i) Naval reactors development and propulsion,

(ii) weapons activities, verification and control technology,

(iii) defense materials production,

(iv) inertial confinement fusion,

(v) defense waste management, and

(vi) defense nuclear materials security and safeguards (all as included in the Department of Energy appropriations account in any fiscal year for atomic energy defense activities).

GENERAL PROVISIONS

SEC. 3. (a) Compacts established under this Act or actions taken under such compacts shall not be applicable to the transportation, management, or disposal of low-level radioactive waste from atomic energy defense activities of the Secretary or Federal research and development activities. 42 USC 2021c.

(b) Any facility established or operated exclusively for the disposal of low-level radioactive waste produced by atomic energy defense activities of the Secretary or Federal research and development

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activities shall not be subject to compacts established under this Act or actions taken under such compacts.

LOW-LEVEL RADIOACTIVE WASTE DISPOSAL

State compacts regarding regional facilities. 42 USC 2021d.

SEC. 4. (a)(1) It is the policy of the Federal Government that—

(A) 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 waste generated as a result of defense activities of the Secretary or Federal research and development activities; and

(B) low-level radioactive waste can be most safely and efficiently managed on a regional basis.

(2)(A) To carry out the policy set forth in paragraph (1), the States may enter into such compacts as may be necessary to provide for the establishment and operation of regional disposal facilities for low-level radioactive waste.

Congressional consent.

(B) A compact entered into under subparagraph (A) shall not take effect until the Congress has by law consented to the compact. Each such compact shall provide that every 5 years after the compact has taken effect the Congress may by law withdraw its consent. After January 1, 1986, any such compact may restrict the use of the regional disposal facilities under the compact to the disposal of low-level radioactive waste generated within the region.

Report to Congress and States.

(b)(1) In order to assist the States in carrying out the policy set forth in subsection (a)(1), the Secretary shall prepare and submit to Congress and to each of the States within 120 days after the date of the enactment of this Act a report which—

(A) defines the disposal capacity needed for present and future low-level radioactive waste on a regional basis;

(B) defines the status of all commercial low-level radioactive waste disposal sites and includes an evaluation of the license status of each such site, the state of operation of each site, including operating history, an analysis of the adequacy of disposal technology employed at each site to contain low-level radioactive wastes for their hazardous lifetimes, and such recommendations as the Secretary considers appropriate to assure protection of the public health and safety from wastes transported to such sites;

(C) evaluates the transportation requirements on a regional basis and in comparison with performance of present transportation practices for the shipment of low-level radioactive wastes, including an inventory of types and quantities of low-level wastes, and evaluation of shipment requirements for each type of waste and an evaluation of the ability of generators, shippers, and carriers to meet such requirements; and

(D) evaluates the capability of the low-level radioactive waste disposal facilities owned and operated by the Department of Energy to provide interim storage for commercially generated low-level waste and estimates the costs associated with such interim storage.

(2) In carrying out this subsection, the Secretary shall consult with the Governors of the States, the Nuclear Regulatory Commission, the Environmental Protection Agency, the United States Geological Survey, and the Secretary of Transportation, and such other agencies and departments as he finds appropriate.

Approved December 22, 1980.

LEGISLATIVE HISTORY:

SENATE REPORT No. 96-548 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 126 (1980):
July 28-30, considered and passed Senate.
Dec. 3, H.R. 8378 considered and passed House; passage vacated and S. 2189, amended, passed in lieu.
Dec. 13, Senate agreed to the House amendment with amendments; House agreed to Senate amendments.

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION REGULATIONS

10 CFR PART 61

PART 61—LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

Subpart A—General Provisions

Sec.

Subpart B—Licenses

Subpart C—Performance Objectives

Subpart D—Technical Requirements for Land Disposal Facilities

Authority: Secs. 53, 57, 62, 63, 65, 81, 161, 182, 183, 68 Stat. 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2073, 2077, 2092, 2093, 2095, 2111, 2201, 2232, 2233); Secs. 202, 206, 88 Stat. 1244, 1246, (42 U.S.C. 5842, 5846); Secs. 10 and 14, Pub. L. 95-601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851).

For the purposes of Sec. 223, 68 Stat. 958, as amended, (42 U.S.C. 2273): Tables 1 and 2, §§61.3, 61.24, 61.25, 61.27(a), 61.41 through 61.43, 61.52, 61.53, 61.55, 61.56, and 61.61 through 61.63 issued under Sec. 161b, 68 Stat. 948 as amended (42 U.S.C. 2201(b)); §§ 61.10 through 61.16, 61.24, and 61.80 issued under Sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

Subpart A—General Provisions

§ 61.1 Purpose and scope.

(a) The regulations in this part establish, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the Commission issues licenses for the disposal of radioactive wastes containing byproduct, source and special nuclear material received from other persons. Disposal of waste by an individual licensee is set forth in Part 20 of this chapter. Applicability of the requirements in this Part to Commission licenses for waste disposal facilities in effect on the effective date of this rule will be determined on a case-by-case basis and implemented through terms and conditions of the license or by orders issued by the Commission.

(b) Except as provided in Part 150 of this chapter, which addresses assumption of certain regulatory authority by Agreement States, and § 61.6 "Exemptions," the regulations in this part apply to all persons in the United States. The regulations in this part do not apply to (1) disposal of high-level waste as provided for in Part 60 of this chapter; (2) disposal of uranium or thorium tailings or wastes (byproduct material as defined in § 40.4(a-1)) as provided for in Part 40 of this chapter in quantities greater than 10,000 kilograms and containing more than five (5) millicuries of radium-226; or (3) disposal of licensed material as provided for in Part 20 of this chapter.

§ 61.2 Definitions.

As used in this part:

"Active maintenance" means any significant remedial activity needed during the period of institutional control to maintain a reasonable assurance that the performance objectives in §§ 61.41 and 61.42 are met. Such active maintenance includes ongoing activities such as the pumping and treatment of water from a disposal unit or one-time measures such as replacement of a disposal unit cover. Active maintenance does not include custodial activities such as repair of fencing, repair or replacement of monitoring equipment, revegetation, minor additions to soil cover, minor repair of disposal unit covers, and general disposal site upkeep such as mowing grass.

"Buffer zone" is a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.

"Chelating agent" means amine polycarboxylic acids (e.g., EDTA, DTPA), hydroxy-carboxylic acids, and ploycarboxylic acids (e.g., citric acid, carbolic acid, and glucinic acid).

"Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a land disposal facility. The term does not mean disposal site exploration, necessary roads for disposal site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

"Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

"Custodial Agency" means an agency of the government designated to act on behalf of the government owner of the disposal site.

"Director" means the Director, Office of Nuclear Material Safety and Safeguards, U. S. Nuclear Regulatory Commission.

"Disposal" means the isolation of radioactive wastes from the biosphere inhabited by man and containing his food chains by emplacement in a land disposal facility.

"Disposal site" means that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.

"Disposal unit" means a discrete portion of the disposal site into which waste is placed for disposal. For near surface disposal the unit is usually a trench.

"Engineered barrier" means a man-made structure or device that is intended to improve the land disposal facility's ability to meet the performance objectives in Subpart C.

"Explosive material" means any chemical compound, mixture, or device, which produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.

"Government agency" means any executive department, commission, independent establishment, or corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States; or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the government.

"Hazardous waste" means those wastes designated as hazardous by Environmental Protection Agency regulations in 40 CFR Part 261.

"Hydrogeologic unit" means any soil or rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater.

"Inadvertent intruder" means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, or other pursuits in which the person might be unknowingly exposed to radiation from the waste.

"Indian Tribe" means an Indian tribe as defined in the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450).

"Intruder barrier" means a sufficient depth of cover over the waste that inhibits contact with waste and helps to ensure that radiation exposures to an inadvertent intruder will meet the performance objectives set forth in this part, or engineered structures that provides equivalent protection to the inadvertent intruder.

"Land disposal facility" means the land, buildings, and equipment which is intended to be used for the disposal of radioactive wastes into the subsurface of the land. For purposes of this chapter, a geologic repository as defined in Part 60 is not considered a land disposal facility.

agencies. Neither NRC nor DOT require a specific form and both allow such dual use. The waste form and packaging requirements are in addition to and compatible with DOT rules. In addition, the manifest terminology and requirements were compared to those in the proposed Uniform Hazardous Waste Manifest, the joint EPA/DOT proposed form published March 4, 1982 (47 FR 9336). A few minor procedural and terminology changes were made to conform to this proposed form. Licensees may use the Uniform Hazardous Waste Manifest, once it is implemented, as both a DOT shipping paper and a NRC manifest for radioactive wastes by using additional spaces to describe wastes and adding information to the back. These changes were made based on consultation with EPA and DOT staff and will help to reduce the burden on all licensees.

The following comment was received from EPA on possible duplicative requirements:

NRC solicited comments on possible duplicative requirements for effluent releases and broker activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This "Superfund" law exempts from notification "any release of source, special nuclear, or byproduct material . . . in compliance with a legally enforceable license, permit, regulations, or order issued pursuant to the Atomic Energy Act of 1954" (CERCLA Section 101(10)(K)). Radioactive releases from nuclear waste disposal facilities which are not in compliance with an NRC license, permit, regulation, or order fall within the reporting requirements of CERCLA. Furthermore, as part of the notification regulations under CERCLA, EPA is planning to develop a notification scheme for releases of radioactive materials not licensed under the Atomic Energy Act of 1954 or the Uranium Mill Tailings Radiation Control Act of 1978. EPA wishes to minimize duplicative reporting requirements for releases reported to other agencies. EPA intends to work with NRC to minimize duplicative reporting requirements to the extent possible.

The EPA also addressed the potential for duplicative costs to the two agencies for wastes that are a mixture of hazardous chemicals and radioactive materials. Close coordination and a memorandum of understanding were suggested. EPA has regulatory responsibility for the disposal of hazardous wastes under the Resource Conservation and Recovery Act (RCRA). NRC agrees that the two regulatory programs need to be coordinated, and will take action in that regard.

The Regulatory Flexibility Act also requires discussion of alternatives to the proposed action. The recordkeeping and reporting requirements impose such a minor incremental burden that no exemption was considered. Initial estimates were that about 2,000 of the Commission's 9,000 licensees are waste generators who might make waste shipments. Waste generators must provide more complete information on the manifest than is currently required to meet DOT shipping paper requirements and must report on investigations of missing shipments. The additional information required in the manifest includes the identities of solidification agents; presence of any chelating agents; whether the waste is Class A, B, or C; and the total quantity of H-3, C-14, Tc-99, and I-129. The annual public burden for all licensees should be no more than about 4,500 staff hours for the preparation of the manifest instead of just preparation of DOT shipping papers and 1,000 hours for investigating and reporting on late or missing shipments. Reactor licensees, who are not small entitites, ship at least half the waste now shipped to disposal sites. The remainder is shipped by hospitals, universities, industrial firms, etc., who may or may not be small entities. Thus, less than half this burden should fall on small entities based on relative volumes of wastes shipped. The waste classification and characteristics portion of the rule does provide relief for most wastes produced by the small entities, i.e., Class A wastes. Where radiological hazard permits, segregated disposal has been provided as an option to complying with more restrictive waste acceptance requirements for Class B and C wastes.

The incremental burdens were initially judged small. Based on further staff evaluations and public comments on the rule, this initial judgment was correct and the rule will not have a significant economic impact. The rulemaking will not affect economic factors such as employment, business viability, or ability of affected entities to compete. The improvements in waste disposal practices and the contribution of those improvements to establishing new disposal capacity are judged to significantly outweigh the small economic impact on small entities.

List of Subjects in 10 CFR Part 61

Low-level waste, Nuclear materials, Penalty, Waste treatment and disposal.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and section 553 of title 5 of the United States Code, the following new 10 CFR Part 61 and the following amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 70, 73, and 170 to Chapter 1 of Title 10, of the Code of Federal Regulations are published as a document subject to codification.

A new Part 61 is added to 10 CFR to read as follows:

PART 61—LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

Subpart A—General Provisions

Sec.

Subpart B—Licenses

Subpart C—Performance Objectives

Subpart D—Technical Requirements for Land Disposal Facilities

"License" means a license issued under the regulations in Part 61 of this chapter. "Licensee" means the holder of such a license.

"Monitoring" means observing and making measurements to provide data to evaluate the performance and characteristics of the disposal site.

"Near-surface disposal facility" means a land disposal facility in which radioactive waste is disposed of in or within the upper 30 meters of the earth's surface.

"Person" means (1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, government agency other than the Commission or the Department of Energy, (except that the Department of Energy is considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244)), any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (2) any legal successor, representative, agent, or agency of the foregoing.

"Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130°F (54.5°C). A pyrophoric solid is any solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.

"Site closure and stablization" means those actions that are taken upon completion of operations that prepare the disposal site for custodial care and that assure that the disposal site will remain stable and will not need ongoing active maintenance.

"State" means any State, Territory, or possession of the United States, Puerto Rico, and the District of Columbia.

"Stability" means structural stability.

"Surveillance" means observation of the disposal site for purposes of visual detection of need for maintenance, custodial care, evidence of intrusion, and compliance with other license and regulatory requirements.

"Tribal Governing Body" means a Tribal organization as defined in the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450).

"Waste" means those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Waste Policy Act, that is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).

§ 61.3 License required.

(a) No person may receive, possess, and dispose of radioactive waste containing source, special nuclear, or byproduct material at a land disposal facility unless authorized by a license issued by the Commission pursuant to this part, or unless exemption has been granted by the Commission under § 61.6 of this part.

(b) Each person shall file an application with the Commission and obtain a license as provided in this part before commencing construction of a land disposal facility. Failure to comply with this requirement may be grounds for denial of a license.

§ 61.4 Communications.

Except where otherwise specified, all communications and reports concerning the regulations in this part and applications filed under them should be addressed to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C. or 7915 Eastern Avenue, Silver Spring, Maryland.

§ 61.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be considered binding upon the Commission.

§ 61.6 Exemptions.

The Commission may, upon application by any interested person, or upon its own initiative, grant any exemption from the requirements of the regulations in this part as it determines is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

§ 61.7 Concepts.

(a) *The Disposal Facility.* (1) Part 61 is intended to apply to land disposal of radioactive waste and not to other methods such as sea or extraterrestrial disposal. Part 61 contains procedural requirements and performance objectives applicable to any method of land disposal. It contains specific technical requirements for near-surface disposal of radioactive waste which involves disposal in the uppermost portion of the earth, approximately 30 meters. Burial deeper than 30 meters may also be satisfactory. Technical requirements for alternative methods will be added in the future.

(2) Near-surface disposal of radioactive waste takes place at a near-surface disposal facility, which includes all of the land and buildings necessary to carry out the disposal. The disposal site is that portion of the facility which waste is used for disposal of waste and consists of disposal units and a buffer zone. A disposal unit is a discrete portion of the disposal site into which waste is placed for disposal. For near-surface disposal, the disposal unit is usually a trench. A buffer zone is a portion of the disposal site that is controlled by the licensee and that lies under the site and between the boundary of the disposal site and any disposal unit. It provides controlled space to establish monitoring locations which are intended to provide an early warning of radionuclide movement, and to take mitigative measures if needed. In choosing a disposal site, site characteristics should be considered in terms of the indefinite future and evaluated for at least a 500 year time frame.

(b) *Waste Classification and Near-Surface Disposal.* (1) Disposal of radioactive waste in near-surface disposal facilities has the following safety objectives: protection of the general population from releases of radioactivity, protection of individuals from inadvertent intrusion, and protection of individuals during operations. A fourth objective is to ensure stability of the site after closure.

(2) A cornerstone of the system is stability—stability of the waste and the disposal site so that once emplaced and covered, the access of water to the waste can be minimized. Migration of radionuclides is thus minimized, long-term active maintenance can be avoided, and potential exposures to intruders reduced. While stability is a

desirable characteristic for all waste much radioactive waste does not contain sufficient amounts of radionuclides to be of great concern from these standpoints; this waste, however, tends to be unstable, such as ordinary trash type wastes. If mixed with the higher activity waste, their deterioration could lead to failure of the system and permit water to penetrate the disposal unit and cause problems with the higher activity waste. Therefore, in order to avoid placing requirements for a stable waste form on relatively innocuous waste, these wastes have been classed as Class A waste. The Class A waste will be disposed of in separate disposal units at the disposal site. However, Class A waste that is stable may be mixed with other classes of waste. Those higher activity wastes that should be stable for proper disposal are classed as Class B and C waste. To the extent that it is practicable, Class B and C waste forms or containers should be designed to be stable, i.e., maintain gross physical properties and identity, over 300 years. For certain radionuclides prone to migration, a maximum disposal site inventory based on the characteristics of the disposal site may be established to limit potential exposure.

(3) It is possible but unlikely that persons might occupy the site in the future and engage in normal pursuits without knowing that they were receiving radiation exposure. These persons are referred to as inadvertent intruders. Protection of such intruders can involve two principal controls: institutional control over the site after operations by the site owner to ensure that no such occupation or improper use of the site occurs; or, designating which waste could present an unacceptable risk to an intruder, and disposing of this waste in a manner that provides some form of intruder barrier that is intended to prevent contact with the waste. This regulation incorporates both types of protective controls.

(4) Institutional control of access to the site is required for up to 100 years. This permits the disposal of Class A and Class B waste without special provisions for intrusion protection, since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year period and will present an acceptable hazard to an intruder. The government landowner administering the active institutional control program has flexibility in controlling site access which may include allowing productive uses of the land provided the integrity and long-term performance of the site are not affected.

(5) Waste that will not decay to levels which present an acceptable hazard to an intruder within 100 years is designated as Class C waste. This waste is disposed of at a greater depth than the other classes of waste so that subsequent surface activities by an intruder will not disturb the waste. Where site conditions prevent deeper disposal, intruder barriers such as concrete covers may be used. The effective life of these intruder barriers should be 500 years. A maximum concentration of radionuclides is specified for all wastes so that at the end of the 500 year period, remaining radioactivity will be at a level that does not pose an unacceptable hazard to an intruder or public health and safety. Waste with concentrations above these limits is generally unacceptable for near-surface disposal. There may be some instances where waste with concentrations greater than permitted for Class C would be acceptable for near-surface disposal with special processing or design. These will be evaluated on a case-by-case basis. Class C waste must also be stable.

(c) *The Licensing Process.* (1) During the preoperational phase, the potential applicant goes through a process of disposal site selection by selecting a region of interest, examining a number of possible disposal sites within the area of interest and narrowing the choice to the proposed site. Through a detailed investigation of the disposal site characteristics the potential applicant obtains data on which to base an analysis of the disposal site's suitability. Along with these data and analyses, the applicant submits other more general information to the Commission in the form of an application for a license for land disposal. The Commission's review of the application is in accordance with administrative procedures established by rule and may involve participation by affected State governments or Indian tribes. While the proposed disposal site must be owned by a State or the Federal government before the Commission will issue a license, it may be privately owned during the preoperational phase if suitable arrangements have been made with a State or the Federal government to take ownership in fee of the land before the license is issued.

(2) During the operational phase, the licensee carries out disposal activities in accordance with the requirements of this regulation and any conditions on the license. Periodically, the authority to conduct the above ground operations and dispose of waste will be subject to a license renewal, at which time the operating history will be reviewed and a decision made to permit or deny continued operation. When disposal operations are to cease, the licensee applies for an amendment to his license to permit site closure. After final review of the licensee's site closure and stabilization plan, the Commission may approve the final activities necessary to prepare the disposal site so that ongoing active maintenance of the site is not required during the period of institutional control.

(3) During the period when the final site closure and stabilization activities are being carried out, the licensee is in a disposal site closure phase. Following that, for a period of 5 years, the licensee must remain at the disposal site for a period of post-closure observation and maintenance to assure that the disposal site is stable and ready for institutional control. The Commission may approve shorter or require longer periods if conditions warrant. At the end of this period, the licensee applies for a license transfer to the disposal site owner.

(4) After a finding of satisfactory disposal site closure, the Commission will transfer the license to the State or Federal government that owns the disposal site. If the Department of Energy is the Federal agency administering the land on behalf of the Federal government the license will be terminated because the Commission lacks regulatory authority over the Department for this activity. Under the conditions of the transferred license, the owner will carry out a program of monitoring to assure continued satisfactory disposal site performance, physical surveillance to restrict access to the site and carry out minor custodial activities. During this period, productive uses of the land might be permitted if those uses do not affect the stability of the site and its ability to meet the performance objectives. At the end of the prescribed period of institutional control, the license will be terminated by the Commission.

§ 61.8 Reporting, recordkeeping, and application requirements: OMB approval not required.

The information collection requirements contained in this part affect fewer than ten persons. Therefore, under section 3506(c)(5) of the Paperwork Reduction Act of 1980 (Pub. L. 96-511), OMB clearance is not required for these information collection requirements.

§ 61.9 Employee protection.

(a) Discrimination by a Commission licensee, an applicant for a Commission licensee, or a contractor or subcontractor of a Commission licensee or applicant against an employee for engaging in certain protected activities is prohibited. Discrimination includes discharge and other actions that relate to compensation, terms, conditions, and privileges of employment. The protected activities are established in Section 210 of the Energy Reorganization Act of 1974, as amended, and in general are related to the administration or enforcement of a requirement imposed under the Atomic Energy Act or the Energy Reorganization Act.

(1) The protected activities include but are not limited to—(i) Providing the Commission information about possible violations of requirements imposed under either of the above statutes;

(ii) Requesting the Commission to institute action against his or her employer for the administration or enforcement of these requirements; or

(iii) Testifying in any Commission proceeding.

(2) These activities are protected even if no formal proceeding is actually initiated as a result of the employee assistance or participation.

(3) This section has no application to any employee alleging discrimination prohibited by this section who, acting without direction from his or her employer (or the employer's agent), deliberately causes a violation of any requirement of the Energy Reorganization Act of 1974, as amended, or the Atomic Energy Act of 1954, as amended.

(b) Any employee who believes that he or she has been discharged or otherwise discriminated against by any person for engaging in the protected activities specified in paragraph (a)(1) of this section may seek a remedy for the discharge or discrimination through an administrative proceeding in the Department of Labor. The administrative proceeding must be initiated within 30 days after an alleged violation occurs by filing a complaint alleging the violation with the Department of Labor, Employment Standards Administration, Wage and Hour Division. The Department of Labor may order reinstatement, back pay, and compensatory damages.

(c) A violation of paragraph (a) of this section by a Commission licensee, an applicant for a Commission licensee, or a contractor or subcontractor of a Commission licensee or applicant may be grounds for—

(1) Denial, revocation, or suspension of the license.

(2) Imposition of a civil penalty on the licensee or applicant.

(3) Other enforcement action.

(d) Actions taken by an employer, or others, which adversely affect an employee may be predicated upon nondiscriminatory grounds. The prohibition applies when the adverse action occurs because the employee has engaged in protected activities. An employee's engagement in protected activities does not automatically render him or her immune from discharge or discipline for legitimate reasons or from adverse action dictated by non-prohibited considerations.

(e) Each licensee and each applicant shall post Form NRC-3, "Notice to Employees," on its premises. Posting must be at locations sufficient to permit employees protected by this section to observe a copy on the way to or from their place of work. Premises must be posted not later than 30 days after an application is docketed and remain posted while the application is pending before the Commission, during the term of the license, and for 30 days following license termination.

Note.—Copies of Form NRC-3 may be obtained by writing to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in Appendix D, Part 20 of this chapter or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Subpart B—Licenses

§ 61.10 Content of application.

An application to receive from others, possess and dispose of wastes containing or contaminated with source, byproduct or special nuclear material by land disposal must consist of general information, specific technical information, institutional information, and financial information as set forth in §§ 61.11 through 61.16. An environmental report prepared in accordance with Part 51 of this chapter must accompany the application.

§ 61.11 General information.

The general information must include each of the following:

(a) Identity of the applicant including:

(1) The full name, address, telephone number and description of the business or occupation of the applicant;

(2) If the applicant is a partnership, the name, and address of each partner and the principal location where the partnership does business;

(3) If the applicant is a corporation or an unincorporated association, (i) the state where it is incorporated or organized and the principal location where it does business, and (ii) the names and addresses of its directors and principal officers; and

(4) If the applicant is acting as an agent or representative of another person in filing the application, all information required under this paragraph must be supplied with respect to the other person.

(b) Qualifications of the applicant:

(1) The organizational structure of the applicant, both offsite and onsite, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions, or otherwise;

(2) The technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities. Minimum training and experience requirements for personnel filling key positions described in Paragraph 61.11(b)(1) must be provided;

(3) A description of the applicant's personnel training program; and

(4) The plan to maintain an adequate complement of trained personnel to carry out waste receipt, handling, and disposal operations in a safe manner

(c) A description of:

(1) The location of the proposed disposal site;

(2) The general character of the proposed activities;

(3) The types and quantities of radioactive waste to be received, possessed, and disposed of;

(4) Plans for use of the land disposal facility for purposes other than disposal of radioactive wastes; and

(5) The proposed facilities and equipment.

(d) Proposed schedules for construction, receipt of waste, and first emplacement of waste at the proposed land disposal facility.

§ 61.12 Specific technical information.

The specific technical information must include the following information needed for demonstration that the performance objectives of Subpart C of this part and the applicable technical requirements of Subpart D of this part will be met:

(a) A description of the natural and demographic disposal site characteristics as determined by disposal site selection and characterization activities. The description must include geologic, geotechnical, hydrologic, meteorologic, climatologic, and biotic features of the disposal site and vicinity.

(b) A description of the design features of the land disposal facility and

the disposal units. For near-surface disposal, the description must include those design features related to infiltration of water; integrity of covers for disposal units; structural stability of backfill, wastes, and covers; contact of wastes with standing water; disposal site drainage; disposal site closure and stabilization; elimination to the extent practicable of long-term disposal site maintenance; inadvertent intrusion; occupational exposures; disposal site monitoring; and adequacy of the size of the buffer zone for monitoring and potential mitigative measures.

(c) A description of the principal design criteria and their relationship to the performance objectives.

(d) A description of the design basis natural events or phenomena and their relationship to the principal design criteria.

(e) A description of codes and standards which the applicant has applied to the design and which will apply to construction of the land disposal facilities.

(f) A description of the construction and operation of the land disposal facility. The description must include as a minimum the methods of construction of disposal units; waste emplacement; the procedures for and areas of waste segregation; types of intruder barriers; onsite traffic and drainage systems; survey control program; methods and areas of waste storage; and methods to control surface water and groundwater access to the wastes. The description must also include a description of the methods to be employed in the handling and disposal of wastes containing chelating agents or other non-radiological substances that might affect meeting the performance objectives in Subpart C of this part.

(g) A description of the disposal site closure plan, including those design features which are intended to facilitate disposal site closure and to eliminate the need for ongoing active maintenance.

(h) An identification of the known natural resources at the disposal site, the exploitation of which could result in inadvertent intrusion into the low-level wastes after removal of active institutional control.

(i) A description of the kind, amount, classification and specifications of the radioactive material proposed to be received, possessed, and disposed of at the land disposal facility.

(j) A description of the quality control program for the determination of natural disposal site characteristics and for quality control during the design, construction, operation and closure of the land disposal facility and the receipt, handling, and emplacement of waste. Audits and managerial controls must be included.

(k) A description of the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the performance objective in § 61.41 of this part and occupational radiation exposure to ensure compliance with the requirements of Part 20 of this chapter and to control contamination of personnel, vehicles, equipment, buildings, and the disposal site. Both routine operations and accidents must be addressed. The program description must include procedures, instrumentation, facilities, and equipment.

(l) A description of the environmental monitoring program to provide data to evaluate potential health and environmental impacts and the plan for taking corrective measures if migration of radionuclides is indicated.

(m) A description of the administrative procedures that the applicant will apply to control activities at the land disposal facility.

§ 61.13 Technical analyses.

The specific technical information must also include the following analyses needed to demonstrate that the performance objectives of Subpart C of this part will be met:

(a) Pathways analyzed in demonstrating protection of the general population from releases of radioactivity must include air, soil, groundwater, surface water, plant uptake, and exhumation by burrowing animals. The analyses must clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses must clearly demonstrate that there is reasonable assurance that the exposure to humans from the release of radioactivity will not exceed the limits set forth in § 61.41.

(b) Analyses of the protection of individuals from inadvertent intrusion must include demonstration that there is reasonable assurance the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided.

(c) Analyses of the protection of individuals during operations must include assessments of expected exposures due to routine operations and likely accidents during handling, storage, and disposal of waste. The analyses must provide reasonable assurance that exposures will be controlled to meet the requirements of Part 20 of this chapter.

(d) Analyses of the long-term stability of the disposal site and the need for ongoing active maintenance after closure must be based upon analyses of active natural processes such as erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses must provide reasonable assurance that there will not be a need for ongoing active maintenance of the disposal site following closure.

§ 61.14 Institutional information.

The institutional information must include:

(a) A certification by the Federal or State government which owns the disposal site that the Federal or State government is prepared to accept transfer of the license when the provisions of § 61.30 are met, and will assume responsibility for custodial care after site closure and postclosure observation and maintenance.

(b) Where the proposed disposal site is on land not owned by the Federal or a State government, the applicant must submit evidence that arrangements have been made for assumption of ownership in fee by the Federal or a State government before the Commission issues a license.

§ 61.15 Financial information.

The financial information must be sufficient to demonstrate that the financial qualifications of the applicant are adequate to carry out the activities for which the license is sought and meet other financial assurance requirements as specified in Subpart E of this part.

§ 61.16 Other information.

Depending upon the nature of the wastes to be disposed of, and the design and proposed operation of the land disposal facility, additional information may be requested by the Commission including the following:

(a) Physical security measures, if appropriate. Any application to receive and possess special nuclear material in quantities subject to the requirements of Part 73 of this chapter shall demonstrate how the physical security requirements of Part 73 will be met. In determining whether receipt and possession will be subject to the requirements of Part 73, the applicant shall not consider the quantity of special nuclear material that has been disposed of.

(b) Safety information concerning criticality, if appropriate.

(1) Any application to receive and possess special nuclear material in quantities that would be subject to the requirements of § 70.24, "Criticality accident requirements" of Part 70 of this chapter shall demonstrate how the requirements of that section will be met, unless the applicant requests an exemption pursuant to § 70.24(d). In determining whether receipt and possession would be subject to the requirements of § 70.24, the applicant shall not consider the quantity of special nuclear material that has been disposed of.

(2) Any application to receive and possess special nuclear material shall describe proposed procedures for avoiding accidental criticality, which address both storage of special nuclear material prior to disposal and waste emplacement for disposal.

§ 61.20 Filing and distribution of application.

(a) An application for a license under this part, and any amendments thereto, shall be filed with the Director, must be signed by the applicant or the applicant's authorized representative under oath, and must consist of 1 signed original and 2 copies.

(b) Another 85 copies of the application and environmental report must be retained by the applicant for distribution in accordance with written instructions from the Director or designee.

(c) *Fees.* Application, amendment, and inspection fees applicable to a license covering the receipt and disposal of radioactive wastes in a land disposal facility are required by Part 170 of this chapter.

§ 61.21 Elimination of repetition.

In its application or environmental report, the applicant may incorporate by reference information contained in previous applications, statements, or reports filed with the Commission if these references are clear and specific.

§61.22 Updating of application and environmental report.

(a) The application and environmental report must be as complete as possible in the light of information that is available at the time of submittal.

(b) The applicant shall supplement its application or environmental report in a timely manner, as necessary, to permit the Commission to review, prior to issuance of a license, any changes in the activities proposed to be carried out or new information regarding the proposed activities.

§ 61.23 Standards for issuance of a license.

A license for the receipt, possession, and disposal of waste containing or contaminated with source, special nuclear, or byproduct material will be issued by the Commission upon finding that the issuance of the license will not be inimical to the common defense and security and will not constitute an unreasonable risk to the health and safety of the public, and:

(a) The applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life or property.

(b) The applicant's proposed disposal site, disposal design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they provide reasonable assurance that the general population will be protected from releases of radioactivity as specified in the performance objective in § 61.41, Protection of the general population from releases of radioactivity.

(c) The applicant's proposed disposal site, disposal site design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that individual inadvertent intruders are protected in accordance with the performance objective in § 61.42, Protection of individuals from inadvertent intrusion.

(d) The applicant's proposed land disposal facility operations, including equipment, facilities, and procedures, are adequate to protect the public health and safety in that they will provide reasonable assurance that the standards for radiation protection set out in Part 20 of this chapter will be met.

(e) The applicant's proposed disposal site, disposal site design, land disposal facility operations, disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that long-term stability of the disposed waste and the disposal site will be achieved and will eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure.

(f) The applicant's demonstration provides reasonable assurance that the applicable technical requirements of Subpart D of this part will be met.

(g) The applicant's proposal for institutional control provides reasonable assurance that institutional control will be provided for the length of time found necessary to ensure the findings in paragraphs (b)–(e) of this section and that the institutional control meets the requirements of § 61.59, Institutional requirements.

(h) The information on financial assurances meets the requirements of Subpart E of this part.

(i) The applicant's physical security information provides reasonable assurance that the requirements of Part 73 of this chapter will be met, insofar as they are applicable to special nuclear material to be possessed before disposal under the license.

(j) The applicant's criticality safety procedures are adequate to protect the public health and safety and provide reasonable assurance that the requirements of § 70.24, Criticality accident requirements, of Part 70 of this chapter will be met, insofar as they are applicable to special nuclear material to be possessed before disposal under the license.

(k) Any additional information submitted as requested by the Commission pursuant to § 61.16, Other information, is adequate.

(l) The requirements of Part 51 of this chapter have been met.

§ 61.24 Conditions of licenses.

(a) A license issued under this part, or any right thereunder, may be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, only if the Commission finds, after securing full information, that the transfer is in accordance with the provisions of the Atomic Energy Act and gives its consent in writing in the form of a license amendment.

(b) The licensee shall submit written statements under oath upon request of the Commission, at any time before termination of the license, to enable the Commission to determine whether or not the license should be modified, suspended, or revoked.

(c) The license will be transferred to the site owner only on the full implementation of the final closure plan as approved by the Commission, including postclosure observation and maintenance.

(d) The licensee shall be subject to the provisions of the Atomic Energy Act now or hereafter in effect, and to all rules, regulations, and orders of the Commission. The terms and conditions of the license are subject to amendment,

revision, or modification, by reason of amendments to, or by reason of rules, regulations, and orders issued in accordance with the terms of the Atomic Energy Act.

(e) Any license may be revoked, suspended or modified in whole or in part for any material false statement in the application or any statement of fact required under Section 182 of the Act, or because of conditions revealed by any application or statement of fact or any report, record, or inspection or other means which would warrant the Commission to refuse to grant a license to the original application, or for failure to operate the facility in accordance with the terms of the license, or for any violation of, or failure to observe any of the terms and conditions of the Act, or any rule, regulation, license or order of the Commission.

(f) Each person licensed by the Commission pursuant to the regulations in this part shall confine possession and use of materials to the locations and purposes authorized in the license.

(g) No radioactive waste may be disposed of until the Commission has inspected the land disposal facility and has found it to be in conformance with the description, design, and construction described in the application for a license.

(h) The Commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, additional requirements and conditions with respect to the licensee's receipt, possession, and disposal of source, special nuclear or byproduct material as it deems appropriate or necessary in order to:

(1) Promote the common defense and security;

(2) Protect health or to minimize danger to life or property;

(3) Require reports and the keeping of records, and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder

(i) Any licensee who receives and possesses special nuclear material under this part in quantities that would be subject to the requirements of § 70.24 of Part 70 of this chapter shall comply with the requirements of that section. The licensee shall not consider the quantity of special nuclear material that has been disposed of.

(j) The authority to dispose of wastes expires on the date stated in the license except as provided in § 61.27(a) of this part.

§ 61.25 Changes.

(a) Except as provided for in specific license conditions, the licensee shall not make changes in the land disposal facility or procedures described in the license application. The license will include conditions restricting subsequent changes to the facility and the procedures authorized which are important to public health and safety. These license restrictions will fall into three categories of descending importance to public health and safety as follows: (1) those features and precedures which may not be changed without (i) 60 days prior notice to the Commission, (ii) 30 days notice of opportunity for a prior hearing, and (iii) prior Commission approval; (2) those features and procedures which may not be changed without (i) 60 days prior notice to the Commisson, and (ii) prior Commission approval; and (3) those features and procedures which may not be changed without 60 days prior notice to the Commission. Features and procedures falling in paragraph (a)(3) of this section may not be changed without prior Commission approval if the Commission, after having received the required notice, so orders.

(b) Amendments authorizing site closure, license transfer, or license termination shall be included in paragraph (a)(1) of this section.

(c) The Commission shall provide a copy of the notice for opportunity for hearings provided in paragraph (a)(1) of this section to State and local officials or tribal governing bodies specified in § 2.104(e) of Part 2 of this chapter.

§ 61.26 Amendment of license.

(a) An application for amendment of a license must be filed in accordance with § 61.20 and shall fully describe the changes desired.

(b) In determining whether an amendment to a license will be approved, the Commission will apply the criteria set forth in § 61.23.

§ 61.27 Application for renewal or closure.

(a) Any expiration date on a license applies only to the above ground activities and to the authority to dispose of waste. Failure to renew the license shall not relieve the licensee of responsibility for carrying out site closure, postclosure observation and transfer of the license to the site owner. An application for renewal or an application for closure under § 61.28 must be filed at least 30 days prior to license expiration.

(b) Applications for renewal of a license must be filed in accordance with §§ 61.10 through 61.16 and § 61.20. Applications for closure must be filed in accordance with §§ 61.20 and 61.28. Information contained in previous applications, statements or reports filed with the Commission under the license may be incorporated by reference if the references are clear and specific.

(c) In any case in which a licensee has timely filed an application for renewal of a license, the license for continued receipt and disposal of licensed materials does not expire until the Commission has taken final action on the application for renewal.

(d) In determining whether a license will be renewed, the Commission will apply the criteria set forth in § 61.23.

§ 61.28 Contents of application for closure.

(a) Prior to final closure of the disposal site, or as otherwise directed by the Commission, the applicant shall submit an application to amend the license for closure. This closure application must include a final revision and specific details of the disposal site closure plan included as part of the license application submitted under § 61.12(g) that includes each of the following:

(1) Any additional geologic, hydrologic, or other disposal site data pertinent to the long-term containment of emplaced radioactive wastes obtained during the operational period.

(2) The results of tests, experiments, or other analyses relating to backfill of excavated areas, closure and sealing, waste migration and interaction with emplacement media, or any other tests, experiments, or analysis pertinent to the long-term containment of emplaced waste within the disposal site.

(3) Any proposed revision of plans for:

(i) Decontamination and/or dismantlement of surface facilities;

(ii) Backfilling of excavated areas; or

(iii) Stabilization of the disposal site for post-closure care.

(4) Any significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site.

(b) Upon review and consideration of an application to amend the license for closure submitted in accordance with paragraph (a) of this section, the Commission shall issue an amendment authorizing closure if there is reasonable assurance that the long-term performance objectives of Subpart C of this part will be met.

§ 61.29 Post-closure observation and maintenance.

Following completion of closure authorized in § 61.28, the licensee shall observe, monitor, and carry out

necessary maintenance and repairs at the disposal site until the license is transferred by the Commission in accordance with § 61.30. Responsibility for the disposal site must be maintained by the licensee for 5 years. A shorter or longer time period for post-closure observation and maintenance may be established and approved as part of the site closure plan, based on site-specific conditions.

§ 61.30 Transfer of license.

(a) Following closure and the period of post-closure observation and maintenance, the licensee may apply for an amendment to transfer the license to the disposal site owner. The license shall be transferred when the Commission finds:

(1) That the closure of the disposal site has been made in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license;

(2) That reasonable assurance has been provided by the licensee that the performance objectives of Subpart C of this part are met;

(3) That any funds and necessary records for care will be transferred to the disposal site owner;

(4) That the post-closure monitoring program is operational for implementation by the disposal site owner; and

(5) That the Federal or State government agency which will assume responsibility for institutional control of the disposal site is prepared to assume responsibility and ensure that the institutional requirements found necessary under § 61.23(g) will be met.

(b) [Reserved]

§ 61.31 Termination of license.

(a) Following any period of institutional control needed to meet the requirements found necessary under § 61.23, the licensee may apply for an amendment to terminate the license.

(b) This application must be filed, and will be reviewed, in accordance with the provision of § 61.20 and of this section.

(c) A license is terminated only when the Commission finds:

(1) That the institutional control requirements found necessary under § 61.23(g) have been met; and

(2) That any additional requirements resulting from new information developed during the institutional control period have been met, and that permanent monuments or markers warning against intrusion have been installed.

Subpart C—Performance Objectives

§ 61.40 General requirement.

Land disposal facilities must be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives in §§ 61.41 through 61.44.

§ 61.41 Protection of the general population from releases of radioactivity.

Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

§ 61.42 Protection of individuals from inadvertent intrusion.

Design, operation, and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

§ 61.43 Protection of individuals during operations.

Operations at the land disposal facility must be conducted in compliance with the standards for radiation protection set out in Part 20 of this chapter, except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by § 61.41 of this part. Every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

§ 61.44 Stability of the disposal site after closure.

The disposal facility must be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

Subpart D—Technical Requirements for Land Disposal Facilities

§ 61.50 Disposal site suitability requirements for land disposal.

(a) Disposal site suitability for near-surface disposal.

(1) The purpose of this section is to specify the minimum characteristics a disposal site must have to be acceptable for use as a near-surface disposal facility. The primary emphasis in disposal site suitability is given to isolation of wastes, a matter having long-term impacts, and to disposal site features that ensure that the long-term performance objectives of Subpart C of this part are met, as opposed to short-term convenience or benefits.

(2) The disposal site shall be capable of being characterized, modeled, analyzed and monitored.

(3) Within the region or state where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the performance objectives of Subpart C of this part.

(4) Areas must be avoided having known natural resources which, if exploited, would result in failure to meet the performance objectives of Subpart C of this part.

(5) The disposal site must be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain, coastal high-hazard area or wetland, as defined in Executive Order 11988, "Floodplain Management Guidelines."

(6) Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate waste disposal units.

(7) The disposal site must provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste will not occur. The Commission will consider an exception to this requirement to allow disposal below the water table if it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Subpart C of this part being met. In no case will waste disposal be permitted in the zone of fluctuation of the water table.

(8) The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.

(9) Areas must be avoided where tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of Subpart C of this part, or may preclude defensible modeling and prediction of long-term impacts.

(10) Areas must be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of Subpart C of this part, or may preclude defensible modeling and prediction of long-term impacts.

(11) The disposal site must not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives of Subpart C of this part or significantly mask the environmental monitoring program.

(b) Disposal site suitability requirements for land disposal other than near-surface (reserved).

§ 61.51 Disposal site design for land disposal.

(a) Disposal site design for near-surface disposal.

(1) Site design features must be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.

(2) The disposal site design and operation must be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides reasonable assurance that the performance objectives of Subpart C of this part will be met.

(3) The disposal site must be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives of Subpart C of this part will be met.

(4) Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity.

(5) Surface features must direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.

(6) The disposal site must be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal.

(b) Disposal site design for other than near-surface disposal (reserved).

§ 61.52 Land disposal facility operation and disposal site closure.

(a) Near-surface disposal facility operation and disposal site closure.

(1) Wastes designated as Class A pursuant to § 61.55, must be segregated from other wastes by placing in disposal units which are sufficiently separated from disposal units for the other waste classes so that any interaction between Class A wastes and other wastes will not result in the failure to meet the performance objectives in Subpart C of this Part. This segregation is not necessary for Class A wastes if they meet the stability requirements in § 61.56(b) of this part.

(2) Wastes designated as Class C pursuant to § 61.55, must be disposed of so that the top of the waste is a minimum of 5 meters below the top surface of the cover or must be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for a least 500 years.

(3) All wastes shall be disposed of in accordance with the requirements of paragraphs (a)(4) through (11) of this section.

(4) Wastes must be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages, and permits the void spaces to be filled.

(5) Void spaces between waste packages must be filled with earth or other material to reduce future subsidence within the fill.

(6) Waste must be placed and covered in a manner that limits the radiation dose rate at the surface of the cover to levels that at a minimum will permit the licensee to comply with all provisions of § 20.105 of this chapter at the time the license is transferred pursuant to § 61.30 of this part.

(7) The boundaries and locations of each disposal unit (e.g., trenches) must be accurately located and mapped by means of a land survey. Near-surface disposal units must be marked in such a way that the boundaries of each unit can be easily defined. Three permanent survey marker control points, referenced to United States Geological Survey (USGS) or National Geodetic Survey (NGS) survey control stations, must be established n the site to facilitate surveys. The USGS or NGS control stations must provide horizontal and vertical controls as checked against USGSD or NGS record files.

(8) A buffer zone of land must be maintained between any buried waste and the disposal site boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in § 61.53(d) of this part and take mitigative measures if needed.

(9) Closure and stabilization measures as set forth in the approved site closure plan must be carried out as each disposal unit (e.g., each trench) is filled and covered.

(10) Active waste disposal operations must not have an adverse effect on completed closure and stabilization measures.

(11) Only wastes containing or contaminated with radioactive materials shall be disposed of at the disposal site.

(b) Facility operation and disposal site closure for land disposal facilities other than near-surface (reserved).

§ 61.53 Environmental monitoring.

(a) At the time a license application is submitted, the applicant shall have conducted a preoperational monitoring program to provide basic environmental data on the disposal site characteristics. The applicant shall obtain information about the ecology, meteorology, climate, hydrology, geology, geochemistry, and seismology of the disposal site. For those characteristics that are subject to seasonal variation, data must cover at least a twelve month period.

(b) The licensee must have plans for taking corrective measures if migration of radionuclides would indicate that the performance objectives of Subpart C may not be met.

(c) During the land disposal facility site construction and operation, the licensee shall maintain a monitoring program. Measurements and observations must be made and recorded to provide data to evaluate the potential health and environmental impacts during both the construction and the operation of the facility and to enable the evaluation of long-term effects and the need for mitigative measures. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary.

(d) After the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the operating history and the closure and stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of radionuclides from the

disposal site before they leave the site boundary.

§ 61.54 Alternative requirements for design and operations.

The Commission may, upon request or on its own initiative, authorize provisions other than those set forth in §§ 61.51 through 61.53 for the segregation and disposal of waste and for the design and operation of a land disposal facility on a specific basis, if it finds reasonable assurance of compliance with the performance objectives of Subpart C of this part.

§ 61.55 Waste classification.

(a) Classification of waste for near surface disposal.

(1) *Considerations.* Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

(2) *Classes of waste.* (i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.

(iv) Waste that is not generally acceptable for near-surface disposal is waste for which waste form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absence of specific requirements in this part, proposals for disposal of this waste may be submitted to the Commission for approval, pursuant to § 61.58 of this part.

(3) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

(i) If the concentration does not exceed 0.1 times the value in Table 1, the waste is Class A.

(ii) If the concentration exceeds 0.1 times the value in Table 1 but does not exceed the value in Table 1, the waste is Class C.

(iii) If the concentration exceeds the value in Table 1, the waste is not generally acceptable for near-surface disposal.

(iv) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

TABLE 1

Radionuclide	Concentration curies per cubic meter
C-14	8
C-14 in activated metal	80
Ni-59 in activated metal	220
Nb-94 in activated metal	0.2
Tc-99	3
I-129	0.08
Alpha emitting transuranic nuclides with half-life greater than five years	[1]100
Pu-241	[1]3,500
Cm-242	[1]20,000

[1] Units are nanocuries per gram.

(4) Classification determined by short-lived radionuclides. If radioactive waste does not contain any of the radionuclides listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. However, as specified in paragraph (a)(6) of this section, if radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(i) If the concentration does not exceed the value in Column 1, the waste is Class A.

(ii) If the concentration exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B.

(iii) If the concentration exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C.

(iv) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(v) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

TABLE 2

Radionuclide	Concentration, curies per cubic meter		
	Col. 1	Col. 2	Col. 3
Total of all nuclides with less than 5 year half life	700	[1]	[1]
H-3	40	[1]	[1]
Co-60	700	[1]	[1]
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	4600

[1] There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the waste to the Class C independent of these nuclides.

(5) Classification determined by both long- and short-lived radionuclides. If radioactive waste contains a mixture of radionuclides, some of which are listed in Table 1, and some of which are listed in Table 2, classification shall be determined as follows:

(i) If the concentration of a nuclide listed in Table 1 does not exceed 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.

(ii) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1 but does not exceed the value in Table 1, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(6) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(7) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a

concentration of 50 Ci/m³ and Cs-137 in a concentration of 22 Ci/m³. Since the concentrations both exceed the values in Column 1, Table 2, they must be compared to Column 2 values. For Sr-90 fraction 50/150=0.33; for Cs-137 fraction, 22/44=0.5; the sum of the fractions=0.83. Since the sum is less than 1.0, the waste is Class B.

(8) *Determination of concentrations in wastes.* The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.

§ 61.56 Waste characteristics.

(a) The following requirements are minimum requirements for all classes of waste and are intended to facilitate handling at the disposal site and provide protection of health and safety of personnel at the disposal site.

(1) Waste must not be packaged for disposal in cardboard or fiberboard boxes.

(2) Liquid waste must be solidified or packaged in sufficient absorbent material to absorb twice the volume of the liquid.

(3) Solid waste containing liquid shall contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.

(4) Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

(5) Waste must not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with paragraph (a)(7) of this section.

(6) Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.

(7) Waste in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C. Total activity must not exceed 100 curies per container.

(8) Waste containing hazardous, biological, pathogenic, or infectious material must be treated to reduce to the mazimum extent practicable the potential hazard from the non-radiological materials.

(b) The requirements in this section are intended to provide stability of the waste. Stability is intended to ensure that the waste does not structurally degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

(1) Waste must have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

(2) Notwithstanding the provisions in §§ 61.56(a) (2) and (3), liquid wastes, or wastes containing liquid, must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

(3) Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.

§ 61.57 Labeling.

Each package of waste must be clearly labeled to identify whether it is Class A waste, Class B waste, or class C waste in accordance with § 61.55.

§ 61.58 Alternative requirements for waste classification and characteristics.

The Commission may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation, of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in Subpart C of this part.

§ 61.59 Institutional requirements.

(a) *Land ownership.* Disposal of radioactive waste received from other persons may be permitted only on land owned in fee by the Federal or a State government.

(b) *Institutional control.* The land owner or custodial agency shall carry out an institutional control program to physically control access to the disposal site following transfer of control of the disposal site from the disposal site operator. The institutional control program must also include, but not be limited to, carrying out an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, and other requirements as determined by the Commission; and administration of funds to cover the costs for these activities. The period of institutional controls will be determined by the Commission, but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner.

Subpart E—Financial Assurances

§ 61.61 Applicant qualifications and assurances.

Each applicant shall show that it either possesses the necessary funds or has reasonable assurance of obtaining the necessary funds, or by a combination of the two, to cover the estimated costs of conducting all licensed activities over the planned operating life of the project, including costs of construction and disposal.

§ 61.62 Funding for disposal site closure and stabilization.

(a) The applicant shall provide assurance that sufficient funds will be available to carry out disposal site closure and stabilization, including: (1) Decontamination or dismantlement of land disposal facility structures; and (2) closure and stabilization of the disposal site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance is eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring are required. These assurances shall be based on Commission-approved cost estimates reflecting the Commission-approved plan for disposal site closure and stabilization. The applicant's cost estimates must take into account total capital costs that would be incurred if an independent contractor were hired to perform the closure and stabilization work.

(b) In order to avoid unnecessary duplication and expense, the Commission will accept financial sureties that have been consolidated with earmarked financial or surety arrangements established to meet

requirements of other Federal or State agencies and/or local governing bodies for such decontamination, closure and stabilization. The Commission will accept this arrangement only if they are considered adequate to satisfy these requirements and that the portion of the surety which covers the closure of the disposal site is clearly identified and committed for use in accomplishing these activities.

(c) The licensee's surety mechanism will be annually reviewed by the Commission to assure that sufficient funds are available for completion of the closure plan, assuming that the work has to be performed by an independent contractor.

(d) The amount of surety liability should change in accordance with the predicted cost of future closure and stabilization. Factors affecting closure and stabilization cost estimates include: inflation; increases in the amount of disturbed land; changes in engineering plans; closure and stabilization that has already been accomplished and any other conditions affecting costs. This will yield a surety that is at least sufficient at all times to cover the costs of closure of the disposal units that are expected to be used before the next license renewal.

(e) The term of the surety mechanism must be open ended unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance could be provided with a surety mechanism which is written for a specified period of time (e.g., five years) yet which must be automatically renewed unless the party who issues the surety notifies the Commission and the beneficiary (the site owner) and the principal (the licensee) not less than 90 days prior to the renewal date of its intention not to renew. In such a situation the licensee must submit a replacement surety within 30 days after notification of cancellation. If the licensee fails to provide a replacement surety acceptable to the Commission, the site owner may collect on the original surety.

(f) Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Liability under the surety mechanism must remain in effect until the closure and stabilization program has been completed and approved by the Commission and the license has been transferred to the site owner.

(g) Financial surety arrangements generally acceptable to the Commission include: surety bonds, cash deposits, certificates of deposits, deposits of government securities, escrow accounts, irrevocable letters or lines of credit, trust funds, and combinations of the above or such other types of arrangements as may be approved by the Commission. However, self-insurance, or any arrangement which essentially constitutes pledging the assets of the licensee, will not satisfy the surety requirement for private sector applicants since this provides no additional assurance other than that which already exists through license requirements.

§ 61.63 Financial assurances for institutional controls.

(a) Prior to the issuance of the license, the applicant shall provide for Commission review and approval a copy of a binding arrangement, such as a lease, between the applicant and the disposal site owner that ensures that sufficient funds will be available to cover the costs of monitoring and any required maintenance during the institutional control period. The binding arrangement will be reviewed periodically by the Commission to ensure that changes in inflation, technology and disposal facility operations are reflected in the arrangements.

(b) Subsequent changes to the binding arrangement specified in paragraph (a) of this section relevant to institutional control shall be submitted to the Commission for approval.

Subpart F—Participation by State Governments and Indian Tribes

§ 61.70 Scope.

This subpart describes mechanisms through which the Commission will implement a formal request from a State or tribal government to participate in the review of a license application for a land disposal facility. Nothing in this subpart may be construed to bar the State or tribal governing body from participating in subsequent Commission proceedings concerning the license application as provided under Federal law and regulations.

§ 61.71 State and Tribal government consultation.

Upon request of a State or tribal governing body, the Director shall make available Commission staff to discuss with representatives of the State or tribal governing body information submitted by the applicant, applicable Commission regulations, licensing procedures, potential schedules, and the type and scope of State activities in the license review permitted by law. In addition, staff shall be made available to consult and cooperate with the State or tribal governing body in developing proposals for participation in the license review.

§ 61.72 Filing of proposals for State and Tribal participation.

(a) A State or tribal governing body whose interest is affected by a near-surface disposal facility at the proposed site may submit to the Director a proposal for participation in the review of a license application. Proposals must be submitted within the following time periods:

(1) For the State in which the disposal facility will be located, or any State that is member of an interstate compact that includes the State in which the disposal facility is located, no later than 45 days following publication in the **Federal Register** of the notice of tendering of an application submitted under § 61.20.

(2) For any other State, or for a tribal governing body, no later than 120 days following publication in the **Federal Register** of the notice of tendering of an application submitted under § 61.20.

(b) Proposals for participation in the licensing process must be made in writing and must be signed by the Governor of the State or the official otherwise provided for by State or tribal law.

(c) At a minimum, proposals must contain each of the following items of information:

(1) A general description of how the State or tribe wishes to participate in the licensing process specifically identifying those issues it wishes to review.

(2) A description of material and information which the State or tribe plans to submit to the Commission for consideration in the licensing process. A tentative schedule referencing steps in the review and calendar dates for planned submittals should be included.

(3) A description of any work that the State or tribe proposes to perform for the Commission in support of the licensing process.

(4) A description of State or tribal plans to facilitate local government and citizen participation.

(5) A preliminary estimate of the types and extent of impacts which the State expects, should a disposal facility be located as proposed.

(6) If desired, any requests for educational or information services (seminars, public meetings) or other

actions from the Commission such as establishment of additional Public Document Rooms or exchange of State personnel under the Intergovernmental Personnel Act.

§ 61.73 Commission approval of proposals.

(a) Upon receipt of a proposal submitted in accordance with § 61.72, the Director shall arrange for a meeting between the representatives of the State or tribal governing body and the Commission staff to discuss the proposal and to ensure full and effective participation by the State or tribe in the Commission's license review.

(b) If requested by a State or tribal governing body, the Director may approve all or any part of a proposal if the Director determines that:

(1) The proposed activities are within the scope of Commission statutory responsibility and the type and magnitude of impacts which the State or tribe may bear are sufficient to justify their participation; and

(2) The proposed activities will contribute productively to the licensing review.

(c) The decision of the Director will be transmitted in writing to the governor or the designated official of the tribal governing body.

(d) Participation by a State or Indian tribe shall not affect their rights to participate in an adjudicatory hearing as provided by Part 2 of this chapter.

Subpart G—Records, Reports, Tests, and Inspections

§ 61.80 Maintenance of records, reports, and transfers.

(a) Each licensee shall maintain any records and make any reports in connection with the licensed activities as may be required by the conditions of the license or by the rules, regulations, and orders of the Commission.

(b) Records which are required by the regulations in this part or by license conditions must be maintained for a period specified by the appropriate regulations in this chapter or by license condition. If a retention period is not otherwise specified, these records must be maintained and transferred to the officials specified in paragraph (e) of this section as a condition of license termination unless the Commission otherwise authorizes their disposition.

(c) Records which must be maintained pursuant to this part may be the original or a reproduced copy or microfilm if this reproduced copy or microfilm is capable of producing copy that is clear and legible at the end of the required retention period.

(d) If there is a conflict between the Commission's regulations in this part, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the longest retention period specified takes precedence.

(e) Notwithstanding paragraphs (a) through (d) of this section, copies of records of the location and the quantity of radioactive wastes contained in the disposal site must be transferred upon license termination to the chief executive of the nearest municipality, the chief executive of the county in which the facility is located, the county zoning board or land development and planning agency, the State governor and other State, local and Federal governmental agencies as designated by the Commission at the time of license termination.

(f) Following receipt and acceptance of a shipment of radioactive waste, the licensee shall record the date of disposal of the waste, the location in the disposal site, the condition of the waste packages as received, any discrepancies between materials listed on the manifest and those received, and any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in Department of Transportation and Commission regulations. The licensee shall briefly describe any repackaging operations of any of the waste packages included in the shipment, plus any other information required by the Commission as a license condition.

(g) Each licensee shall comply with the safeguards reporting requirements of §§ 30.55, 40.64, 70.53 and 70.54 of this chapter if the quantities or activities of materials received or transferred exceed the limits of these sections. Inventory reports required by these sections are not required for materials after disposal.

(h) Each licensee authorized to dispose of radioactive waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the Commission in order to update the information base for determining financial qualifications.

(i)(1) Each licensee authorized to dispose of waste materials received from other persons, pursuant to this part, shall submit annual reports to the appropriate Commission regional office shown in Appendix D of Part 20 of this chapter, with copies to the Director of the Office of Inspection and Enforcement and the Director of the Division of Waste Management, USNRC, Washington, D.C., 20555. Reports shall be submitted by the end of the first calendar quarter of each year for the preceding year; (2) The reports shall include (i) specification of the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in airborne effluents during the preceding year, (ii) the results of the environmental monitoring program, (iii) a summary of licensee disposal unit survey and maintenance activities, (iv) a summary, by waste class, of activities and quantities of radionuclides disposed of, (v) any instances in which observed site characteristics were significantly different from those described in the application for a license; and (vi) any other information the Commission may require. If the quantities of radioactive materials released during the reporting period, monitoring results, or maintenance performed are significantly different from those expected in the materials previously reviewed as part of the licensing action, the report must cover this specifically.

(j) Each licensee shall report in accordance with the requirements of § 70.52 of this chapter.

(k) Any transfer of byproduct, source, and special nuclear materials by the licensee is subject to the requirements in §§ 30.41, 40.51, and 70.42 of this chapter. Byproduct, source and special nuclear material means materials as defined in these parts, respectively.

§ 61.81 Tests at land disposal facilities.

(a) Each licensee shall perform, or permit the Commission to perform, any tests as the Commission deems appropriate or necessary for the administration of the regulations in this part, including tests of:

(1) Radioactive wastes and facilities used for the receipt, storage, treatment, handling and disposal of radioactive wastes.

(2) Radiation detection and monitoring instruments; and

(3) Other equipment and devices used in connection with the receipt, possession, handling, treatment, storage, or disposal of radioactive waste.

(b) [Reserved]

§ 61.82 Commission inspections of land disposal facilities.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect radioactive waste not yet disposed of, and the premises, equipment, operations, and facilities in which radioactive wastes are received, possessed, handled, treated, stored, or disposed of.

(b) Each licensee shall make available to the Commission for inspection, upon

reasonable notice, records kept by it pursuant to the regulations in this chapter. Authorized representatives of the Commission may copy and take away copies of, for the Commission's use, any record required to be kept pursuant to this part.

§ 61.83 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule.

The following amendments are also made to existing parts of the regulations in this chapter.

APPENDIX C

TITLE 38, M.R.S.A., CHAPTER 14-A

TITLE 38, M.R.S.A., SUBSECTION 482 and

TITLE 38, M.R.S.A., SUBSECTION 1305-A

TITLE 38

CHAPTER 14-A

NUCLEAR WASTE ACTIVITY

SUBCHAPTER I

GENERAL PROVISIONS

§1451. Definitions

As used in this chapter, unless the context otherwise indicates, the following terms have the following meanings.

1. Area studies, for high-level radioactive waste. "Area studies," for high-level radioactive waste, means the study of areas with potentially acceptable sites using available geophysical, geologic, geochemical, hydrologic and other information; and additional geological reconnaissance and field work, including geophysical testing, preliminary borings and excavation as necessary to assess whether site characterization should be undertaken for any sites within the area. Area studies also include socioeconomic and environmental studies and preparation of any environmental assessment relating to the suitability of the site for nomination for site characterization.

2. By-product material. "By-product material" means:

A. Any radioactive material except special nuclear material yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing nuclear material; and

B. The tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

3. Closure or site closure. "Closure" or "site clo-

sure" means all activities performed at a waste disposal site, such as stabilization and contouring, to assure that the site is in a stable condition so that only minor custodial care, surveillance and monitoring are necessary at the site, following termination of licensed operation.

4. Decommissioning a nuclear power plant. "Decommissioning a nuclear power plant" means the series of activities undertaken, beginning at the time of closing of a nuclear power plant, to ensure that the final disposition of the site or any radioactive components or material, but not including spent fuel, associated with the plant is accomplished safely in compliance with all applicable state and federal laws. Decommissioning includes activities undertaken to prepare a nuclear power plant for final disposition, to monitor and maintain it after closing and to effect final disposition of any radioactive components of the nuclear power plant.

5. Environmental impact statement. "Environmental impact statement" means any document prepared pursuant to or in compliance with the requirements of the United States National Environmental Policy Act of 1969, Section 102(2)(c), 83 Stat. 852, 1981.

6. High-level radioactive waste. "High-level radioactive waste" means the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from that liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that the United States Nuclear Regulatory Commission, consistent with existing law, determines by rule to require permanent isolation.

7. High-level radioactive waste disposal. "High-level radioactive waste disposal" means the emplacement in a repository of high-level radioactive waste, spent nuclear fuel or other highly radioactive material with no foreseeable intent of recovery, whether or not that emplacement permits the recovery of that waste.

8. High-level radioactive waste repository or repository. "High-level radioactive waste repository" or "repository" means any system licensed by the United States Nuclear Regulatory Commission that is intended to be used for, or may be used for, the permanent deep geologic disposal of

high-level radioactive waste and spent nuclear fuel, whether or not the system is designed to permit the recovery, for a limited period during initial operation, of any materials placed in the system. This term includes both surface and subsurface areas at which high-level radioactive waste and spent nuclear fuel handling activities are conducted.

9. High-level radioactive waste storage. "High-level radioactive waste storage" means retention of high-level radioactive waste, spent nuclear fuel, or transuranic waste with the intent to recover that waste or fuel for subsequent use, processing or disposal.

10. License. "License" means a federal or state license, issued to a named person upon application to use, manufacture, produce, transfer, receive, acquire or possess quantities of, or devices or equipment utilizing, radioactive material.

11. Low-level radioactive waste. "Low-level radioactive waste" means radioactive material that is not high-level radioactive waste, spent nuclear fuel, transuranic waste or by-product material, as defined in the United States Code, Title 42, Section 2014(e)(2), the Atomic Energy Act of 1954, Section 11(e)(2); and that the United States Nuclear Regulatory Commission, consistent with existing law, classifies as low-level radioactive waste.

12. Low-level radioactive waste disposal facility. "Low-level radioactive waste disposal facility" means a facility for the isolation of low-level radioactive waste from the biosphere inhabited by people and their food chains.

13. Low-level radioactive waste generator. "Low-level radioactive waste generator" means a person who produces or processes low-level radioactive waste, whether or not that waste is shipped off site.

14. Low-level radioactive waste licensee or low-level waste licensee. "Low-level radioactive waste licensee" or "low-level waste licensee" means any person licensed by the State or Federal Government to generate, treat, store or dispose of low-level radioactive waste.

15. Low-level radioactive waste storage facility. "Low-level radioactive waste storage facility" means any facility for storage of low-level radioactive waste, except

for temporary on-site storage prior to disposal.

16. Radioactive material. "Radioactive material" means any material which emits ionizing radiation spontaneously. It includes accelerator-produced, by-product, naturally occurring, source and special nuclear materials.

17. Site characterization, for high-level radioactive waste. "Site characterization," for high-level radioactive waste, means:

A. Siting research facilities with respect to a test and evaluation facility at a candidate site; and

B. Activities, whether in the laboratory or in the field, undertaken to establish the geologic condition and the ranges of the parameters of a candidate site relevant to the location of a repository, including borings, surface excavations, excavations of exploratory shafts, limited subsurface lateral excavations and borings, and in site testing needed to evaluate the suitability of a candidate site for the location of a repository, but not including preliminary borings and geophysical testing needed to assess whether site characterization should be undertaken.

18. Source material. "Source material" means:

A. Uranium or thorium, or any combination thereof, in any physical or chemical form; or

B. Ores which contain by weight 1/20th of 1%, 0.05% or more of uranium, thorium or any combination thereof. Source material does not include special nuclear material.

19. Source material mill tailings. "Source material mill tailings" means the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface waste resulting from underground solution extraction processes, but not including underground ore bodies depleted by those solution extraction processes.

20. Special nuclear material. "Special nuclear material" means:

A. Plutonium, uranium 233 and uranium enriched in the isotope 233 or in the isotope 235, but does not include source material; or

B. Any material artificially enriched by any of the material listed in paragraph A, but does not include source material.

21. Spent nuclear fuel. "Spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

22. Transuranic waste. "Transuranic waste" means radioactive waste containing alpha-emitting transuranic elements with radioactive half-lives greater than 5 years, in excess of 10 nanocuries per gram.

§1452. Consent of Legislature for federal radioactive waste storage facilities

Notwithstanding any other provision of law, this State does not consent to the acquisition by the Federal Government, by purchase, condemnation, lease, easement or by any other means, of any land, building or other structure, above or below ground, in or under the waters of the State for use in storing, depositing or treating high-level or low-level radioactive waste materials, except by prior affirmative vote of the Legislature.

SUBCHAPTER II

HIGH-LEVEL RADIOACTIVE WASTE

SUBCHAPTER III

LOW-LEVEL RADIOACTIVE WASTE

§1471. Purpose

In accordance with the United States Low-level Radioactive Waste Policy Act of 1980, Public Law 96-573, the Legislature accepts its responsibility for providing for the capacity for the disposal of low-level radioactive waste generated within this State. It is the purpose of this subchapter to establish a program for the safe management of low-level radioactive waste, and to provide capacity for its disposal either within this State or in regional facilities.

§1472. Reporting

Each low-level radioactive waste generator shall annually report, by March 31st, the volume and radioactivity of low-level waste generated and the volume and radioactivity of low-level waste shipped to commercial disposal facilities. This report shall be submitted to the commissioner, and shall include information on the specific radioactive materials handled.

§1473. Geological characterization

The State Geologist shall advise the Governor and the Legislature on the suitability of areas of the State for low-level waste disposal. In determining suitability, the State Geologist shall consider final rules for facility siting under 10 Code of Federal Regulations, Part 61, and other rules, as appropriate.

§1474. Regional compacts

The Governor may negotiate on behalf of the State, with other states and the Federal Government with respect to the siting, licensing, operation and use of low-level waste disposal facilities within and outside this State. The Governor may recommend regional compacts with states that have identified their annual low-level radioactive waste generation, and identified areas within their state that meet preliminary site criteria.

§ 1474. Regional compacts

The Governor may negotiate on behalf of the State, with other states and the Federal Government with respect to the siting, licensing, operation and use of low-level waste facilities within and outside this State. The Governor may recommend regional compacts with states that have: Identified their annual low-level radioactive waste generation; and identified areas within their state that meet preliminary site criteria.

Any regional compact for low-level waste disposal shall be ratified by legislative Act.

§1476. Low-level Waste Siting Commission

1. Establishment. There is established a Low-level Waste Siting Commission, referred to as the "commission."

2. Membership; appointment. The commission shall consist of 11 members, who shall be appointed as follows. The Commissioners of Environmental Protection and Human Services, and the State Geologist, or their designees, shall be members of the commission. The President of the Senate shall appoint 3 Senators, 2 from the majority party and one from the minority party and one person from an organization that is a low-level waste licensee. The Speaker of the House of Representatives shall appoint 3 Representatives, 2 from the majority party and one from the minority party and one person from an organization that is a low-level waste licensee. The members shall be appointed in a timely manner. The Chairman of the Legislative Council shall call the first meeting of the commission, and at this meeting the commis-

sion shall elect a chairman and a vice-chairman from its membership.

3. Duties. The duties of the commission are to:

A. Study the management, transportation and disposal of low-level waste generated in or near this State;

B. Evaluate current radioactive waste classifications and propose alternatives, if appropriate;

C. Evaluate methods and criteria for siting low-level waste disposal facilities; and

D. Assist the Governor in regional efforts to manage low-level waste.

4. Reports. The commission shall regularly report on its progress to the Governor and the Legislature.

5. Compensation. Members, except state employees, shall receive reimbursement for the necessary actual expenses incurred in carrying out their duties.

6. Assistance. The Commissioner of Environmental Protection shall assist the commission in the conduct of its business.

§ 1477. Low-level Waste Siting Fund

1. Establishment. There is established the Low-level Waste Siting Fund to be used to carry out the purpose of this subchapter. This fund shall be administered by the Commissioner of Environmental Protection in accordance with established budgetary procedures. The commissioner may accept state, federal and private funds to be used to assure safe and effective low-level waste management, and to develop capacity to safely dispose of these wastes.

2. Service fee. A service fee of $10 per cubic foot shall be levied on all low-level radioactive waste generated in this State and shipped to commercial disposal facilities. The revenue from this service fee shall be credited to the fund established in subsection 1 and used to carry out the purposes of this subchapter. This service fee shall be levied only on low-level radioactive waste generated and shipped on or before December 31, 1985.

3. Allocation. The expenses for the administration of the commission in carrying out the duties as set forth in this subchapter shall be paid from such amounts as the Legislature may allocate from the revenues in the Low-level Waste Siting Fund. These amounts shall become available in accordance with Title 5, chapters 141 to 155.

4. Balance carried forward. Any unexpended balance shall not lapse, but shall be carried forward to the same fund for the next fiscal year and shall be available for the purposes authorized by this subchapter.

5. Report to Legislature. The commissioner shall report annually to the Legislature the revenues and expenditures under this subchapter. The commissioner shall report annually, before February 1st, to the joint standing committee of the Legislature having jurisdiction over natural resources on the income to and expenditures from the Low-level Waste Siting Fund and on the budget for the coming year. That report shall include total fees received from each generator, and line item detail on expenditures, including in-state travel and out-of-state travel, printing, mailing and hearings; personnel; consultant services, general operating expenses, supplies and overhead, for both the commission and the department.

§1478. Departmental review of low-level radioactive waste facilities

1. Notice. Any person intending to construct or operate a low-level radioactive waste storage or disposal facility shall file a preliminary notice with the department and the municipality in accordance with section 483, subsection 1 and also notify the board of his intent in accordance with section 483, subsection 2.

2. Hearings. The board shall hold hearings on the proposed facility in accordance with section 484. Subject to the requirements of Title 5, section 9057 any person who resides within the State is entitled to be heard. The hearings shall as a minimum address the following issues:

A. The technical feasibility of the proposed waste disposal or storage facility;

B. The environmental impact of the proposed waste disposal or storage facility on the surrounding area;

C. The social impact of the proposed waste disposal or storage facility on the surrounding area; and

D. The economic impact of the proposed waste disposal or storage facility on the surrounding area.

Whether the proposed facility will satisfy any requirements under: Section 413, waste discharge licenses; section 590, air emission licensing; section 1304, licenses for waste facilities; and any other laws administered by the department that may be applicable.

3. Municipal participation. The municipality in which the proposed facility would be located may participate in the departmental site review using procedures conformed to the procedures for municipal participation in siting or hazardous waste facilities under section 1305-A, subsection 2.

4. Findings; recommendations. Notwithstanding any requirement of chapter 3, subchapter I, Article 6, within 90 days after adjournment of the hearings, the board shall make findings of fact and conclusions derived from those findings. Based upon those findings and conclusions, the board shall issue an order denying permission for construction and operation of the facility on grounds stated in section 484, or shall recommend to the Legislature granting that permission, subject to any terms and conditions deemed appropriate. Any favorable recommendation shall be transmitted to the Legislature, together with the supporting findings and conclusions, for action under section 1479.

5. Judicial review. Either action of the board under subsection 4 shall constitute final agency action, reviewable in accordance with the Maine Administrative Procedure Act, Title 5, chapter 375, subchapter VII.

§1479. Legislative approval of facilities required

No low-level radioactive waste disposal or storage facility may be established in the State, unless the Legislature has, by Private and Special Act, approved the establishment of that facility pursuant to the provisions of this subchapter. The Legislature shall act expeditiously on any recommendation of the board under section 1478, but shall not act until after the conclusion of any judicial review of the recommendation and any resulting administrative proceed-

ings.

Approval under this subchapter constitutes approval under the site location of development laws, but does not replace any other license required by law.

§1480. Applicability of regulations

All low-level radioactive waste storage facilities, whether privately or publicly owned or operated, shall be subject to regulation in accordance with this chapter.

§1480-A. Joint hearings; intervention

The board may hold joint hearings with the United States Nuclear Regulatory Commission and intervene in any federal licensing proceeding to carry out the purpose of this chapter.

§ 482. Definitions

As used in this subchapter, unless the context otherwise indicates, the following terms shall have the following meanings.

1. Board. "Board" means the Board of Environmental Protection.

2. Development which may substantially affect the environment. "Development which may substantially affect the environment," in this Article called "development," means any state, municipal, quasi-municipal, educational, charitable, commercial or industrial development, including subdivisions, which occupies a land or water area in excess of 20 acres, or which contemplates drilling for or excavating natural resources, on land or under water where the area affected is in excess of 60,000 square feet, or which is a mining activity, or which is a hazardous activity, or which is a structure; but excluding state highways, state aid highways, and, borrow pits for sand, fill or gravel, of less than 5 acres or when regulated by the Department of Transportation.

No person shall construct or cause to be constructed or operate or cause to be operated, or in the case of a subdivision sell, offer for sale, or cause to be sold, any development requiring approval under section 483 without first having obtained approval for such construction, operation or sale from the Board of Environmental Protection.

2-A. Exploration. "Exploration" means an activity solely intended to determine the existence, quality and quantity of product provided less than 1,000 cubic yards of product is extracted or removed within 12 successive months.

2-B. Mining activity. "Mining activity" means the breaking of the surface soil in order to facilitate or accomplish the extraction or removal of more than 1,000 cubic yards of product or overburden from the earth within 12 successive calendar months; any activity or process that for

the extraction or removal of the product or overburden; and the preparation, washing, cleaning or other treatment of that product so as to make it suitable for commercial, industrial or construction use, but shall not include excavation or grading preliminary to a construction project.

2-C. Hazardous activity. "Hazardous activity" means any activity that consumes, generates or handles any of the following:

A. Hazardous wastes, as defined in section 1303;

B. Hazardous matter, as defined in section 1317;

C. Oil, as defined in section 542; or

D. Quantities of road salt in excess of one ton per year.

"Hazardous activity" also includes any low-level radioactive waste storage or disposal facility, as defined in section 1451.

This definition shall not include an expansion of an existing development unless that expansion by itself would be a hazardous activity.

The board shall identify by regulation activities that are exempt from this definition, including domestic and other uses of substances in quantities too small to present a significant risk of groundwater contamination. U

Revision Note: Last paragraph "groundwater" should be 2 words.

3. Natural environment of a locality. "Natural environment of a locality" includes the character, quality and uses of land, air and waters in the development site or the area likely to be affected by such development, and the degree to which such land, air and waters are free from nonnaturally occurring contamination.

3-A. Overburden. "Overburden" means earth and other materials naturally lying over the product to be mined.

4. Person. "Person" means any person, firm, association, partnership, corporation, municipal or other local

governmental entity, quasi-municipal entity, state agency, educational or charitable organization or institution or other legal entity.

4-A. Product. "Product" means clay, peat, stone minerals, ores, topsoils or other solid matter.

4-B. Reclamation. "Reclamation" means the rehabilitation of the area of land affected by mining under a plan approved by the board, including, but not limited to, the creation of lakes or ponds, where practicable, the planting of forests, the seeding of grasses and legumes for grazing purposes, the planting of crops for harvest and the enhancement of wildlife and aquatic resources, but not including the filling in of pits, shafts and underground workings with solid materials.

4-C. Primary sand and gravel recharge areas. "Primary sand and gravel recharge area" means the surface area directly overlying sand and gravel formations that provide direct replenishment of ground water in sand and gravel and fractured bedrock aquifers. The term does not include areas overlying formations that have been identified as unsaturated and are not contiguous with saturated formations.

4-D. Significant ground water aquifer. "Significant ground water aquifer" means a porous formation of ice-contact and glacial outwash sand and gravel that contains significant recoverable quantities of water which is likely to provide drinking water supplies.

5. Subdivision. A "subdivision" is the division of a parcel of land into 5 or more lots to be offered for sale or lease to the general public during any 5-year period if such lots make up an aggregate land area of more than 20 acres except for the following:

A. All the lots are at least 10 acres in size;

B. All the lots are at least 5 acres, and the municipality has adopted additional regulations governing subdivisions pursuant to Title 30, section 4956, and the lots less than 10 acres are of such dimensions as to accommodate within the boundaries of each a rectangle measuring 200 feet and 300 feet, which abuts at one point the principal access way or the lots have at least 75

feet of frontage on a cul-de-sac which provides access;

C. All the lots are at least 5 acres, but do not make up a total of more than 100 acres and the lots less than 10 acres are of such dimensions as to accommodate within the boundaries of each a rectangle measuring 200 feet and 300 feet, which abuts at one point the principal access way or the lots have at least 75 feet of frontage on a cul-de-sac which provides access; or

D. Unless intended to circumvent this Article, the following transactions shall not be considered lots offered for sale or lease to the general public:

(1) Sale or lease of lots to an abutting owner or to a spouse, child, parent, grandparent or sibling of the developer; or

(2) Personal, nonprofit transactions, such as the transfer of lots by gift or devise.

6. Structure. A "structure" shall mean:

A. A building or buildings on a single parcel constructed or erected with a fixed location on or in the ground or attached to something on or in the ground which occupies a ground area in excess of 60,000 square feet; or

B. Parking lots, roads, paved areas, wharves or areas to be stripped or graded and not to be revegetated which causes a total project, including any buildings to occupy a ground area in excess of 3 acres.

§ 1305-A. Municipal participation for commercial hazardous waste facilities

1. Municipal ordinances. Municipalities may enact necessary police power ordinances dealing with commercial hazardous waste facilities, provided that they are not more stringent than or duplicative of the hazardous waste provisions of this chapter or rules and orders promulgated by the board. The board shall incorporate all applicable local requirements to the fullest extent practicable.

2. Site review. All persons who make application for a license to construct, operate or substantially expand a commercial hazardous waste facility shall, at the same time, give written notice to the municipal officers of the municipality in which the proposed facility will be located. The municipality through its municipal officers shall be granted intervenor status in any proceeding for site review of a commercial hazardous waste facility. The department shall reimburse the municipalities' direct costs, not to exceed $5,000, for participation in the proceedings.

The Governor may appoint a person to facilitate communications between the applicant and the municipality and between the department and the municipality.

The State may accept public and private funds from any source for the purpose of carrying out responsibilities under this section.

The board shall hold at least one public hearing within the municipality in which the facility will be located.

During any proceeding for site review of a commercial hazardous waste facility, the municipal legislative body in which the facility is to be located may appoint 4 representatives to the board. If the facility is proposed to be located within an unorganized township, the county commissioners of that county may appoint 4 representatives. These representatives may vote on board decisions related to the proposed commercial hazardous waste facility. All represen-

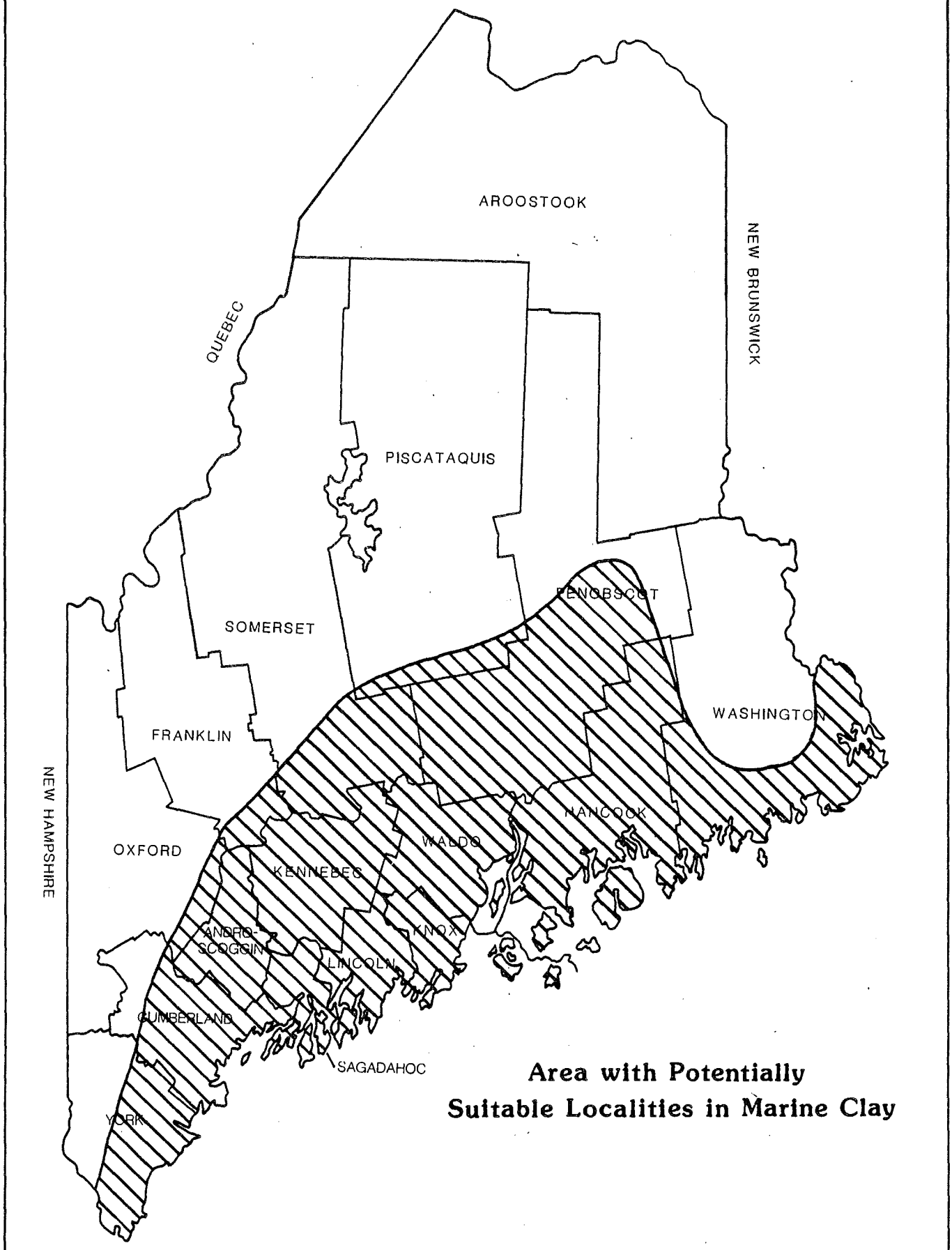
tatives appointed under this subsection shall participate on the board only for that site review, until final disposition of the application, including any administrative or judicial appeals. The municipal members shall receive the same pay for each day and expenses as regular board members during the period of their service, to be paid by the department.

3. Municipal fees authorized. A municipality may, by ordinance, levy a fee on a commercial hazardous waste facility located in the municipality. These fees shall be applied as a percentage of the annual billings of the facility to its customers. No fee so levied may exceed 2% of the annual billings. The department may audit the accounts of a facility to determine the amount of the fee owed to the municipality.

4. Application. Except for substantial expansion, this section does not apply to any facility which has been granted an interim or final license prior to the effective date of this Act.

APPENDIX D

GEOLOGICAL RANGE OF MARINE SILT AND CLAY DEPOSITS IN MAINE

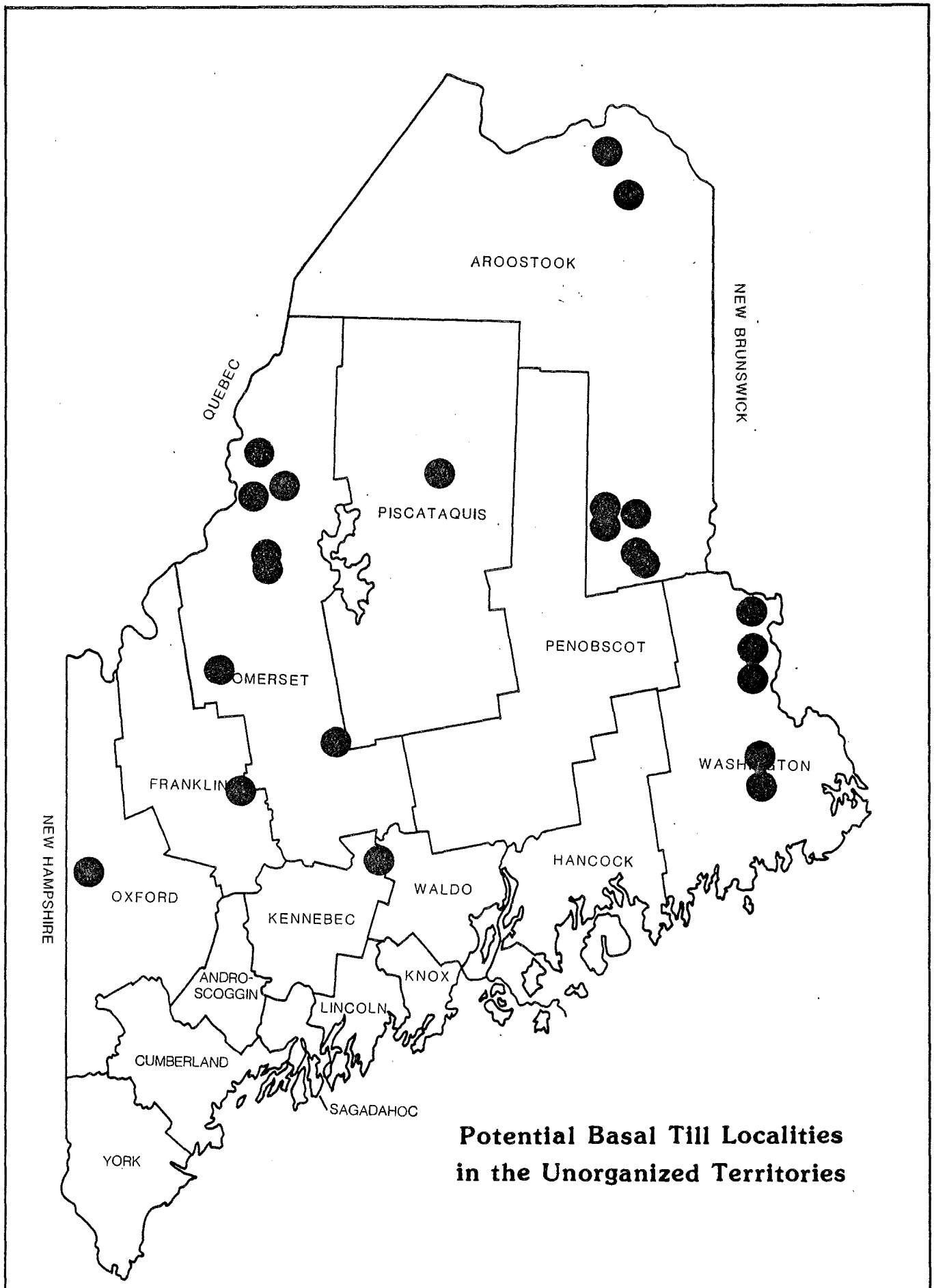


Area with Potentially Suitable Localities in Marine Clay

Source: Maine Geological Survey

APPENDIX E

POTENTIAL BASAL TILL LOCALITIES IN THE UNORGANIZED TOWNSHIPS OF MAINE



Potential Basal Till Localities in the Unorganized Territories

Source: Maine Geological Survey

THE LOCATIONS OF POTENTIAL BASAL TILL LOCALITIES
IN THE UNORGANIZED TOWNSHIPS OF MAINE

Township Name	County	Geological Rating[a]	Result of Socio-Economic Screening Study[b]
1. T17R5 WELS	Aroostook	8-10	Not eliminated from future consideration.
2. Pittston Academy Grant	Somerset	8-10	Not eliminated from future consideration.
3. Hammond Twp	Somerset	8-10	Not eliminated from future consideration.
4. T4 R11 WELS	Piscataquis	8-10	Not eliminated from future consideration.
5. Reed Plantation	Aroostook	8-10	Not eliminated from future consideration.
6. Freeman Township	Franklin	8-10	Not eliminated from future consideration.
7. Reed Plantation	Aroostook	7	Not eliminated from future consideration.
8. Riley Township	Oxford	7	Not eliminated from future consideration.
9. T37 MD	Washington	6	Not eliminated from future consideration.
10. T3 R4	Aroostook	6	Eliminated.
11. Thorndike Twp	Somerset	6	Not eliminated from future consideration.
12. Long Pond Twp	Somerset	6	Not eliminated from future consideration.

[a] The rating is a combination of the strength of the available geologic information supporting the interpretation of a thick section of basal till and an evaluation of the field evidence supporting the geological interpretation. The higher the rating, the more likely the area will be proven to have a thick basal till deposit by in-depth investigation.

[b] Localities were eliminated where 75 percent or more of the area within a three mile radius of the basal till locality was found unsuitable on the basis of criteria of the socio-economic screening study.

THE LOCATIONS OF POTENTIAL BASAL TILL LOCALITIES
IN THE UNORGANIZED TOWNSHIPS OF MAINE

Township Name	County	Geological Rating[a]	Result of Socio-Economic Screening Study[b]
13. T3 R3	Aroostook	5	Not eliminated from future consideration.
14. T3 R4	Aroostook	5	Eliminated.
15. Brighton Plantation	Piscataquis	5	Not eliminated from future consideration.
16. Unity Township	Kennebec	5	Not eliminated from future consideration.
17. T25 MD	Washington	5	Not eliminated from future consideration.
18. T4 R15	Somerset	5	Not eliminated from future consideration.
19. T1 R3	Washington	5	Eliminated.
20. T3 R4 BKR	Somerset	5	Not eliminated from future consideration.
21. Dyer Township	Washington	5	Eliminated.
22. Fowler Township	Washington	5	Eliminated.
23. T15 R5	Aroostook	5	Not eliminated from future consideration.

[a] The rating is a combination of the strength of the available geologic information supporting the interpretation of a thick section of basal till and an evaluation of the field evidence supporting the geological interpretation. The higher the rating, the more likely the area will be proven to have a thick basal till deposit by in-depth investigation.

[b] Localities were eliminated where 75 percent or more of the area within a three mile radius of the basal till locality was found unsuitable on the basis of criteria of the socio-economic screening study.

APPENDIX F

FEBRUARY 15, 1983 LETTER OF MAINE ATTORNEY GENERAL ON EXCLUDING OUT-OF-STATE LOW-LEVEL RADIOACTIVE WASTE

JAMES E. TIERNEY
ATTORNEY GENERAL

STATE OF MAINE
DEPARTMENT OF THE ATTORNEY GENERAL
STATE HOUSE STATION 6
AUGUSTA, MAINE 04333

February 15, 1983

Honorable Judy C. Kany
Chairman, Joint Standing Committee on
Energy and Natural Resources
State House
Augusta, Maine 04333

Dear Senator Kany:

You have asked whether, if the State of Maine were to establish a site for the disposal of low level radioactive waste,[1] it could constitutionally limit use of that site to waste generated entirely within the state. Since no court has ruled directly on this question, the response of this Department must necessarily be somewhat uncertain. Nonetheless, it appears that the state may well be constitutionally able to operate a low level radioactive waste site in the manner set forth.

The exclusion of low level radioactive waste from a state operated disposal site presents difficulties under two clauses of the United State Constitution. The first is the Supremacy Clause, Article VI, clause 2, which provides:

> This Constitution, and the laws of the United States which shall be made in Pursuance thereof . . . shall be the Supreme Law of the Land.

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[1] Low level radioactive waste is defined by federal law as "radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel or ['byproduct material']," 42 U.S.C. § 2021b(2), and includes such things as "filter sludges, resins, filter bottoms, used gloves and protective clothing, rags, tools, papers, plastic and materials used in the manufacture of smoke detectors, luminous dials and emergency exit signs." Washington State Building and Construction Trades Council v. Spellman, infra at 629.

Under this clause, state activity may be invalidated if the United States Congress enacts legislation which either clearly expresses its intention to preempt such activity, or is interpreted by the courts to constitute a pervasive statutory scheme whose purpose would be frustrated by the state's actions. Fidelity Federal Savings and Loan Association v. de la Cuesta, ____ U.S. ____, 73 L.Ed 2d 664, 674-676 (June 28, 1982), quoting Jones v. Rath Packing Co., 430 U.S. 519, 525 (1977) (express preemption) and Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947) (implied preemption). See also Florida Lime & Avocado Growers v. Paul, 373 U.S. 132 (1963); Hines v. Davidowitz, 312 U.S. 52 (1941). **The federal statute which might be found to prohibit the exclusion of out-of-state wastes from a state-operated low-level radioactive waste site is the Atomic Energy Act of 1954, 42 U.S.C. § 2011 et seq.,** particularly as it has been amended by the Low-Level Radioactive Waste Policy Act of 1981, 42 U.S.C. §§ 2021b-2021d.

In addition, even if the State's proposed activity were found not to be preempted by the Atomic Energy Act, as amended, **it might still be found to violate the Commerce Clause,** Article I, Section 8, clause 3. That clause provides:

> The Congress shall have Power . . . To regulate Commerce . . . among the several States.

and has been held to impose restraints independent of any federal legislation on state action which unreasonably affects the flow of interstate commerce. Gibbons v. Ogden, 22 U.S. (9 Wheat.) 1 (1824). This Opinion will therefore discuss in turn the application each of these clauses to the question presented.

I. Supremacy Clause

In 1954, the Congress enacted the Atomic Energy Act with the general objective of encouraging the development of the safe generation of nuclear power. Since that time, considerable debate has occurred over the extent to which Congress, in enacting and amending the Act, intended to preempt state power to regulate various aspects of nuclear power plants. See e.g., Washington State Building and Construction Trades Council v. Spellman, 684 F.2d 627, 630 (9th Cir. 1982), petition for cert. filed sub nom. Don't Waste Washington Legal Defense Foundation v. Washington, 51 U.S.L.W. 3421 (U.S. Nov. 15, 1982) (No. 82-841); Pacific Legal Foundations v. State Energy Resources Conservation & Development Comm'n, 659 F.2d 903, 919-928 (9th Cir. 1981), cert. granted sub nom. Pacific

Gas & Electric Company v. State Energy Resources Conservation & Development Comm'n, 50 U.S.L.W. 3998.01 (U.S. June 21, 1982) (No. 81-1945); Northern States Power Co. v. Minnesota, 447 F.2d 1143, 1147-52 (8th Cir. 1971), aff'd mem., 405 U.S. 1035 (1972).2/ The precise question presented here is whether the Congress, in passing the Atomic Energy Act in its amended form, intended to preempt a state from excluding out-of-state low-level radioactive wastes from a state-owned disposal site.

The obvious place to look to determine the Congress's intention on this point are the amendments to the Atomic Energy Act enacted at the end of 1980 which deal expressly with the problems of low-level radioactive waste.3/ These amendments, titled the Low-Level Radioactive Waste Policy Act, and found as indicated above at 42 U.S.C. §§ 2021b-2021d, establish federal policy as to the disposal of low-level radioactive waste. Their principal thrust was to encourage the development of regional sites for the disposal of low-level radioactive waste. To accomplish this goal, the amendments place on each state the responsibility of disposing of all low-level radioactive waste generated within its borders, but allow any state to discharge this responsibility by entering into an interstate compact, as contemplated by Article I, Section 10, clause 3 of the United States Constitution, which compact could restrict the use of any disposal facility located with the territory of the compacting states to low-level radioactive waste generated within that territory. 42 U.S.C. § 2021d(a).

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2 The history of the Atomic Energy Act and its amendments has been described by this Department in an earlier opinion. See Op. Me. Atty. Gen., December 14, 1979 at 3-6.

3/ Prior to these amendments, the most relevant portion of the Atomic Energy Act would have been the 1959 amendment thereto, 73 Stat. 688, enacting 42 U.S.C. § 2021, which attempted to clarify the respective authorities of the state and federal governments with regard to the regulation of radioactive material which until then had been within the exclusive jurisdiction of the federal government. On its face, however, this amendment did not address the question of the regulation of low-level radioactive waste, its scope being limited to "byproduct, source and special nuclear materials," which terms are defined in Section 2014 of the Act not to include low-level radioactive waste. In any event, whatever Congressional intent were to be inferred from the 1959 amendments would have to be regarded as now superseded by the 1981 amendments which specifically address the subject of low-level radioactive waste.

The clear implication of this scheme is that a state may not unilaterally ban the importation of low-level radioactive waste unless it enters into an approved compact containing such a prohibition. That was the holding of the United States Court of Appeals for the Ninth Circuit in the Washington State case, supra at 630, in which the Court invalidated a Washington initiative which enacted such a ban. **But neither the Low-Level Radioactive Waste Act, nor the Washington State case, addresses the question of whether a state may deny access to out-of-state radioactive waste to a disposal site operated by the state itself. Thus, it must be concluded that the Congress has simply not expressed itself on this point.**

In the absence of an express Congressional directive preempting a state from operating its own disposal site in the manner just described, the only remaining question is whether such an intention may be inferred because such a ban would interfere with a "pervasive statutory scheme." It is difficult to see, however, how such an interference might be found to occur. A state is under no obligation whatever under the Low-Level Radioactive Waste Policy Act to operate a low-level radioactive waste disposal site of its own. If it voluntarily undertakes to do so, but wishes to restrict access to the site in some way, the national waste disposal problem addressed by Congress in the Act will nonetheless be significantly alleviated. So long as the state does not directly restrict the flow of out-of-state waste across its borders, or prohibit the disposal of such waste at all sites, public or private, on its territory, it should not be found to be interfering with any federal policy, whether expressed in the Atomic Energy Act or elsewhere, simply by operating a limited-access facility of its own. Consequently, this Department is of the view that such action on the part of a State would not be impliedly preempted by the Atomic Energy Act.4/

4/ In reaching this conclusion, this Department offers no opinion as to what its view might be if the out-of-state waste which was to be disposed of at the proposed state facility was generated by the federal government itself. The fact that some of the waste prohibited from crossing the state line in Washington State was federally generated was apparently of concern to the court since it found that the state's prohibition was seeking, in part, to "regulate legitimate federal activity", and therefore violated the Supremacy Clause independent of any act of Congress. Washington State, supra at 630. See also the District Court opinion in the same case which treats this point at greater length . Washington State Building and Construction Trades Council v. Spellman, 518 F.Supp. 928, 931 (E.D. Wash. 1981), citing, inter alia, Mayo v. United States, 319 U.S. 441 (1943).

II. Commerce Clause

The question of whether the state may deny access at its own disposal site to radioactive waste generated out-of-state without violating the Commerce Clause has been addressed by this Department once before. Op. Me. Att'y Gen., No. 81-7 (Jan. 20, 1981).5/ On page 5 of that Opinion, a copy of which is attached, the Department noted that in Philadelphia v. New Jersey, 437 U.S. 617 (1976), the United States Supreme Court had expressly not ruled on this question, leaving open for further argument the possibility that a state operating in such a manner might qualify for the so-called "market participant" exception to the Commerce Clause, wherein states are permitted to engage in legitimate business activities which discriminate in favor of their own resident businesses. Id. at 627, n. 6. The Opinion also cited the then recent case of Reeves, Inc. v. Stake, 447 U.S. 429 (1980) for the same proposition. The Opinion thus concluded that since no court had foreclosed a state from so restricting the use of its own disposal site, "an argument can be made" that a state may do so.

The only question to be answered here, therefore, is whether any court has addressed this question since this Department's 1981 opinion. The only case of which we are aware which comes close to doing so is Washington State, supra, where the Ninth Circuit examined the Washington importation ban to determine whether it qualified for the "market participant" exception. The Court found that ban did not so qualify, for three reasons:

> The measure is based on public safety rather than on economic considerations. The measure denies entry of waste at the state's borders rather than at the site the state is operating as a market participant. The measure establishes civil and criminal penalties which only a state and not a mere proprietor can enforce. Id. at 631.

Under the proposal which you describe, it would not appear that any of these concerns would be violated. The purpose of establishing a state-owned site for the use of businesses operating within the state would obviously be to facilitate the

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5/ The issue in the 1981 opinion was access to a state-owned disposal site for hazardous waste, not low-level radioactive waste. For purposes of the Commerce Clause, however, the nature of the waste is of no constitutional significance, since the Supreme Court held, in the Philadelphia case, infra, that waste is an article of commerce.

continued operation of those enterprises, not to guard against any particular disposal hazard. The prohibition against out-of-state waste would be at the site, not at the state's border; low-level radioactive waste would remain free to enter the state for disposal somewhere else, subject, of course, to any necessary state permits (See note 7, infra). And no civil or criminal penalties would be established. Thus, the Washington State case would appear to be inapplicable and the 1981 Opinion would continue in force.6/

* * *

For the foregoing reasons, it is the opinion of this Department that the denial of access to a state-owned facility for the disposal of low-level radioactive waste to waste generated out-of-state would not violate the Supremacy or

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6/ There is one other point that deserves mention, though it has not been the subject of any direct holding by any court. In Reeves, Inc. v. Stake, supra, the Supreme Court intimated that the result in that case might have been different if the state were operating a business for the purpose of hoarding a natural resource. Since the subject of the business in that case - cement - was held not to be such a resource, the Court did not deny "market participant" status to the state of South Dakota. However, in Philadelphia v. New Jersey, supra, the Court found that landfill space in New Jersey was a scarce natural resource, and was therefore protected by the Commerce Clause. Thus, it might be argued that an attempt by Maine to limit access to a state-owned low-level radioactive waste landfill to in-state businesses might be an invalid attempt to conserve its natural resources. This, of course, was the issue expressly not resolved by the Supreme Court in the Philadelphia case, as indicated at the outset of Part II of this Opinion. This Department is inclined to think, however, that the sheer size of the State of Maine, coupled with its relatively sparse population, might make a court reluctant to conclude that landfill space was a scarce resource, as it might well be in the New Jersey suburbs of Philadelphia. Thus, the Department's 1981 view of the applicability of the Commerce Clause to the situation presented remains unchanged.

Commerce Clause of the United States Constitution.[7] If any of the foregoing is unclear, or if you have any further questions, please feel free to reinquire.

Sincerely,

JAMES E. TIERNEY
Attorney General

JET/11

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[7] You should also note that this Opinion deals only with constitutional restriction on state action. Obviously, neither the Supremacy or Commerce Clauses operate as a restriction on private activity at all. Thus, should any private person establish a low-level radioactive waste site in Maine (which establishment would require a permit from the Maine Board of Environmental Protection pursuant to the Maine Hazardous Waste, Septage, and Solid Waste Management Act, 38 M.R.S.A § 1301 et seq., as well as any other federal or local licenses) such person would be free to allow or deny access to anyone at all for any reason.

APPENDIX G

DRAFT NORTHEAST REGIONAL COMPACT

NORTHEAST INTERSTATE LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT COMPACT

OFFICIAL DRAFT
FEBRUARY 1983

COALITION OF NORTHEASTERN GOVERNORS

ARTICLE I. POLICY AND PURPOSE

There is hereby created the Northeast Interstate Low-Level Radioactive Waste Management Compact. The party states recognize that the Congress has declared that each state is responsible for providing for the availability of capacity, either within or outside its borders, for disposal of low-level radioactive waste generated within its borders, except for waste generated as a result of atomic energy defense activities of the federal government, as defined in the Low-Level Radioactive Waste Policy Act (P.L. 96-573, "The Act"), or federal research and development activities. They also recognize that the management of low-level radioactive waste is handled most efficiently on a regional basis. The party states further recognize that the Congress of the United States, by enacting the Act has provided for and encouraged the development of regional low-level radioactive waste compacts to manage such waste. The party states recognize that the long-term, safe and efficient management of low-level radioactive waste generated within the region requires that sufficient capacity to manage such waste be properly provided.

In order to promote the health and safety of the region, it is the policy of the party states to: enter into a regional low-level radioactive waste management compact as a means of facilitating an interstate cooperative effort, provide for proper transportation of low-level waste generated in the region, minimize the number of facilities required to effectively and efficiently manage low-level

radioactive waste generated in the region, encourage the reduction of the amounts of low-level waste generated in the region, distribute the costs, benefits, and obligations of proper low-level radioactive waste management equitably among the party states, and ensure the environmentally sound and economical management of low-level radioactive waste.

ARTICLE II. DEFINITIONS

As used in this compact, unless the context clearly requires a different construction:

a. "commission" means the Northeast Interstate Low-Level Radioactive Waste Commission established pursuant to Article IV of this compact;

b. "custodial agency" means the agency of the government designated to act on behalf of the government owner of the regional facility;

c. "disposal" means the isolation of low-level radioactive waste from the biosphere inhabited by man and his food chains;

d. "facility" means a parcel of land, together with the structures, equipment and improvements thereon or appurtenant thereto, which is used or is being developed for the treatment, storage or disposal of low-level waste, but shall not include on-site treatment or storage by a generator;

e. "generator" means a person who produces or processes low-level waste, but does not include persons who only provide a service by arranging for the collection, transportation, treatment, storage or disposal of wastes generated outside the region;

f. "high-level waste" means 1) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentration; and 2)

any other highly radioactive material determined by the federal government as requiring permanent isolation;

g. "host state" means a party state in which a regional facility is located or being developed;

h. "institutional control" means the continued observation, monitoring, and care of the regional facility following transfer of control of the regional facility from the operator to the custodial agency;

i. "low-level waste" means radioactive waste that 1) is neither high-level waste nor transuranic waste, nor spent nuclear fuel, nor by-product material as defined in section 11e (2) of the Atomic Energy Act of 1954 as amended; and 2) is classified by the federal government as low-level waste, consistent with existing law; but does not include waste generated as a result of atomic energy defense activities of the federal government, as defined in P.L. 96-573, or federal research and development activities;

j. "party state" means any state which is a signatory party in good standing to this compact;

k. "person" means an individual, corporation, business enterprise or other legal entity, either public or private and their legal successors;

l. "post-closure observation and maintenance" means the continued

monitoring of a closed regional facility to ensure the integrity and environmental safety of the site through compliance with applicable licensing and regulatory requirements; prevention of unwarranted intrusion, and correction of problems;

m. "region" means the entire area of the party states;

n. "regional facility" means a facility as defined in this section which has been designated or accepted by the Commission;

o. "state" means a state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands or any other territory subject to the laws of the United States;

p. "storage" means the holding of waste for treatment or disposal;

q. "transuranic waste" means waste material containing radionuclides with an atomic number greater than 92 which are excluded from shallow land burial by the federal government;

r. "treatment" means any method, technique or process, including storage for decay, designed to change the physical, chemical or biological characteristics or composition of any waste in order to render such waste safer for transport or disposal, amenable for recovery, convertible to another usable material or reduced in volume;

s. "waste" means low-level radioactive waste as defined in this section;

t. "waste management" means the storage, treatment, transportation, and disposal, where applicable, of waste.

ARTICLE III. RIGHTS AND OBLIGATIONS

a. There shall be provided within the region one or more regional facilities which, together with such other facilities as may be made available to the region, will provide sufficient capacity to manage all wastes generated within the region.

1. Regional facilities shall be entitled to waste generated within the region, unless otherwise provided by the Commission. To the extent regional facilities are available, no waste generated within a party state shall be exported to facilities outside the region unless such exportation is approved by the Commission and the affected host state(s).

2. After January 1, 1986, no person shall deposit at a regional facility waste generated outside the region, and further, no regional facility shall accept waste generated outside the region, unless approved by the Commission and the affected host state(s).

b. The rights, responsibilities and obligations of each party state to this compact are as follows:

1. Each party state shall have the right to have all wastes generated within its borders managed at regional facilities, and shall have the right of access to facilities made available to the region through agreements entered into by the Commission pursuant to Article IV(i)(11). The right of access by a generator within a party

state to any regional facility is limited by the generator's adherence to applicable state and federal laws and regulations and the provisions of this compact.

2. To the extent not prohibited by federal law, each party state shall institute procedures which will require shipments of low-level waste generated within or passing through its borders to be consistent with applicable federal packaging and transportation regulations and applicable host state packaging and transportation regulations for management of low-level waste; provided, however, that these practices shall not impose unreasonable, burdensome impediments to the management of low-level waste in the region. Upon notification by a host state that a generator, shipper, or carrier within the party state is in violation of applicable packaging or transportation regulations, the party state shall take appropriate action to ensure that such violations do not recur.

3. Each party state may impose reasonable fees upon generators, shippers, or carriers to recover the cost of inspections and other practices under this compact.

4. Each party state shall encourage generators within its borders to minimize the volumes of waste requiring disposal.

5. Each party state has the right to rely on the good faith

performance by every other party state of acts which ensure the provision of facilities for regional availability and their use in a manner consistent with this compact.

6. Each party state shall provide to the Commission any data and information necessary for the implementation of the Commission's responsibilities, and shall establish the capability to obtain any data and information necessary to meet its obligation as herein defined.

7. Each party state shall have the capability to host a regional facility in a timely manner and to ensure the post-closure observation and maintenance, and institutional control of any regional facility within its borders.

8. No non-host party state shall be liable for any injury to persons or property resulting from the operation of a regional facility or the transportation of waste to a regional facility; however, if the host state itself is the operator of the regional facility, its liability shall be that of any private operator.

c. The rights, responsibilities and obligations of a host state are as follows:

1. To the extent not prohibited by federal law, a host state shall ensure the timely development and the safe operation, closure, post-closure observation and maintenance, and institutional control of any regional

facility within its borders.

2. In accordance with procedures established in Articles V and IX, the host state shall provide for the establishment of a reasonable structure of fees sufficient to cover all costs related to the development, operation, closure, post-closure observation and maintenance, and institutional control of a regional facility. It may also establish surcharges to cover the regulatory costs, incentives, and compensation associated with a regional facility; provided, however, that without the express approval of the Commission, no distinction in fees or surcharges shall be made between persons of the several states party to this compact.

3. To the extent not prohibited by federal law, a host state may establish requirements and regulations pertaining to the management of waste at a regional facility; provided, however, that such requirements shall not impose unreasonable impediments to the management of low-level waste within the region. Nor may a host state or a subdivision impose such restrictive requirements on the siting or operation of a regional facility that, alone or as a whole, they serve as unreasonable barriers or prohibitions to the siting or operation of such a facility.

4. Each host state shall submit to the Commission annually a

report concerning each operating regional facility within its borders. The report shall contain projections of the anticipated future capacity and availability of the regional facility, a financial audit of its operation, and other information as may be required by the Commission; and in the case of regional facilities in institutional control or otherwise no longer operating, the host states shall furnish such information as may be required on the facilities still subject to their jurisdiction.

5. A host state shall notify the Commission immediately if any exigency arises which requires the permanent, temporary, or possible closure of any regional facility located therein at a time earlier than projected in its most recent annual report to the Commission. The Commission may conduct studies, hold hearings, or take such other measures to ensure that the actions taken are necessary and compatible with the obligations of the host state under this compact.

ARTICLE IV. THE COMMISSION

a. There is hereby created the Northeast Interstate Low-Level Radioactive Waste Commission. The Commission shall consist of one member from each party state to be appointed by the Governor according to procedures of each party state, except that a host state shall have two members during the period that it has an operating regional facility. The Governor shall notify the Commission in writing of the identity of the member and one alternate, who may act on behalf of the member only in the member's absence.

b. Each Commission member shall be entitled to one vote. No action of the Commission shall be binding unless a majority of the total membership cast their vote in the affirmative.

c. The Commission shall elect annually from among its members a presiding officer and such other officers as it deems appropriate. The Commission shall adopt and publish, in convenient form, such rules and regulations as are necessary for due process in the performance of its duties and powers under this compact.

d. The Commission shall meet at least once a year and shall also meet upon the call of the presiding officer, or upon the call of a party state member.

e. All meetings of the Commission shall be open to the public with reasonable prior public notice. The Commission may, by majority vote, close a meeting to the public for the purpose

of considering sensitive personnel or legal matters. All Commission actions and decisions shall be made in open meetings and appropriately recorded. A roll call vote may be required upon request of any party state or the presiding officer.

f. The Commission may establish such committees as it deems necessary.

g. The Commission may appoint, contract for, and compensate such limited staff as it determines necessary to carry out its duties and functions. The staff shall serve at the Commission's pleasure irrespective of the civil service, personnel or other merit laws of any of the party states or the federal government and shall be compensated from funds of the Commission.

h. The Commission shall adopt an annual budget for its operations.

i. The Commission shall have the following duties and powers:

1. The Commission shall receive and act on the application of a non-party state to become an eligible state in accordance with Article VII(e).

2. The Commission shall receive and act on the application of an eligible state to become a party state in accordance with Article VII(b).

3. The Commission shall submit an annual report to and

otherwise communicate with the governors and the presiding officer of each body of the legislature of the party states regarding the activities of the Commission.

4. Upon request of party states, the Commission shall mediate disputes which arise between the party states regarding this compact.

5. The Commission shall develop, adopt and maintain a regional management plan to ensure safe and effective management of waste within the region, pursuant to Article V.

6. The Commission may conduct such legislative or adjudicatory hearings, and require such reports, studies, evidence and testimony as are necessary to perform its duties and functions.

7. The Commission shall establish by regulation, after public notice and opportunity for comment, such procedural regulations as deemed necessary to ensure efficient operation, the orderly gathering of information, and the protection of the rights of due process of affected persons.

8. In accordance with the procedures and criteria set forth in Article V, the Commission shall accept a host state's proposed facility as a regional facility.

9. In accordance with the procedures and criteria set forth in Article V, the Commission may designate, by a two-thirds

vote, host states for the establishment of needed regional facilities. The Commission shall not exercise this authority unless the party states have failed to voluntarily pursue the development of such facilities.

10. The Commission may require of and obtain from party states, eligible states seeking to become party states, and non-party states seeking to become eligible states, data and information necessary for the implementation of Commission responsibilities.

11. The Commission may enter into agreements with any person, state, regional body, or group of states for the importation of waste into the region and for the right of access to facilities outside the region for waste generated within the region. Such authorization to import requires a two-thirds majority vote of the Commission, including an affirmative vote of the representatives of the host state in which any affected regional facility is located. This shall be done only after the Commission and the host state have made an assessment of the affected facilities' capability to handle such wastes and of relevant environmental, economic, and public health factors, as defined by the appropriate regulatory authorities.

12. The Commission may, upon petition, grant an individual

generator or group of generators in the region the right to export wastes to a facility located outside the region. Such grant of right shall be for a period of time and amount of waste and on such other terms and conditions as determined by the Commission and approved by the affected host states.

13. The Commission may appear as an intervenor or party in interest before any court of law, federal, state or local agency, board or commission that has jurisdiction over the management of wastes. Such authority to intervene or otherwise appear shall be exercised only after a two-thirds vote of the Commission. In order to represent its views, the Commission may arrange for any expert testimony, reports, evidence or other participation as it deems necessary.

14. The Commission may impose sanctions, including but not limited to, fines, suspension of privileges or revocation of the membership of a party state in accordance with Article VII. The Commission shall have the authority to revoke, in accordance with Article VII(g), the membership of a party state that creates unreasonable barriers to the siting of a needed regional facility or refuses to accept host state responsibilities upon designation by the Commission.

15. The Commission shall establish by regulation criteria for

and shall review the fee and surcharge systems in accordance with Articles V and IX.

16. The Commission shall review the capability of party states to ensure the siting, operation, post-closure observation and maintenance, and institutional control of any facility within its borders.

17. The Commission shall review the compact legislation every five years prior to federal congressional review provided for in the Act, and may recommend legislative action.

18. The Commission has the authority to develop and provide to party states such rules, regulations and guidelines as it deems appropriate for the efficient, consistent, fair and reasonable implementation of the compact.

j. There is hereby established a Commission operating account. The Commission is authorized to expend monies from such account for the expenses of any staff and consultants designated under section (g) of this Article and for official Commission business. Financial support for the Commission account shall be provided as follows:

1. Each eligible state, upon becoming a party state, shall pay $70,000 to the Commission, which shall be used for administrative costs of the Commission.

2. The Commission shall impose a "commission surcharge" per unit of waste received at any regional facility as provided in Article V.

3. Until such time as at least one regional facility is in operation and accepting waste for management, or to the extent that revenues under paragraphs (1) and (2) of this section are unavailable or insufficient to cover the approved annual budget of the Commission, each party state shall pay an apportioned amount of the difference between the funds available and the total budget in accordance with the following formula:

   (a) 20 percent in equal shares;

   (b) 30 percent in the proportion that the population of the party state bears to the total population of all party states, according to the most recent U.S. census;

   (c) 50 percent in the proportion that the waste generated for management in each party state bears to the total waste generated for management in the region for the most recent calendar year in which reliable data are available, as determined by the Commission.

k. The Commission shall keep accurate accounts of all receipts and disbursements. An independent certified public accountant shall annually audit all receipts and disbursements of Commission accounts and funds and submit an audit report to the Commission. Such audit report shall be made a part of the annual report of the Commission required by Article IV(i) (3).

ARTICLE IV.

l. The Commission may accept, receive, utilize and dispose for any of its purposes and functions any and all donations, loans, grants of money, equipment, supplies, materials and services (conditional or otherwise) from any state or the United States or any subdivision or agency thereof, or interstate agency, or from any institution, person, firm or corporation. The nature, amount and condition, if any, attendant upon any donation, loan, or grant accepted pursuant to this paragraph, together with the identity of the donor, grantor, or lender, shall be detailed in the annual report of the Commission. The Commission shall by rule establish guidelines for the acceptance of donations, loans, grants of money, equipment, supplies, materials and services. This shall provide that no donor, grantor or lender may derive unfair or unreasonable advantage in any proceeding before the Commission.

m. The Commission herein established is a body corporate and politic, separate and distinct from the party states and shall be so liable for its own actions. Liabilities of the Commission shall not be deemed liabilities of the party states, nor shall members of the Commission be personally liable for action taken by them in their official capacity.

1. The Commission shall not be responsible for any costs or expenses associated with the creation, operation, closure, post-closure observation and maintenance, and

institutional control of any regional facility, or any associated regulatory activities of the party states.

2. Except as otherwise provided herein, this compact shall not be construed to alter the incidence of liability of any kind for any act, omission, or course of conduct. Generators, shippers and carriers of wastes, and owners and operators of sites shall be liable for their acts, omissions, conduct, or relationships in accordance with all laws relating thereto.

n. The United States district courts in the District of Columbia shall have original jurisdiction of all actions brought by or against the Commission. Any such action initiated in a state court shall be removed to the designated United States district court in the manner provided by Act of June 25, 1948 as amended (28 U.S.C. §1446). This section shall not alter the jurisdiction of the United States Court of Appeals for the District of Columbia Circuit to review the final administrative decisions of the Commission as set forth in the paragraph below.

o. The United States Court of Appeals for the District of Columbia Circuit shall have jurisdiction to review the final administrative decisions of the Commission.

1. Any person aggrieved by a final administrative decision may obtain review of the decision by filing a petition for review within 60 days after the Commission's

final decision.

2. In the event that review is sought of the Commission's decision relative to the designation of a host state, the Court of Appeals shall accord the matter an expedited review, and, if the Court does not rule within 90 days after a petition for review has been filed, the Commission's decision shall be deemed to be affirmed.

3. The courts shall not substitute their judgment for that of the Commission as to the decisions of policy or weight of the evidence on questions of fact. The Court may affirm the decision of the Commission or remand the case for further proceedings if it finds that the petitioner has been aggrieved because the finding, inferences, conclusions or decisions of the Commission are:

   a. in violation of the Constitution of the United States;

   b. in excess of the authority granted to the Commission by this compact;

   c. made upon unlawful procedure to the detriment of any person;

   d. arbitrary or capricious or characterized by abuse of discretion or clearly unwarranted exercise of discretion.

4. The Commission shall be deemed to be acting in a legislative capacity except in those instances where it decides, pursuant to its rules and regulations, that its determinations are adjudicatory in nature.

ARTICLE V. HOST STATE SELECTION AND DEVELOPMENT AND OPERATION OF REGIONAL FACILITIES

a. The Commission shall develop, adopt, maintain, and implement a regional management plan to ensure the safe and efficient management of waste within the region. The plan shall include the following:

1. a current inventory of all generators within the region;

2. a current inventory of all facilities within the region, including information on the size, capacity, location, specific waste being handled, and projected useful life of each facility;

3. consistent with considerations for public health and safety as defined by appropriate regulatory authorities, a determination of the type and number of regional facilities which are presently necessary and projected to be necessary to manage waste generated within the region;

4. reference guidelines, as defined by appropriate regulatory authorities, for the party states for establishing the criteria and procedures to evaluate locations for regional facilities.

b. The Commission shall develop and adopt criteria and procedures for reviewing a party state which volunteers to host a regional facility within its borders. These criteria shall be developed with public notice and shall include the following factors: the capability of the volunteering party state to host a regional facility in a timely manner and to ensure its post-closure

observation and maintenance, and institutional control; and the anticipated economic feasibility of the proposed facility.

1. Any party state may volunteer to host a regional facility within its borders. The Commission may set terms and conditions to encourage a party state to volunteer to be the first host state.

2. Consistent with the review required above, the Commission shall, upon a two-thirds affirmative vote, designate a volunteering party state to serve as a host state.

c. If all regional facilities required by the regional management plan are not developed pursuant to section (b), or upon notification that an existing facility will be closed, or upon determination that an additional regional facility is or may be required, the Commission shall convene to consider designation of a host state.

1. The Commission shall develop and adopt procedures for designating a party state to be a host state for a regional facility. The Commission shall base its decision on the following criteria:

a. the health, safety and welfare of citizens of the party states as defined by the appropriate regulatory authorities;

b. the environmental, economic, and social effects of a

regional facility on the party states;

The Commission shall also base its decision on the following criteria:

c. economic benefits and costs;

d. the volumes and types of waste generated within each party state;

e. the minimization of waste transportation; and

f. the existence of regional facilities within the party states.

2. Following its established criteria and procedures, the Commission shall designate by a two-thirds affirmative vote a party state to serve as a host state. A current host state shall have the right of first refusal for a succeeding regional facility.

3. The Commission shall conduct such hearings and studies, and take such evidence and testimony as is required by its approved procedures prior to designating a host state. Public hearings shall be held upon request in each candidate host state prior to final evaluation and selection.

4. A party state which has been designated as a host state by the Commission and which fails to fulfill its obligations as a host state may have its privileges under the compact suspended or membership in the compact revoked by the Commission.

d. Each host state shall be responsible for the timely identification of a site and the timely development and operation of a regional facility. The proposed facility shall meet geologic, environmental and economic criteria which shall not conflict with applicable federal and host state laws and regulations.

1. To the extent not prohibited by federal law, a host state may regulate and license any facility within its borders.

2. To the extent not prohibited by federal law, a host state shall ensure the safe operation, closure, post-closure observation and maintenance, and institutional control of a facility, including adequate financial assurances by the operator and adequate emergency response procedures. It shall periodically review and report to the Commission on the status of the post-closure and institutional control funds and the remaining useful life of the facility.

3. A host state shall solicit comments from each party state and the Commission regarding the siting, operation, financial assurances, closure, post-closure observation and maintenance, and institutional control of a regional facility.

e. A host state intending to close a regional facility within its borders shall notify the Commission in writing of its intention and the reasons therefore.

1. Except as otherwise provided, such notification shall be given

to the Commission at least five years prior to the scheduled date of closure.

2. A host state may close a regional facility within its borders in the event of an emergency or if a condition exists which constitutes a substantial threat to public health and safety. A host state shall notify the Commission in writing within three days of its action and shall, within 30 working days, show justification for the closing.

3. In the event that a regional facility closes before an additional or new facility becomes operational, the Commission shall make interim arrangements for the storage or disposal of waste generated within the region until such time that a new regional facility is operational.

f. Fees and surcharges shall be imposed equitably upon all users of a regional facility, based upon criteria established by the Commission.

1. A host state shall, according to its lawful administrative procedures, approve fee schedules to be charged to all users of the regional facility within its borders. Except as provided herein, such fee schedules shall be established by the operator of a regional facility, under applicable state regulations, and shall be reasonable and sufficient to cover all costs related to the development, operation, closure, post-closure observation and maintenance, institutional control of the

regional facility. The host state shall determine a schedule for contributions to the post-closure observation and maintenance, and institutional control funds. Such fee schedules shall not be approved unless the Commission has been given reasonable opportunity to review and make recommendations on the proposed fee schedules.

2. A host state may, according to its lawful administrative procedures, impose a state surcharge per unit of waste received at any regional facility within its borders. The state surcharge shall be in addition to the fees charged for waste management. The surcharge shall be sufficient to cover all reasonable costs associated with administration and regulation of the facility. The surcharge shall not be established unless the Commission has been provided reasonable opportunity to review and make recommendations on the proposed state surcharge.

3. The Commission shall impose a commission surcharge per unit of waste received at any regional facility. The total monies collected shall be adequate to pay the costs and expenses of the Commission and shall be remitted to the Commission on a timely basis as determined by the Commission. The surcharge may be increased or decreased as the Commission deems necessary.

4. Nothing herein shall be construed to limit the ability of the

host state, or the political subdivision in which the regional facility is situated, to impose surcharges for purposes including, but not limited to, host community compensation and host community development incentives. Such surcharges shall be reasonable and shall not be imposed unless the Commission has been provided reasonable opportunity to review and make recommendations on the proposed surcharge. Such surcharge may be recovered through the approved fee and surcharge schedules provided for in this section.

ARTICLE VI. OTHER LAWS AND REGULATIONS

a. Nothing in this compact shall be construed to abrogate or limit the regulatory responsibility or authority of the U.S. Nuclear Regulatory Commission or of an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended.

b. The laws or portions of those laws of a party state that are not inconsistent with this compact remain in full force.

c. Nothing in this compact shall make unlawful the continued development and operation of any facility already licensed for development or operation on the date this compact becomes effective.

d. No judicial or administrative proceeding pending on the effective date of the compact shall be affected by the compact.

e. Except as provided for in Article III(b)(2) and (c)(3), this compact shall not affect the relations between and the respective internal responsibilities of the government of a party state and its subdivisions.

f. The generation, treatment, storage, transportation, or disposal of waste generated by the atomic energy defense activities of the federal government, as defined in P.L. 96-573, or federal research and development activities are not affected by this compact.

g. To the extent that the rights and powers of any state or political subdivision to license and regulate any facility

within its borders and to impose taxes, fees, and surcharges on the waste managed at that regional facility do not operate as an unreasonable impediment to the transportation, treatment or disposal of waste, such rights and powers shall not be diminished by this compact.

h. No party state shall enact any law or regulation or attempt to enforce any measure which is inconsistent with this compact. Such measures may provide the basis for the Commission to suspend or terminate a party state's membership and privileges under this compact.

i. All laws and regulations, or parts thereof of any party state or subdivision or instrumentality thereof which are inconsistent with this compact are hereby repealed and declared null and void. Any legal right, obligation, violation or penalty arising under such laws or regulations prior to the enactment of this compact, or not in conflict with it, shall not be affected.

j. Subject to Article III(c)(2), no law or regulation of a party state or subdivision or instrumentality thereof may be applied so as to restrict or make more costly or inconvenient access to any regional facility by the generators of another party state than for the generators of the state where the facility is situated.

k. No law, ordinance, or regulation of any party state or any subdivision or instrumentality thereof shall prohibit, suspend, or unreasonably delay, limit or restrict the operation of a

siting or licensing agency in the designation, siting, or licensing of a regional facility. Any such provision in existence at the time of ratification of this compact is hereby repealed.

ARTICLE VII. ELIGIBLE PARTIES, WITHDRAWAL, REVOCATION, ENTRY INTO FORCE, TERMINATION

a. The initially eligible parties to this compact shall be the eleven states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Initial eligibility will expire June 30, 1984.

b. Each state eligible to become a party state to this compact shall be declared a party state upon enactment of this compact into law by the state, repeal of all statutes or statutory provisions that pose unreasonable impediments to the capability of the state to host a regional facility in a timely manner, and upon payment of the fees required by Article IV(j)(1). An eligible state may become a party to this compact by an executive order by the governor of the state and upon payment of the fees required by Article IV(j)(1). However, any state which becomes a party state by executive order shall cease to be a party state upon the final adjournment of the next general or regular session of its legislature, unless this compact has by then been enacted as a statute by the state and all statutes and statutory provisions that conflict with the compact have been repealed.

c. The compact shall become effective in a party state upon enactment by that state. It shall not become initially

effective in the region until enacted into law by three party states and consent given to it by the Congress.

d. The first three states eligible to become party states to this compact which adopt this compact into law as required in Article VII(b) shall immediately, upon the appointment of their Commission members, constitute themselves as the Northeast Interstate Low-Level Radioactive Waste Commission. They shall cause legislation to be introduced in the Congress which grants the consent of the Congress to this compact, and shall do those things necessary to organize the Commission and implement the provisions of this compact.

1. The Commission shall be the judge of the qualifications of the party states and of its members and of their compliance with the conditions and requirements of this compact and of the laws of the party states relating to the enactment of this compact.

2. All succeeding states eligible to become party states to this compact shall be declared party states pursuant to the provisions of section (b) of this Article.

e. Any state not expressly declared eligible to become a party state to this compact in section (a) of this Article may petition the Commission to be declared eligible. The Commission may establish such conditions as it deems necessary and appropriate to be met by a state requesting eligibility as a party state to this compact pursuant to the provisions of

this section, including a public hearing on the application. Upon satisfactorily meeting such conditions and upon the affirmative vote of two-thirds of the Commission, including the affirmative vote of the representatives of the host states in which any affected regional facility is located, the petitioning state shall be eligible to become a party state to this compact and may become a party state in the same manner as those states declared eligible in section (a) of this Article.

f. No state holding membership in any other regional compact for the management of low-level radioactive waste may become a member of this compact.

g. Any party state which fails to comply with the provisions of this compact or to fulfill its obligations hereunder may have its privileges suspended or, upon a two-thirds vote of the Commission, after full opportunity for hearing and comment, have its membership in the compact revoked. Revocation shall take effect one year from the date the affected party state receives written notice from the Commission of its action. All legal rights of the affected party state established under this compact shall cease upon the effective date of revocation, except that any legal obligations of that party state arising prior to revocation will not cease until they have been fulfilled. As soon as practicable after a Commission decision suspending or revoking party state status,

the Commission shall provide written notice of the action and a copy of the resolution to the governors and the presiding officer of each body of the state legislatures of the party states, and to chairmen of the appropriate committees of the Congress.

h. Any party state may withdraw from this compact by repealing its authorization legislation, and all legal rights under this compact of the party state cease upon repeal. However, no such withdrawal shall take effect until five years after the Governor of the withdrawing state has given notice in writing of such withdrawal to the Commission and to the governor of each party state. No withdrawal shall affect any liability already incurred by or chargeable to a party state prior to that time.

1. Upon receipt of the notification, the Commission shall, as soon as practicable, provide copies to the governors and the presiding officer of each body of the state legislatures of the party states, and to the chairmen of the appropriate committees of the Congress.

2. A regional facility in a withdrawing state shall remain available to the region for five years after the date the Commission receives written notification of the intent to withdraw or until the prescheduled date of closure, whichever occurs first.

ARTICLE VII.

i. This compact may be terminated only by the affirmative action of the Congress or by the repeal of all laws enacting the compact in each party state. The Congress may by law withdraw its consent every five years after the compact takes effect.

1. The consent given to this compact by the Congress shall extend to any future admittance of new party states under sections (b) and (e) of this Article.

2. The withdrawal of a party state from this compact under section (h) or the revocation of a state's membership in this compact under section (g) of this Article shall not affect the applicability of the compact to the remaining party states.

ARTICLE VIII. PENALTIES

a. Each party state, consistent with federal and host state regulations and laws, shall enforce penalties against any person not acting as an official of a party state for violation of this compact in the party state. Each party state acknowledges that the shipment to a host state of waste packaged or transported in violation of applicable laws and regulations can result in the imposition of sanctions by the host state. These sanctions may include, but are not limited to, suspension or revocation of the violator's right of access to the facility in the host state.

b. Without the express approval of the Commission, it shall be unlawful for any person to dispose of any low-level waste within the region except at a regonal facility; provided, however, that this restriction shall not apply to waste which is permitted by applicable federal or state regulations to be discarded without regard to its radioactivity.

c. Unless specifically approved by the Commission and affected host state(s) pursuant to Article IV, it shall be a violation of this compact for: 1) any person to deposit at a regional facility waste not generated within the region; 2) any regional facility to accept waste not generated within the region; and 3) any person to export from the region waste generated within the region.

d. Primary responsibility for enforcing provisions of the law will rest with the affected state or states. The Commission, upon a two-thirds vote of its members, may bring action to seek

enforcement or appropriate remedies against violators of the provisions and regulations for this compact as provided for in Article IV.

ARTICLE IX. COMPENSATION PROVISIONS

a. The responsibility for ensuring compensation and clean-up during the operational and post-closure periods rests with the host state, as set forth herein.

1. The host state shall ensure the availability of funds and procedures for compensation of injured persons, including facility employees, and property damage (except any possible claims for diminution of property values) due to the existence and operation of a regional facility, and for clean-up and restoration of the facility and surrounding areas.

2. The state may satisfy this obligation by requiring bonds, insurance, compensation funds, or any other means or combination of means, imposed either on the facility operator or assumed by the state itself, or both. Nothing in this article alters the liability of any person or governmental entity under applicable state and federal laws.

b. The Commission shall provide a means of compensation for persons injured or property damaged during the institutional control period due to the radioactive and waste management nature of the regional facility. This responsibility may be met by a special fund, insurance, or other means.

1. The Commission is authorized, at its discretion, to impose a waste management surcharge, to be collected by the operator or owner of the regional facility; to establish a separate

insurance entity, formed by but separate from the Commission itself, but under such terms and conditions as it decides, and exempt from state insurance regulation; to contract with this company or other entity for coverage; or to take any other measures, or combination of measures, to implement the goals of this section.

2. The existence of this fund or other means of compensation shall not imply any liability by the Commission, the non-host party states, or any of their officials and staff, which are exempted from liability by other provisions of this compact. Claims or suits for compensation shall be directed against the fund, the insurance company, or other entity, unless the Commission, by regulation, directs otherwise.

c. Not withstanding any other provisions, the Commission fund, insurance, or other means of compensation shall also be available for third party relief during the operational and post-closure periods, as the Commission may direct, but only to the extent that no other funds, insurance, tort compensation, or other means are available from the host state or other entitites, under section a. of this Article or otherwise; provided, that this Commission contribution shall not apply to clean-up or restoration of the regional facility and its environs during the operational and post-closure period.

d. The liability of the Commission's fund, insurance entity, or any other means of compensation shall be limited to the amount currently contained therein; provided that the Commission may set some lower limit to ensure the integrity and availability of the fund or other entity for liability.

ARTICLE X. SEVERABILITY AND CONSTRUCTION

The provisions of this compact shall be severable, and if any phrase, clause, sentence or provision of this compact is declared by a federal court of competent jurisdiction to be contrary to the Constitution of the United States or the applicability thereof to any government, agency, person or circumstance is held invalid, the validity of the remainder of this compact and the applicability thereof to any other government, agency, person or circumstance shall not be affected thereby. The provisions of this compact shall be liberally construed to give effect to the purposes thereof.

APPENDIX H

DRAFT NORTHERN NEW ENGLAND COMPACT

S.232

Introduced by Senator Parker of Caledonia County and Senator Skinner of Washington County

Subject: Radioactive waste; low-level waste; northern New England regional compact

Statement of purpose: It is the purpose of this bill to enact the northern New England low-level radioactive waste compact combining the proposals set forth by representatives of the states of Maine, New Hampshire and Vermont.

Own Vote			Legislative Vote						
Yes	No		Date	Senate	House	Yes	No	Date	Comments
		1st Reading							
		Com. Report							
		2nd Reading							
		3rd Reading							
		Amend.-Calendar							
		Amended-Journal							
		Amended-Journal							
		Committed							
		Recommitted							
		Ordered to Lie							
		Called up							
		Passed							
		Messaged							
		Com. of Conf.							
		Withdrawn							
		Sign.by Governor							

AN ACT TO ADD 10 V.S.A. CHAPTER 54 RELATING TO THE NORTHERN NEW ENGLAND LOW-LEVEL RADIOACTIVE WASTE COMPACT

It is hereby enacted by the General Assembly of the State of Vermont:

1984 - S.232

Sec. 1. 10 V.S.A. chapter 54 is added to read:

CHAPTER 54. NORTHERN NEW ENGLAND LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT COMPACT

§ 1551. POLICY AND PURPOSE - ARTICLE I

There is hereby created the Northern New England Low-Level Radioactive Waste Management Compact.

The party states recognize that Congress has declared that each state is responsible to provide for the availability of capacity, either within or outside its borders, for disposal of low-level radioactive waste, as defined in the federal Low-Level Radioactive Waste Policy Act. That congressional act was precipitated by congressional sentiment that it was unfair to have a few states bear a disproportionate burden in serving as a low-level radioactive waste repository for the entire country. To remedy this perceived injustice, Congress has encouraged the development of regional compacts to manage these wastes. Unfortunately, the compact initially negotiated among the Northeastern states, states which generate approximately 40 percent of the waste generated in the entire nation, failed to exclude by its terms the possibility that states which are extremely small generators of waste may become host states for the entire region. This eventuality would perpetrate the unfairness that Congress was attempting to alleviate, a situation where one state is forced to bear a disproportionate burden, and it would do so in a part of the country less well suited in its geology and its climate than were the

states whose waste handling problems precipitated this congressional action in the first place.

The party states also recognize the federal emphasis, as expressed by Congress and the Nuclear Regulatory Commission, that wastes be disposed of permanently, and they recognize the advantages of minimizing the number of disposal sites in the country. Nevertheless, because of the relatively small volume of waste generated within the states which initially are party to this compact, cost estimates are discouraging as to the economic feasiblity of a site operated solely for waste produced within these states. Additionally, the party states share a deep distrust of the prospects of siting a conventional trench disposal facility, with its concomitant risk to ground and surface water quality. This factor causes the party states to favor engineered facilities for disposal, an alternative which is expected to be even more expensive than trench burial, at least in the short term, and which has not yet been investigated by the federal government in the same detail as has the alternative of shallow trench disposal. Finally, this federally mandated state responsibility was not accompanied by federal funds to assist in carrying out that mandate.

As a result of the above considerations, the party states, by the terms of this compact, employ the use of on-site retrievable, monitored storage and other steps which are intended to delay final disposal within the party states, so as to permit more time for the development of a satisfactory resolution of the above problems. This

policy seems wise not only from a technological standpoint, but it also will serve to reduce the total volume of waste disposed at the eventual site.

In addition, in order to promote the health and safety of the region, it is the policy of the party states to: enter into a regional low-level radioactive waste management compact as a means of facilitating an interstate cooperative effort, encourage the separation of wastes by type at the point of their generation in order to make their eventual disposal more appropriate, provide for proper transportation of low-level waste generated in the region, minimize the number of facilities required to effectively and efficiently manage low-level radioactive waste generated in the region, encourage the reduction of the amounts of low-level waste generated in the region, distribute the costs, benefits, and obligations of proper low-level radioactive waste management equitably among the party states, and ensure the environmentally sound and economical management of low-level radioactive waste.

§ 1552. DEFINITIONS - ARTICLE II

As used in this compact, unless the context clearly requires a different construction:

(1) "commission" means the Northern New England Low-Level Radioactive Waste Commission established pursuant to Article IV of this compact;

(2) "custodial agency" means the agency of the government designated to act on behalf of the government owner of the regional facility;

(3) "disposal" means the isolation of low-level radioactive waste from the biosphere inhabited by human beings and their food chains;

(4) "facility" means a parcel of land, together with the structures, equipment and improvements thereon or appurtenant thereto, which is used or is being developed for the treatment, storage or disposal of low-level waste, but shall not include on-site treatment or storage by a generator;

(5) "generator" means a person who produces or processes low-level waste, but does not include persons who only provide a service by arranging for the collection, transportation, treatment, storage or disposal of wastes generated outside the region;

(6) "high-level waste" means

(A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentration; and

(B) any other highly radioactive material determined by the federal government as requiring permanent isolation;

(7) "host state" means a party state which is designated to host a regional facility or in which a regional facility is or has been located or developed;

(8) "institutional control" means the continued observation, monitoring, and care of the regional facility following transfer of control of the regional facility from the operator to the custodial agency;

(9) "low-level waste" means radioactive waste that

(A) is neither high-level waste nor transuranic waste, nor spent nuclear fuel, nor by-product material as defined in section 11e (2) of the Atomic Energy Act of 1954 as amended; and

(B) is classified by the federal government as low-level waste, consistent with existing law; but does not include waste generated as a result of atomic energy defense activities of the federal government as defined in the federal Low-Level Radioactive Waste Policy Act, or federal research and development activities;

(10) "party state" means any state which is a signatory party to this compact;

(11) "person" means an individual, corporation, business enterprise or other legal entity, either public or private and their legal successors;

(12) "post-closure observation and maintenance" means the continued monitoring of a closed regional facility to ensure the integrity and environmental safety of the site through compliance with applica-

ble licensing and regulatory requirements, prevention of unwarranted intrusion, and correction of problems;

(13) "region" means the entire area of the party states;

(14) "regional facility" means a facility as defined in this section;

(15) "state" means a state of the United States, the District of Columbia, the commonwealth of Puerto Rico, the Virgin Islands or any other territory subject to the laws of the United States;

(16) "storage" means the holding of waste for treatment or disposal;

(17) "transuranic waste" means waste material containing radionuclides with an atomic number greater than 92 which are excluded from shallow land burial by the federal government;

(18) "treatment" means any method, technique or process, including storage for decay, designed to change the physical, chemical or biological characteristics or composition of any waste in order to render such waste safer for transport or disposal, amenable for recovery, convertible to another usable material or reduced in volume;

(19) "waste" means low-level radioactive waste as defined in this section;

(20) "waste management" means the storage, treatment, transportation, and disposal, where applicable, of waste.

§ 1553. RIGHTS AND OBLIGATIONS - ARTICLE III

(a) According to the procedure established in Article V, there shall be provided within the region one or more regional facilities which, together with such other facilities as may be made available to the region, will provide sufficient capacity to manage all wastes generated within the region.

(1) Regional facilities shall be entitled to waste generated within the region. To the extent regional facilities are available, no waste generated within a party state shall be exported to facilities outside the region unless such exportation is approved by the legislature of the host state or states.

(2) After January 1, 1986, no person shall deposit at a regional facility waste generated outside the region, and further, no regional facility shall accept waste generated outside the region, unless approved by the legislatures of the party states.

(b) The rights, responsibilities and obligations of each party state to this compact are as follows:

(1) Each party state shall have the right to have all wastes generated within its borders managed at regional facilities, and shall have the right of access to facilities made available to the region through agreements entered into by the party states pursuant to this compact. The right of access by a generator within a party state to any regional facility is limited by the generator's adherence to applicable state and federal laws and regulations and the provisions of this compact.

(2) To the extent not prohibited by federal law, each party state shall institute procedures which will require shipments of low-level waste generated within or passing through its borders to be consistent with applicable federal packaging and transportation regulations and applicable host state packaging and transportation regulations for management of low-level waste. Upon notification by a host or party state that a generator, shipper, or carrier within a party state is in violation of applicable packaging or transportation regulations, that party state shall take appropriate action to ensure that such violations do not recur.

(3) Each party state may impose reasonable fees upon generators, shippers, or carriers to recover the cost of inspections and other practices under this compact.

(4) Each party state shall encourage generators within its borders to minimize the volumes of waste requiring disposal.

(5) Each party state has the right to rely on the good faith performance by every other party state of acts required under this compact relating to the provision of facilities for regional availability and their use in a manner consistent with this compact.

(6) Each party state shall have the capability to host a regional facility in a timely manner and to ensure the post-closure observation and maintenance, and institutional control of any regional facility within its borders.

(7) In the event that costs involved in closure, post-closure observation and maintenance and institutional control of a regional

facility exceed the funds set aside or made available for those purposes, including insurance funds, emergency funds, and funds obtained from generators or the federal government, those costs shall be apportioned as follows:

The host state shall be responsible for 20 percent of the costs so incurred and the two non-host states shall be responsible for 40 percent of those costs, which may be collected by the host state in federal court in an action for contribution under this compact. In the event that one or more other states join this compact, liability shall be adjusted proportionately so that a host state shall pay one-half the amount due from a non-host state of equal population, which has disposed of an equal amount of waste with an equal total radioactivity level. State population, volume of waste and total radioactivity of waste deposited in the facility shall be given equal weight in determining liability in such an event.

(8) No party state shall be liable for any injury to persons or property resulting from the transportation of waste to a facility.

(9) To the extent not prohibited by federal law, non-host states will be granted reasonable requests to inspect facilities located within a host state and to make recommendations related to those inspections.

(10) Non-host states may review the siting process employed by a host state and may make recommendations for changes in that process.

(11) Disputes between party states which are not resolved by means of negotiation will be submitted for a period of at least 30

days to mediators agreed upon by the parties, before they may be filed in state or federal court. At the end of this 30 day period, any party state may file an appropriate action in state or federal court. Costs of mediation between states will be borne equally by the states which are party to it.

(12) Each state shall designate a state agency, department or other state entity as being primarily responsible for waste management, for acting as the custodial agency, as defined under this compact, and for providing funds required under this compact.

(c) The rights, responsibilities and obligations of a host state are as follows:

(1) To the extent not prohibited by federal law, but in a manner consistent with the provisions of this compact and the preservation of the public health and welfare, a host state shall ensure the timely development and the safe operation, closure, post-closure observation and maintenance, and institutional control of any regional facility within its borders.

(2) In accordance with procedures established in Article V and Article IX, the host state shall provide for the establishment of a reasonable structure of fees sufficient to cover all costs related to the development, administration, operation, closure, post-closure observation and maintenance, and institutional control of a regional facility. It may also establish surcharges to cover the regulatory costs, incentives, and compensation associated with a regional facility; provided, however, that no distinction in fees or surcharges

shall be made between persons of the several states party to this compact.

(3) To the extent not prohibited by federal law, a host state may establish requirements and regulations pertaining to the management of waste at a regional facility which is located within the host state.

(4) A host state shall notify the other member states immediately if any exigency arises which requires the permanent, temporary, or possible closure of any regional facility located therein at a time earlier than projected.

§ 1554. CREATION AND POWERS OF THE COMMISSION - ARTICLE IV

(a) There is created the Northern New England Low-Level Radioactive Waste Commission. The commission shall consist of six members from each party state: one representative of an environmental organization, one public member and two agency or department heads to be appointed by the Governor, and one member from each house of the legislatures of the party states, appointed according to the procedures of the party states. The Governor shall notify the commission in writing of the identity of the members.

(b) Each commission member shall be entitled to one vote. No action of the commission shall be binding unless a majority of the total membership cast their vote in the affirmative.

(c) The commission shall meet at least once a year and shall also meet upon the call of the presiding officer or of any three members.

(d) All meetings of the commission shall be open to the public and with reasonable prior public notice given. The commission may, by majority vote, close a meeting to the public for the purpose of considering matters relating to litigation. All commission actions and decisions shall be made in open meetings and appropriately recorded. A roll call vote may be required upon request of any member.

(e) Other aspects relating to the internal functioning of the commission shall be established in bylaws as agreed upon by the governors of the party states and as approved by means of the rulemaking procedures of the party states.

(f) The commission shall be financed by the party states through the state entities named by the respective party states under Article III(b)(12).

(g) The commission shall serve in an advisory capacity, and shall provide other services as unanimously requested by the party states, which may include, but shall not be limited to the following:

(1) mediation of disputes;

(2) assistance in development of a regional waste management plan;

(3) holding public hearings;

(4) negotiations, subject to legislative approval as provided by this compact, with persons, states or regional entities for the importation of waste into the region and for access to facilities outside the region for waste generated within the region;

(5) reviewing the compact and recommending revisions, if appropriate;

(6) working with the congressional delegation of the party states and with the federal government to attempt to assure that the federal government does not site a high level waste site in a state which is a host state under this compact; and

(7) facilitating communication among the party states.

(h) The commission is a body corporate and politic, separate and distinct from the party states and shall be liable for its own actions. Liabilities of the commission shall not be deemed liabilities of the party states, nor shall members of the commission be personally liable for action taken by them in their official capacity.

(1) The commission shall not be responsible for any costs or expenses associated with the creation, operation, closure, post-closure observation and maintenance, and institutional control of any regional facility, or any associated regulatory activities of the party states.

(2) Except as otherwise provided herein, this compact shall not be construed to alter the incidence of liability of any kind for any act, omission, or course of conduct. Generators, shippers and carriers of wastes, and owners and operators of sites shall be liable for their acts, omissions, conduct, or relationships in accordance with all laws relating thereto.

§ 1555. HOST STATE SELECTION AND DEVELOPMENT AND OPERATION OF REGIONAL FACILITIES - ARTICLE V

(a) The party states shall develop, adopt, maintain, and implement a regional management plan to ensure the safe and efficient management of waste within the region. The plan shall include the following:

(1) a current inventory of all generators within the region;

(2) a current inventory of all facilities within the region, including information on the size, capacity, location, specific waste being handled, and projected useful life of each facility;

(3) consistent with considerations for public health and safety as defined by appropriate regulatory authorities, a determination of the type and number of regional facilities which are presently necessary and projected to be necessary to manage waste generated within the region.

(b) The party states shall dispose of wastes generated within the party states in the following manner:

(1) Curtailment of waste at its point of generation shall be explored with the various generators.

(2) Generators will be encouraged to contract for the ability to return wastes to the sources from which materials which preceded the wastes were obtained.

(3) The party states will attempt to find facilities outside the region that would be willing to contract to receive wastes generated within the region.

(4) The party states will negotiate with representatives of non-compact states who may be interested in joining this compact, and who would be willing to host disposal facilities.

(5) Generators will be encouraged to develop on-site storage, to the extent it is practical to do so while remaining consistent with the preservation of the public health, safety and welfare.

(6) Party states will negotiate with the operators of nuclear power plants and the federal government to explore the option of long term storage at nuclear plant sites and the option of expanding upon those storage facilities so that they may accept waste which is not generated at the nuclear power plants.

(7) At such time as the legislative body of one of the party states finds that the above measures cannot reasonably be expected to provide sufficient disposal capacity for that state's near term disposal requirements, the party states will implement the siting process established below in this section. A host state selected according to this process shall be obligated to receive wastes generated within the region for a period of 35 years from the effective date of this compact. At that time, there will be a renegotiation among the party states as to how host state obligations will be allocated until the termination of the compact. Twenty-five years after the effective date of this compact, the party states will commence a complete review and evaluation of the functioning of this compact. This review and evaluation and any relevant recommendations will be

completed prior to the termination of the obligations of the first host state.

(8) Each state will complete a macroscreening process of its entire land mass to assess all relevant geological and hydrological characteristics. On the basis of this information, each state will exclude from further consideration all geographic areas geologically or hydrologically unsuitable as sites for a facility.

(9) From among the areas not excluded under subdivision (8) above, each state will identify at least one potential site located within its boundaries. In addition, if a potential site exists in a location which crosses the borders of two party states, that site shall be identified. In determinations under this subdivision, the primary criteria shall be environmental impact and public health and safety, with particular attention being devoted to protecting the ground and surface water of the region. In addition, this process shall be guided by the following criteria:

(A) the appropriate use of land, air, and water resources;

(B) social impact; and

(C) economic impact.

(10) Upon selection of potential sites, the governors will announce those choices. The governor of each state will appoint one or more appropriate state entities to hold one or more public hearings near each potential site located within the state and to report to the governor and the legislature on the suitability of the potential site or sites. After completion of the public hearings, affected

citizens, as determined by each of the governors or their designees, will vote on the question of whether they want to volunteer to have the siting process proceed in their location. If a facility is sited totally within a municipality, that municipality will be entitled to an annual fee of no less than $100,000.00 in lieu of taxes. If a facility is sited in something other than a municipality, the fee shall be allocated as provided by state law.

(11) After reviewing the considerations raised at public hearings, the local vote on the issue of volunteering, and other relevant matters, the governors of the states will announce whether or not their state will volunteer to serve as host state. If an individual state volunteers to serve as host state, that state will process siting proposals submitted by private developers or will establish a state authority with a mandate to proceed with the siting process until an acceptable site emerges from that process and a facility is established.

(12) If the governors of two adjoining states volunteer for further consideration one or more potential joint sites which are in a location which crosses the borders of two party states, the legislatures of those adjoining states will have two years from the date of the volunteering to enact legislation which specifies the allocation of host state duties and responsibilities between those two states. If that legislation is enacted, the siting process will proceed according to its terms and according to other relevant state and federal law until an acceptable site emerges or until it is determined

that an acceptable site is not to be found from among the potential sites so submitted.

(13) In the event that there are no volunteers, or in the event that the legislatures of two adjoining states which are volunteering a potential joint site fail to enact legislation within two years from the date of volunteering, or in the event that an acceptable site does not emerge from among the potential joint sites volunteered by two adjoining states, the governors or their designees will select a host state by lot. The state selected will process siting proposals submitted by private developers or will establish a state authority with the mandate to proceed with the siting process until an acceptable site emerges from that process and a facility is established.

(14) Under no circumstances may a facility be sited in a state without first receiving the approval of that site by the legislature of that state.

(15) A facility sited under this section shall be on a parcel of land large enough to contain the wastes which the host state projects will be generated within the compact region for the period of time extending for 75 years from the effective date of this compact.

(16) If a facility is not to be financed by private developers, the host state shall bond to cover the costs of land acquisition, site preparation and related costs.

(c) A host shall exercise its responsibilities under this compact in a timely manner.

(1) To the extent not prohibited by federal law, a host state may regulate and license any facility within its borders.

(2) To the extent not prohibited by federal law, a host state shall ensure the safe operation, closure, post-closure observation and maintenance, and institutional control of a facility, including adequate financial assurances by the operator and adequate emergency response procedures. It shall periodically review and report to the other states on the status of the post-closure and institutional control funds and the remaining useful life of the facility.

(3) A host state shall solicit comments from each other party state regarding the siting, operation, financial assurances, closure, post-closure observation and maintenance, and institutional control of a regional facility.

(d) A host state intending to close a regional facility within its borders shall notify the governors of the other party states in writing of its intention and the reasons therefor.

(1) Except as otherwise provided, such notification shall be given to the other party states at least five years prior to the scheduled date of closure.

(2) A host state may close a regional facility within its borders in the event of an emergency or if a condition exists which constitutes a substantial threat to public health and safety. A host state shall notify the other party states immediately and shall, within 30 working days, show justification for the closing.

(3) In the event that a regional facility closes before an additional or new facility becomes operational, the parties shall make interim arrangements for the storage or disposal of waste generated within the region until the facility again becomes operational or until a new regional facility is operational.

(e) Fees and surcharges shall be imposed equitably upon all users of a regional facility, based upon criteria established by the host state, subject to the advice of the party states.

(1) A host state shall, according to its lawful administrative procedures, approve fee schedules to be charged to all users of the regional facility within its borders. Except as provided herein, such fee schedules shall be established by the operator of a regional facility, under applicable state regulations, and shall be reasonable and sufficient to cover all costs related to the development, operation, closure, post-closure observation and maintenance, institutional control of the regional facility. The host state shall determine a schedule for contributions to the post-closure observation and maintenance, and institutional control funds. Such fee schedules shall not be approved unless the other party states have been given reasonable opportunity to review and make recommendations on the proposed fee schedules.

(2) A host state may, according to its lawful administrative procedures, impose a state surcharge per unit of waste received at any regional facility within its borders. The state surcharge shall be in addition to the fees charged for waste management. The sur-

charge shall be sufficient to cover all reasonable costs associated with administration and regulation of the facility. The surcharge shall not be established unless the other party states have been provided reasonable opportunity to review and make recommendations on the proposed state surcharge.

(3) Nothing herein shall be construed to limit the ability of the host state, or the political subdivision in which the regional facility is situated, to impose surcharges for purposes including, but not limited to, host community compensation and host community development incentives. Such surcharges shall be reasonable and shall not be imposed unless the other party states have been provided reasonable opportunity to review and make recommendations on the proposed surcharge. Such surcharge may be recovered through the approved fee and surcharge schedules provided for in this section.

§ 1556. OTHER LAWS AND REGULATIONS - ARTICLE VI

(a) Nothing in this compact shall be construed to abrogate or limit the regulatory responsibility or authority of the U.S. Nuclear Regulatory Commission or of an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended.

(b) Nothing in this compact shall make unlawful the continued development and operation of any facility already licensed for development or operation on the date this compact becomes effective.

(c) No judicial or administrative proceeding pending on the effective date of the compact shall be affected by the compact.

(d) No law or regulation of a party state or subdivision or instrumentality thereof may be applied so as to restrict or make more costly or inconvenient access to any regional facility by the generators of another party state than for the generators of the state where the facility is situated.

§ 1557. ELIGIBLE PARTIES; ENTRY INTO FORCE; WITHDRAWAL; TERMINATION - ARTICLE VII

(a) The initially eligible parties to this compact shall be the states of Maine, New Hampshire and Vermont.

(b) Each state eligible to become a party state to this compact shall be declared a party state upon enactment of this compact into law by the state.

(c) The compact shall become effective upon enactment by the three party states and upon receiving the consent of Congress.

(d) The three states upon enactment of this compact shall request that legislation to be introduced in the Congress which grants the consent of the Congress to this compact, and upon receipt of that consent, shall do those things necessary to organize the commission and implement the provisions of this compact.

(e) Any state not expressly declared eligible to become a party state to this compact in subsection (a) of this section may petition the governors of the party states to be declared eligible. The governors upon receipt of the approval of the legislatures of the party states may establish such conditions as they deem necessary and appropriate to be met by a state requesting eligibility as a party

state to this compact pursuant to the provisions of this section, including a public hearing on the application. Those conditions will supersede inconsistent terms of this compact which allocate duties and responsibilities among the party states. Upon satisfactorily meeting such conditions and upon the unanimous affirmative vote of the governors, the petitioning state shall be eligible to become a party state to this compact and may become a party state in the same manner as those states declared eligible in subsection (a) of this section.

(f) No party state may withdraw from this compact after its effective date, and prior to its scheduled date of termination. If a state, through litigation, succeeds in withdrawing from this compact, despite the provisions of this subsection, that withdrawal shall not affect any liability already incurred by or chargeable to a party state prior to that time. Additionally, no withdrawal shall remove the obligation of the party state to continue to pay an amount equal to the total amount of fees which would have been due had the state continued to use the facility until the termination of the obligations of the host state, as provided in this compact.

(g) This compact may be terminated only by the affirmative action of the Congress or by the repeal of all laws enacting the compact in each party state. Otherwise, it shall terminate 75 years from its effective date, unless reenacted prior to that time by all of the party states in language which clearly evidences legislative intent that reenactment take place.

(1) The consent given to this compact by the Congress shall extend to any future admittance of new party states under subsections (b) and (e) of this section.

(2) Termination of the compact will not affect any liability already incurred by or chargeable to a party state, prior to that time.

§ 1558. PENALTIES - ARTICLE VIII

(a) Each party state, consistent with federal and host state regulations and laws, shall enforce penalties against any person not acting as an official of a party state for violation of this compact in the party state. Each party state acknowledges that the shipment to a host state of waste packaged or transported in violation of applicable laws and regulations can result in the imposition of sanctions by the host state. These sanctions may include, but are not limited to, suspension or revocation of the violator's right of access to the facility in the host state.

(b) Unless specifically approved pursuant to Article IV, it shall be a violation of this compact for:

(1) any person to deposit at a regional facility waste not generated within the region;

(2) any regional facility to accept waste not generated within the region; and

(3) any person to export from the region waste generated within the region, after a regional facility has been established.

(d) Responsibility for enforcing violations of the law will rest with the affected state or states.

§ 1559. COMPENSATION - ARTICLE IX

The responsibility for ensuring compensation and clean-up during the operational and post-closure periods rests with the host state, as set forth herein.

(1) The host state shall ensure the availability of funds and procedures for compensation of injured persons, including facility employees, and property damage (except any possible claims for diminution of property values) due to the existence and operation of a regional facility, and for clean-up and restoration of the facility and surrounding areas.

(2) The state may satisfy this obligation by requiring bonds, insurance, compensation funds, or any other means or combination of means, imposed either on the facility operator or assumed by the state itself, or both. Nothing in this section alters the liability of any person or governmental entity under applicable state and federal laws.

§ 1560. SEVERABILITY AND CONSTRUCTION - ARTICLE X

The provisions of this compact shall be severable, and if any phrase, clause, sentence or provision of this compact is declared by a federal court of competent jurisdiction to be contrary to the Constitution of the United States or the applicability thereof to any government, agency, person or circumstance is held invalid, the validity of the remainder of this compact and the applicability

thereof to any other government, agency, person or circumstances shall not be affected thereby. The provisions of this compact shall be liberally construed to give effect to its purposes.

APPENDIX I

CORRESPONDENCE WITH NRC REGARDING ON-SITE STORAGE AT MAINE YANKEE

State of Maine

Senate Chamber

Augusta, Maine 04333

November 16, 1983

Mr. Nunzio Palladino, Chair
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Palladino:

Maine's Low-level Radioactive Waste Siting Commission is currently evaluating options for Maine's future method of dealing with its commercial low-level radioactive waste.

Since over 90% of our waste is generated by our single nuclear power plant, we are considering as one option the possibility of on-site storage of the low-level waste for the life of the nuclear power plant.

1. Would an amendment to Maine Yankee's license become necessary if it were to build such a long-term storage facility?

2. Would long-term storage be deemed suitable management for our commercial waste?

If Maine Yankee were allowed to store its low-level wastes on-site until decommissioning, perhaps the waste generated from operating the plant could be transported to a shallow-land burial facility at the same time as the dismantled nuclear power plant.

3. Will N.R.C. allow such a scenario?

Another possibility would be to entomb the stored low-level waste along with the decommissioned nuclear power plant.

4. Will the N.R.C. allow entombment as an option for "permanent" disposal of a nuclear power plant and its low-level waste?

5. If Maine prefers the on-site storage-for-the-life-of-the-facility option, can the state require Maine Yankee to build such a facility?
Can a state force a nuclear power plant to store other generators' wastes for any length of time? For health and safety reasons? For economic reasons?

We would greatly appreciate a written response to our questions. Maine's Low-level Radioactive Waste Siting Commission is an advisory commission consisting of executive branch, legislative branch and licensee members. We are very much interested in the option of above-ground storage and are encouraged at the viability of this option after seeing your responses to Governor Earl of Wisconsin.

Sincerely,

Judy Kany

Judy C. Kany
State Senator
Chair, Maine's Low-level
Waste Siting Commission

elk

cc: Dr. Faith Brennerman
Philip Ahrens, Attorney General's office
Commissioner Henry Warren, Department of Environmental Protecti
George Seel, Department of Environmental Protection
Haven Whiteside, Legislative Assistant

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JAN 0 5 1984

The Honorable Judy C. Kany
Maine State Senate
Augusta, Maine 04333

Dear Ms. Kany:

Thank you for your letter of November 16, 1983 regarding alternatives for managing low-level radioactive waste. In view of your reference to our letter to Governor Earl of Wisconsin, we believe it is imperative to note that our response to Governor Earl was not a blanket endorsement of engineered above-ground storage but merely a clarification that it is not a prohibited activity. We will address each of your concerns individually.

1. Since over 90% of our waste is generated by our single nuclear power plant, we are considering as one option the possibility of on-site storage of the low-level waste for the life of the nuclear power plant. Would an amendment to Maine Yankee's license become necessary if it were to build such a long-term storage facility?

This question cannot be answered without actually reviewing the specifics of the proposal. If the proposed low-level waste storage facility is separate from the nuclear power facility, that is, if it has no impact on the safe operation of the reactor and is sited relatively remotely from the reactor, it would not require an amendment to the reactor license. Such a storage facility could be licensed and regulated by a State, if it is an Agreement State, or by NRC as a materials license in a non-Agreement state. If the proposed storage activity could impact on the safety of reactor operations or on an existing license condition or technical specification limit on the amount of waste storage, Maine Yankee's license may have to be amended. A copy of our Generic Letter 81-38 to reactor license holders and applicants has been enclosed to provide you additional information on storage of reactor-generated low-level radioactive wastes at power reactor sites. Please note that our Generic Letter does not support life of plant storage as a planned activity in lieu of off-site disposal as low-level waste is generated. Rather, the Generic Letter provides authority to temporarily store low-level waste in the event that disposal capacity is temporarily unavailable.

2. Would long-term storage be deemed to be suitable management for our commercial waste?

Even assuming that the wastes will be permanently disposed of after storage, this question cannot be answered without reference to proposals for specific storage facilities. As we noted in our recent letter to Governor Earl the technology for construction of structures lasting for decades is well established, and the general engineering and safety principles involved are well known. However, the duration of intended storage, and the quantities, radioactive half-lives and other characteristics of the waste to be stored are extremely important considerations in facility design and facility siting, and in establishment of institutional controls and regulatory criteria. All of these considerations as well as plans for final disposal of the waste would have to be taken into account to assure "suitable management" of at-reactor, life-of-plant storage with subsequent retrieval and transfer to a disposal site.

3. If Maine Yankee were allowed to store its low-level wastes on-site until decommissioning, perhaps the waste generated from operating the plant could be transported to a shallow-land burial facility at the same time as the dismantled nuclear power plant. Will NRC allow such a scenario?

A scenario such as the one you describe is allowable provided that all NRC licensing requirements are met as specified in our Generic Letter 81-38. This question is also addressed in our response to Question 2.

4. Will the NRC allow entombment as an option for "permanent" disposal of a nuclear power plant and its low-level waste?

This question is particularly timely as the Commission is currently conducting a rulemaking on decontamination and decommissioning of nuclear power plants. The Commission anticipates promulgation of the proposed rule in the spring of 1984.

An NRC Draft Generic Environmental Impact Statement on decommissioning nuclear facilities (NUREG-0586, January 1981) concluded that entombment was less desirable than either immediately removing all radioactive materials down to levels which are considered acceptable to permit the property to be released for unrestricted use or temporary storage and subsequent decontamination to levels which permit release of the facility

for unrestricted use. A copy of NUREG-0586 has been enclosed for your information. Chapter 4.5 compares the decommissioning alternatives for pressurized water reactors.

5. If Maine prefers the on-site storage-for-the-life-of-the-facility option, can the state require Maine Yankee to build such a facility? Can a state force a nuclear power plant to store other generators' wastes for any length of time? For health and safety reasons? For economic reasons?

No, the state cannot require a nuclear power plant operator to build such a facility or to store wastes on the reactor site because the NRC has exclusive jurisdiction and NRC cannot force an operator to take such actions unless there is a health or safety concern relating to reactor operation. The operator must first decide to submit an application to be licensed to pursue these endeavors, and then must meet the applicable requirements for licensing. NRC licensing jurisdiction will be retained in Agreement States in accordance with 10 CFR 150.15(a)(1) for storage of low-level waste generated and stored onsite.

Please do not hesitate to call us if we may be of further assistance in your efforts.

Sincerely,

John G. Davis, Director
Office of Nuclear Material
Safety and Safeguards

Enclosures:
1. Generic Letter 81-38
2. NUREG-0586

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 10, 1981

TO ALL HOLDERS OF AND APPLICANTS FOR OPERATING LICENSES AND CONSTRUCTION PERMITS

SUBJECT: STORAGE OF LOW-LEVEL RADIOACTIVE WASTES AT POWER REACTOR SITES
(Generic Letter 81-38)

Gentlemen:

As a result of a reduction in waste disposal availability in the United States, many nuclear power reactor licensees are taking or are planning to take steps to provide for additional onsite storage of low-level radioactive wastes generated onsite. These steps range from storing packaged wastes in unused space to construction of new facilities for volume reduction and extended storage. The NRC has been considering the variety of plans which are underway and how they should be reviewed and approved.

Actions on waste storage can influence the development and implementation of final disposal plans by states, acting individually or on a regional basis, to establish additional disposal capacity. Some states have indicated to NRC that utilization of disposal services by nuclear power plant licensees is essential if disposal sites are to be developed by states or regional compacts. Thus, it is important that the NRC not take deliberate action that would hinder the establishment of additional disposal capacity by the states and yet, consistent with NRC regulatory safety requirements, permit necessary operational flexibility by its licensees. It is with these points in mind that the following guidance is provided.

For proposed increases in storage capacity for low-level waste generated by normal reactor operation and maintenance at power reactor sites, the safety of the proposal must be evaluated by the licensee under the provisions of 10 CFR 50.59. If (1) your existing license conditions or technical specifications do not prohibit increased storage, (2) no unreviewed safety question exists, and (3) the proposed increased storage capacity does not exceed the generated waste projected for five years, the licensee may provide the added capacity, document the 50.59 evaluation and report it to the Commission annually or as specified in the license.

Radiological safety guidance has been developed by the staff for the design and operation of interim contingency low-level waste storage facilities. Necessary design features and administrative controls will be dictated by such factors as the waste form, concentrations of radioactive material in individual waste containers, total amount of radioactivity to be stored, and retrievability of waste. A copy of the guidance document is enclosed with this letter. This guidance shall be used in the design, construction and operation of your storage facility. In addition, the NRC will judge the adequacy of your 50.59 evaluation based on your compliance with the guidance. Please note also that IE Circular No. 80-19, dated August 22, 1980, provides information on preparing 50.59 evaluations for changes to radioactive waste treatment systems.

If you determine that an unreviewed safety question exists, authority for use should be requested through application to the Office of Nuclear Material Safety and Safeguards (NMSS) pursuant to 10 CFR 30, accompanied by an environmental evaluation that considers the incremental impact as related to reactor operations. Such application for a separate Part 30 license is for the administrative convenience of the Commission and is not intended to be substantively different than an application for amendment of the facility operating license. Application for use should also be accompanied by a showing that the storage provisions will not impact on the safety of reactor operations and will not foreclose alternatives for disposal of the wastes.

NMSS will notice the receipt of application in the Federal Register, offer an opportunity for public hearing if significant public interest is demonstrated, and will perform an environmental assessment to determine if the proposed activity will significantly affect the quality of the environment. Facility construction prior to the staff's determination would be carried out at the licensee's risk. Any license issued will be for a standard five-year term, renewable if continued need is demonstrated and if safety of continued storage is established. NRC licensing jurisdiction will be retained in Agreement States in accordance with 10 CFR 150.15(a)(1) for storage of low-level waste generated and stored onsite. Indemnity coverage will be provided under and in accordance with your existing indemnity agreement with the Commission.

If it is determined that the storage provisions could impact on the safety of reactor operations or an existing license condition or technical specification limit on the amount of waste storage, a change in the conditions of the reactor facility license may be necessary.

The provisions for added capacity should be used only for interim contingency storage, and low-level wastes should continue to be shipped to disposal sites to the extent practicable. The "Low Level Radioactive Waste Policy Act" of 1980 gives primary responsibility for the disposal of low-level waste to the states. Some states have initiated disposal plans, and we believe it is important that power reactor licensees, as major waste generators, work with and provide technical assistance and other support to assist individual states or regions in developing new disposal sites. You are encouraged to take an active role in the development of additional disposal sites.

Some licensees are considering the installation of major volume reduction processes, e.g., incineration, dehydration, or crystallization to substantially reduce the volume of waste for disposal. You are encouraged to examine the costs and benefits of such processes for your operations. However, notwithstanding the use of volume reduction, you are also encouraged to take an active role in the development of additional disposal sites.

For proposed increases in storage capacity for more than five years (long-term), the application and review procedures will be pursuant to 10 CFR 30 with consideration of container integrity and retrievability, volume reduction, influence on state planning for disposal, and implications of de facto onsite disposal. Any long-term license issued will be for a five-year, renewable term.

If you have any questions about these matters, please let us know.

Sincerely,

William J. Dircks
Executive Director
for Operations

Enclosure:
Guidance Document

Enclosure

RADIOLOGICAL SAFETY GUIDANCE FOR ONSITE CONTINGENCY STORAGE CAPACITY

I. Introduction

The objective of this technical position is to provide guidance to licensees considering additional onsite low level radioactive waste storage capabilities. While it may be prudent and/or necessary to establish additional onsite storage capability, waste should not be placed in contingency storage if the ability to dispose of waste at a licensed disposal site exists. The shipping of waste at the earliest practicable time minimizes the need for eventual waste reprocessing due to possibly changing burial ground requirements, reduces occupational and non-occupational exposures and potential accident consequences, and in the event of burial ground closure, maximizes the amount of storage space available for use.

The duration of the intended storage, the type and form of waste, and the amount of radioactive material present will dictate the safeguards and the level of complexity required to assure public health and safety, and minimal risk to operating personnel. The longer the intended storage period, the greater the degree of controls that will be required for radiation protection and accident prevention. For purposes of this document, the duration of temporary waste storage is to be up to five (5) years. The magnitude of the onsite storage safety hazard is predicated on the type of waste being stored, the amount of radionuclides present, and how readily they might be transported into the environment. In general, it is preferable to store radioactive material in solid form. Under some circumstances, however, temporary storage in a liquid form may be desirable or required. The specific design and operation of any storage facility will be significantly influenced by the various waste forms, consequently, this document addresses wet waste, solidified wet waste and dry low level radioactive waste.

Guidance similar to that provided in this enclosure has been incorporated in NUREG-0800, NRC/NRR Standard Review Plan, July 1981, as Appendix 11.4-A to SRP 11.4, Solid Waste Management Systems.

II. General Information

Prior to any implementation of additional onsite storage, substantial safety review and environmental assessments should be conducted to assure adequate public health and safety and minimal environmental impact. The acceptance criteria and performance objectives of any proposed storage facility, or area, will need to meet minimal requirements in areas of design, operations, safety considerations and policy

considerations. For purposes of this technical position, the major emphasis will be on safety considerations in the storing, handling and eventual disposition of the radioactive waste. Design and operational acceptability will be based on minimal requirements which are defined in existing SRPs, Regulatory Guides, and industry standards for proper management of radioactive waste. Considerations for waste minimization and volume reduction will also have to be incorporated into an overall site waste management plan and the onsite storage alternative. Additional waste management considerations for ALARA, decontamination, and decommissioning of the temporary storage facility, including disposal, should be performed as early as possible because future requirements for waste forms may make stored wastes unacceptable for final disposition.

Facility design and operation should assure that radiological consequences of design basis events (fire, tornado, seismic event, flood) should not exceed a small fraction (10%) of 10 CFR Part 100, i.e., no more than a few rem whole body dose.

The added capacity would typically extend storage to accommodate no more than an amount of waste generated during a nominal five-year period. In addition, waste should not be stored for a duration that exceeds five-years. Storage of waste in excess of the quantities and duration described herein requires Part 30 licensing approval. The design capacity (ft^3, Ci) should be determined from historical waste generation rates for the station, considering both volume minimization/reduction programs and the need for surge capacity due to operations which may generate unusually large amounts of waste.

The five-year period is sufficient to allow licensees to design and construct additional volume reduction facilities (incinerators, etc.), as necessary, and then process wastes that may have been stored during construction. Regional state compacts to create additional low-level waste disposal sites should also be established within the next five years.

III. Generally Applicable Guidance

(a) The quantity of radioactive material allowed and the shielding configurations will be dictated by the dose rate criteria for both the site boundary and unrestricted areas onsite. The 40 CFR 190 limits will restrict the annual dose from direct radiation and effluent releases from all sources of uranium fuel cycle and 10 CFR Part 20.105 limits the exposure rates in unrestricted areas. Offsite doses from onsite storage must be sufficiently low to account for other uranium fuel cycle sources (e.g., an additional dose of $\leq$ 1 mrem/year is

not likely to cause the limits of 40 CFR 190 to be exceeded). Onsite dose limits associated with temporary storage will be controlled per 10 CFR Part 20 including the ALARA principal of 10 CFR 20.1.

(b) Compatibility of the container materials with the waste forms and with environmental conditions external to the containers is necessary to prevent significant container corrosion. Container selection should be based on data which demonstrates minimal corrosion from the anticipated internal and external environment for a period well in excess of the planned storage duration. Container integrity after the period of storage should be sufficient to allow handling during transportation and disposal without container breach.

Gas generation from organic materials in waste containers can also lead to container breach and potentially flammable/explosive conditions. To minimize the number of potential problems, the waste form gas generation rates from radiolysis, biodegradation, or chemical reaction should be evaluated with respect to container breach and the creation of flammable/explosive conditions. Unless storage containers are equipped with special vent designs which allow depressurization and do not permit the migration of radioactive materials, resins highly loaded with radioactive material, such as BWR reactor water cleanup system resins, should not be stored for a period in excess of approximately one year.

A program of at least periodic (quarterly) visual inspection of container integrity (swelling, corrosion products, breach) should be performed. Inspection can be accomplished by use of TV monitors; by walk-throughs if storage facility layout, shielding, and the container storage array permit; or by selecting waste containers that are representative of the types of waste and containers stored in the facility and placing them in a location specifically designed for inspection purposes. All inspection procedures developed should minimize occupational exposure. The use of high integrity containers (300 year lifetime design) would permit an inspection program of reduced scope.

(c) If possible, the preferred location of the additional storage facility is inside the plant protected area. If adequate space in the protected area is not available, the storage facility should be placed on the plant site and both a physical security program (fence, locked and alarmed gates/doors, periodic patrols) and a restricted area for radiation protection purposes should be established. The facility should not be placed in a location that

requires transportation of the waste over public roads unless no other feasible alternatives exist. Any transportation over public roads must be conducted in accordance with NRC and DOT regulations.

(d) For low level dry waste and solidified waste storage:

1. Potential release pathways of all radionuclides present in the solidified waste form shall be monitored as per 10 CFR 50, Appendix A. Surveillance programs shall incorporate adequate methods for detecting failure of container integrity and measuring releases to the environment. For outside storage, periodic direct radiation and surface contamination monitoring shall be conducted to insure that levels are below limits specified in 10 CFR 20.202, 20.205, and 49 CFR 173.397. All containers should be decontaminated to these levels or below before storage.

2. Provisions should be incorporated for collecting liquid drainage including provisions for sampling all collected liquids. Routing of the collected liquids should be to radwaste systems if contamination is detected or to normal discharge pathways if the water ingress is from external sources and remains uncontaminated.

3. Waste stored in outside areas should be held securely by installed hold down systems. The hold down system should secure all containers during severe environmental conditions up to and including the design basis event for this waste storage facility.

4. Container integrity should be assured against corrosion from the external environment; external weather protection should be included where necessary and practical. Storage containers should be raised off storage pads where water accumulation can be expected to cause external corrosion and possible degradation of container integrity.

5. Total curie limits should be established based on the design of the storage area and the safety features provided.

6. Inventory records of waste types, contents, dates of storage, shipment, etc., should be maintained.

IV. Wet Radioactive Waste Storage

(a) Wet radioactive waste will be defined as any liquid or liquid/solid slurry. For storage considerations, wet waste is further defined

as any waste which contains free liquid in amounts which exceed the requirements for burial as established by the burial ground licensing authority.

(b) The facility supporting structure and tanks should be designed to prevent uncontrolled releases of radioactive materials due to spillage or accident conditions.

(c) The following design objectives and criteria are applicable for wet radioactive waste storage facilities:

1. Structures that house liquid radwaste storage tanks should be designed to seismic criteria as defined in Standard Review Plan (Section 11.2). Foundations and walls shall also be designed and fabricated to contain the liquid inventory which might be released during a container/tank failure.

2. All tanks or containers should be designed to withstand the corrosive nature of the wet waste stored. The duration of storage under which the corrosive conditions exist shall also be considered in the design.

3. All storage structures should have curbs or elevated thresholds with floor drains and sumps to safely collect wet waste assuming the failure of all tanks or containers. Provisions should be incorporated to remove spilled wet waste to the radwaste treatment systems.

4. All tanks and containers shall have provisions to monitor liquid levels and to alarm potential overflow conditions.

5. All potential release pathways of radionuclides (e.g., evolved gases, breach of container, etc.) shall be controlled, if feasible, and monitored as per 10 CFR 50, Appendix A (General Design Criteria 60 and 64). Surveillance programs should incorporate adequate methods for monitoring breach of container integrity or accidental releases.

6. All temporarily stored wet waste will require additional reprocessing prior to shipment offsite; therefore, provisions should be established to integrate the required treatment with the waste processing and solidification systems. The interface and associated systems should be designed and tested in accordance with the codes and standards described in Standard Review Plan Section 11.

V. Solidified Radioactive Waste Storage

(a) Solidified radwaste for storage purposes shall be defined as that waste which meets burial site solidified waste criteria. For purposes of this document, resins or filter sludges dewatered to the above criteria will be defined under this waste classification/criteria.

(b) Any storage plans should address container protection as well as any reprocessing requirements for eventual shipment and burial.

(c) Casks, tanks, and liners containing solidified radioactive waste should be designed with good engineering judgment to preclude or reduce the probability of occurrence of uncontrolled releases of radioactive materials due to handling, transportation or storage. Accident mitigation and control for design basis events (e.g., fire, flooding, tornadoes, etc.) must be evaluated and protected against unless otherwise justified.

(d) The following design objectives and criteria are applicable for solidified waste storage containers and facilities:

1. All solidified radwaste should be located in restricted areas where effective material control and accountability can be maintained. While structures are not required to meet seismic criteria, protection should be afforded to insure the radioactivity is contained safely by use of good engineering judgment, such as the use of curbs and drains to contain spills of dewatered resins or sludges.

2. If liquids exist which are corrosive, proven provisions should be made to protect the container (i.e., special liners or coatings) and/or neutralize the excess liquids. If deemed appropriate and necessary, highly non-corrosive materials (e.g., stainless steel) should be used. Potential corrosion between the solid waste forms and the container should also be considered. In the case of dewatered resins, highly corrosive acids and bases can be generated which will significantly reduce the longevity of the container. The Process Control Program (PCP) should implement steps to assure the above does not occur; provisions on container material selection and precoating should be made to insure that container breach does not occur during temporary storage periods.

3. Provision should be made for additional reprocessing or repackaging due to container failure and/or, as required for

final transporting and burial as per DOT and burial site criteria. Contamination isolation and decontamination capabilities should be developed. When significant handling and personnel exposure can be anticipated, ALARA methodology should be incorporated as per Regulatory Guides 8.8 and 8.10.

4. Procedures should be developed and implemented for early detection, prevention and mitigation of accidents (e.g., fires). Storage areas and facility designs should incorporate good engineering features and capabilities for contingencies so as to handle accidents and provide safeguard systems such as fire detectors and suppression systems, (e.g., smoke detector and sprinklers). Personnel training and administrative procedures should be estabished to insure both control of radioactive materials and minimum personnel exposures. Fire suppression devices may not be necessary if combustible materials are minimal in the area.

V. Low Level Dry Waste Storage

(a) Low level dry waste is classified as contaminated material (e.g., paper, trash, air filters) which contains radioactive material dispersed in small concentrations throughout large volumes of inert material and contains no free water. Generally, this consists of dry material such as rags, clothing, paper and small equipment (i.e., tools and instruments) which cannot be easily decontaminated.

(b) Licensees should implement controls to segregate and minimize the generation of low level dry waste to lessen the impact on waste storage. Integration of Volume Reduction (VR) hardware should be considered to minimize the need for additional waste storage facilities.

(c) The following design objectives and criteria are applicable for low level dry waste storage containers and facilities.

1. All dry or compacted radwaste should be located in restricted areas where effective material control and accountability can be maintained. While structures are not required to meet seismic criteria, protection should be afforded to insure the radioactivity is contained safely by use of good engineering judgment.

2. The waste container should be designed to insure radioactive material containment during normal and abnormal occurrences. The waste container materials should not support combustion. The packaged material should not cause fires through spontaneous chemical reactions, retained heat, etc.

3. Containers should generally comply with the criteria of 10 CFR 71 and 49 CFR 170 to minimize the need for repackaging for shipment.

4. Increased container handling and personnel exposure can be anticipated, consequently, all ALARA methodology should be incorporated per Regulatory Guides 8.8 and 8.10.

4.5 COMPARISON OF DECOMMISSIONING ALTERNATIVES

From careful examination of Tables 4.3-1 and 4.3-2 it appears that DECON or 30-year SAFSTOR are reasonable options for decommissioning a PWR. 100-year SAFSTOR is not considered a reasonable option since it results in the continued presence of a site dedicated to radioactivity containment for an extended time period with little benefit in dose reduction compared to 30-year SAFSTOR. DECON costs less than SAFSTOR and its larger occupational radiation dose is considered of marginal significance to health and safety, and, therefore, DECON would be considered the more preferable alternative in most instances since it would restore the facility and site for unrestricted use in a much shorter time period than SAFSTOR.

Either ENTOMB option requires indefinite dedication of the site as a radioactive waste burial ground. In the ENTOMB option with the reactor internals and its long-lived activation products entombed, the security of the site could not be assured for thousands of years necessary for radioactive decay, so this option is not viable. In the ENTOMB option with the reactor internals removed, it may be possible to release the site for unrestricted use at some time within the order of a hundred years if calculations demonstrate that the radioactive inventory has decayed to acceptable residual levels. However, even this ENTOMB alternative appears to be less desirable than either DECON or SAFSTOR based on consideration of the fact that ENTOMB results in higher radiation exposure and higher initial costs than 30-year SAFSTOR, that the overall cost of ENTOMB over the entombment period is approximately the same as DECON, and the fact that regulatory uncertainty after the long entombment time period might result in additional costly decommissioning activity in order to release the facility for unrestricted use.

It is instructive to consider the cumulative impact of decommissioning all existing and planned PWRs. In 1977 there were 36 PWRs in operation, with a total electric-power-producing capacity of 27,000 MWe. The environmental impact of decommissioning these 36 reactors will be approximately 30 times the impact of decommissioning the 1,175-MWe reference reactor discussed here. This impact will increase as the number of PWRs increases, although one might expect some mitigation of the impact of decommissioning, based on decommissioning experience or if future reactors are sited near waste disposal facilities or in multiple reactor sites (see Section 13).

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