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**LENGTH:** 17960 words**ARTICLE:** MIXED MESSAGES ON MIXED WASTE: CONTINUED DEBATE OVER THE REGULATION OF MIXTURES OF RADIOACTIVE WASTE AND HAZARDOUS CHEMICAL WASTE**NAME:** Gary A. Davis \***BIO:**

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**SUMMARY:**

... Much of this "mixed waste," however, contains highly toxic chemicals and only small amounts of radioactivity. ... The Nuclear Regulatory Commission (NRC) is also concerned about the application of hazardous waste laws to mixed waste because of the implications for the disposal of commercial low-level radioactive waste from nuclear power plants and other commercial generators of mixed waste. ... This provision defines as byproduct material "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." ... The fact that Congress found it necessary to specifically include non-radioactive waste components in this expanded definition of byproduct material and that it did not change the original definition in order to exclude RCRA coverage indicates that the original definition of byproduct material was not intended to include mixed waste. ... Due to the explicit exclusion of source, special nuclear, and byproduct material from the RCRA, the DOE and NRC have the exclusive authority to regulate the radiation hazards of mixed waste as radioactive waste facilities pursuant to DOE orders and NRC regulations issued under the AEA. ...

**TEXT:**

## [\*586] I. Introduction

In Tennessee and other states several thousand tons of hazardous chemical waste have been disposed of in ways that threaten public health and the environment. These methods of disposal, which do not comply with federal and state hazardous waste regulations, have been allowed simply because the hazardous waste contains radioactive materials. Much of this "mixed waste," however, contains highly toxic chemicals and only small amounts of radioactivity. "Mixed waste" has escaped regulation under hazardous chemical waste laws because it was supposedly regulated for its radioactive properties under the Atomic Energy Act of 1954 (AEA). n1 The disposal practices that have been used indicate that regulation under the AEA has not been adequate and has created a serious loophole in the regulation of these hazardous wastes.

Most of the mixed waste in the United States is generated by the various activities of the U.S. Department of Energy (DOE). These activities include the production of nuclear weapons, the enrichment of uranium, and nuclear research. The DOE originally claimed an exemption from all regulation under the hazardous waste laws because its activities are covered under the AEA. When this claimed exemption was rejected by a Tennessee federal court in *Legal Environmental Assistance Foundation v. Hodel*, n2 the DOE asserted an exemption for all mixed waste. Although the DOE has now

acknowledged that, in principle, mixed waste is covered under hazardous waste laws, the agency continues to resist the application of hazardous waste standards to a major portion of its mixed waste.

[\*587] The Nuclear Regulatory Commission (NRC) is also concerned about the application of hazardous waste laws to mixed waste because of the implications for the disposal of commercial low-level radioactive waste from nuclear power plants and other commercial generators of mixed waste. These other generators could potentially include hundreds of hospitals and laboratories using radioisotopes for medical treatment, analysis, and research purposes. Commercial generators have disposed of this waste in NRC-regulated low-level radioactive waste repositories that generally do not meet current hazardous waste standards for land disposal facilities.

The U.S. Environmental Protection Agency (EPA) and the states hosting nuclear facilities are also interested parties in the mixed waste debate. The EPA, the federal agency charged with regulating hazardous waste, has suffered from internal conflicts over the issue and has been reluctant to assert authority over mixed waste. On the other hand, the states, particularly Tennessee, South Carolina, and Washington, are not hesitating to apply their hazardous waste authority to cover mixed waste at DOE facilities. The disposal practices used by the DOE in the past have caused the states to become determined adversaries of DOE self-regulation.

Currently, there is still no resolution to the mixed waste issue. Negotiations continue between the DOE, NRC, and EPA regarding recent DOE proposals designed to circumvent hazardous waste regulation for a significant portion of its mixed waste. The states have been left out of these negotiations but have put in motion their own hazardous waste regulatory process for mixed waste at DOE facilities. Congress attempted to deal with the mixed waste problem in 1985 but backed away to avoid additional controversy in its Low-Level Radioactive Waste Policy Amendments Act of 1985. n3 The result has been uncertainty for the regulated community and the continuation of inadequate mixed waste disposal practices.

This article describes the legal and technical issues giving rise to this problem, the resolution of the main jurisdictional issues, and current DOE, EPA, NRC, and Congressional proposals for mixed waste regulation. The final section outlines a recommended approach for the resolution of the problem in a legally and technically sound manner.

## II. The Overlapping Regulatory Schemes for Hazardous and Radioactive Waste

The question of which set of regulations to apply to mixed hazardous and radioactive waste arises because of the overlapping [\*588] jurisdiction of the Atomic Energy Act of 1954 (AEA) n4 and the Resource Conservation and Recovery Act (RCRA). n5 Other regulatory schemes that are potentially affected are the Low-Level Radioactive Waste Policy Act, n6 the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), n7 and the Safe Drinking Water Act's Underground Injection Control Provisions. n8 The following is a discussion of the provisions of each act applicable to mixed waste management and the regulations adopted thereunder.

### A. The Atomic Energy Act of 1954

Following the nation's initial military experience with nuclear weapons and nuclear power, Congress decided that in order to promote commercial uses of nuclear power, the nuclear program needed to be housed in a civilian agency. n9 The Atomic Energy Commission (AEC), created by the AEA, was given multifaceted authority over all aspects of the nuclear program. The AEA directed the AEC to produce "special nuclear material" in its own facilities, n10 to produce atomic weapons, to research and develop the uses of special nuclear material for military applications n11 and medical, biological and commercial purposes, n12 and to encourage and regulate the use of atomic energy for civilian commercial purposes. n13

The AEA specifically required the AEC to license commercial uses of atomic energy and nuclear materials and to establish standards to protect health and safety. n14 Amendments to the AEA in 1959 established programs for controlling radiation hazards associated with the use of nuclear materials. n15 However, nothing in the amended AEA specifically refers to the management of radioactive waste or hazardous waste. The AEA specifically did not require licenses for activities conducted by the AEC itself or by its contractors. n16 Section 161(i)(3) of the Act authorized the AEC to govern its own nuclear weapons activities by issuing orders for the purpose of protecting public health, [\*589] life, and property, which could include standards governing the design, location, and operation of facilities used in these activities. n17

The federal nuclear program has undergone two major transformations since the formation of the AEC by the AEA. First, the Energy Reorganization Act of 1974 abolished the AEC and transferred all of the licensing and regulatory

functions of that agency to the Nuclear Regulatory Commission (NRC). n18 This authority specifically included the regulation of commercial radioactive waste management. n19 The Energy Reorganization Act also created the Energy Research and Development Administration (ERDA), endowing it with all non-regulatory functions of the AEC, including nuclear materials production and the nuclear weapons program. n20

The second transformation occurred with the Department of Energy Reorganization Act, which transferred all of ERDA's programs to the Department of Energy and maintained the regulatory functions of the NRC. n21 The Act also gave the DOE certain responsibilities for the management of nuclear waste from commercial facilities n22 but provided no specific guidance for the management of radioactive waste at DOE's own facilities. Neither of the two reorganization acts included any provisions concerning the management of hazardous waste.

The states have a limited role in the protection of the public from radiation hazards under section 274 of the AEA. n23 If a state has entered into an agreement with the NRC it may regulate byproduct materials, source materials, and special nuclear material in quantities not sufficient to form a critical mass. Exceptions to this delegation of authority include regulation of the construction and operation of any production or utilization facility, the export or import of nuclear materials or nuclear facilities, the disposal in the ocean or sea of nuclear waste materials, and the disposal of certain nuclear materials which the NRC determines are too hazardous to be disposed of without NRC regulation. Finally, section 274(k) states that "[n]othing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards." n24

#### B. The Low-Level Radioactive Waste Policy Act

The Low-Level Radioactive Waste Policy Act n25 was passed in 1980 to define the responsibility for managing commercial low-level radioactive [\*590] waste. n26 The Act assigned the responsibility for managing this waste to the states and established that states may enter into regional compacts for the establishment and operation of regional disposal facilities. The Act also provided that after January 1, 1986, any such compact can restrict the use of regional facilities established pursuant to a compact to waste generated in the region covered by the compact. n27 Congress recently amended the Low-Level Radioactive Waste Policy Act, primarily to extend the January 1986 deadline and to assure the three disposal site states that new disposal sites would be established in other states. n28

For states that are "agreement states" under section 274 of the AEA and have established facilities for the disposal of low-level radioactive wastes, the regulation of these disposal facilities is a state function. Thus, the states may be ultimately responsible for the regulation of commercially generated low-level mixed waste under their AEA authority and their RCRA authority.

#### C. Radioactive and Mixed Waste Regulations Under the AEA

##### 1. DOE Orders

The Department of Energy and its predecessors have used their authority under section 161(i)(3) of the AEA n29 to issue orders for the protection of public health and safety from the dangers of radioactive, hazardous, and mixed waste. These orders are framed in broad terms in comparison to both NRC regulations and RCRA regulations and leave much to the discretion of various DOE field offices.

The DOE promulgated an order for radioactive waste management in 1984, which delegates most authority to the head of each field office for determining how low-level radioactive waste should be managed. n30 DOE Order 5820.2 lists several factors which the field office should consider in developing site-specific standards for site selection, design, operation, and closure of low-level waste facilities, but contains few specific criteria which the field offices must follow in developing such [\*591] standards. The Order states specifically that solid low-level waste must be disposed of at shallow land burial or greater confinement disposal sites. Greater confinement is defined as a "technique for disposal of wastes that uses natural and/or engineered barriers which provide a degree of isolation greater than that of shallow land burial but possibly less than that of a geologic repository." n31 The Order also requires that techniques such as solidification prior to disposal shall replace current disposal operations where liquid low-level waste is discharged directly into the environment or on natural soil columns. n32 The field offices, however, may decline to follow these two specific requirements after consulting with DOE headquarters. n33

For high-level radioactive waste, the DOE Order specifically requires interim retrievable storage in double containers with leak detection systems prior to eventual disposal in a geologic repository according to the requirements of the Nuclear Waste Policy Act of 1982. n34 Transuranic waste criteria are similar to those for high-level waste. n35 These

requirements in the Order, although more specific than those for low-level waste management, are not as detailed or stringent as the NRC regulations for high-level waste management. n36

The DOE has also published an order for hazardous and mixed waste management at its facilities. n37 Although this order references most of the technical requirements of RCRA for the management of this waste, it merely requires compliance with these requirements "to the extent practicable," provides a number of opportunities for exemptions from RCRA requirements, and does not provide any of RCRA's procedural safeguards such as permit requirements, enforcement, and public participation. n38 Exemption opportunities, which make this order much less stringent than RCRA, include the ability of DOE headquarters to grant an exemption from any requirement "based on the unique characteristics of the sites and/or facilities, or unrealistically high costs compared to the risks involved." n39 The operations offices may also show that alternative methods provide assurance of equal or greater environmental safety and health protection. n40 RCRA provides no such exemptions.

[\*592] While few exemption requests were made under this Order by the DOE Oak Ridge Operations Office concerning hazardous and mixed waste, n41 numerous requests were made by the Savannah River Plant in its proposed hazardous waste management plan submitted in June 1984. n42 In that draft plan the operations office requested an exemption from RCRA technical standards for several seepage basins known to be contaminating groundwater, for a landfill to dispose of mixed waste, and for storage of mixed waste in storage facilities. The exemption requests under the DOE Order are now moot because of the agreement between EPA and DOE to apply the LEAF v. Hodel n43 decision to all of the DOE's facilities.

## 2. NRC Regulations

The Nuclear Regulatory Commission has promulgated regulations for the disposal of commercial high-level and low-level radioactive waste. n44 The high-level waste regulations set out technical standards for geologic repositories and require this waste to be disposed of in such repositories. The technical standards include performance objectives, siting criteria, design criteria, and performance confirmation requirements. The siting criteria, for instance, require the host rock to have low permeability. They also require the repository to be at least 300 meters from the surface, and located in a hydrogeological regime so that any radionuclide travel time in ground water will take significantly more than 1000 years to reach the accessible environment. The design criteria include standards for radiation protection, protection against natural phenomena (such as earthquakes), and criticality control. n45

Standards for low-level radioactive waste disposal apply only to land disposal and do not include any standards for other forms of management. The regulations define which wastes are acceptable for near-surface burial. They include performance objectives, groundwater protection and monitoring requirements, siting criteria, design criteria, land ownership and access control, and financial requirements for facility operators. n46

The performance objectives state radiation exposure limits for members of the public from the operation of low-level waste landfills and establish limits for radionuclides in groundwater. General objectives [\*593] also relate to the long-term stability of the waste and the disposal site so that, once emplaced and covered, the access of water to the waste can be minimized. Siting criteria include restrictions on siting in a 100-year floodplain and a requirement for sufficient depth to groundwater so that groundwater intrusion into the site will not occur. The licensee must conduct a preoperation monitoring program, and continue monitoring throughout operation and after closure to provide early warning of migration of radionuclides from the site. Plans for taking corrective measures if the monitoring indicates that performance objectives will not be met must also be included.

Finally, the regulations provide that the NRC can exempt certain radioactive wastes from regulation where the Commission considers the radiation hazard to be minimal. Under this authority, the NRC decided that "scintillation cocktail" fluids, a mixed waste containing small amounts of radioactive materials in a hazardous chemical medium and produced in large quantities at medical research facilities, need not be regulated under the AEA. n47 Thus, these wastes need not be disposed of in a disposal facility regulated under the AEA, but would generally not be accepted at a facility for hazardous waste because of their radioactivity.

### D. The Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act was passed in 1976 to establish a comprehensive program to regulate hazardous waste from "cradle to grave." n48 The RCRA defines hazardous waste as a subset of solid waste. Solid waste is defined as follows:

[Solid waste is] any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include . . . source, special nuclear, or byproduct material as defined by Atomic Energy Act of 1954, as amended. n49

It is, in part, the exemption for "source, special nuclear, and byproduct material" in this definition that has created the debate over regulation of mixed waste. n50

[\*594] Hazardous waste is defined by the RCRA as:

a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may — (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. n51

The RCRA directs EPA to promulgate standards for the identification and listing of hazardous waste and standards governing the generation, transportation, treatment, storage, and disposal of hazardous waste, including a permit program for facilities at which hazardous waste is managed. n52 The RCRA explicitly applies to federal facilities, n53 and also allows the states to administer hazardous waste regulatory programs upon authorization by the EPA, which requires that state programs be at least as stringent as the federal program. n54

The RCRA was extensively amended in 1984 to broaden its coverage and close regulatory loopholes with unprecedented specificity. n55 One major change was effected in the regulation of land disposal of hazardous waste. Congress specifically restricted certain types of hazardous waste from being disposed of in landfills and surface impoundments and mandated stringent design criteria for land disposal facilities. n56 Congress also set deadlines for issuance of final permits to land disposal facilities and required that landfills cease operation by November 1985 if they did not meet certain basic groundwater monitoring [\*595] requirements. n57 Two other areas of change in the 1984 amendments that will impact on the generation and management of mixed waste are the provisions requiring generators of hazardous waste to undertake waste minimization programs, and the provisions bringing underground storage tanks for hazardous substances under the regulatory control of the EPA. n58

Since the RCRA was directed toward all phases of the management of specific types of waste and not at the impact upon a discreet environmental medium (such as air, water, or land), there was inevitable overlap with other environmental statutes. These laws include the Federal Water Pollution Control Act, n59 the Safe Drinking Water Act, n60 the Marine Protection, Research and Sanctuaries Act of 1972, n61 and the Atomic Energy Act of 1954. n62 In order to prevent conflicts with these statutes, Congress provided in section 1006(a) a limited exception to RCRA's comprehensive coverage in instances when the provisions of these statutes are actually inconsistent with the RCRA. n63 Section 1006(b) also directs the EPA to integrate the provisions of the RCRA with those of other environmental acts to the maximum extent practicable. n64

#### E. Regulation of Hazardous Waste and Mixed Waste Under the RCRA

The Environmental Protection Agency has promulgated extensive and detailed regulations pursuant to the RCRA. n65 These regulations include notification, recordkeeping, and reporting requirements for generators of hazardous wastes; criteria and testing procedures to determine whether a solid waste is a hazardous waste; a manifest system to track shipments of hazardous waste from generator to management facility; a permit system for facilities managing hazardous waste; and specific design and operating standards for each type of [\*596] hazardous waste facility. Design and operating standards applicable to all facilities include requirements for waste analysis, personnel training, emergency preparedness, recordkeeping and reporting, container handling, closure and post closure maintenance, and financial assurances. There are specific standards for landfill facilities, surface impoundments, tank storage, waste piles, land treatment, and incineration. n66

Design standards for landfills, which have been the most common method of mixed waste disposal, are much more prescriptive than their counterparts in the DOE orders or NRC regulations. These standards require that hazardous waste landfills have double-liners and a drain system to collect any liquid leaching through the waste. The philosophy behind these regulations is to prevent groundwater contamination under any conditions of hydrogeology. Exemptions from the letter of the design requirements are extremely limited. Under the recent amendments to the RCRA, all liquids are

prohibited from disposal in landfills, n67 and the EPA is directed to restrict certain types of hazardous waste from being disposed of without pretreatment to reduce their toxicity and mobility. n68

#### F. The Comprehensive Environmental Response, Compensation, and Liability Act

Another mixed waste overlap issue is whether leaking dumpsites containing mixed waste are covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the "Superfund." n69 CERCLA provides EPA and the states with authority to order responsible parties to clean up sites where "hazardous substances" have been released, to pay for such cleanup first and later to sue the responsible parties for the costs of cleanup, and to use Superfund money to clean up those sites for which no solvent responsible parties can be found. The original Superfund was \$1.6 billion from general tax revenues and from a special tax levied on chemical feedstocks used by the chemical industry. n70 CERCLA was reauthorized in 1986, and the fund was increased to \$8.5 billion. n71

"Hazardous substance" is defined in CERCLA by reference to substances regulated or listed under other environmental statutes, including the Federal Water Pollution Control Act, n72 the Resource [\*597] Conservation and Recovery Act, n73 the Clean Air Act, n74 and the Toxic Substances Control Act. n75 Section 102 of CERCLA also directs the EPA to develop a list of substances which, "when released into the environment may present substantial danger to the public health or welfare of the environment," and these substances are also considered to be hazardous substances under the Act. n76

It is clear that CERCLA's definition of hazardous substance covers practically any hazardous chemical that might be present in a dumpsite containing mixed waste. What has not been so clear under CERCLA is whether the statute gives EPA and the states any authority over the radiation hazards presented by mixed waste sites. n77 Since the definition of hazardous substance includes "any hazardous air pollutant designated under section 112 of the Clean Air Act," n78 and radionuclides have been designated as hazardous air pollutants by the EPA under this section, n79 the definition of hazardous substances appears to be broad enough to include radioactive materials. But since CERCLA authority is keyed to releases of hazardous substances throughout the Act, section 101(22) of CERCLA somewhat limits this authority in its definition of "release." That definition excludes:

release of source, special nuclear, and byproduct material from a nuclear incident as that term is defined in the Atomic Energy Act of 1954, if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such Act, or for the purposes of section 104 of this title [CERCLA] or any other response action, any release of source, byproduct, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978. n80

The first part of this exclusion would apply only to commercial nuclear facilities that are licensed by the Nuclear Regulatory Commission and required to maintain financial assurances for cleanup and compensation in the event of a nuclear incident. This should mean that EPA and the states would be able to take action under CERCLA for radiation [\*598] hazards at DOE mixed waste sites. The exclusion for commercial facilities would apply only when the release was from a "nuclear incident," which is defined by the AEA, in pertinent part, as "any occurrence, including an extraordinary nuclear occurrence, within the United States causing, within or outside the United States, bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material." n81 This definition is much more restrictive than the definition of "release" under CERCLA, which includes "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." n82 Therefore, for those releases of source, special nuclear, and byproduct material from commercial facilities licensed by the Nuclear Regulatory Commission that do not rise to the level of a "nuclear incident," CERCLA should apply. n83

Another issue, already resolved, was whether the DOE had the responsibility under section 103(c) of CERCLA, n84 to notify EPA of sites where it had disposed of hazardous waste as defined in the RCRA. The DOE initially claimed that it had no such responsibility under section 103(c) because the RCRA was not applicable to its activities conducted under the AEA. However, prior to the federal district court's decision in *LEAF v. Hodel*, n85 the DOE reversed its position and reported many of the sites which became the subject of that decision.

#### G. Underground Injection Control Provisions of the Safe Drinking Water Act

At some DOE facilities mixed waste is injected into wells for disposal deep below the surface. The objective is to place the waste far below the water table to prevent contamination of potential drinking water aquifers. Underground

injection of waste is regulated by the EPA under the Safe Drinking Water Act's Underground Injection Control (UIC) Program. The UIC provisions explicitly apply to hazardous and radioactive wastes. n86

Regulations promulgated under the UIC provisions classify injection wells into five classes, establish design and operating standards, [\*599] and prohibit the injection of hazardous waste and radioactive waste directly into or above an underground source of drinking water. The regulations also prohibit injection of any fluid into an underground source of drinking water in a manner which causes a violation of any primary drinking water standard. n87

In addition to these UIC regulations, injection well facilities for hazardous waste must comply with RCRA regulations for aboveground storage and handling equipment and with the manifest reporting requirements of the RCRA. Furthermore, the 1984 RCRA amendments establish a schedule for the EPA to restrict certain types of hazardous waste from underground injection.

### III. Resolution of Basic Jurisdictional Issues: LEAF v. Hodel

The whole issue of the regulation of mixed waste was brought to the forefront by the case of Legal Environmental Assistance Foundation v. Hodel, decided by the U.S. District Court for the Eastern District of Tennessee, Northern Division, on April 13, 1984. n88 Two environmental organizations, the Legal Environmental Assistance Foundation (LEAF) and the Natural Resources Defense Council (NRDC), n89 successfully challenged a claim by DOE that certain of its facilities were totally exempt from the RCRA by virtue of their coverage under the AEA. The decision did not explicitly resolve the mixed waste issue, although the court's opinion that DOE facilities are fully subject to RCRA has been interpreted as subjecting mixed waste to RCRA regulation.

Prior to implementation of the RCRA by the adoption of EPA regulations in 1980, DOE officials began to assert the position that DOE nuclear facilities were totally exempt from RCRA regulation, including both purely hazardous waste and mixed waste generated at these facilities. n90 This position was first discussed internally, then presented to the EPA. n91 The EPA failed to dispute this claimed [\*600] exemption, and made no effort to regulate hazardous waste management at DOE facilities. n92 When the State of Tennessee attempted to assert hazardous waste regulatory authority over DOE facilities in Oak Ridge, Tennessee, DOE asserted its claimed exemption and the state acquiesced. n93 DOE continued to dispose of several thousand tons per year of hazardous waste and mixed waste in an environmentally unsound manner with no regulatory oversight.

In late 1982, sampling of a creek near the Y-12 nuclear weapons plant in Oak Ridge, Tennessee, led the Tennessee Division of Water Quality to post the creek against fishing due to mercury contamination. This, in turn, led to inspections of the plant site which resulted in the "discovery" of hazardous waste disposal practices that were contaminating groundwater and surface water in clear violation of Tennessee water quality regulations. These hazardous waste disposal practices included the dumping of millions of gallons of heavy metal waste solutions contaminated with uranium and and solvents into four unlined, solvents into four unlined, leaking lagoons. Also included were the spreading of PCB's n94 containing waste oil and chlorinated solvents on the ground, ostensibly for treatment by soil bacteria, and the pouring of thousands of gallons of waste organic solvents into unlined trenches used for the disposal of low-level radioactive waste. n95

The inspection started a chain of events that led to the LEAF lawsuit. In response to a Freedom of Information Act request shortly after the inspection, DOE revealed to the public that it had released into the environment or otherwise lost at least 2.4 million pounds of mercury from the Y-12 Plant during the 1950s and 1960s, a large portion of which had been discharged into the creek that was posted by the State. n96 This revelation created unprecedented public concern [\*601] and drew the attention of high-level regulatory officials and members of Congress. In response to this public concern, the Tennessee Department of Health and Environment, the United States EPA and DOE entered into a Memorandum of Understanding which was to function as a work plan for obtaining information on the extent of the environmental contamination at the Y-12 Plant. The Memorandum, however, did not address compliance with environmental laws or any of the thorny jurisdictional issues. n97 Congressional attention to the problems resulted in an investigation and hearing in Oak Ridge in July 1983. n98

When it became clear that neither the State nor the EPA were willing to press the RCRA jurisdictional issue, LEAF and NRDC filed suit against DOE under the citizen suit provision of the RCRA n99 for numerous violations of RCRA regulations at the Y-12 Plant. n100 The case was resolved on summary judgment motions, since the violations were well-documented in DOE's own reports and substantially admitted in DOE's answer to the LEAF complaint. The main

issue was whether hazardous waste generated at the Y-12 Plant was subject to RCRA regulations. n101 Tennessee intervened in the lawsuit to support the position of the plaintiffs. n102

The court's decision in the case turned on its interpretation of the interplay between sections 6001 and 1006(a) of the RCRA and the requirements of the AEA. Section 6001 n103 is the federal facility provision [\*602] of the RCRA, which makes the Act applicable to all federal facilities. Section 1006(a) n104 is the provision which, as discussed above, is designed to prevent inconsistencies between the RCRA and "the requirements" of other listed statutes, including the AEA. n105

DOE claimed that its facilities were totally exempt from RCRA regulation because of three broad inconsistencies between the RCRA and the AEA. n106 First, the Department claimed that the grant of state authority over federal facilities in the RCRA was inconsistent with section 271 of the AEA, n107 which it claimed precluded any state authority from regulating, controlling or restricting any DOE activities. Second, DOE argued that the application of RCRA to the Y-12 Plant conflicted with AEA requirements related to the protection of national security. Finally, DOE asserted that any regulation of hazardous waste by the EPA or the State under the RCRA conflicted with DOE's authority under section 161(i)(3) of the AEA to protect health and safety at its own facilities. n108

LEAF and NRDC contested each of these claimed inconsistencies. First, they pointed out that section 271 of the AEA deals entirely with the regulation by the states of the generation, transmission and sale [\*603] of electricity. This section's first clause, they argued, was intended to preserve the states' traditional regulatory power in this field, and the second clause was included to clarify that this authority of the states did not extend to facilities owned by the AEC and its successors. Plaintiffs also pointed out that DOE nuclear weapons facilities are currently regulated by the states under other environmental statutes, such as the Clean Water Act n109 and the Safe Drinking Water Act. Furthermore, section 274(k) of the AEA declares that states are free to regulate nonradiation hazards produced by activities regulated under the AEA. n110 Plaintiffs argued that section 274(k), coupled with the waiver of sovereign immunity in RCRA section 6001, demonstrated that state RCRA regulation of DOE facilities is not inconsistent with the AEA. n111

As to DOE's claim that the RCRA is inconsistent with the AEA's national security requirements, LEAF and NRDC argued that DOE had offered no evidence of any such inconsistencies and that the only way in which national security considerations could be raised by DOE under the RCRA was through the exclusive procedures of section 6001 of the RCRA. n112 That provision allows for presidential exemptions for federal facilities from RCRA requirements that would conflict with national security.

Finally, LEAF and NRDC challenged DOE's claim that RCRA regulation would be inconsistent with section 161(i)(3) of the AEA. They argued that this section does not apply to hazardous waste, but only to radiation hazards. Furthermore, section 161(i)(3) "authorizes" DOE to set standards for protection of health and safety at its facilities. Any standards that DOE had issued for hazardous and mixed waste management pursuant to this section were not "requirements" of the AEA as envisioned in section 1006(a) of the RCRA. n113

Federal Judge Robert Taylor granted the plaintiff's motion for summary judgment, rejecting DOE's claim for a total exemption from the RCRA. n114 The court stated that such a total exemption could not have been intended by Congress n115 and specifically rejected each of the [\*604] three inconsistencies claimed by DOE. Judge Taylor rejected DOE's claim that the AEA facilities could not be subject to state regulation under the RCRA, since the Y-12 Plant is subject to other state and local environmental regulations. n116 The court also held that the RCRA is not inconsistent with DOE's authority under section 161(i)(3) of the AEA, because that provision does not give DOE exclusive authority to regulate health and safety at the Y-12 Plant. n117 Finally, the court refused to consider any claimed inconsistencies between the RCRA and the national security requirements of the AEA, since these claimed inconsistencies were unsupported and since DOE had failed to apply for a presidential national security exemption. n118

The court discussed a general reconciliation of the RCRA and the AEA, concluding:

[T]he most reasonable reconciliation of the RCRA and the AEA is that AEA facilities are subject to the RCRA except as to those wastes which are expressly regulated by the AEA: nuclear and radioactive materials. Although it could be said that this interpretation renders § 6905(a) redundant with § 6903(27), the Court believes that these two sections support one another and firmly evince Congressional intent as to the application of the RCRA. n119

The court ordered DOE "with all deliberate speed to apply for RCRA permits for the treatment, storage, and disposal of hazardous waste at the Y-12 Plant." n120 DOE did not appeal the district court's decision and has generally complied

with the order by filing applications for RCRA permits for its hazardous waste treatment, storage, and disposal facilities in Oak Ridge and by closing all of the facilities that were disposing of hazardous and mixed waste improperly.

Unfortunately, Judge Taylor did not explicitly address the mixed waste issue in his opinion, although it was raised by the plaintiffs in their summary judgment brief. By simply stating that RCRA does not apply to those wastes that are "expressly regulated by the AEA" and by using an imprecise reference to the types of materials that are regulated by the AEA ("nuclear and radioactive materials" instead of "source, special nuclear, and byproduct material"), n121 the opinion left enough uncertainty about the application of the RCRA to mixed waste that DOE initially resisted such application.

Shortly after DOE's deadline for appeal had passed, LEAF and NRDC wrote to the Administrator of the EPA recommending that EPA apply the district court's ruling to all DOE facilities operated [\*605] under the AEA throughout the country and that EPA regulate mixed waste at DOE facilities under its RCRA authority. n122 Subsequently, DOE and EPA announced an agreement to apply the ruling to each DOE facility and to set up a joint program "to ensure aggressive implementation of RCRA to protect public health and the environment, and to define precisely those instances when application of RCRA to DOE facilities would be inconsistent with the AEA." n123 Although EPA's reply to the environmental groups stated that EPA and DOE had agreed that mixed waste is subject to the requirements of the RCRA, that issue has continued to be a sticking point in the implementation of the court's decision. n124 As discussed below, DOE has now proposed a regulation that would designate a substantial quantity of mixed waste as "byproduct material" under AEA so that it would be exempt from the RCRA by virtue of the definitional exclusion in section 1002(27), n125 DOE's continued reluctance to comply with the RCRA for some of its mixed waste has prompted more litigation and renewed legislative activity to unambiguously apply the RCRA to DOE mixed waste.

#### IV. Continued Debate Over the Regulation of Mixed Waste

The issue of mixed waste regulation remains unresolved and continues to be debated in the administrative process, in Congress, and in the courts.

##### A. DOE's Proposed Definition of Byproduct Material to Exempt Certain Mixed Waste from the RCRA

On November 1, 1985, DOE proposed a regulatory definition "to clarify the term 'byproduct material' for use in determining the Department of Energy's obligations under the Resource Conservation and Recovery Act with regard to radioactive waste substances owned or produced by the Department of Energy pursuant to the exercise of authority under the Atomic Energy Act." n126 The proposed regulation states:

[\*606] For purposes of this part [new Part 962 regarding Byproduct Material], the term Byproduct Material means a waste substance containing radioactivity that is either directly yielded in the process of producing or utilizing Special Nuclear Material as that term is defined in the Atomic Energy Act of 1954, as amended, or its being made radioactive is a direct and necessary consequence of that process. n127

Without commenting, for the present, on whether this proposed regulation actually clarifies anything, it is useful to compare the proposed regulatory definition to the statutory definition of byproduct material in order to facilitate an understanding of DOE's proposal. The statute defines byproduct material as "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 special nuclear material." n128

First, the regulatory proposal defines byproduct material as a "waste substance," whereas the statute uses the term "material." Indeed, DOE's proposed definition is predicated on its interpretation that the statutory definition of byproduct material was intended to encompass nuclear waste. n129

Second, the regulatory proposal encompasses any substance "containing radioactivity," whereas the statute uses the term "radioactive material." Thus, DOE has decided that a substance "containing radioactivity" is the same as a "radioactive material." In the preamble to the proposed regulation, DOE states that the term "radioactive material" must be taken to include the entirety of certain waste in which radioactive elements are dispersed, including nonradioactive materials, or "the exclusion of byproduct material from RCRA's coverage would be reduced to a virtual nullity." n130

Third, the regulatory definition does not explicitly except "special nuclear material" from being included in the definition of byproduct material as does the statute. Thus, DOE seems to be saying in the proposed regulation that a waste substance containing special nuclear material could be considered to be byproduct material. There is no explanation of this position in the preamble.

The remaining portions of the statute and the proposed regulation are very similar, but the proposed regulation contains some additional terms which, at least, amplify the meaning of the statute. Where the statute states that byproduct material is "yielded in" the process of [\*607] producing or utilizing special nuclear material, n131 the proposed regulation uses the term "directly yielded in." n132 Under the statute, a byproduct material can also be one "made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material." n133 Under the proposed regulation, its being made radioactive must be a "direct and necessary consequence of" the process of producing or utilizing special nuclear material. n134

The additional wording was intended by DOE to emphasize that the origin of the waste material is the key to a determination of whether it is byproduct material. DOE speaks of three categories of mixed waste under the regulations, depending upon the origin of the waste: (1) Waste that is accelerator produced or is yielded in the process of producing or utilizing source material or byproduct material, which would not be byproduct material under the proposed definition; (2) "direct process wastes," such as high-level radioactive waste from chemical processing of spent fuel, for which the radioactivity contained therein is "a direct, necessary, and inherent consequence of the process of producing and utilizing special nuclear material," which would be byproduct material under the proposed definition; and (3) "indirect process wastes," such as the residues from production of byproduct material for use in commerce, whose radioactivity is "an indirect result . . . from the process of producing and utilizing special nuclear material." Although this third category of waste contains byproduct material, states DOE, it would not be byproduct material in its entirety. Therefore, only the "direct process wastes" in category (2) would be exempt from the RCRA, and waste which fits the other two categories would be covered under the requirements of the RCRA if it contained hazardous waste. n135

DOE states explicitly that the ultimate effect of the application of the proposed regulation would be that DOE would maintain exclusive authority to regulate DOE radioactive wastes stored in high-level waste tanks at DOE facilities. It states, not so explicitly, that other DOE mixed hazardous and radioactive waste would either be regulated exclusively under the AEA or under both RCRA and the AEA, depending upon whether it is "direct process" waste. DOE also points to reports for each of its facilities which purportedly categorize each waste stream as to whether it would be byproduct material under the proposed definition.

The report for the seven major DOE facilities under the management of the Oak Ridge Operations Office, including the Y-12 Plant, [\*608] states that out of 109 mixed hazardous and radioactive waste streams, eighteen would be considered byproduct material. n136 Out of a total annual volume of 800 million liters of liquid mixed wastes generated, 1.8 million of these would be byproduct material. Out of a total volume of 206,000 kilograms of solid mixed wastes, all would be considered byproduct material. Most of the waste streams designated as byproduct material in the report are from the Y-12 Plant and contain small amounts of enriched uranium mixed with hazardous waste such as spent solvents, degreasing solvents, ignitable organics, cutting oils, and alkaline solutions with toxic metals. n137

As for the management of this waste, the byproduct material designation apparently makes little difference to DOE at the Oak Ridge facilities. Although much of the waste designated as byproduct material was disposed of improperly in the past at the Y-12 Plant while under DOE's exclusive jurisdiction, for the waste streams listed as byproduct material in DOE's report, the management of the waste will be in facilities regulated under the RCRA. n138

#### B. EPA's Posture And Draft Mixed Waste Regulations

As noted above, EPA's posture has shifted on the general issue of whether or not the RCRA applies to DOE facilities operated under the AEA. EPA's current position is that the RCRA applies to hazardous waste generated and managed at all DOE facilities and that states may regulate hazardous waste generated by DOE facilities under state law and under their RCRA authority. Specifically concerning mixed waste, EPA recently stated that mixed waste is subject to RCRA regulation, including regulation by authorized states, but has not ruled out adoption of DOE's proposed definition of byproduct material. n139

In fact, EPA has been working with DOE on the proposed definition of byproduct material and has been developing regulations that would provide for variances from RCRA standards in RCRA permits where DOE could demonstrate that compliance with such standards would: (i) increase the hazard to human health and the environment resulting from radiation, or (ii) result in the disclosure or dissemination of restricted data or national security information. n140 [\*609] The draft of these regulations also provides that DOE must accompany its application for a variance with a risk analysis that "compares the added risk due to radiation exposure associated with implementing the regulations as compared to the added risk due to exposure to hazardous constituents associated with not implementing the regulation." n141 EPA has

not yet published these draft provisions as proposed regulations, but is still negotiating with DOE and NRC on procedures for addressing the inconsistency issue. n142

### C. A Mixed Bag of Congressional Responses

The United States Congress has been aware of the mixed waste issue, but chose not to deal with it in the 1984 amendments to RCRA. n143 Now that the significance of the issue has become apparent to some members as a result of publicity surrounding DOE environmental problems and the presence of DOE facilities in their states, activity has intensified on Capitol Hill, but no resolution has occurred.

In 1985 the congressional discussions of mixed waste centered on DOE facilities, and proposals were directed to amending RCRA itself. During discussions concerning the reauthorization of the Comprehensive Environmental Response Compensation and Liability Act (CER-CLA) Senator John Glenn introduced a clarifying amendment to the RCRA that would have made it clear that the RCRA applies to mixed waste at DOE facilities. n144 Senator Glenn's bill was later withdrawn [\*610] after the Environmental Pollution Subcommittee of the Senate Environment and Public Works Committee agreed to hold hearings on the issue in 1986. n145

Toward the end of 1985 Congressional proposals for mixed waste regulation were discussed in the context of the reauthorization of the Low-Level Radioactive Waste Policy Act. n146 Congress spent a significant amount of time dealing with mixed waste amendments to an already controversial bill, only to drop them from the bill at the last minute, again with the promise of hearings in 1986. n147 One amendment by Congressman Luken, passed by the House, would have made it clear that low-level radioactive waste mixed with hazardous waste generated by DOE facilities would be covered by RCRA. n148 Coupled with this amendment dealing with DOE facilities was another amendment to the House bill that would have directed EPA and NRC to perform joint rulemaking on the regulation of mixed waste at commercial low-level radioactive waste disposal facilities. n149

The House version of the mixed waste amendments would have first granted commercial low-level waste facilities a grace period for compliance with certain requirements of the 1984 RCRA amendments. n150 Second, the House version would have required NRC and EPA to revise their respective regulations dealing with low-level radioactive and hazardous waste to resolve any conflicts that would result in violations from attempting to comply with both sets of regulations for disposal of mixed waste at commercial low-level radioactive waste facilities. In revising these regulations, EPA and NRC were directed to maintain the same or a higher level of protection of public health and the environment than is currently provided by each set of regulations, and NRC was designated as the primary regulatory contact for the enforcement of these regulations. Finally, the House amendments would have required both agencies to promulgate joint regulations for [\*611] commercial mixed waste management within twenty-four months after passage to provide for consolidation of permits. n151

The Senate version of the commercial mixed waste amendments did not include a provision dealing with DOE mixed waste and would not have required joint rulemaking for mixed waste management. First, the Senate version would have directed the NRC and EPA to develop a list of commercial mixed waste, including the origin, characteristics, and quantities. Second, EPA and NRC would designate which of these mixed waste streams could be disposed of at either a RCRA facility or a facility meeting only NRC standards without harming public health or the environment, and such disposal would constitute compliance with both Acts. Finally, for those mixed waste streams that could not be disposed of safely at a purely RCRA or NRC facility, EPA would identify specific additional RCRA requirements that should be added to NRC regulations for these streams and NRC would have the power to decide whether these additional requirements are "not inconsistent with the Atomic Energy Act." If NRC determined that they were "not inconsistent" with the AEA, then they would be applied, either through amendments to regulations or in specific facility licenses. If NRC determined the EPA's additional requirements could not be applied in a manner consistent with the AEA, then NRC could prohibit the disposal of those mixed waste streams at commercial low-level facilities. n152 During the late hours of December 19, 1985, these provisions were stripped from the compromise bill that was enacted, possibly because lack of agreement concerning mixed waste threatened the entire package of low-level radioactive waste amendments that were needed to avert a major crisis in the management of commercial low-level radioactive waste. Although hearings were held concerning mixed waste in the spring of 1986, no new legislation has passed.

### D. Litigation Regarding Mixed Waste

Frustrated by DOE's refusal to submit to RCRA regulation for mixed waste generated and disposed of at DOE's Savannah River nuclear weapons plant in South Carolina, the Natural Resources Defense Council (NRDC) and three other

environmental organizations filed suit against DOE under the RCRA in federal district court in Aiken, South Carolina, on September 24, 1985. The complaint alleged, among other things, that at least fifteen disposal sites at the plant have been used for disposal of mixed hazardous and radioactive waste [\*612] that has leaked into groundwater and surface water at the plant, for which DOE has not applied for RCRA permits and does not comply with RCRA regulations. The complaint sought a declaratory judgment that these mixed waste facilities are in violation of the RCRA and asked the court to order DOE to halt the illegal management of these waste streams and to bring the facilities into compliance with RCRA regulations. n153 Discovery and pretrial motions have been continuing in the case.

## V. Proposed Resolution of the Mixed Waste Issue

### A. Criticism of DOE's Proposed Byproduct Material Definition

After DOE's hard-fought battle to avoid any application of the RCRA to its facilities, the appearance created by DOE's proposed regulatory definition of byproduct material is one of an agency still struggling for a loophole. DOE's proposed regulation should not be promulgated for three reasons: (1) the categorization of certain mixed wastes as byproduct material is beyond the statutory authority of DOE; (2) the definition is vague and unworkable; and (3) the regulation is unnecessary because any legitimate concerns DOE has about RCRA coverage of mixed waste can be dealt with in the context of the RCRA.

#### 1. The Proposed Regulatory Definition is Outside the Scope of DOE's Statutory Authority

The proposed regulation is outside the scope of the statutory definition of byproduct material because the statutory definition was not intended to include the entirety of mixed waste. First, the statutory definition only applies to "radioactive materials," whereas the proposed regulatory definition would apply the term "byproduct material" to "a waste substance containing radioactivity." While it is true that waste containing byproduct material has been regulated under the AEA, neither the legislative history of the AEA or the RCRA, nor any cases interpreting these statutes, indicate that Congress intended the term "byproduct material" to include mixed waste. n154

When the statutory term was first defined in the Atomic Energy Act of 1946 with a nearly identical definition, the legislative history of [\*613] the provision demonstrated that the understanding of Congress was that "byproduct material" was to be the valuable isotopes generated by the nuclear fission process. As stated in the Senate report accompanying the definition of byproduct material:

[T]he radioactive materials yielded in the production of fissionable material are of enormous scientific and industrial value and their distribution involves no danger to the national security. The Commission is required to distribute these materials without charge for research and development activities, medical therapy, and industrial and other uses, giving priority to medical uses and research. n155

In amending the AEA in 1954, Congress gave no indication of changing this interpretation of the definition of byproduct material.

In 1978 Congress added, for the first time, a definition of byproduct material that specifically included non-radioactive waste material containing radioactive material when it passed the Uranium Mill Tailings Reclamation and Control Act. n156 This provision defines as byproduct material "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." n157 The legislative history of this subsection indicates that Congress included associated non-radioactive waste materials in this definition to ensure that uranium mill tailings would be regulated entirely under the AEA rather than the RCRA. n158 The fact that Congress found it necessary to specifically include non-radioactive waste components in this expanded definition of byproduct material and that it did not change the original definition in order to exclude RCRA coverage indicates that the original definition of byproduct material was not intended to include mixed waste.

DOE's redefinition of a "radioactive material" as a "waste substance containing radioactivity" is also inconsistent with common sense and the laws of physics. A waste chlorinated solvent containing a small amount of strontium-90, for instance, does not become a radioactive material. The molecules of the solvent itself do not become radioactive. Such a mixed waste would remain a mixture of a solvent and a radioactive material.

DOE's assertion that the byproduct material exclusion would be reduced to a nullity if the term "radioactive material" is not taken to include the entirety of a mixture of radioactive and non-radioactive material is simply not correct. The exemption for byproduct material in the RCRA would still exempt those radioactive materials defined as [\*614]

byproduct material that are not mixed with solid or hazardous waste as defined by the RCRA and, most importantly, would still preempt EPA or the states from regulating, under their RCRA authority, the radioactive properties of byproduct material contained in any solid waste or hazardous waste.

DOE has also impermissibly broadened the scope of the statutory definition of byproduct material by failing to exclude special nuclear material from its proposed definition of byproduct material. DOE cannot ignore the statutory exclusion of special nuclear material and classify waste substances containing special nuclear material as byproduct material for the purpose of exempting them from RCRA. For instance, a mixed waste containing plutonium or enriched uranium could not be considered to be byproduct material, since these substances are special nuclear material as defined in the AEA. n159

## 2. The Proposed Regulation is Too Vague to Provide Any Objective Standard for Implementation

Although DOE spells out in reports referenced in the introductory material the waste streams that it believes would be considered byproduct material under the proposed definition, the size of the loophole could be made much larger at the whim of the agency, since the proposed definition is too vague to provide any objective standard for implementation. The terms "directly yielded" and "direct and necessary consequence" are capable of practically any interpretation the agency cares to give them.

The examples used in the preamble and the terms, "direct process waste" and "indirect process waste," while slightly more understandable, are not part of the proposed regulation. There is practically no basis in the language of the provision itself for determining that one mixed waste is byproduct material while another is not. For instance, in explaining why high-level radioactive waste emanating from the chemical processing of spent fuel for the production of plutonium would be byproduct material under the proposed rule, DOE merely echoes the wording of the provision, stating that this waste would be excluded from RCRA regulation because the radioactivity it contains is a "direct, necessary, and inherent consequence" of the process of producing and utilizing special nuclear material.

A review of the waste stream report for the seven major DOE facilities under the management of the Oak Ridge Operations Office, referenced in the preamble, shows that most of the waste streams from those facilities designated as "byproduct material" contain small amounts of enriched uranium mixed with hazardous wastes such as [\*615] spent solvents, degreasing solvents, ignitable organics, cutting oils, and alkaline solutions with toxic metals. Based upon the information in the report, there is really no way to determine how DOE applied the direct/indirect distinction to any of the waste streams in the report. For instance, for the Y-12 Plant, there are sixteen waste streams considered by DOE to be byproduct material. Although all of these waste streams contain enriched uranium, this is obviously not the criterion used by DOE to distinguish direct process waste from indirect process waste, since there are five waste streams listed that contain enriched uranium that are not considered to be byproduct material. The descriptions of some of the "byproduct" waste streams are identical to the descriptions of waste streams containing enriched uranium that are not considered to be byproduct material. n160

## 3. The Proposed Regulation is Unnecessary

DOE's proposed regulatory definition is unnecessary because the framework already exists for the regulation of mixed waste under the RCRA and the AEA. That framework is discussed below. Furthermore, congressional action may yet preempt DOE's regulation.

Given DOE's track record in the management of mixed waste at the Y-12 Plant, the Savannah River Plant, and other DOE facilities, any categorical exemption from the RCRA that would allow DOE to operate with no oversight should be viewed as suspect. With such a vague definition, the possibility always exists that DOE could arbitrarily classify most of its mixed waste as byproduct material to avoid RCRA regulation and continue its environmentally destructive disposal practices.

### B. Analysis of Congressional Proposals

Although some congressional action may be necessary in order to clarify the regulatory jurisdiction over mixed waste, the House and Senate were wise in rejecting both of the proposed mixed waste amendments to the Low-Level Radioactive Waste Policy Act. Both mixed waste provisions contained serious flaws.

Both the Senate and the House amendments applied only to low-level radioactive waste, ignoring the issue of regulation of mixed wastes that contain high-level radioactive waste. The Senate bill did not deal with DOE mixed waste

at all, and the House bill would not have sufficiently clarified the term "byproduct material," leaving DOE the option of exempting much of its mixed waste from RCRA regulation by redefining this term to include mixed waste.

[\*616] For commercial low-level waste facilities, both bills would have maintained NRC as the sole regulatory authority over mixed waste, although the House bill was not entirely clear on this issue. n161 NRC staff have little or no experience in the application of RCRA regulations or in the difficult assessments that must be made in the course of issuing permits to land disposal facilities which handle hazardous waste. Furthermore, NRC regulations do not even cover other forms of mixed waste management, such as incineration or above-ground storage. On the other hand, EPA staff members have no experience with the issuing of permits for and regulation of low-level radioactive waste disposal facilities. Joint regulation by EPA and NRC would be much more appropriate for commercial mixed waste than sole regulation by either NRC or EPA.

Where the House bill would have required the NRC and EPA to revise their regulations to make them consistent for mixed waste and to maintain the stringency of each set of regulations in the process, the Senate bill would have forced the EPA and NRC to designate certain mixed waste streams that could safely be disposed of in facilities meeting only the RCRA or NRC standards. Although the Senate approach might be expedient, it could result in hazardous waste being disposed of in facilities not meeting all RCRA standards, or low-level radioactive waste being disposed of in facilities not meeting NRC standards. The House approach, maintaining the stringency of both sets of regulations, is clearly preferable in order to ensure the protection of public health and the environment.

For mixed waste that could not be safely disposed of in facilities only meeting one set of standards, the Senate bill would have relegated the EPA to an advisory role, essentially stripping the agency of its RCRA authority over mixed waste. Finally, the Senate proposal allowed the NRC to leave mixed waste generators "high and dry" by prohibiting the disposal of mixed waste in commercial low-level radioactive waste disposal facilities where the NRC finds that the EPA's suggestions for additional requirements are inconsistent with the AEA.

### C. Proposed Resolution of the Mixed Waste Issue

Although some congressional clarification may be needed to stop the feuding between the DOE, the EPA and the NRC, a framework already exists for the regulation of mixed waste under the RCRA and [\*617] the AEA. It is only the details of the implementation of that framework that need to be worked out. That framework exists in section 1006(a) of the RCRA, n162 as interpreted in *LEAF v. Hodel*, n163 and in the line of federal court decisions defining the scope of the AEA. n164 The framework can be stated as follows:

1. Due to the explicit exclusion of source, special nuclear, and byproduct material from the RCRA, the DOE and NRC have the exclusive authority to regulate the radiation hazards of mixed waste as radioactive waste facilities pursuant to DOE orders and NRC regulations issued under the AEA. The EPA and the states may only regulate the non-radiation hazards of mixed waste under their RCRA authority.

2. Where RCRA regulations and DOE orders (or NRC regulations) for mixed waste management are the same or similar, both sets of regulations apply.

3. Where RCRA regulations and DOE orders (or NRC regulations) for mixed waste management are different, RCRA regulations still apply, unless complying with specific RCRA regulations would impact upon the ability to protect against radiation hazards or would result in the public release of restricted information.

Due to the continued debate over the regulation of mixed waste generated by DOE facilities, it will probably be necessary for Congress to establish, by amending RCRA section 1004(27), n165 that all mixed waste is solid waste under the RCRA (i.e., that there is no basis for defining some mixed waste streams as byproduct material as DOE is attempting to do). Congress should also make the framework stated above explicit in any mixed waste legislation. Doing so would make it clear that EPA has regulatory authority over the nonradiation hazards of mixed waste and would make the standard for when specific RCRA regulations should yield to the requirements of the AEA clear and consistent with section 1006(a) of the RCRA. Additionally, Congress should establish that the RCRA applies to both low-level and high-level mixed waste and that both DOE facilities and commercial low-level radioactive waste facilities disposing of mixed waste should be treated in the same manner under the RCRA.

Beyond this clarification of authority, there are two ways in which the above mixed waste regulatory framework could be implemented: either through joint rulemaking with the EPA, NRC, and DOE all participating, or through a variance procedure in EPA's RCRA permit procedures for facilities managing mixed waste. Joint rulemaking as [\*618]

contemplated in the House mixed waste amendment would have the advantage of certainty for the regulated community, but it would be difficult to cover all waste types and all potential points of conflict between RCRA regulations and the requirements of the AEA in joint regulations. A variance procedure would have the advantage of flexibility, but could create inconsistent application of RCRA regulations to mixed waste facilities.

EPA is already working out a variance procedure for DOE facilities, as discussed above, and has encapsulated the RCRA section 1006(a) framework in its draft regulation. EPA's procedure could easily be extended to commercial low-level radioactive waste facilities, putting the onus on the facility operator to demonstrate that a variance from specific RCRA regulations is necessary. The draft variance procedure would provide mixed waste facilities a legitimate escape hatch from specific RCRA regulations in their management of mixed waste for those waste streams that pose a high degree of radiation hazard, without compromising protection against hazardous chemical contamination of the environment.

In application, much of the mixed waste for which DOE seeks "byproduct material" designation and exemption from the RCRA may be appropriate for a variance from certain RCRA regulations under EPA's draft variance scheme. It may even be appropriate for EPA to issue permits by rule under the RCRA for certain types of mixed waste facilities, such as high-level waste tanks, that would be designed and operated under DOE orders in a much more stringent manner than under RCRA regulations. For commercial low-level radioactive waste facilities, the application of RCRA regulations will increase the costs of mixed waste disposal, but will also improve the security of the sites to contain radioactive materials.

Whether the specific instances in which RCRA regulations should not apply fully to mixed waste management are determined by joint rulemaking or through an EPA-administered variance procedure, the result will be fulfillment of the RCRA policy of ensuring comprehensive regulation of the impacts of hazardous waste management without compromising the protection of the public from radiation hazards. This can be accomplished without significant changes to any of the statutes involved.

#### VI. Conclusion

The debate over the regulation of mixed waste began as a question of whether or not DOE could continue to shield its inadequate waste [\*619] disposal practices from regulation under the same environmental regulations that apply to other industrial facilities throughout the country. This question had been floating around in the federal and state bureaucracies since the time the RCRA regulations began to be developed. In the three years since *LEAF v. Hodel* forced a resolution of this basic question, the broader implications of the mixed waste issue have become apparent.

Due to the variety of ways in which mixed waste generated by both DOE and commercial generators can be managed, the regulation of mixed waste cuts across several regulatory schemes. The interface between the AEA and the RCRA for mixed waste regulation is the most important and most controversial, but CERCLA and the Safe Drinking Water Act also touch upon mixed waste in significant ways. The reluctance of Congress to adopt a hurried resolution to the mixed waste problem in 1985 is understandable, given the complexity of the issue.

The question is not so much one of the regulatory authority but of choice of technology and the short-term costs of managing mixed waste. The DOE has proven that, given the opportunity to avoid regulation, it will use improper disposal practices for mixed waste management in order to cut costs. This is true despite the fact that the long-term costs of cleanup will far exceed the costs that would have been incurred in the proper management of the waste. The agency's past record casts automatic suspicion on its proposal to exempt certain of its mixed wastes from the RCRA, especially when any conflicts between the RCRA and the requirements of the AEA can be handled in the RCRA context.

In the case of commercial mixed waste, the problem is that the RCRA's more exacting standards for land disposal may make it more difficult (and expensive) to site and operate low-level radioactive waste shallow land burial facilities, at a time when the three existing facilities are being phased out and several new facilities must be sited. The RCRA's clear direction away from land disposal may also be perceived as a threat to the continued reliance on shallow land burial for low-level radioactive waste.

At this point, because of the mixed messages that have come from the EPA, DOE, NRC, and Congress, the regulated community is unable to proceed with the job of managing mixed waste in a manner that fully protects public health and the environment. Unfortunately, the task of resolving the issue may once again fall upon the courts.

#### FOOTNOTES:

- n1 42 U.S.C. §§ 2011–2296 (1982 & Supp. III 1985).
- n2 586 F. Supp. 1163 (E.D. Tenn. 1984).
- n3 42 U.S.C. §§ 2021b–2021j (Supp. III 1985).
- n4 42 U.S.C. §§ 2011–2296 (1982 & Supp. III 1985).
- n5 42 U.S.C. §§ 6901–6991 (1982 & Supp. 1985).
- n6 42 U.S.C. §§ 2021b–2021j (1982 & Supp. 1985).
- n7 26 U.S.C. §§ 4611–4682 (1982 & Supp. 1985); 42 U.S.C. §§ 9601–9657 (1982 & Supp. 1985).
- n8 42 U.S.C. §§ 300g–300h (1982).
- n9 42 U.S.C. § 2011 (1982). See S. Rep. No. 1699, 83rd Cong., 2d. Sess. 3, reprinted in 1954 U.S. Code Cong. & Ad. News 3456.
- n10 42 U.S.C. § 2061(b) (1982).
- n11 42 U.S.C. § 2121(a) (1982).
- n12 42 U.S.C. § 2051(a)(1)–(6) (1982).
- n13 42 U.S.C. §§ 2013(a), 2013(b), 2013(d), 2073, 2077, 2092–2093, 2099, 2111, 2131–2140 (1982).
- n14 42 U.S.C. §§ 2111, 2133(b) (1982).
- n15 42 U.S.C. § 2021 (1982).
- n16 42 U.S.C. § 2140(a) (1982).
- n17 42 U.S.C. § 2201(i)(3) (1982).
- n18 42 U.S.C. §§ 5801–5891 (1982).
- n19 42 U.S.C. § 5841 (1982).
- n20 42 U.S.C. §§ 5814(c), 5817 (1982).
- n21 42 U.S.C. §§ 7112(18), 7151(a) (1982).
- n22 42 U.S.C. § 7133(a)(8) (1982).
- n23 42 U.S.C. § 2021 (1982).
- n24 42 U.S.C. § 2021(k) (1982).
- n25 Low-Level Radioactive Waste Policy Act, Pub. L. No. 96-573, 94 Stat. 3341 (1980) (codified at 42 U.S.C. §§ 2021b–2021d (1982 & Supp. III 1985)).
- n26 42 U.S.C. § 2021d (1982). Low-level radioactive waste is defined as neither high-level radioactive waste, transuranic waste, spent nuclear fuel, nor uranium mill tailings (defined as byproduct material pursuant to section

11(e)(2) of the AEA, 42 U.S.C. § 2014(e)(2)). 42 U.S.C. § 2021(2) (1982).

n27 42 U.S.C. § 2021d(a)(2)(B) (1982).

n28 Low-Level Radioactive Policy Amendments Act of 1985, Pub. L. No. 99-240, § 102, 99 Stat. 1842 (1986) (codified at 42 U.S.C. §§ 2021b-2021j (Supp. III 1985)).

n29 42 U.S.C. § 2201(i)(3) (1982).

n30 U.S. Department of Energy, Radioactive Waste Management (Feb. 1984) (Order 5820.2) (unpublished intra-agency order, available from author or from DOE).

n31 *Id.* at § III(3)(a)(1).

n32 *Id.* at § III(3)(a)(2).

n33 *Id.*

n34 *Id.* at § I(3)(a).

n35 *Id.* at § II.

n36 See 10 C.F.R. §§ 60.1 – 60.162 (1986).

n37 U.S. Department of Energy, Hazardous and Radioactive Mixed Waste Management (Dec. 1982) (Order 5480.2) (unpublished intra-agency order available from author or from DOE).

n38 *Id.* at § I(1)(c). For RCRA requirements, see 42 U.S.C. §§ 6921-6939 (1982).

n39 U.S. Department of Energy, Hazardous and Radioactive Mixed Waste Management (Dec. 1982) (Order 5480.2), § I(1)(d).

n40 *Id.*

n41 Union Carbide Corporation, Nuclear Division, Hazardous Waste Management Plan, Oak Ridge Y-12 Plant (May 11, 1984).

n42 E.I. duPont de Nemours & Co., Hazardous Waste Management Plan, Savannah River Plant (June 1984)(draft).

n43 586 F. Supp. 1163 (E.D. Tenn. 1984).

n44 10 C.F.R. §§ 60.1 – 61.83 (1986).

n45 10 C.F.R. §§ 60.1 – 60.162 (1986).

n46 10 C.F.R. §§ 61.1 – 61.83 (1986).

n47 46 Fed. Reg. 16230 (March 11, 1981). The EPA and NRC estimate that as much as 400,000 gallons of these fluids, which contain benzene, toluene, xylene, and other solvents, are generated and disposed of in a potentially hazardous manner. [1984] *Env't Rep.* (BNA) 452-54.

n48 H.R. Rep. No. 94-1491, 94th Cong., 2d Sess. 4-5, reprinted in 1976 U.S. Code Cong. & Ad. News 6241-42.

n49 42 U.S.C. § 6903(27) (1982) (emphasis added).

n50 Unfortunately, Congress in passing RCRA offered little or no guidance about how to interpret this provision with regard to mixed waste. An earlier version of the bill that became the RCRA specifically included radioactivity as a criteria of hazardous waste, and hazardous waste was not a subset of solid waste. S. 2150, 94th Cong., 2d Sess. § 6, 122 Cong. Rec. S21435 (daily ed. June 30, 1976). The final compromise bill, produced without a conference committee in the last days of the session, inserted the Senate bill's definition of solid waste with the exclusion of source, special nuclear, and byproduct material, and made hazardous waste a subset of solid waste. H.R. 14496, 94th Cong., 2d Sess. § 1004, 122 Cong. Rec. H32618-19 (daily ed. Sept. 27, 1976).

n51 42 U.S.C. § 6903(5) (1982).

n52 42 U.S.C. §§ 6921-6925 (1982 & Supp. III 1985).

n53 Section 6001 of RCRA, 42 U.S.C. § 6961 (1982), states that:

[E]ach department . . . engaged in any activity resulting, or which may result, in the disposal or management of solid waste or hazardous waste shall be subject to, and comply with, all Federal, State, interstate, and local requirements, both substantive and procedural (including any requirement for permits or reporting or any provisions for injunctive relief and such sanctions as may be imposed by a court to enforce such relief), respecting control and abatement of solid waste or hazardous waste disposal in the same manner, and to the same extent, as any person is subject such requirements, including the payment of reasonable service charges.

n54 42 U.S.C. § 6926 (1982 & Supp. III 1985).

n55 Act of Nov. 8, 1984, Pub. L. No. 98-616, 98 Stat. 3265 (1984).

n56 42 U.S.C. § 6924 (Supp. III 1985).

n57 42 U.S.C. § 6925 (Supp. III 1985).

n58 42 U.S.C. §§ 6922(b), 6925(h), 6991 (Supp. III 1985).

n59 33 U.S.C. §§ 1251-1376 (1982 & Supp. III 1985).

n60 42 U.S.C. §§ 300f-300j-9 (1982).

n61 33 U.S.C. §§ 1401-1445 (1982).

n62 42 U.S.C. §§ 2011-2296 (1982 & Supp. III 1985).

n63 The exception is stated as follows:

(a) Application of chapter — Nothing in this chapter shall be construed to apply to (or to authorize any State, interstate, or local authority to regulate) any activity or substance which is subject to the Federal Water Pollution Control Act, the Safe Drinking Water Act, the Marine Protection, Research and Sanctuaries Act of 1972, or the Atomic Energy Act of 1954, except to the extent that such application or regulation is not inconsistent with the requirements of such Acts.

42 U.S.C. § 6905(a) (1982).

n64 42 U.S.C. § 6905(b) (1982).

n65 40 C.F.R. §§ 260.1-271.138 (1986).

n66 40 C.F.R. §§ 264.1 - 265.430 (1986).

n67 42 U.S.C. § 6924(c) (Supp. III 1985).

n68 42 U.S.C. § 6924(m) (Supp. III 1985).

n69 42 U.S.C. §§ 9601–9567 (1982 & Supp. III 1985).

n70 42 U.S.C. § 9631 (1982); 26 U.S.C. §§ 4611, 4661 (1982).

n71 H.R. 2005, 99th Cong., 2d Sess. § 111(a), 132 Cong. Rec. H9041 (daily ed. Oct. 3, 1986).

n72 33 U.S.C. §§ 1251–1376 (1982 & Supp. III 1985).

n73 42 U.S.C. §§ 6921–6939 (1982 & Supp. 1985).

n74 42 U.S.C. §§ 7401–7642 (1982 & Supp. III 1985).

n75 15 U.S.C. §§ 2601–2629 (1982 & Supp. III 1985).

n76 42 U.S.C. § 9602 (1982 & Supp. III 1985).

n77 A case decided prior to the passage of CERCLA, *Illinois v. Kerr McGee*, 17 Env't Rep. Cas. (BNA) 1681 (7th Cir. 1982), dealt with a local government ordered cleanup of a site where mixed wastes were disposed of. The Seventh Circuit held that a local government was not preempted by the AEA from regulating the nonradiation hazards of mixed wastes. *Id.* at 1691.

n78 42 U.S.C. § 9601(14)(E) (1982); section 112 of the Clean Air Act is found at 42 U.S.C. § 7412 (1982).

n79 40 C.F.R. §§ 61.90 – 61.108 (1986).

n80 42 U.S.C. § 9601(22) (1982).

n81 42 U.S.C. § 2014(q) (1982).

n82 42 U.S.C. § 9601(22) (1982).

n83 EPA has, in fact, included sites on the National Priority List for cleanup under Superfund where the predominant hazard is radioactive. See, e.g., 51 Fed. Reg. 21063 (June 10, 1986).

n84 42 U.S.C. § 9603(c) (1982).

n85 586 F. Supp. 1163 (E.D. Tenn. 1984).

n86 42 U.S.C. §§ 300f(6), 300h(d)(2) (1982).

n87 40 C.F.R. §§ 141.1 – 144.70 (1986).

n88 586 F. Supp. 1163 (E.D. Tenn. 1984).

n89 LEAF is a Southern regional public interest environmental law firm, headquartered in Tallahassee, Florida with attorneys in Knoxville, Tennessee, Atlanta, Georgia, and Montgomery, Alabama.

n90 This position arose out of a concern for the costs that would be incurred by DOE's nuclear weapons facilities in complying with RCRA regulations, since most of DOE's facilities could not comply without substantial modifications. Letter from J. F. Wing, Chief, Environmental Protection Branch, Safety and Environmental Control

Division, DOE Oak Ridge Operations, to W. H. Travis, Director, Safety and Environmental Control Division, DOE Oak Ridge Operations (Sept. 9, 1980).

n91 Letter from Stephen H. Greenleigh, Assistant General Counsel for Environment, DOE, to James A. Rogers, Associate General Counsel, EPA (Nov. 14, 1980).

n92 There was some dissension in the ranks at EPA. In a memorandum to Paul Cahill, EPA's Director of the Office of Federal Activities, Charles Jeter, Regional Administrator for Region IV (which includes Tennessee), stated that "the intent of Congress in Section 1004(4) and 6001 [of the RCRA] is unmistakably clear that all Federal facilities without exception are subject to [the RCRA and state and local law]."

n93 Letter from J. F. Wing, Chief, Environmental Protection Branch, Safety and Environmental Control Division, DOE Oak Ridge Operations, to Dwight Hinch, Hazardous Waste Management Program, Division of Solid Waste Management, Tennessee Department of Public Health (December 5, 1980).

n94 Polychlorinated biphenyls (PCB's) are a class of chlorinated organic that has been used in electrical equipment and is toxic and persistent in the environment.

n95 See Knoxville Basin Office, Division of Water Management, Department of Health and Environment, Compliance Evaluation Inspection, Oak Ridge Y-12 Facility (Mar. 1983).

n96 House Comm. on Science and Technology, The Extent and Impact of Mercury Releases and Other Pollutants at the Department of Energy's Oak Ridge Complex at Oak Ridge, Tennessee, H.R. Rep. No. 558, 98th Cong., 1st Sess. 2 (1983) [hereinafter Impact of Mercury Releases].

n97 See Memorandum of Understanding Between the United States Department of Energy and the United States Environmental Protection Agency and the State of Tennessee Department of Health and Environment Concerning Compliance with Pollution Control Standards at the Department of Energy Y-12 Plant, Anderson and Roane Counties, Tennessee (May 26, 1983).

n98 See Impact of Mercury Releases, *supra* note 96.

n99 42 U.S.C. § 6972 (1982 and Supp. III 1985).

n100 See Complaint of LEAF and NRDC (Sept. 20, 1983). DOE continued to resist any application of RCRA to its Y-12 Plant, despite the opinions of EPA and the Department of Justice's Office of Legal Counsel concluding that the RCRA applied to DOE facilities. See Memorandum from A. James Barnes, Acting General Counsel, EPA, to Pasquale A. Alberico, Acting Director, Office of Federal Activities, EPA, (June 22, 1983) (concerning RCRA regulation of wastes handled by DOE facilities); Memorandum from Theodore B. Olsen, Assistant Attorney General, Office of Legal Counsel, Justice Department, to Henry Habicht III, Assistant Attorney General, Land and Natural Resources Division, Justice Department (February 9, 1984).

n101 See *LEAF v. Hodel*, 586 F. Supp. 1163 (E.D. Tenn. 1984) (Memorandum of Points and Authorities in Support of Plaintiffs' Motion for Summary Judgment) [hereinafter Plaintiffs' Memorandum]. The lawsuit also involved a successful claim under the citizen's suit provision of the Clean Water Act that DOE was violating the Act by not having permits for numerous point source discharges of pollutants. See 33 U.S.C. § 1311(a) (1982).

n102 *LEAF v. Hodel*, 586 F. Supp. 1163 (E.D. Tenn. 1984) (Motion of the State of Tennessee to Intervene (Jan. 1, 1984)); (Order (Feb. 7, 1984)).

n103 42 U.S.C. § 6961 (1982).

n104 42 U.S.C. § 6905(a) (1982).

n105 Section 1006(a) states:

Nothing in this chapter shall be construed to apply to (or to authorize any State, interstate, or local authority to regulate) any activity or substance which is subject to the Federal Water Pollution Control Act, the Safe Drinking Water Act, the Marine Protection, Research and Sanctuaries Act of 1972, or the Atomic Energy Act of 1954, except to the extent that such application (or regulation) is not inconsistent with the requirements of such Acts. 42 U.S.C. § 6905(a) (1982).

n106 LEAF v. Hodel, 586 F. Supp. 1163 (E.D. Tenn. 1984) (Memorandum in Support of Defendant's Motion for Summary Judgment and in Opposition to Plaintiffs' Motion for Summary Judgment) [hereinafter DOE Memorandum]. In addition, DOE and EPA signed a memorandum of understanding on the day that DOE's response brief was due, which purported to apply certain substantive RCRA requirements to DOE facilities but left DOE in a position of self-regulation with no state or citizen oversight. Memorandum of Understanding Between the United States Department of Energy and the United States Environmental Protection Agency for Hazardous Waste and Radioactive Mixed Waste Management (Feb. 22, 1984). In its brief, DOE claimed that this Memorandum resolved the RCRA issue and extinguished the claims of the environmental groups.

n107 This section states:

Nothing in this Act shall be construed to affect the authority or regulations of any Federal, State or local agency with respect to the generation, sale, or transmission of electric power produced through the use of nuclear facilities licensed by the Commission: Provided, that this section shall not be deemed to confer upon any Federal, State, or local agency any authority to regulate, control, or restrict any activities of the Commission. 42 U.S.C. § 2018 (1982).

n108 42 U.S.C. § 2201(i)(3). See DOE Memorandum, supra note 106.

n109 33 U.S.C. §§ 1251-1376 (1982 & Supp. III 1985).

n110 42 U.S.C. § 2021(k) (1982). See Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n, 461 U.S. 190 (1983) (State regulation of need and economics of nuclear power plant siting not preempted by AEA).

n111 See Plaintiffs' Memorandum, supra note 101.

n112 42 U.S.C. § 6961(b). DOE claimed that the RCRA would allow entry of state officials onto restricted sites and access to restricted information in violation of the AEA, and pointed to the nuclear freeze movement as evidence that states may attempt to shut down DOE nuclear weapons facilities using their RCRA authority. DOE Memorandum, supra note 106, at 5 n.4.

n113 Plaintiffs' Memorandum, supra note 101.

n114 LEAF v. Hodel, 586 F. Supp. 1163 (E.D. Tenn. 1984).

n115 Id. at 1167.

n116 Id. at 1166.

n117 Id. at 1167.

n118 Id.

n119 Id.

n120 Id. at 1169.

n121 Id. at 1167.

n122 Letter from Barbara A. Finamore, NRDC, Jane L. Bloom, NRDC, and Gary A. Davis, LEAF, to William Ruckelshaus, Administrator, U.S. EPA (June 14, 1984).

n123 U.S. EPA, Press Release (Aug. 1, 1984).

n124 Letter from Lee M. Thomas, Assistant Administrator for Solid Waste and Emergency Response, EPA, to Barbara Finamore, NRDC (Aug. 13, 1984).

n125 42 U.S.C. § 6903(27) (1982).

n126 50 Fed. Reg. 45736 (1985) (to be codified at 10 C.F.R. §§ 962.1 – 962.3) (proposed Nov. 1, 1985). As discussed above, the RCRA's definition of solid waste specifically excludes source, special nuclear, and byproduct material, as defined by the AEA. 42 U.S.C. § 6903(27) (1982).

n127 50 Fed. Reg. 45,738 (1985).

n128 42 U.S.C. § 2014(e) (1982).

n129 DOE cited two early cases for the proposition that nuclear waste could be regulated as byproduct material: *Harris County v. United States*, 292 F.2d 370 (5th Cir. 1961); *City of New Britain v. Atomic Energy Comm'n*, 308 F.2d 648 (D.C. Cir. 1962).

n130 50 Fed. Reg. 45,737 (1985).

n131 42 U.S.C. § 2014(e) (1982).

n132 50 Fed. Reg. 45,737 (1985) (emphasis added).

n133 42 U.S.C. § 2014(e) (1982).

n134 50 Fed. Reg. 45,737 (1985) (emphasis added).

n135 50 Fed. Reg. 45,736–37 (1985).

n136 DOE Oak Ridge Operations, Waste Streams Identification Report (Nov. 1984). Interestingly, this report does not apply the proposed regulatory definition but instead is "based upon the statutory definition." Id. at 1.

n137 Id. at 11.

n138 Id. at 12, 18, 27.

n139 EPA issued a policy statement regarding state regulation of mixed waste on July 3, 1986. See 51 Fed. Reg. 24,504. Regarding the byproduct material definition, see *Inside Washington Publishers, Inside EPA 2* (July 19, 1985). With regard to commercial mixed waste, however, EPA has taken the position that the NRC should be the sole regulatory authority. 17 *Env't Rep. (BNA)* 34 (May 9, 1986).

n140 EPA Draft Regulations (Nov. 9, 1984).

n141 Id.

n142 See 51 Fed. Reg. 24505 (July 3, 1986).

n143 The legislative history of the 1984 RCRA amendments provides conflicting messages on how Congress intends mixed waste to be regulated. On July 26, 1984, Senator John H. Chafee (R., R.I.), the sponsor of the RCRA reauthorization bill, stated:

RCRA's definition of solid waste, of which hazardous waste is a subset, specifically excludes "source, special nuclear, and byproduct material as defined by the Atomic Energy Act." That definition does not exclude hazardous wastes that are mixed with such radioactive materials. The exclusion of Atomic Energy Act materials applies only to the radioactive materials themselves and not to any other wastes with which the AEA material may be associated. 130 Cong. Rec. S9269 (daily ed. July 26, 1984) (statement of Sen. Chafee). On August 6, 1984, Senator Alan K. Simpson (R., Wyo.) stated:

As I read this provision, the mere presence of other hazardous materials in a waste stream that is primarily composed of radioactive materials, measured either by volume or risk posed, is not a sufficient base upon which to assert regulatory authority under the Solid Waste Disposal Act, and to regulate authority under the Solid Waste Disposal Act, and to regulate, as a de facto matter, a radioactive waste stream that will, in many instances, include small quantities of hazardous materials. 130 Cong. Rec. S9727 (daily ed. Aug. 6, 1984) (statement of Sen. Simpson).

n144 S. 892, 99th Cong., 1st Sess. 131 Cong. Rec. S. 892 (daily ed. Feb. 18, 1985). The bill would have amended section 1004(27) of RCRA, 42 U.S.C. § 6903(27), which provides the definition of solid waste.

n145 131 Cong. Rec. S11854-55 (daily ed. September 20, 1985).

n146 Low-Level Radioactive Waste Policy Act Amendments Act of 1985, H.R. 1083, 99th Cong., 1st Sess., 131 Cong. Rec. H11403 (daily ed. Dec. 9, 1985). See 131 Cong. Rec. S18343 (daily ed. Dec. 19, 1985); 131 Cong. Rec. H13075 (daily ed. Dec. 19, 1985).

n147 131 Cong. Rec. S18102-23, S18343-68, H13075-77, S18252-54 (daily ed. Dec. 19, 1985).

n148 H.R. 1083, 99th Cong., 1st Sess. § 14, 131 Cong. Rec. H11409 (daily ed. Dec. 9, 1985).

n149 H.R. 1083, 99th Cong., 1st Sess. § 13, 131 Cong. Rec. H11408 (daily ed. Dec. 9, 1985).

n150 The 1984 RCRA amendments would have required these facilities to stop accepting any hazardous waste or close down in November, 1985, since they could neither certify compliance with RCRA groundwater monitoring requirements nor submit a final permit application by that time. See 42 U.S.C. § 6925(e) (Supp. III 1985).

n151 H.R. 1803, 99th Cong., 1st Sess. § 13, 131 Cong. Rec. H11408 (daily ed. Dec. 19, 1985).

n152 H.R. 1803, S. Amend. 1429, 99th Cong., 1st Sess., 131 Cong. Rec. S18348 (daily ed. Dec. 19, 1985).

n153 Complaint, NRDC v. Herrington, Civil Action No. 85-2583-6 (D.S.C. Sept. 24, 1985).

n154 As DOE admitted, the cases cited in its introductory material to the proposed regulation, 50 Fed. Reg. 45,736 (1985), do not define byproduct material but merely hold that radioactive wastes can be regulated under the AEA because they contain byproduct material. See *City of New Britain v. Atomic Energy Comm'n*, 308 F.2d 648 (D.C. Cir. 1962); *Harris County v. United States*, 292 F.2d 370 (5th Cir. 1961).

n155 S. Rep. No. 1211, 79th Cong., 2d Sess. 19, reprinted in 1946 U.S. Code Cong. & Ad. News 1327, 1332.

n156 42 U.S.C. § 2014(e)(2) (1982).

n157 *Id.*

n158 H.R. Rep. No. 1480, 95th Cong., 2d Sess. 11-13, reprinted in 1978 U.S. Code Cong. & Ad. News 7433-

35.

n159 42 U.S.C. § 2014(a) (1982).

n160 U.S. Department of Energy, Oak Ridge Operations, Waste Stream Identification Report (Nov. 1984).

n161 The House bill stated that the "Nuclear Regulatory Commission shall be solely responsible for communications with low-level radioactive waste disposal facilities regarding any regulations or guidelines issued under this section." H.R. 1803, 99th Cong., 1st Sess. § 13(c)(3), 131 Cong. Rec. H10838 (daily ed. Dec. 4, 1985). Whether this precludes any EPA or state enforcement of RCRA regulations at the facilities is unclear.

n162 42 U.S.C. § 6905(a) (1982).

n163 586 F. Supp. 1163 (E.D. Tenn. 1984).

n164 See discussion in *Pacific Gas & Elec. v. State Energy Resources Conservation and Dev. Comm'n*, 461 U.S. 190 (1983).

n165 42 U.S.C. § 6903(27) (1982).

n166 Permits by rule can be issued currently for certain types of RCRA facilities that are adequately covered under other sets of regulations, such as ocean disposal barges or vessels, injection wells, and publicly-owned treatment works. See 40 C.F.R. § 270.60 (1986).