

2. Recent EPA Mixed Waste Actions

As described above, on May 16, 2001, we promulgated regulations related to the storage, treatment, transportation, and disposal of mixed low-level radioactive waste (subpart N of 40 CFR part 266). These regulations describe conditions under which MLLW can be exempted from certain RCRA hazardous waste requirements. In particular, a generator of MLLW may store and treat the waste at the generator's facility without obtaining a RCRA permit (required for hazardous waste treatment, disposal, and on-site storage beyond 90 days), as long as the storage and treatment take place in tanks or containers and conform to the generator's AEA license conditions. Similarly, transportation to an AEA-licensed low-level radioactive waste disposal facility, and subsequent disposal, may also take place solely according to AEA requirements. However, eligible MLLW must still meet the RCRA land disposal treatment standards prior to transportation for disposal at a licensed low-level waste disposal facility.

We believe our conceptual approach to disposal of low-activity mixed waste is complementary to the regulations we promulgated in subpart N. We believe that a significant proportion of MLLW could qualify as low-activity mixed waste (just as most low-level waste is in the lowest-activity class), depending on where the technical analyses indicate the limits should be set. The approach we are outlining today would also significantly increase disposal options, if fully implemented. Compared to the three operating low-level radioactive waste disposal facilities, there are roughly twenty commercial RCRA Subtitle C disposal facilities operating today, with many more that take waste from only a limited number of generators.

The approach we took in promulgating the subpart N disposal requirements relied on a comparison of the RCRA and AEA requirements for disposal. In that context, and recognizing that RCRA waste meeting the treatment standards for land disposal would likely be significantly lower in risk, we determined that AEA disposal requirements offered sufficient protectiveness for the hazardous constituents in MLLW. Our approach to establishing disposal standards for low-activity mixed waste is similar in concept. For example, our approach would consider the effects of waste form for the treated LAMW and containerization in minimizing the availability of radionuclides in the

waste for release in the presence of water. However, our approach will rely on modeling to determine when the risk to workers and the public from disposal of radionuclides is acceptably low. The LAMW concentration limits developed under this approach will be analogous to the RCRA concentration-based treatment standards that reduce the toxicity and mobility of hazardous constituents in the waste. Additional measures that support and build public confidence in this determination, such as ground-water monitoring for radionuclides, may be advisable.

There will be unavoidable overlap of the mixed waste eligible for disposal under the two rules. Our subpart N regulations cover a broader spectrum of MLLW, while we expect the LAMW concept to address only the lower-activity portion of that MLLW spectrum. Generators with waste eligible under both rules may make their disposal choice based on cost, access to a disposal facility, and regulatory constraints.

C. How Would the RCRA Regulatory Framework Support a Viable Disposal Concept?

We propose to rely to a large extent on the protections offered by the RCRA hazardous waste disposal facilities for disposal of low-activity mixed waste. We believe that the RCRA Subtitle C requirements provide a uniform level of waste containment and isolation technology that warrants confidence in their ability to address low concentrations of radionuclides; although RCRA does not regulate on the basis of radioactivity, there is no general prohibition on disposal of material not regulated as hazardous in a hazardous waste facility, and some RCRA facilities are permitted to accept certain types of TENORM waste. In addition, requirements related to hazardous waste characteristics have evolved over the life of the Subtitle C program to the point that they are tightly controlled through application of treatment standards. Below we discuss several points that we believe provide strong support for the LAMW disposal approach.

1. Technological Basis for Disposal (RCRA Hazardous Waste Landfill Criteria)

To assess the protectiveness of LAMW disposal at RCRA-C facilities, we first need to understand how the disposal cell itself will contribute to the isolation of radionuclides. It is recognized that RCRA and AEA employ different regulatory philosophies. RCRA has explicit engineering and construction

criteria for Subtitle C landfills. Therefore, any permitted RCRA-C facility is expected to meet these basic criteria and they can be accounted for in the technical analyses. In contrast, as discussed further in section II.C.4, AEA low-level waste facilities in 10 CFR part 61 must meet certain performance objectives to be licensed. Thus the AEA approach allows for some variation among AEA facilities, depending upon factors such as climate and site geology. This provides flexibility in facility design in that it can be tailored to the hazard of the waste. Ultimately, the purpose of both systems is to contain and isolate the waste in order to protect public health and the environment.

We believe RCRA's uniformity of design, and the specific engineering features required, provide assurance that RCRA-C facilities can limit contact of waste with water (and subsequent leachate generation) and should allow disposal of LAMW containing low concentrations of radionuclides. The RCRA regulations describing landfill attributes are located in 40 CFR part 264, subpart N. They require, among other things, that a disposal facility have:

- A cap on the disposal cell that minimizes infiltration of liquids, promotes drainage, minimizes erosion, accommodates settling and subsidence, and has permeability no greater than that of the disposal cell liner system or natural subsoils;
- A liner system beneath the disposal cell constructed of materials of specified thickness, hydraulic conductivity, physical strength, and chemical resistance;
- A leachate collection and removal system capable of limiting leachate depth above the liner to 30 cm; and
- A leak detection system constructed with a specific slope and materials of a certain thickness, hydraulic conductivity, physical strength, and chemical resistance.

2. RCRA Treatment Standards

Besides having specific requirements for disposal cell construction, RCRA also requires that hazardous waste be treated prior to land disposal. This treatment may serve two purposes: First, it can reduce the concentration of hazardous constituents in the waste, which also reduces the associated risk; second, it may change the physical form of the waste, which can change the volume of the waste, make the waste easier to handle, reduce the likelihood of releasing hazardous constituents from the waste, or reduce the likelihood that the waste itself will migrate out of the disposal cell (e.g., as a liquid or