



Environmental Guidance Regulatory Bulletin

Office of Pollution Prevention and Resource Conservation (EH-43)

April 2005

Land Disposal Restrictions (LDR)

National Treatability Variance for Radioactively Contaminated Cadmium-, Mercury-, and Silver- Containing Waste Batteries

Direct Final Rule: [67 FR 62618](#)¹

Effective Date: November 21, 2002²

Rule Synopsis

In response to a petition from the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) issued a direct final rule ([67 FR 62618 - 62625](#); October 7,

2002) granting a national treatability variance from the Land Disposal Restrictions (LDR) treatment standards for radioactively contaminated cadmium-, mercury-, and silver-containing waste batteries. This national treatability variance designates three treatment subcategories in the table of Treatment Standards for Hazardous Wastes (40 CFR 268.40) as follows:

- D006, Radioactively contaminated cadmium-containing batteries,
- D009, Radioactively contaminated mercury-containing batteries,
- D011, Radioactively contaminated silver-containing batteries.

The specified LDR treatment standard for all three of the treatment subcategories is “macroencapsulation in accordance with 40 CFR 268.45,” which is the macroencapsulation option in the alternative LDR treatment standards for hazardous debris. In other words, the direct final rule establishes the following LDR treatment standard for radioactively contaminated cadmium-, mercury-, and silver-containing batteries (derived from 40 CFR 268.45, Table 1, Item C.1):

Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Encapsulating material must completely encapsulate the batteries and be resistant to degradation by the batteries and their contaminants and by materials with which it may come into contact after placement (leachate, other waste, microbes).

¹ “Direct final rule” means that if the issuing federal agency receives no substantive adverse comments before a specified comment deadline, then the rule becomes effective on the announced effective date. Otherwise, the rule must be withdrawn and does not take effect. Although EPA received comments on the subject direct final rule, none were deemed adverse. Therefore, the variance took effect on November 21, 2002, as announced.

² Because EPA has determined the regulatory revisions associated with the direct final rule to be neither more nor less stringent than current regulatory requirements, the national treatability variance will not be implemented in States that have been authorized pursuant to the Resource Conservation and Recovery Act (RCRA) to administer and enforce the LDR treatment program, unless and until such States adopt it.

Background

In June 2002, DOE filed a petition requesting that EPA approve treatability variances, under 40 CFR 268.44(a), from the LDR treatment standards for radioactively contaminated cadmium-, mercury-, and silver-containing waste batteries. The petition explained that cadmium- and mercury-containing batteries are used in a variety of ways across the DOE complex and that DOE sites may also use silver-containing batteries. For example, nickel-cadmium (NiCd) rechargeable batteries are commonly found in cellular and cordless telephones, 2-way radios, video cameras, portable power tools, laptop computers, and radiological monitoring equipment, while mercury-containing and silver-containing batteries have been widely used in watches, calculators, and cameras.

The petition described cadmium-containing batteries as being mostly NiCd batteries, although other types of cadmium-containing waste batteries such as mercury-cadmium and silver-cadmium were mentioned as possibly being present. The mercury-containing batteries were described as including both mercury-zinc and mercury-cadmium batteries. The silver-containing batteries were described as being silver-cadmium and possibly other unspecified silver compositions.

The petition also explained that sometimes, because of cracks, fissures, holes or uneven surfaces in the battery casings, a reasonable confidence level that these batteries are free of radioactive contamination cannot be achieved after the batteries have been used in radioactively contaminated areas. Therefore, when discarded, they are typically classified as radioactive waste, unless through decontamination and/or radiological surveys they can be cleared for management as non-radiological waste.

Finally, the petition explained that waste cadmium-, mercury-, and silver-containing batteries exhibit the toxicity characteristic (TC), as defined in

the Resource Conservation and Recovery Act (RCRA) regulations, for their respective metals. Accordingly, when these waste batteries are radioactively contaminated, they are mixed wastes and require treatment to meet RCRA LDR treatment standards prior to disposal.

DOE filed the June 2002 petition for treatability variances because the treatment required to meet the otherwise applicable LDR treatment standards existing at that time for cadmium-, mercury-, and silver-containing waste batteries was inappropriate for radioactively contaminated waste batteries. Furthermore, in the case of radioactively contaminated cadmium- and mercury-containing waste batteries, there was no viable treatment pathway absent a treatability variance.

Rationale for Granting the Treatability Variance

The LDR treatment standards previously applicable to D006 cadmium-containing waste batteries and D009 mercury-containing waste batteries required the use of high temperature treatment units to volatilize the hazardous metals and subsequently condense and collect them for reuse (i.e., thermal recovery).³ However, neither EPA nor DOE was aware of any metals recovery facility that would accept radioactively contaminated cadmium- or mercury-containing waste batteries for treatment. Furthermore, even if such a facility had been available, the recovered metals would have contained residual radioactive material that could limit or prevent their use/reuse. On this basis, the direct final rule stated EPA's conclusion that requiring thermal recovery of metals from radioactively contaminated cadmium- and

³ The applicable LDR waste code subcategories (40 CFR 268.40) were D006 Cadmium Containing Batteries Subcategory and D009 High Mercury-Inorganic Subcategory (for inorganic wastes containing greater than or equal to 260 ppm total mercury).

mercury-containing waste batteries was technically inappropriate [67 FR 62618, 62621, col. 1].

Similarly, EPA concluded that the previously applicable LDR treatment standard for radioactively contaminated D011 silver-containing waste batteries was inappropriate. However, in the case of silver-containing waste batteries, the previous standard required treatment to meet numerical constituent concentration levels for silver and any underlying hazardous constituents. The direct final rule recognized that efforts to meet these standards could involve manually segregating the silver-containing waste batteries from other waste batteries prior to treatment. Thus, the concern was that such activities could increase worker exposures to radiation and increase the volume of radioactively contaminated waste for disposal [67 FR 62618, 62621, cols. 1 and 2].

Implementation In Authorized States

In general, States authorized to administer and enforce the RCRA LDR treatment program within their boundaries are not required to revise their programs to incorporate changed Federal regulations, unless the changed Federal regulations are more stringent than the previous requirements. The direct final rule described in this *Regulatory Bulletin* contains requirements that are neither more nor less stringent than the Federal requirements in existence at the time it was promulgated [67 FR 62618, 62621, col. 3]. Therefore, authorized States are not bound to adopt the provisions in the direct final rule. Notwithstanding, EPA has urged the States to do so.

Appropriately permitted facilities located in authorized States that have adopted the direct final rule may now accept radioactively contaminated cadmium-, mercury-, and silver-containing waste batteries for treatment and disposal in accordance with the revised LDR treatment standards established by the national treatability variance. Accordingly, DOE sites may proceed to make arrangements with such facilities for the final disposition of these types of batteries.

Questions of policy or questions requiring policy decisions will not be dealt with in EH-43 Regulatory Bulletins unless that policy has already been established through appropriate documentation. Please refer any questions concerning the subject material covered in this Regulatory Bulletin to:

Bill Fortune
U.S. Department of Energy
Office of Pollution Prevention and
Resource Conservation (EH-43)
Regulatory Affairs Unit
1000 Independence Ave., S.W.
Washington, D.C. 20585

Phone: (202) 586-7302
E-mail: william.fortune@eh.doe.gov

