



Requirements for Recycling of Used Cathode Ray Tubes



Resource Conservation and Recovery Act: Hazardous Waste Management Regulations

Cathode Ray Tubes Final Rule 40 CFR Parts 260 and 261

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RULE SYNOPSIS

On July 28, 2006, the U.S. Environmental Protection Agency (EPA) published a [Final Rule](#) streamlining the management requirements under the hazardous waste provisions of the Resource Conservation and Recovery Act (RCRA) for the reuse and recycling of used cathode ray tubes (CRTs) (i.e., components in computer monitors, televisions, and electronic displays) and glass removed from CRTs. In [40 CFR 261.4\(a\)\(22\)](#), the Final Rule provides a conditional exclusion for used CRTs and glass removed from CRTs from the RCRA definitions of solid waste and hazardous waste (i.e., certain criteria must be met for CRTs to qualify for the new exclusion). The qualifying criteria are finalized in [40 CFR 261.39](#). Relevant provisions of the Final Rule are summarized in Table 1 on Page 3 of this Information Brief.

In addition to explaining the provisions of the new conditional exemption, the preamble to the Final Rule clarifies EPA's existing policy that: (1) CRTs sent to a collector or reseller for potential reuse are not subject to RCRA regulations; and (2) unused CRTs sent for recycling are not subject to RCRA regulations. The preamble also clarifies that CRTs sent directly for disposal at a landfill or incinerator are solid wastes that require characterization to determine whether or not they are hazardous waste. Moreover, such CRTs, if hazardous, would be subject to the RCRA hazardous waste regulations, including Land Disposal Restrictions (LDR) treatment requirements ([71 FR 42929 - 42930](#)).

The Final Rule also contains requirements applicable to exporters of CRTs. Any Department of Energy (DOE)

site considering the export of CRTs, should review these requirements, which are located in [40 CFR 261.39\(a\)\(5\)](#); [261.40](#); and [261.41](#).

IMPORTANCE TO DOE OPERATIONS

Used CRTs and other electronics represent a growing waste stream within the DOE complex. The disposal of such items can sometimes pose a problem at DOE sites because these types of assets can contain enough hazardous constituents to be classified as hazardous waste when they are disposed. By streamlining the hazardous waste regulatory requirements applicable to CRTs and CRT glass, the CRT Final Rule is intended to encourage increased reuse, recycling and better management of end-of-life CRTs and glass removed from CRTs.

Management of DOE Electronic Assets

DOE has long supported sustainable environmental stewardship of federal electronic assets. Among other things, DOE joined as a partner in the Federal Electronics Challenge (FEC), which was initiated in 2002 by the Federal Environmental Executive (FEE) and EPA as a voluntary organization to promote environmentally sound management of electronics. DOE also entered into a Memorandum of Understanding ([MOU](#)) in November 2004 with 10 other Federal agencies and the Executive Office of the President to improve the environmental management of Federal electronic assets throughout their entire life cycle (i.e., procurement; operation and maintenance; and disposition).

In December 2005, the Deputy Secretary of Energy approved Change (Chg) 2 to [DOE O 450.1](#) establishing performance-based Pollution Prevention (P2) and Sustainable Environmental Stewardship goals to be achieved by DOE sites through integration of P2 into Environmental Management Systems (EMSs). DOE O 450.1 Chg 2 requires that, pursuant to specified goals, DOE sites must reduce or eliminate the generation of wastes entailing disposal (e.g., in landfills) through source reduction (including segregation and substitution), reuse, recycling, and sustainable development, and by purchasing environmentally preferable products and services.

In addition, the Order provides strategies, including electronic stewardship-related strategies, for achieving the P2 and sustainable environmental stewardship goals. Such strategies include using accredited recycling services as an environmentally compliant means for disposition of end-of-life electronics, including CRTs. Consistent with the November 2004 MOU and DOE O 450.1 Chg 2, Departmental entities are implementing electronics stewardship throughout the DOE Complex.

More information on applicable regulatory requirements and interagency initiatives, electronics stewardship programs and practices, and performance measures and reporting requirements is available in *Implementing Electronics Stewardship at Department of Energy Facilities* ([HS-20-IB-2007-01](#); March 2007).

BACKGROUND

EPA estimates that CRT television and computer monitors, which frequently exhibit the RCRA toxicity characteristic for lead, contain on average approximately [four pounds of lead](#) (the exact amount depends on size and make). Other hazardous constituents in CRT glass may include mercury, cadmium, and arsenic. These constituents, however, are found in very low concentrations that are unlikely to exceed Toxicity Characteristic (TC) concentration limits ([67 FR 40510](#)). On June 12, 2002, EPA put forward streamlined management requirements for used CRTs and glass removed from CRTs in a Notice of Proposed Rulemaking (NPRM) that appeared in the *Federal Register* ([67 FR 40508](#)). The purposes of the proposal were to increase the collection and recycling of CRTs and to reduce the amount of lead in landfills by reusing lead to make new CRT glass, or by sending it to lead smelters.

The NPRM explained that under some circumstances, used CRTs sent for recycling do not resemble spent materials and, depending on each State's program provisions, might not be regulated as hazardous wastes. Furthermore, EPA encouraged the States to adopt approaches consistent with the proposal. DOE submitted comments in response to the NPRM on August 12, 2002. In its comments, DOE supported EPA's efforts to encourage the reuse and recycling of used CRTs and CRT glass.

STATE IMPLEMENTATION

States currently regulating CRTs as hazardous or universal wastes are not required to adopt the Final Rule

because the Final Rule is less stringent than their existing programs. Several States, however, have already banned land disposal of CRTs or are considering doing so, and many States are encouraging recycling through separate legislation and regulations. Such States may already have implemented a regulatory approach for CRT recycling consistent with the June 12, 2002 NPRM. If so, program amendments may be required in these States because some aspects of the Final Rule are more stringent than the proposal. The only provision that is "more stringent" in the Final Rule that is relevant to DOE site operations prohibits speculative accumulation (as defined in [40 CFR 261.1\(c\)\(8\)](#)) of used, intact CRTs. Because EPA issued this provision under RCRA authority (not the Hazardous and Solid Waste Amendments), it will become effective in States with approved RCRA programs only after the States amend their programs. DOE personnel with responsibility for managing end-of-life CRTs are encouraged to check on the status of State CRT regulation in their locality.

If conditionally-excluded CRTs or CRT glass are transported from, to, or through a State that regulates them as hazardous or universal waste, then they must be packaged, labeled, manifested, and managed consistent with the regulations applicable to such wastes.

Questions of policy or questions requiring policy decisions will not be addressed in HS-20 Information Briefs unless that policy has already been established through appropriate documentation. Please refer any questions concerning the subject material covered in this Information Brief to:

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TABLE 1: Summary of Conditions on Exclusion from the Definition of Solid Waste for CRTs and Glass Removed from CRTs

Material	Conditions	Management Limitations	Reference
Used, intact CRTs	<ul style="list-style-type: none"> • Destined for reuse or recycling in the U.S. 	<ul style="list-style-type: none"> • Cannot be directly disposed of; and • Cannot be speculatively accumulated by a CRT collector or glass processor. 	<p><u>40 CFR 261.4(a)(22)(i);</u> <u>71 FR 42948</u></p>
Used, broken CRTs prior to processing	<ul style="list-style-type: none"> • Destined for recycling in the U.S.; and <ul style="list-style-type: none"> – Stored in a building with roof, floor, and walls; or – Stored in containers that minimize releases of glass and are clearly labeled or marked; and – Transported in containers that minimize releases of glass and are clearly labeled or marked. 	<ul style="list-style-type: none"> • Cannot be directly disposed of; • Cannot be speculatively accumulated; and, • If recycle method involves “use in a manner constituting disposal,” must comply with <u>40 CFR 266, Subpart C</u>, rather than <u>40 CFR 261, Subpart E</u>. 	<p><u>40 CFR 261.39(a);</u> <u>71 FR 42948</u></p>
Used, broken CRTs during processing	<ul style="list-style-type: none"> • Undergoing CRT processing; and <ul style="list-style-type: none"> – CRT processing takes place in a building with roof, floor, and walls; and – CRT processing does not involve temperatures high enough to volatilize lead. 	<ul style="list-style-type: none"> • Cannot be speculatively accumulated when stored during processing; and • If processing method involves “use in a manner constituting disposal,” must comply with <u>40 CFR 266, Subpart C</u>, rather than <u>40 CFR 261, Subpart E</u>. 	<p><u>40 CFR 261.39(b);</u> <u>71 FR 42949</u></p>
Processed CRT glass	<ul style="list-style-type: none"> • Destined for recycling at a CRT glass manufacturer or lead smelter. • Note: CRT glass sent for use or reuse as a substitute for commercial products may be excluded from the definition of solid waste if it meets the criteria in <u>40 CFR 261.2(e)(ii)</u>. 	<ul style="list-style-type: none"> • Cannot be speculatively accumulated; and • If recycle method involves “use in a manner constituting disposal,” must comply with <u>40 CFR 266, Subpart C</u>, rather than <u>40 CFR 261, Subpart E</u>. 	<p><u>40 CFR 261.39(c) & (d);</u> <u>71 FR 42949</u></p>

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