UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

May 11, 1992

Mr. William C. Osborn
Lighting Recycling, Inc.
115 Buckminster Road
Brookline, MA 02146

Dear Mr. Osborn:

This letter is in response to your recent inquiries regarding the recycling of fluorescent bulbs to recover mercury. Over the past few months John Gauthier of my staff has had a number of discussions on the principle regulatory issues associated with this process, both with you and with a number of other federal, state and industry representatives. I have, in this letter, summarized those issues of greatest concern to both you and the U.S. Environmental Protection Agency, Region I (EPA), and hope to offer you some insight on the status of the recycling of hazardous wastes in a manner that is fully consistent with the existing federal regulations.

As Mr. Gauthier has mentioned to you previously, the key concern is whether or not the recycling process that you have proposed would be subject to hazardous waste permitting requirements pursuant to 40 CFR Part 270. In addition, I am aware that you have been in contact with Steven Dreeszen et al at the Massachusetts Department of Environmental Protection (MA DEP) to ascertain what requirements (i.e. Class A recycling permit) at the state level may additionally affect this type of operation.

Background on Fluorescent Bulbs as Hazardous Waste

In order to be considered a federal hazardous waste, any waste, must first meet the definition of a solid waste. A solid waste is defined in 40 CFR § 261.2. Simply stated, a solid waste is any discarded material that is not excluded under 40 CFR § 261.4(a). Under Section 261.4(a), there are specific wastes that are excluded from the definition of solid waste.

Spent fluorescent bulbs are not listed in § 261.4(a). Therefore, they are a solid waste regardless of whether you dispose of it, burn it, accumulate it, store it, treat it, or **recycle it.** Since spent fluorescent bulbs are solid wastes, generators must then determine whether they are a hazardous waste or not. The definition of a hazardous waste is found at 40 CFR § 261.3. Again, simply put, a solid waste is a hazardous waste if it is:

A) Not excluded under 40 CFR § 261.4(b);

B) And it is listed under Sections 261.31, 261.32, or 261.33;

C) Or it exhibits one of the characteristics of a hazardous waste found in Sections 261.21, 261.22, 261.23, or 261.24;

D) Or it is a solid waste that is mixed with any of the wastes listed in B) above.

Spent fluorescent bulbs are not listed as a specific waste in Sections 261.31, 261.32, or 261.33. These three sections, identify hazardous waste streams that are generated from both specific processes and unspecific sources. Wastes found in these sections are generally referred to as "listed" wastes. Some examples of "listed" wastes are "spent halogenated solvents used in degreasing" (designated as EPA Hazardous Waste Number F001) and "still bottoms from the distillation of benzyl chloride" (designated as EPA Hazardous Waste Number K015). In reviewing the lists in these section, it can be determined that spent fluorescent bulbs are not a listed hazardous waste.

A generator of spent fluorescent bulbs must then determine whether or not this waste exhibits any of the characteristics of a hazardous waste. There are four characteristics of a hazardous waste defined in Sections 261.21 through 261.24. They are ignitability (designated as EPA Hazardous Waste Number D001), corrosivity (designated as EPA Hazardous Waste Number D002), reactivity (designated as EPA Hazardous Waste Number D003) and toxicity (designated as EPA Hazardous Waste Numbers D004-D043).

In most circumstances, spent fluorescent bulbs would not be characterized as ignitable, corrosive, or reactive. Therefore, these three characteristics would probably not cause spent fluorescent bulbs to be considered hazardous. The fourth characteristic, **toxicity**, is comprised of a list of 39 constituents, that have specific concentration levels associated with them. If a solid waste has any of these constituents at concentrations that equal or exceed the specific regulatory levels, as determined by the appropriate test method, it is a hazardous waste. Refer to 40 CFR § 261.24 for the complete list of these 39 constituents and the maximum concentrations associated with them.

A change in the federal regulations to the toxicity characteristic is one of the primary factors that have caused generators of spent fluorescent bulbs to be concerned with proper management of this waste. The change to the federal regulations to the toxicity characteristic (TC) is most commonly referred to as the "TC Rule."

When Congress passed the Hazardous and Solid Waste Amendments of 1984 (HSWA) to the Resource Conservation and Recovery Act of 1976 (RCRA) it realized that EPA would need to reassess the criteria and test method that determine the characteristic of toxicity. The former test method, the Extraction Procedure Toxicity Characteristic, or EP Toxicity, included 8 metals and 6 pesticides/herbicides (EPA waste codes D004-D017) that comprised the list of toxic constituents.

On March 29, 1990 (55 FR 11798), EPA expanded the list of toxicity characteristic (TC) constituents and incorporated a new test method to replace the EP Toxicity method. The original list of 14 constituents had 25 new organic constituents (EPA waste codes D018 -D043) added to it, to now bring the total number of TC constituents to 39. These revisions also introduced the Toxicity Characteristic Leaching Procedure (SW-846 Method 1311), or TCLP, as the replacement test method for EP Toxicity to determine the TC of a waste. The TCLP had been in use since 1986 to meet the Land Disposal Restrictions (LDR) treatment standards.

The TC Rule required affected generators and facilities to submit notifications, applications and/or modifications at various set dates in order to continue managing these newly toxic wastes. Generally speaking, large quantity generators and treatment, storage and disposal facilities had to begin complying with the TC rule by September 25, 1990, and small quantity generators had until March 29, 1991 to comply.

EPA expected that many companies that had previously been unaffected by the RCRA regulations, would now potentially find themselves generating TC wastes, and many companies that were already generators of hazardous waste would now find there generation of hazardous wastes increased, or may now be treating or storing these wastes as well.

Regulations Applicable to Fluorescent Bulb Recycling

Recent data from generators of spent fluorescent bulbs and the National Electrical Manufacturers Association (NEMA) indicate that more often than not, spent fluorescent bulbs exhibit the TC for mercury (i.e. equal or exceed the TCLP regulatory level of 0.2 mg/l). Thus, it is likely that generators of this waste will reach a determination that spent fluorescent bulbs are a hazardous waste. That being the case, fluorescent bulbs must then be managed as a hazardous waste and disposed of at a permitted or interim status facility in accordance with 40 CFR parts 264 or 265, and parts 268 and 270.

There are, however, existing technologies that are able to reclaim the primary components of fluorescent bulbs, including the mercury. Thus, hazardous waste fluorescent bulbs would, when legitimately recycled, be considered a **"recyclable material"**, as

defined in 40 CFR § 261.6.

40 CFR § 261.6(c)(2) states that owners or operators of facilities that recycle recyclable materials without storing them prior to recycling are subject to the notification requirements under section 3010 of RCRA, sections 265.71 and 265.72 of 40 CFR (manifest discrepancies), and the air emission standards set forth in subparts AA and BB of part 264 or 265.

Facilities that store recyclable materials prior to recycling are subject to the requirements outlined in 40 CFR § 261.6(c)(1). Simply put, this requires facilities who store recyclable materials prior to recycling to be in full compliance with all the applicable requirements of a treatment, storage and disposal (TSD) facility, including the Part A and B permit requirements found at 40 CFR sections 270.13 and 270.14.

Conclusions

Since the MA DEP is authorized to implement the base RCRA program, it has primacy over interpretive language associated with authorized aspects of RCRA. Within the scope of authorized regulations that are equivalent to, no less stringent than and consistent with the federal RCRA program, the DEP is the primary agency responsible for regulatory interpretations. Therefore, you should consult the MA DEP when determining the definition of "storage prior to recycling" of recyclable materials. If, in fact, the specific management components being proposed for your recyclable materials (i.e. hazardous waste fluorescent bulbs) prior to recycling are not considered storage, but instead integral parts of the actual recycling process, the requirements of 40 CFR § 261.6(c)(2) may be applicable to your operation of fluorescent bulb recycling. If the requirements of 40 CFR § 261.6(c)(2) are applicable to your operation, the MA DEP requirements pursuant to 310 CMR 30.212(10) may additionally apply.

I would also like to respond to Mr. Dreeszen's letter of April 8, 1992 requesting EPA concurrence on the issue of "site of generation" of a recyclable material. EPA maintains that the point of generation of a hazardous waste is that point at which a generator determines the material to be spent. That point, in accordance with 40 CFR § 261.2, is when a material is discarded. The term discarded is further defined as disposal, incineration or recycling; and storage, accumulation or treatment prior to any of these actions. Generally, the point at which a material becomes a solid waste (and hence subject to a hazardous waste determination pursuant to 40 CFR § 262.11) is that point when the material can no longer serve its original intended purpose without first being reclaimed. For a further discussion on this issue, please refer to the preamble to the definition of solid waste found at 50 FR 624 (January 4, 1985). Therefore, once a

fluorescent bulb can no longer serve its original purpose and is removed from service, it has been generated. Any subsequent use or reuse of that bulb that is not consistent with its intended use as a light source would result in it meeting the definition of a solid waste.

EPA also believes that process residues resulting from the recycling operation are, however, "newly" generated wastes and thus subject to a hazardous waste determination of their own. The actual crushing of the bulbs at the beginning of the recycling process would most likely be considered part of the recycling process and not waste generation.

I hope this letter serves to detail EPA Region I's position on this matter and further provides some background on these issues. If you have any additional questions regarding this matter, please contact John Gauthier of my staff at (617) 573-9629.

Sincerely,

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ME & VT Waste Management Branch & RCRA Policy Lead

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