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LIGHTING WASTE DISPOSAL

Upgrading a lighting system will likely involve the removal and disposal of lamps and ballasts. Some of this waste may be hazardous, and you must manage it accordingly. This document provides an overview of issues relating to the disposal of lamps and ballasts. For project-specific assistance, please refer to the information resources provided at the end of this document.

Note: The information in this document is believed to be correct as of September 1998. EPA does not provide legal advice, nor does this document. Generators of lighting wastes should check with local, state and regional authorities for the most up-to-date information.

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DISPOSAL OF PCB-CONTAINING BALLASTS

ACTION CHECKLIST

- ✓ Investigate and follow state and local requirements for handling and disposing of ballasts.
- ✓ Identify ballasts that contain PCBs and ballasts that are leaking PCBs.
- ✓ Remove, handle, and dispose of *leaking* PCB-containing ballasts by high-temperature incineration.
- ✓ The Green Lights and ENERGY STAR Buildings Partnership recommends disposing of non-leaking PCB-containing ballasts in an environmentally responsible manner, such as by high-temperature incineration, recycling, or chemical or hazardous waste landfill.
- ✓ Maintain permanent records of PCB-containing ballast disposal.

DISPOSAL OF MERCURY-CONTAINING LAMPS

ACTION CHECKLIST

- ✓ Investigate and follow state and local requirements for handling and disposing of lamps.
- ✓ If you have not tested, or have state-accepted proof, to show that your mercury-containing lamps are not hazardous, then assume they are hazardous and dispose of them as hazardous waste.
- ✓ Mercury-containing lamps that test hazardous must be handled in compliance with hazardous waste regulations.
- ✓ Maintain permanent records of mercury-containing lamps that are disposed as hazardous waste

PCB-CONTAINING BALLASTS

The primary concern regarding the disposal of used fluorescent ballasts is the health risk associated with polychlorinated biphenyls (PCBs). Human exposure to these possible carcinogens can cause skin, liver, and reproductive disorders. Fluorescent and high-intensity discharge (HID) ballasts contain a small capacitor that may contain high concentrations of PCBs (greater than 90% pure PCBs or 900,000 ppm). These chemical compounds were widely used as insulators in electrical equipment such as capacitors, switches, and voltage regulators through the late 1970s.

The Toxic Substances Control Act (TSCA) was enacted in 1976, and subsequently banned the production of PCBs in the United States. The specific regulations governing the use and disposal of PCBs are found in Volume 40 Code of Federal Regulations (CFR) Part 761.

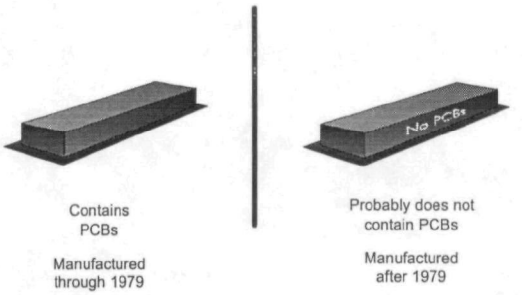
The proper method for disposing used ballasts depends on several factors, such as the type and condition of the ballasts and the regulations or recommendations in effect in the state(s) where you remove or discard them. TSCA specifies the disposal method for ballasts that are *leaking* PCBs. In addition, generators of PCB-containing ballast wastes may be subject to notification and liability provisions under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) — also known as "Superfund." To select the appropriate disposal method for PCB-containing ballasts, refer to the decision flow chart on the following page.

Because disposal requirements vary from state to state, check with regional, state, or local authorities for all applicable regulations in your area. For your convenience, information resources are listed at the end of this document.

Identifying PCB Ballasts

Use the following guidelines to identify ballasts that contain PCBs.

- All ballasts manufactured through 1979 contain PCBs.
- Ballasts manufactured after 1979 that do not contain PCBs are labeled **"No PCBs."**
- If a ballast is not labeled "No PCBs," *assume it contains PCBs.*



It is extremely important to find out if a ballast containing PCBs is leaking *before you remove it from the fixture*, so that you can handle it properly.

Federal Requirements

Non-Leaking PCB Ballast Disposal

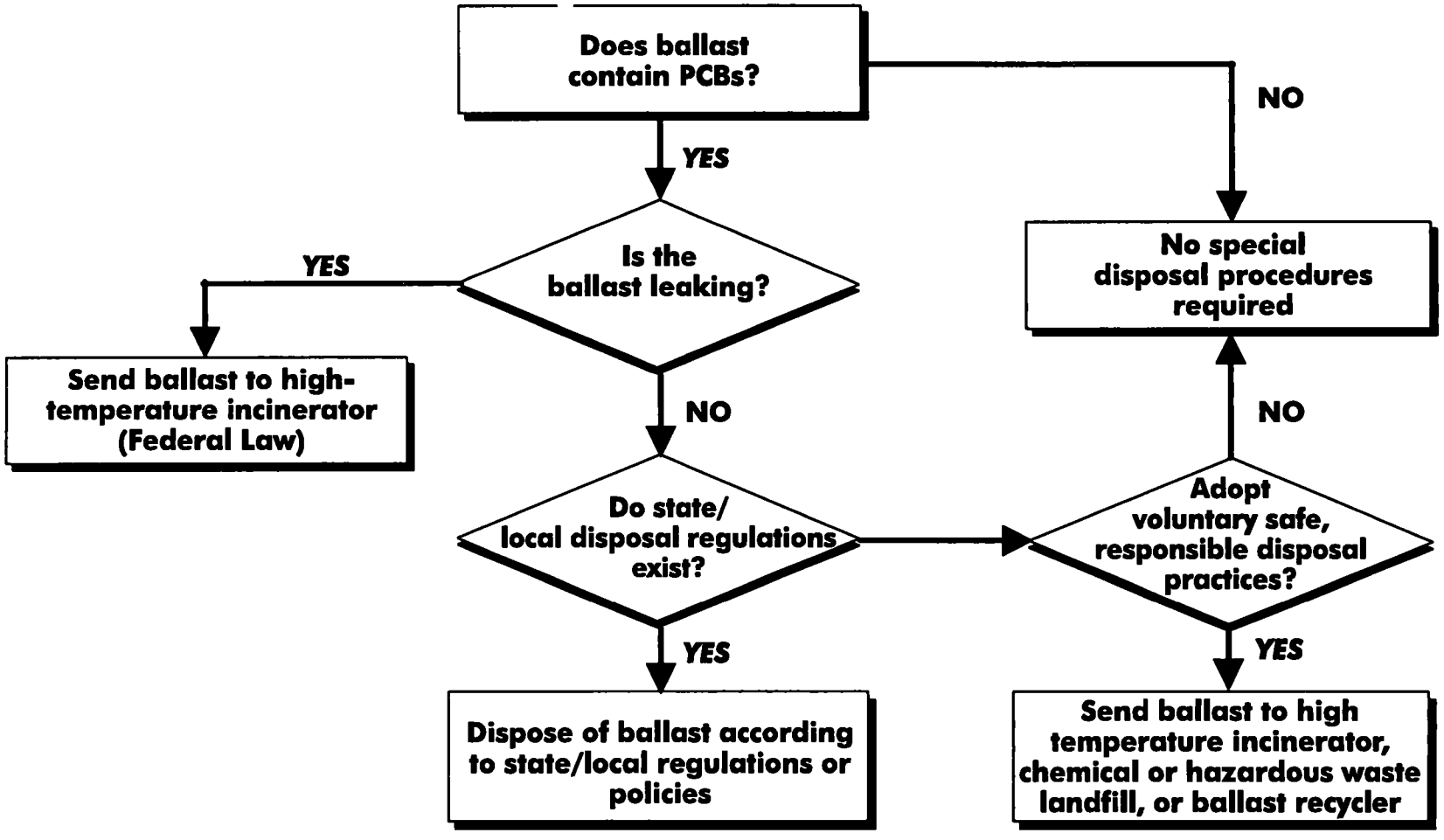
TSCA regulates ballasts that contain PCBs (40 CFR 761.60(b)(2)(ii)). Under TSCA, intact fluorescent and HID ballasts that are *not leaking* PCBs may be disposed in a municipal solid waste landfill. EPA recommends packing and sealing the intact ballasts in 55 gallon drums. Green Lights also encourages its participants to dispose of PCB-containing ballast wastes responsibly, and recommends high-temperature incineration, recycling, or a chemical or hazardous waste landfill.

In addition, CERCLA regulates the disposal of non-leaking PCB-containing ballasts. CERCLA requires building owners and waste generators to notify the National Response Center at (800) 424-8802. They must notify when disposing a pound or more of PCBs (roughly equivalent to 12-16 fluorescent ballasts) in a 24-hour period.

As a generator of PCB-containing ballast wastes, you could be liable in any subsequent Superfund cleanup at a municipal, hazardous, or chemical land disposal site, incinerator, or recycling facility.

EPA encouraged proper disposal of PCB-containing ballasts in the preamble to the 1979 PCB Ban Rule (44 FR 31514) and in the preamble to the final rule on August 25, 1982 (47 FR 37342).

"EPA encourages commercial and industrial firms that use and dispose of large quantities of small PCB capacitors to establish voluntarily a collection and disposal program that would result in the waste capacitors going to chemical or hazardous waste landfills or high-temperature incinerators."


Does ballast contain PCBs?
NO
YES
Is the ballast leaking?
YES
Send ballast to high-temperature incinerator (Federal Law)
NO
Do state/ local disposal regulations exist?
YES
Dispose of ballast according to state/local regulations or policies
Adopt voluntary safe, responsible disposal practices?
NO
No special disposal procedures required
YES
Send ballast to high temperature incinerator, chemical or hazardous waste landfill, or ballast recycler

Leaking PCB Ballast Disposal

A puncture or other damage to ballasts in a lighting system exposes an oily tar-like substance. If this substance contains PCBs, the ballast and all materials it contacts are considered PCB waste, and are subject to TSCA requirements. ***Leaking PCB-containing ballasts must be incinerated at an EPA-approved high-temperature incinerator.*** (See last section for a list of incinerators).

It is very important that you remove, handle, and dispose PCB-containing ballasts *properly*. Take precautions to prevent exposure of the leaking ballast, ***since all materials that contact the ballast or the leaking substance are also PCB waste.*** Use trained personnel or contractors to handle and dispose leaking PCB-containing ballasts.

For proper packing, storage, transportation, and disposal information call the TSCA assistance information hotline at (202) 554-1404.

State Requirements

Non-Leaking PCB Ballast Disposal

Many states have developed regulations governing the disposal of non-leaking PCB-containing ballasts that are more stringent than Federal regulations. In addition, some EPA Regional offices published policies specifying ballast disposal methods adopted by individual states.

State standards can take several forms (e.g., written regulations, regional policies, written and verbal recommendations, transportation documentation). Some states do not regulate PCB-containing ballasts as toxic waste, but prohibit their disposal in municipal solid waste landfills. The table on the next page provides a listing of state regulations and recommendations. The last section of this document lists solid and hazardous waste agencies for states and EPA Regions.

All generators of PCB-containing ballasts should thoroughly investigate their state's regulations and follow local requirements.

Green Lights recommends three methods for disposing of *non-leaking* PCB-containing ballasts: high-temperature incineration, recycling, and chemical or hazardous waste landfill.

When upgrading lighting, make sure your contractor removes all disconnected PCB-containing ballasts from the lighting fixtures. Non-leaking PCB-containing ballasts may still be hazardous if left in upgraded fixtures, especially in case of fire.

High-Temperature Incineration

High-temperature incineration is the method preferred by many companies because it *destroys PCBs, removing them from the waste stream permanently and removing the potential for future CERCLA liability.* Incinerating a PCB-containing ballast costs more than sending it to a hazardous waste landfill, but this additional cost is one many organizations are willing to absorb.

Recycling Ballasts

Recyclers remove the PCB-containing materials (i e., the capacitor and possibly the asphalt potting material surrounding the capacitor) for incineration or land disposal. Metals, such as copper and steel, can be reclaimed from the ballasts for use in manufacturing other products. You may recycle used non-leaking ballasts despite PCBs. The last section of this document contains a list of companies that recycle ballasts.

Chemical or Hazardous Waste Landfill

PCB-containing ballasts may also be disposed in a chemical or hazardous waste landfill. Landfill disposal is less expensive than high-temperature incineration or recycling, but does not eliminate PCBs from the waste stream permanently. While chemical or hazardous waste landfill disposal is an acceptable, regulated disposal method, your organization may be legitimately concerned about potential future CERCLA liability using this method.

Packing PCB Ballasts for Disposal

Despite the disposal method selected, ballasts are packed — according to PCB regulations — in 55-gallon drums for transportation.

- ☞ One drum holds 150 to 300 ballasts depending on how tightly the ballasts are packed.
- ☞ Fill void space with an absorbent packing material for safety reasons.
- ☞ Label drums according to Department of Transportation regulations.
- ☞ Note that tightly packed drums may weigh more than 1,000 pounds, which may present a safety risk, particularly when moving the drum for loading or unloading.

STATE REGULATIONS REGARDING BALLAST DISPOSAL	
AL	In-State landfill requires prior approval. Recommend incineration or chemical waste landfill.
AR	PCB-containing ballasts tranported as hazardous waste
CA	PCB-containing ballasts should be handled, transported, and disposed of as hazardous waste
CO	Non-leaking PCB ballasts require prior approval from solid waste landfill operator Leaking PCB ballasts must be sent to high-temperature incinerator in accord to TSCA regulations Non-PCB ballasts require approval from solid waste landfill operator.
CT	PCB ballasts must be incinerated or sent to a chemical waste landfill
DE	Ballast disposal is regulated under the Deleware Regulations Governing Solid Waste
FL	Follow EPA Region 4 Policy. Per Florida regulations, PCB capacitors or other contaminated ballast material cannot be disposed in any solid waste management facility in Florida Recycling of non-PCB ballast components is highly recommended.
GA	Follow EPA Region 4 Policy
ID	PCB-containing ballasts are governed according to EPA Region 10 policy (leaking ballasts or generation of more than 5 ballasts/year must be handled as PCB waste)
IL	Leaking PCB-containing ballasts meet definition of special waste (35 IAC)
IN	Disposing > 25 non-leaking ballasts (or small capacitors) requires written approval prior to disposal at a municipal solid waste landfill Recycling requires approval pursuant to 329 IAC 4-1-5(7) as incorporated from 40 CFR 761.60e.
KY	Recommend recycling, chemical landfill, or incineration
LA	Ballasts may be recycled as regulated by the recycling regulations. If disposed, it is a solid waste and it must be determined if it is a hazard as specified by the Louisiana Environmental Regulatory Code
MA	Considered hazardous waste at point of consolidation or dismantling See DEP Policy HW 92-01
MD	PCBs > 500 ppm regulated as acute hazardous waste. 1kg (based on entire weight of the ballasts) subject to full regulation as hazardous waste Average limit is 1-2 ballasts.
ME	PCBs > 50 ppm regulated as hazardous waste
MI	Follow EPA Region 5 policy.
MN	Ballasts that are NOT marked "Does not nontain PCBs" must be managed 1) as hazardous waste, or 2) according to MPCA special waste guidelines.
MO	PCB ballasts must be disposed in a chemical waste landfill or incinerated .
NC	PCB >50 ppm not allowed in municipal solid waste landfills.
ND	Encourage recycling PCB ballasts are allowed to be disposed in permitted municipal landfills
NJ	PCBs > 50 ppm considered hazardous waste.
NM	Follow EPA Region 6 policy
NY	Ballast disposal must comply with 6NYCRR Part 364 (permitting of waste haulers) and 6NYCRR Part 360 (solid waste disposal)
OR	Follow EPA Region 10 policy (>5 ballasts/year must be incinerated or sent to chemical waste landfill)
PA	PCB ballasts must go to an approved PCB disposal facility
RI	PCBs > 50 ppm regulated as hazardous waste. No exemptions for small quantity generators of hazardous waste
SC	PCB waste may NOT be disposed of in a municipal landfill.
SD	PCB ballasts are allowed to be disposed of at municipal landfills as long as the generator is not in the business of manufacturing these items.
TX	PCBs > 50 ppm may be disposed of at hazardous waste landfills which are also authorized for PCB disposal or at authorized hazardous waste disposal facilities.
VA	PCB-containing materials regulated as Special Solid Waste. PCBs > 50 ppm may NOT be disposed or stored without EPA approval. PCBs between 1 and 50 ppm restricted to disposal in sanitary landfills or industrial waste landfills
VT	Intact and non-leaking PCB-containing ballasts may be managed as Universal Waste Follow Vermont Hazardous Waste Management Regulations - 1998 Revision, Subchapter 9, Universal Waste Management Standards
WA	Follow EPA Region 10 policy (>5 ballasts/yr must be incinerated or sent to chemical waste landfill.)
WI	Regulates all PCB-containing ballasts as hazardous waste. Recommend recycling of PCB ballasts
WV	Follow EPA Region 3 policy PCBs below Federal regulatory level are considered a special waste by WV Solid Waste Permit Section
WY	Recommend recycling of all ballasts. Follow EPA Region 8 policy.

States not listed follow Federal Regulations

PCB Ballast Disposal Costs

High-temperature incineration and chemical or hazardous waste landfill costs can vary considerably. Disposal prices vary according to the following.

- quantity of waste generated
- location of removal site
- proximity to an EPA-approved high-temperature incinerator or chemical or hazardous waste landfill
- state and local taxes

When shopping for ballast disposal services, request cost estimates in terms of both pounds and number of ballasts. Typical F40 (fluorescent) ballasts weigh about 3.5 lbs., and F96 (fluorescent) ballasts weigh about 8 lbs. Negotiate with hazardous waste brokers, transporters, waste management companies, and disposal sites to obtain the lowest fees.

High-Temperature Incineration Costs

Incineration costs are calculated by weight.

- Costs range from $0.55/lb. to $2.10/lb.
- Average cost is $1.50/lb., which equals approximately **$5.25 per F40 ballast**.

Note: Estimated costs do not include packaging, transportation, or profile fees.

Recycling Costs

When recyclers remove the PCB-containing capacitor, the volume and weight of the ballast are reduced. This change results in lower packing, transportation, and incineration or disposal costs.

Recycling costs are calculated by weight.

- Costs range from $0.75/lb. to $1.75/lb.
- Average cost is $1.00/lb., which equals approximately **$3.50 per F40 ballast.**

Note: Recycling cost can range from $1.25 per F40 ballast (if the PCB wastes are sent to a chemical or hazardous waste landfill) to approximately $3.50 per F40 ballast (if the PCB wastes are high-temperature incinerated). Estimated costs do not include packaging, transportation, or profile fees.

Chemical or Hazardous Waste Landfill Costs

Chemical or hazardous waste landfill costs are calculated per 55-gallon drum.

- Costs range from $65/drum to $165/drum
- Average cost is $100/drum, which equals approximately **$0.50/F40 ballast.**

Note: Estimated costs do not include packaging, transportation, or profile fees.

Transportation Costs

Transportation fees are calculated as cents per pound per mile. They vary according to (1) the number of drums removed from the site, and (2) the distance from your location to the location of the high-temperature incinerator, chemical or hazardous waste landfill, or recycler.

Transporters may need to be registered or licensed to move hazardous wastes in certain states. Documentation of the movement of hazardous waste may be required even if a state does not regulate disposal or require the use of a licensed transporter.

Profile Fees

Operators of the high-temperature incinerator or chemical or hazardous waste landfill may charge a profile fee to document incoming hazardous waste. Profile fees vary depending on the volume of waste materials generated.

- Profile fees range from $0 to $300 per delivery.
- Fees may be waived if a certain volume or frequency of deliveries is assured or a working relationship has been established with a waste management broker, lighting management company, or other contractor.

Record Keeping

To track transported TSCA or hazardous waste, EPA requires generators to prepare a *Uniform Hazardous Waste Manifest.* The hazardous waste landfill, incinerator, or recycler that you use can provide this one-page form. The manifest identifies the type and quantity of waste, the generator, the transporter, and its ultimate destination.

The manifest must accompany the waste wherever it travels. Each handler of the waste must sign the manifest and keep one copy. When the waste reaches its destination, the owner of that facility returns a copy of the manifest to the generator to confirm that the waste arrived. If the waste does not arrive as scheduled, generators must immediately notify EPA or the authorized state environmental agency (see the last section), so that they can investigate and act appropriately.

In addition, require your contractor to provide you with documents verifying the disposal method, whether the PCBs are incinerated at high-temperatures or disposed in a chemical or hazardous waste landfill.

DEHP-CONTAINING BALLASTS

Di (2-ethylhexyl) phathatlate (DEHP) is a substance that was used to replace PCBs in certain ballast capacitors beginning in 1979. DEHP in its pure form is listed as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). However, once it has been used in a lighting ballast, *it is no longer hazardous* as defined by RCRA. (See 40 CFR 261.33, Part 261 Appendix VII, Section 268.34, and Section 268.43.)

DEHP is regulated under CERCLA—the Superfund law. The "Reportable Quantity" (RQ) of DEHP under CERCLA is 100 pounds. (See 40 CFR, Section 302.4.) This means that if you are disposing of 100 pounds or more of the material in a 24 hour period (approximately 1,600 fluorescent lighting ballasts), you are required to notify the National Resource Center at (800) 424-8802. It also means that parties involved with the disposal of DEHP ballasts may be held liable under Superfund if clean up of the DEHP is required.

DEHP has been found in ballasts designed for the following lighting fixtures: four-foot fluorescent fixtures manufactured between 1979 and 1985; eight-foot fluorescent fixtures manufactured between 1979 and 1991; and high-intensity discharge (HID) fixtures manufactured between 1979 and 1991. Some ballasts manufactured during these periods may contain dry capacitors or substances other than DEHP. To make sure your ballasts do not contain DEHP, contact the manufacturer or send the capacitor to a laboratory for testing.

MERCURY-CONTAINING LAMPS

Fluorescent and high-intensity discharge (HID) lamps contain a small quantity of mercury that can be harmful to the environment and to human health when improperly managed. Mercury is regulated under RCRA, which is administered by the US Environmental Protection Agency. Under current Federal law, mercury-containing lamps — such as fluorescent and HID lamps — may be hazardous waste. In addition, incandescent and HID lamps may contain small quantities of lead that can also be potentially harmful to human health and the environment. To prevent these toxic materials from contaminating the environment, dispose of used lamps responsibly.

Federal Regulations

Resource Conservation and Recovery Act (RCRA)

RCRA requires generators of solid wastes containing toxic constituents (such as mercury) to determine whether or not the waste is hazardous by using generator knowledge or testing representative samples of that waste. According to RCRA, generators of used fluorescent and HID lamps are responsible for determining whether their lamp wastes are hazardous. *If you do not test used fluorescent and HID lamps and prove them non-hazardous, assume they are hazardous waste and dispose them accordingly.*

Generator Knowledge

To use generator knowledge in making a hazardous waste determination, the generator must have information on possible hazardous constituents and their quantities in the waste. Sometimes manufacturers generate solid waste as part of their manufacturing process, and can use process knowledge to determine whether the waste exhibits a characteristic of hazardous waste. However, with expired lamp wastes, the generator has little process knowledge on which to make a hazardous waste determination (since the generator is not the manufacturer). The generator could base a determination on data obtained from the manufacturer. Alternately, refer to EPA's study entitled "Analytical Results of Mercury in Fluorescent Lamps" (dated 5/15/92, available in EPA's RCRA docket).

Testing Lamps To Determine If They Are Hazardous Waste

The Toxicity Characteristic Leaching Procedure (TCLP) identifies whether a waste is toxic and must be managed as hazardous waste. The test attempts to replicate the conditions in a municipal landfill to detect the mercury concentration of water that would leach from the landfill. If the mercury concentration exceeds 0.2 milligrams per liter, the lamp fails the toxicity test and is managed as hazardous waste.

When mercury-containing lamps are tested using the TCLP, the test results can vary considerably, depending on the lamp manufacturer, the age of the lamp, and the laboratory procedures used. These lamps often fail the TCLP. If you do not use the TCLP to verify that your lamps are non-hazardous, you should (1) assume that they are hazardous waste, and (2) manage them as hazardous waste. Contact your state hazardous waste agency for information on laboratories in your state that conduct the TCLP test. The cost to test one lamp is approximately $140. However, due to variability in TCLP testing for lamps, EPA recommends that a large representative sample be tested.

For more information on RCRA regulations and waste identification, storage, transportation, and disposal, contact the RCRA hotline at 1-800-424-9346 (in the District of Columbia call 703-412-9810).

Conditionally Exempt Small Quantity Generators

A conditionally exempt small quantity generator, as defined under RCRA, is a generator who disposes 100 kg or less of hazardous waste per month. Generators must add the weight of all the hazardous waste (lamps plus other hazardous wastes) that their business generates during a month. For lamp disposal, this quantity of waste includes the mercury in the lamp along with the glass, phosphors, and other materials (the weight of the entire lamp).

Conditionally exempt small quantity generators are excused from RCRA identification, storage, treatment and disposal regulations. To qualify as a conditionally exempt small quantity generator (if the only hazardous waste is mercury-containing lamps), a generator must dispose of fewer than 300-350 four-foot T12 fluorescent lamps or 400-450 four-foot T8 fluorescent lamps per month, depending upon the approximate weight of each lamp. EPA encourages all users of fluorescent and HID lamps to dispose of mercury-containing lamps responsibly to limit the release of mercury into the environment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA also regulates the disposal of mercury-containing lamps. The law requires building owners and waste generators to notify the National Response Center at (800) 424-8802 under certain conditions. For example, they must notify if they dispose of a pound or more of mercury (roughly equivalent to 11,000 four-foot T12 fluorescent lamps) in a 24-hour period. All generators of mercury-containing lamp waste (large, small, and conditionally exempt small generators) could be held liable in any subsequent Superfund cleanup at a land disposal site, incinerator, storage site, or recycling or other treatment facility.

State Regulations

Some states have adopted lamp disposal regulations that are more stringent than current Federal requirements, while other states have added mercury-containing lamps to their universal waste rule (see below). Check the table on the following page for a listing of state regulations, and contact your regional EPA office or state agency to confirm the most current rules and information on fluorescent and HID lamp waste management in your state.

Under the universal waste rule, storage, handling, and transportation practices are streamlined. Although lamps may be identified as a universal waste under state law, they are still considered hazardous waste and must be recycled or properly disposed in a chemical or hazardous waste landfill. Please note that although a state may have previously adopted the universal waste rule for batteries, pesticides and thermostats, this rule does not automatically apply to mercury-containing lamps. Mercury-containing lamps may be added to the state's list of universal wastes only after the state has adopted a special petitioning process, has obtained authorization to implement the RCRA toxicity characteristic rule, and petitions have been granted by the state (40 CFR 273). In states that do not adopt the universal waste rule for mercury-containing lamps, the disposal of such lamps would remain subject to current RCRA hazardous waste regulations.

Low-Mercury Lamps

Recently, low-mercury fluorescent and HID lamps have been introduced. Although these lamps contain much less mercury than conventional lamps, they may still be hazardous waste. To determine if they are hazardous waste, the lamps must be tested using the TCLP, or the generator can apply "knowledge of the hazard characteristic of the waste in light of the materials or the process used" (40 CFR 262.11(c)(2)). However,

STATE REGULATIONS REGARDING MERCURY-CONTAINING LAMP DISPOSAL	
AL	Lamps failing TCLP test are handled as hazardous waste
AZ	All spent lamps should be managed in accordance with EPA Universal Waste Rule (40 CFR 273)
CA	Over 25 lamps per 24-hour period must be disposed of as hazardous waste
CO	Lamps exhibiting a characteristic of a hazardous waste would be expected to be managed in accordance with the Colorado Hazardous Waste Act and implementing regulations Non-hazardous lamps can be disposed in a solid waste landfill with prior approval from the solid waste landfill operator
CT	Mercury-containing lamps are subject to Federal (RCRA) regulations through TCLP testing, and if they fail the TCLP test, must be treated as a hazardous waste
DE	Lamps exceeding TCLP regulatory limits are fully regulated as hazardous waste pursuant to the *Delaware Regulations Governing Hazardous Waste* Transportation must be conducted by a Delaware permitted hazardous waste transporter
FL	Lamps may not be disposed in any municipal waste combustor Generators of > 10 lamps/month must arrange for disposal in permitted lined landfills or recycling at mercury reclamation facilities Lamps that are recycled are subject to streamlined, universal-waste regulations (Chapter 62-737, FAC)
HI	Follow Federal (RCRA) regulations Recommend recycling
IA	Lamps failing TCLP test are considered hazardous waste Recycling recommended EPA RCRA transportation requirements apply
ID	Follow Federal (RCRA) regulations Conditionally-exempt generators may dispose of mercury-containing lamps in a municipal landfill with prior approval from the landfill operator
IL	Lamps exhibiting the toxicity characteristic are subject to hazardous waste management Mercury-containing lamps have been added to the list of Universal Wastes.
IN	Subject to RCRA through TCLP testing and may be regulated as hazardous waste under 329 IAC 3 1 Mercury-containing lamps have been added to the list of Universal Wastes in Indiana
KS	Follow State guidance policy
KY	Spent lamps are regulated as a Universal Waste under 401 KAR Chapter 43
LA	Fluorescent lamps containing mercury can be recycled as a Universal Waste under LAC 33V Chapter 38 If disposed, it is a solid wasted and it must be determined if it is hazardous as specified by LAC 33 V 1103
MA	Regulated under the Universal Waste Rule
MD	Lamps exhibiting the toxicity characteristic subject to hazardous waste regulations Persons who generate 100 kg or more of hazardous waste or who accumulate 100 kg or more of hazardous waste at any time (all hazardous waste, not just lamps) are fully regulated hazardous waste generators
ME	Lamps that are unbroken, managed according to Maine's current policy, and recycled do not need to be handled as hazardous waste If the lamps are broken or not managed according to Maine's policy they must be handled as hazardous waste
MI	Lamps may be managed as Universal Waste
MN	Mercury containing lamps must be stored according to Minnesota Pollution Control Agency (MPCA) guidelines and shipped to an existing recycling facility in accordance with MPCA requirements Illegal to place lamps into a solid waste landfill
MO	All spent lamps should be managed as Universal Waste
NC	Lamps that are intact and destined for recycling can be managed as Universal Waste If < 220 lbs per month of lamps is generated, a facility can send their lamps to a landfill in NC without lab data upon the landfill's approval If > 220 lbs per month, lab data must be submitted to a lined landfill indicating that they are non-hazardous prior to them accepting the lamps
ND	Follow Federal (RCRA) regulations. Encourage recycling
NE	Mercury-containing lamps can be recycled or disposed of as Universal Waste (NDEQ Title 128, Chapter 25) Mercury-containing lamps not managed as Universal Waste that fail a TCLP for mercury must be managed as hazardous waste CESQG lamps can go to a regulated landfill in 43 lb per day quantities
NH	Hazardous fluorescent lamps that are NOT designated for recycling or which are broken are subject to NH hazardous waste rules
NM	Follow Federal (RCRA) regulations Recommend Recycling
NY	Mercury-containing lamps must comply with the hazardous waste management regulations (6NYCRR Parts 370-374 and 376) if they fail TCLP test for any hazardous constituent
OH	Lamps designated for recycling are NOT considered hazardous waste, and are not subject to Ohio hazardous waste regulations
OR	Lamps may be managed as Universal Waste
PA	Handling, storage and shipment requirements are relaxed when lamps are sent to approved recycling facilities.
RI	Handle and ship lamps that are determined to be hazardous in accordance with all applicable hazardous waste requirements
SC	Disposal is regulated by SCHWMR-R 61-79 and SCHWMR-R 61-107 Intact fluorescent lamps destined for recycling that are properly packaged and are not speculatively accumulated can be handled as non-hazardous
SD	Follow Federal (RCRA) regulations Recommend Recycling
TN	Lamps designated for recycling are not considered hazardous waste and are not subject to Tennessee hazardous waste regulations Tube crushers must meet state regulations. State approval is required for disposal of non-hazardous lamps and hazardous waste from small-quantity generators in solid waste (Subtitle D) landfills
UT	Lamps may be managed as Universal Waste Follow Utah Administrative Code R315-16, Standards for Universal Waste Management
VT	Intact lamps may be managed as Universal Waste Follow Vermont Hazardous Waste Management Regulations - 1998 Revision, Subchapter 9, Universal Waste Management Standards
WA	Recommends recycling Follow Chapter 173-351 WAC for disposal in a municipal solid waste landfill Fluorescent lamps may not be sent to a municipal waste incinerator or industrial landfill
WI	Hazardous waste lamps and bulbs (including bulbs with high lead concentrations) may not be placed in a solid waste landfill Lamps and bulbs that are recycled are subject to reduced hazardous waste management requirements as Special Wastes
WV	Follow EPA Region 3 recommendations Adopted the Universal Waste Rule Can only be managed as a non-hazardous waste if determined to be below TCLP level
WY	Recommend recycling and compliance with State Universal Waste Rule, Chapter 14 Wyoming State Hazardous Waste Rules and Regulations
Wash DC	Fluorescent lamps that are not designated for recycling or that are broken are subject to District of Columbia Hazardous Waste Management Regulations (20DCMR, Chapters 40-54)

States not listed follow Federal (RCRA) Regulations

most states require the lamps to be tested (using TCLP) by the generator to determine if the lamps are non-hazardous. Check with your regional EPA office or state agency to confirm the most current rules and information on the disposal requirements of these new low-mercury lamps.

Disposal of Used Fluorescent and HID Lamps

The following sections outline the storage, packing, transportation and disposal options for used mercury-containing lamps discarded as hazardous waste.

Used lamps that test hazardous or are determined hazardous by the generator must be disposed of at a hazardous waste landfill or sent to a lamp recycling facility. *Mercury-containing lamps should never be incinerated.* Most municipal incinerators and solid waste combustors lack the necessary control technologies to effectively remove mercury from the flue gas before it is released into the atmosphere.

Hazardous Waste Landfill

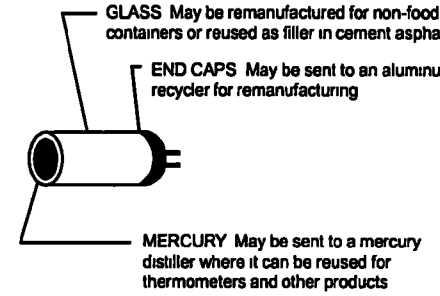
A hazardous waste landfill — also known as a RCRA Subtitle C facility — is a landfill that is permitted under Subtitle C of RCRA and is engineered to contain hazardous waste. Incoming wastes are manifested by the facility and some incoming wastes are subject to treatment standards.

Recycling Fluorescent and HID Lamps

Any lamp may be recycled at permitted or licensed recycling facilities, regardless of whether the lamp tests hazardous. However, for lamps that are hazardous waste, generators must follow generation, transport, and storage requirements under RCRA Subtitle C. Recycling separates the toxic substances (such as mercury) from the glass, aluminum, and other lamp components, and all materials may be re-used in manufacturing other products. Some lamp recycling companies recycle HID lamps as well as fluorescent lamps. A list of companies that provide lamp recycling services is included in the last section.

Lamp Disposal Costs

The costs for lamp disposal by recycling or hazardous waste landfill can vary considerably. Prices vary according to the following.



- quantity of waste generated
- location of disposal site
- proximity to a permitted hazardous waste landfill or recycling facility
- state and local taxes

Negotiate with hazardous waste brokers, transporters, waste management companies, and disposal sites to obtain lowest fees.

Recycling Costs

Recycling costs for fluorescent lamps are typically calculated by linear foot. HID lamp recycling costs are typically quoted on a per-lamp basis.

- fluorescent recycling costs range from $0 06/ft to $0.15/ft
- average cost is $0.10/ft
- approximately $0.40 per F40 lamp
- HID recycling costs range from $1 25/lamp to $4.50/lamp
- average cost is $2.50/lamp

Note: Estimated costs do not include packaging, transportation, or profile fees.

Chemical or Hazardous Waste Landfill Costs

Disposal costs for fluorescent lamps at a hazardous waste landfill range from 25-50 cents per 4-foot tube, not including costs for packaging, transportation, or profile fees.

Packing Lamps for Disposal

To prevent used fluorescent and HID lamps from breaking, lamps should be properly packed for storage and transportation. When lamps are removed and replaced with new lamps (e.g., during group relamping), the used lamps should be packed in the cardboard boxes that contained the replacement lamps. The boxes containing the hazardous waste must be properly labeled. Pre-printed labels or rubber stamps that meet Department of Transportation regulations are recommended for high-volume disposal.

Storing Lamps for Disposal

RCRA sets storage requirements for generators depending on how much hazardous waste they dispose each month.

- Small quantity generators dispose 100 to 1,000 kg of hazardous waste per month (which roughly corresponds to 350 to 3,600 four foot lamps), and can store hazardous waste up to 180 days.
- Large quantity generators dispose over 1,000 kg of hazardous waste per month (more than 3,600 four foot lamps), and can store hazardous waste up to 90 days.
- Conditionally exempt small quantity generators dispose 100 kg or less of hazardous waste per month and are exempt from RCRA storage requirements.

In addition to proper packing, care should be taken when stacking the boxes of used lamps for storage to avoid crushing the bottom boxes under the weight of the boxes on top. If you work with a contractor to maintain your lighting system, you may want to specify a safe storage arrangement in your contract. This approach ensures that your used lamps are not accidentally broken or crushed before they are sent to a disposal facility.

Some organizations crush their used lamps before disposal. This option should be pursued with care. The crushing equipment should have the approval of state and local authorities, and crushing methods should be evaluated *carefully*. The lamp should be crushed entirely *inside the drum or storage unit so that no mercury vapor enters the atmosphere*. There should also be adequate ventilation in the space where the crushing occurs. Under current EPA hazardous waste regulations, crushing lamps before sending them to a hazardous waste landfill may be considered treatment. Therefore, a RCRA treatment permit may be required.

Transportation

Registered haulers and other transporters of hazardous waste calculate transportation fees as cents per pound per mile. The costs will vary according to the number of lamps, drums, or other containers to be removed from the site and the distance from your location to the location of the hazardous waste landfill or recycling facility.

Profile Fees

Operators of chemical or hazardous waste landfills may charge a profile fee to document incoming waste. Profile fees vary depending on the volume of waste materials generated and may be waived if a certain volume or frequency of deliveries is assured. Establishing a working relationship with a lighting management company or lighting maintenance contractor who assists with the maintenance of your lighting system can reduce your disposal costs.

Record Keeping

To track transported waste, EPA requires generators to prepare a *Uniform Hazardous Waste Manifest*. This one-page form can be provided by the recycler or hazardous waste landfill where you dispose of your used fluorescent or HID lamps. The manifest identifies the type and quantity of waste, the generator, the transporter, and the facility to which the waste is being shipped. The manifest must accompany the waste wherever it travels. Each handler of the waste must sign the manifest and keep one copy. When the waste reaches its destination, the owner of that facility returns a copy of the manifest to the generator to confirm that the waste arrived. If the waste does not arrive as scheduled, generators must immediately notify EPA or the authorized state environmental agency (see the last section), so that they can investigate and take appropriate action.

In addition, require your contractor to provide you with documentation verifying that the lamps were properly recycled or disposed in a hazardous waste landfill.

Municipal Solid Waste Landfill

Lamp wastes generated in small quantities (see "Conditionally Exempt Small Quantity Generators" in the previous section) and used fluorescent and HID lamps that *do not test hazardous* under RCRA may be disposed in a properly managed municipal solid waste landfill (RCRA Subtitle D facility). The municipal landfill may impose restrictions or regulate incoming wastes in

accordance with local rules or company guidelines. Disposal costs for lamps at a Subtitle D municipal solid waste landfill are approximately 2-3 cents per 4-foot lamp.

Generators may be legitimately concerned about potential future Superfund liability in connection with this disposal method. All generators of mercury-containing lamp waste, regardless of size, could be held liable in any subsequent Superfund cleanup at a municipal solid waste landfill.

EVALUATING DISPOSAL OPTIONS

Liability Issues

Under CERCLA, owners and operators of facilities and persons disposing hazardous substances may be held liable for response costs, if there is a release or threat of a release of a hazardous substance into the environment. Liability under CERCLA is broad and potentially costly, and can apply retroactively. All generators may incur Superfund liability for disposing mercury-containing lamps or PCB-containing ballasts in a dumpster, local landfill, or recycling, storage, or treatment facility. *Disposal of mercury wastes or PCBs in an environmentally sound manner, however, will help to minimize the potential for environmental contamination and thus also minimize the potential for liability.*

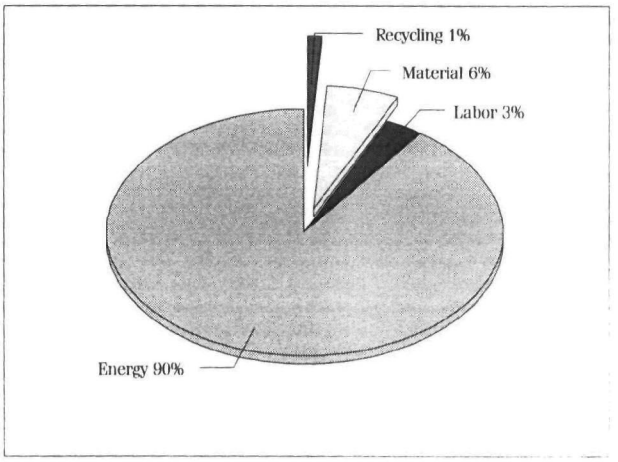
Impact of Lamp Disposal Cost on Profitability

The overall impact of lamp disposal on the profitability of typical Green Lights lighting upgrade projects is minimal. The example below shows the impact of various lamp recycling costs on the internal rate of return (IRR) and the net present value (NPV) of a typical lighting upgrade project. The assumed project consists of upgrading a 4-lamp standard fluorescent system that uses magnetic ballasts and 40-watt lamps with a 4-lamp T8/electronic system and occupancy sensors. Without considering the cost of lamp disposal, the IRR and NPV were calculated at 47.1% and $52,242, respectively. Note that even when assuming lamp disposal costs of $1.50 per lamp — three times the average recycling cost — the IRR and NPV values decreased only slightly to 44.8% and $51,642, respectively. These results were obtained using the Green Lights analysis tool *ProjectKalc*.

Disposal Costs (per lamp)		
Lamp Disposal Cost	**IRR**	**NPV**
No fee	47.1%	$52,242
$0.50	46.3%	$52,042
$1.00	45.5%	$51,842
$1.50	44.8%	$51,642
$2.00	44.1%	$51,442
$2.50	43.4%	$51,242
$3.00	42.7%	$51,042
$3.50	42.1%	$50,842

ProjectKalc Assumptions

63% energy savings
Before: 2x4 4-lamp fixture, 40W T12 lamps, standard ballasts
After: 2x4 4-lamp fixture, 32W T8 lamps, electronic ballasts, occupancy sensors, 25% operating hour reduction



FLUORESCENT LAMP LIFE-CYCLE COST

he total cost of disposing of a lamp as a hazardous waste either by recycling or using a hazardous waste landfill can be put into perspective in three additional ways.
First, the cost of operating a lamp (including ballast losses) for its 20,000-hour life is $64 at the national average electric rate of 7 cents per kilowatt-hour. The 50-cent disposal cost is quite modest in comparison.

Second, replacing an old fixture with a new one usually costs about $100-$150, including installation. Disposing of an old fixture's lamps will cost approximately $2, depending on market conditions and disposal services purchased. If the new fixture uses half the electricity of the old fixture (as is typical with Green Lights upgrades), then the electric bill savings will pay for the cost of disposing of the old lamps after 310 hours of operation — about one month for most businesses. Essentially, lamp disposal will extend the payback of a project by approximately one month.

Third, as shown in the pie chart, the cost of disposing of a lamp as hazardous waste either by recycling or using a hazardous waste landfill represents only a small fraction of the total life-cycle operating costs of a lighting system. If operating a 2-lamp T8/electronic system, disposal as a hazardous waste represents only about 1 percent of total life-cycle operating costs.

- T8 lamps contain about 15 mg of mercury compared to 20-30 mg for T12 lamps (low-mercury T8 lamps contain <10mg)
  - so less mercury is disposed of during relamping
- T8 lamps are more energy efficient than T12 lamps
  - so less mercury is emitted from fossil-fueled generating plants*

*(average emission is 0.04 mg/kWh)

Mercury Emissions and the Environment

The largest man-made sources of mercury in the atmosphere are fossil fuel combustion (58% of total) and municipal solid waste incineration (37% of total). When the mercury in a fossil fuel is heated in a combustor, it turns into a vapor. In vapor form, mercury is difficult to remove from the flue gas and easily escapes into the atmosphere. When moisture vapor in the atmosphere turns to rain, mercury returns to the earth and is deposited in streams, lakes, and other waterways. The mercury that is released into the atmosphere by burning fossil fuels can be substantially minimized using efficient lighting technologies.

On average, fossil-fueled power plants emit 0.04 milligrams of mercury per kilowatt-hour sold. By *maximizing* the efficiency of your lighting system, you can *minimize* mercury emissions from the power plants that provide your electricity.

The amount of mercury emitted into the atmosphere through solid waste incineration and resource recovery facilities (which burn solid waste to produce energy) can be minimized if you adopt a sound lamp disposal practice.

WORKING WITH CONTRACTORS

Your lighting upgrade project specification should include provisions for proper handling and safe disposal of lamps, ballasts, and other hazardous materials that may be associated with the project Here are some general guidelines.

- Investigate your disposal options thoroughly.
- Do not expect your contractor to be well-versed in all disposal requirements and options.
- Ask your lighting or electrical contractor to provide disposal services (either directly or through a sub-contractor) as part of their contract.
- Be specific in your disposal requests (e.g , request high-temperature incineration of PCB-containing ballasts at an EPA-approved incinerator).
- Ask for certifications, licenses, and references from all subcontractors providing waste disposal services.

DEFINITIONS

CERCLA
The Comprehensive Emergency Response, Compensation and Liability Act of 1980. CERCLA — referred to also as "Superfund" — established cleanup and emergency response guidelines for releases of hazardous substances into the environment. A release of a hazardous substance in an amount equal to or greater than its "reportable quantity" (one pound for mercury and PCBs) in a 24-hour period triggers CERCLA notification requirements CERCLA applies to any size generator.

Chemical Waste Landfill
A TSCA permitted landfill that accepts hazardous substances and extremely hazardous waste. These facilities must meet different engineering requirements than RCRA Subtitle C (hazardous waste) landfills.

Conditionally Exempt Small Quantity Generator (CESQG)
A generator who generates 100 kilograms or less a month of a hazardous waste. Under RCRA, small

quantity generators are exempt from RCRA regulations for the transportation, storage, treatment, and disposal of that hazardous waste.

Hazardous Waste Landfill
See Subtitle C landfill.

RCRA
The Resource Conservation and Recovery Act which regulates the management of solid (hazardous and non-hazardous) wastes. Under RCRA, generators of solid wastes are responsible for determining whether the solid wastes are hazardous and following RCRA transportation, storage, treatment, and disposal requirements for those wastes.

RCRA Subtitle C Landfill
A landfill containing hazardous wastes that is permitted under Subtitle C of RCRA. Land disposal of hazardous wastes is restricted to permitted RCRA Subtitle C disposal facilities.

RCRA Subtitle D Landfill
A municipal solid waste landfill containing non-hazardous wastes permitted under Subtitle D of RCRA.

TSCA
The Toxic Substances Control Act of 1976 which regulates the handling, storage, transportation and disposal of polychlorinated biphenyls (PCBs)

INFORMATION RESOURCES

EPA Regional Offices

REGION I (ME, VT, NH, MA, CT, RI)
Environmental Protection Agency
1 Congress St.
10th Floor
Boston, MA 02203
(617) 565-3420

REGION II (NY, NJ, PUERTO RICO, VIRGIN ISLANDS)
Environmental Protection Agency
290 Broadway
New York, NY 10007-1866
(212) 637-3000

REGION III (PA, WV, VA, MD, DE, WASHINGTON DC)
Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107
(215) 566-5000

REGION IV (TN, KY, NC, SC, GA, AL, MS, FL)
Environmental Protection Agency
61 Forsyth St., SW
Atlanta, GA 30303
(404) 562-9900

REGION V (IL, WI, IN, MI, MN, OH)
Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507
(312) 353-2000

REGION VI (NM, TX, OK, AR, LA)
Environmental Protection Agency
"Fountain Place"
12th Floor/Suite 1200
1445 Ross Avenue
Dallas, TX 75202-2733
(214) 665-6444

REGION VII (NE, KS, MO, IA)
Environmental Protection Agency
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7000

REGION VIII (MT, WY, ND, SD, UT, CO)
Environmental Protection Agency
Suite 500
999 18th Street
Denver, CO 80202
(303) 236-3636

REGION IX (CA, NV, AZ, HI, AMERICAN SAMOA, GUAM)
Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-1305

REGION X (WA, OR, ID, AK)
Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101
(206) 553-4973

State Solid and Hazardous Waste Agencies

ALABAMA
Clete Stallworth
Department of Environmental Management
Land Division — Solid/Hazardous Waste
1751 Federal Drive
Montgomery, AL 36130
(334) 271-7761/7735
(334) 279-3053

ALASKA
Steve Willingham
Manager, Solid Waste Program
State of Alaska
Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801-1795
(907) 465-5158

ARIZONA
Anthony Leverock
Arizona Department of Environmental Quality
Hazardous Waste Permits Unit
3033 North Central Avenue
Phoenix, AZ 85012
(602) 207-4160

ARKANSAS
Bob Finn
Department of Pollution Control and Ecology
Hazardous Waste Division
PO Box 8913
Little Rock, AR 72219-8913
(501) 758-0745

CALIFORNIA
Mardis Coers
Department of Toxic Substances Control
PO Box 806
Sacramento, CA 95812-0806
(916) 322-0712

COLORADO
Scott Klarich
Environmental Compliance Officer
Monitoring and Enforcement Section
Hazardous Materials and Waste Management Division
Colorado Department of Health and Environment
Mail Code: HMWMD-HWC-B2
4300 Cherry Creek Drive South
Denver, CO 80222-1530
(303) 692-3369

CONNECTICUT
Mark Parker
Department of Environmental Protection
Waste Management Bureau
79 Elm Street
Hartford, CT 06106
(860) 424-3372

DELAWARE
Karen J'Anthony
Department of Natural Resources and Environmental Control
Division of Environmental Control
Solid Waste/Hazardous Waste Section
Edward Tatnall Building
PO Box 1401
Dover, DE 19901
(302) 739-4403
(302) 739-3689

DISTRICT OF COLUMBIA
Department of Consumer and Regulatory Affairs
Environmental Regulation Administration
Pesticides, Hazardous Waste and Underground Storage Tank Division
Hazardous Waste Management Branch
(Hazardous Waste Disposal)
2100 Martin Luther King, Jr. Ave. SE,
Suite 203
Washington, DC 20020
(202) 404-1167

Department of Public Works
Public Space Maintenance Administration
Bureau of Sanitation Services
(Solid Waste Disposal/Recycling)
2750 South Capitol St., SE
(202) 767-8512

FLORIDA
John Price
Bureau of Solid and Hazardous Waste
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
(850) 488-0300

GEORGIA
Vern George
Environmental Protection Agency
Toxics Branch
345 Courtland St., NW
Atlanta, GA 30334
(404) 562-9900

John Williams
Department of Natural Resources
Environmental Protection Division
Land Protection Branch
205 Butler Street, SE
Suite 1154
Atlanta, GA 30334
(404) 656-2833

HAWAII
Paul Kalai Waa
State of Hawaii
Department of Health
Environmental Management Division
Clean Air Branch
Asbestos Abatement Office
PO Box 3378
Honolulu, HI 96801-3378
(808) 586-8144

IDAHO
Mike Gregory
Division of Environmental Quality
Division of Environment
Bureau of Hazardous Materials
450 W. State Street
Boise, ID 83720
(208) 373-0494

ILLINOIS
Edwin Bakowski
State of Illinois
Environmental Protection Agency
2200 Churchill Road
Springfield, IL 62794-9276
(217) 524-3300

INDIANA
Robert Snodgrass
Solid Waste Permit Section
105 South Meridian Street
Indianapolis, IN 46206-6015
(317) 635-2491

IOWA
Lavoy Haage
Department of Natural Resources
Solid Waste Section
Land Quality Bureau
Wallace State Office Building
900 East Grand Avenue
Des Moines, IA 50319
(515) 281-4968

KANSAS
Ron Smith
Department of Health and Environment
Solid Waste Management Division
Forbes AFB Bldg. No. 740
Topeka, KS 66620
(913) 296-1500

KENTUCKY
Abbie Myer
Department for Environmental Protection
Division of Waste Management
Ft. Boone Plaza
14 Reilly Road
Frankfort, KY 40601
(502) 564-6716 x242

LOUISIANA
Rosselle Foote
Department of Environmental Quality
Office of Solid and Hazardous Waste
Solid Waste Division
PO Box 44307
Baton Rouge, LA 70804
(504) 765-0355
(504) 765-0246

MAINE
Cherrie Plummer
Department of Environmental Protection
Bureau of Oil & Hazardous Materials Control
State House Station 17
August, ME 04333
(207) 287-2651

MARYLAND
Ed Hammerburg
Department of Environment
Toxic Operations Program
2500 Boening Highway
Baltimore, MD 21224
(410) 631-3345

MASSACHUSETTS
Dikran Kaligian
Office of Hazardous Waste
Enforcement Division
1 Winter Street
Boston, MA 02108
(617) 556-1022

MICHIGAN
Tish May
Department of Natural Resources
Hazardous Waste Division
PO Box 30241
Lansing, MI 48909
(517) 373-2730
(517) 373-4630

MINNESOTA
Nancy Ellefson or Bob Cross
Minnesota Pollution Control Agency
Solid or Hazardous Waste Division
520 Lafayette Road North
St. Paul, MN 55155
1-800-657-3864
(651) 297-7560
(612) 296-6300

MISSISSIPPI
David Lee
Department of Environmental Quality
Office of Pollution Control
PO Box 10358
Jackson, MS 39209
(601) 961-5171

MISSOURI
Cathy Flippin
Department of Natural Resources
Division of Environmental Quality
Waste Management Program
Jefferson State Office Building

205 Jefferson Street
PO Box 176
Missouri Boulevard
Jefferson City, MO 65102
(573) 751-3176

MONTANA
Don Vidrine
Department of Health and Environmental Sciences
Environmental Sciences Division
Solid and Hazardous Waste Bureau
PO Box 200901
Helena, MT 59620-0901
(406) 444-1430

NEBRASKA
Jim Harford
Department of Environmental Control
PO Box 94877
State Office Building
Lincoln, NE 68509
(402) 471-8308
(402) 471-2186

NEVADA
Colleen Crips
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333 West Nye Lane
Carson City, NV 89710
(702) 687-5872

NEW HAMPSHIRE
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Department of Environmental Services
Air Resources Division/Toxics Management Bureau
64 N. Main St., Caller Box 2033
Concord, NH 03302-2033
(603) 271-1370

Department of Environmental Services
Waste Management Division/Compliance Bureau
6 Hazen Drive
Concord, NH 03301
(603) 271-2942

NEW JERSEY
John Shevlin
NJ Department of Environmental
Protection and Energy
Hazardous Waste Regulation Program
401 East State Street
CN 421
Trenton, NJ 08625
(609) 984-6650

NJ Department of Environmental Protection and Energy
Solid Waste Management Division
840 Bear Tavern Road
CN 44
Trenton, NJ 08625
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NEW MEXICO
John Gimkowych
New Mexico Environmental Department
Harold Runnels Building
PO Box 26110
Santa Fe, New Mexico 87502

Hazardous and Radioactive Materials Bureau
(505) 827-1508

Solid Waste Bureau
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Columbus, OH 43266-0149
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Public Information and Education

1000 Northeast 10th Street
Oklahoma City, OK 73117-1212
(405) 271-7353

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Rick Vopel
Department of Environmental Quality
Waste Management Clean-up Division
811 S.W. 6th Avenue
Portland, OR 97204
(503) 229-5630

PENNSYLVANIA
Jim Roof
Department of Environmental Protection
Bureau of Waste Management
PO Box 8471
Harrisburg, PA 17105-8471
(717) 787-6239

PUERTO RICO
Environmental Quality Board
Solid and Hazardous Waste Bureau
PO Box 11488
Santurce, PR 00910

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Air and Hazardous Materials
291 Promenade Street
Providence, RI 02908
(401) 222-1360 x7516

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Bureau of Solid and Hazardous Waste
2600 Bull Street
Columbia, SC 29201
(803) 896-4126
(803) 896-4174

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Carrie Jacobson
Department of Water and Natural Resources
Environmental Health Division
Joe Foss Building
Pierre, SD 57501
(605) 773-3153

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Elizabeth Jayne, Technical Coordinator
Department of Environment and Conservation
Division of Solid Waste Management
5th Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535
(615) 532-0834
(615) 532-0780

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Sonia Ralls
Texas Water Commission
PO Box 13087
1700 North Congress Avenue
Austin, TX 78711-3087
(512) 463-7830 (Fax)
(512) 463-8176

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Dennis Downs
Department of Environmental Quality
Division of Solid and Hazardous Waste
PO Box 144880
Salt Lake City, Utah 84114-4880

VERMONT
Lynn Metcalf,
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street
Waterbury, Vermont 05671-0404
(802) 241-3888

VIRGINIA
Robert Lincoln, Waste Division
Virginia Department of Environmental Quality
Special Solid Waste Program
P.O. Box 10009
Richmond, VA 22240
(804) 698-4000

WASHINGTON
Stacie Singleton
Department of Ecology
Solid and Hazardous Waste Program
PO Box 47600
Olympia, WA 98504-7600
1-800-633-7585

WEST VIRGINIA
Tom Fisher
WV Division of Environmental Protection
Office of Waste Management
1356 Hansford Street
Charleston, WV 25301
(304) 558-5989
(304) 558-5929

WISCONSIN
Tim Mulholland
Department of Natural Resources
Bureau of Solid Waste Management
101 South Webster Street
Madison, WI 53707
(608) 266-2111
(608) 266-1327

WYOMING
Tim Link
Department of Environmental Quality
Solid and Hazardous Waste Division
122 West 25th Street
Cheyenne, WY 82002
(307) 777-7752

TSCA, RCRA, and CERCLA Information Phone Lines

Toxic Substances Control Act (TSCA)
Assistance Information Hotline
(202) 554-1404

RCRA/CERCLA Hotline
(800) 424-9346
in the Washington, DC Metro Area
(703) 412-9810

CERCLA National Response Center
(NRC) Hotline
(800) 424-8802

EPA-Approved Disposal Locations

Commercially permitted PCB INCINERATORS

Aptus, Inc.
PO Box 1328
Coffeyville, KS 67337
(316) 251-6380

Aptus, Inc.
P.O. Box 27448
Salt Lake City, UT 84127
11600 N. Aptus Road
Argonite, UT 84029
(801) 531-4200
Chemical Waste Management
PO Box 2563
Port Arthur, TX 77643
(409) 736-2821

Rollins
PO Box 609
Deer Park, TX 77536
(713) 930-2300

Weston
One Weston Way
West Chester, PA 19380
(215) 692-3030

Commercially permitted HAZARDOUS WASTE LANDFILLS

Chemical Waste Management
Call 1-800-843-3604 for
information on CWM disposal
facilities nation-wide.

Envirosafe Services Inc. of Idaho
PO Box 16217
Boise, ID 83715-6217
(800) 274-1516

US Ecology, Inc.
Box 578
Beatty, NV 89003
(702) 553-2203

US Pollution Control, Inc.
Grayback Mountain
8960N Hwy 40
Lake Point, UT 84074
(801) 595-3900

Waste Control Specialists
P.O. Box 1937
Pasadena, TX 77501
(713) 944-5900

THIS IS NOT A COMPLETE LIST OF COMPANIES WHO PROVIDE DISPOSAL SERVICES THROUGHOUT THE UNITED STATES. COMPANIES LISTED IN THIS SECTION ARE NOT ENDORSED BY THE EPA OR THE ENERGY STAR BUILDINGS AND GREEN LIGHTS PARTNERSHIP.

GREEN LIGHTS®

A Bright Investment in the Environment

Green Lights, one of several ENERGY STAR programs, is sponsored by the US Environmental Protection Agency (EPA) and encourages major US corporations and other organizations to install energy-efficient lighting technologies.

Organizations that make the commitment to Green Lights will profit by lowering their electricity bills, improving lighting quality, and increasing worker productivity. They will also reduce the air pollution caused by electricity generation.

For more information, contact the Green Lights program office.

Green Lights Program
US EPA
401 M Street, SW (6202J)
Washington, DC 20460

ENERGY STAR Hotline

☎ 1-888-STAR-YES (1-888-782-7937)
Fax: (202) 775-6680

Green Lights Homepage

www.epa.gov/greenlights/

ENERGY STAR Homepage

www.epa.gov/energystar/

Lighting Waste Disposal is one of a series of documents known collectively as the *Lighting Upgrade Manual*. Other documents in the Manual are Listed below.

LIGHTING UPGRADE MANUAL

Planning

- *Green Lights Program*
- *Implementation Planning Guidebook*
- *Financial Considerations*
- *Lighting Waste Disposal*
- *Progress Reporting*
- *Communicating Green Lights Success*

Technical

- *Lighting Fundamentals*
- *Lighting Upgrade Technologies*
- *Lighting Maintenance*
- *Lighting Evaluations*
- *The Lighting Survey*

Appendices

- *Upgrading Tenant Spaces*
- *Green Lights for Federal Participants*
- *Requesting Proposals*

☛ To order other documents or appendices in this series, contact the ENERGY STAR Hotline at 1-888-STAR-YES. Look in the ENERGY STAR *Update* newsletter for announcements of new publications.

EPA Green Lights
an ENERGY STAR program