



Minnesota  
Pollution  
Control  
Agency

# Managing Electronic Equipment

Hazardous Waste #4.15, July, 1999

*This fact sheet discusses how businesses should manage unusable, outdated and waste electronic equipment.*

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## Background

As the number of products with electronic components continues to grow, the resulting increase in electronic waste poses a management challenge for solid waste managers. Examples of electronic equipment and appliances include: computer monitors and computers, televisions, photocopiers, facsimile machines, video monitors and equipment, telephones and telecommunications equipment, cordless rechargeable appliances, and audio equipment.

Computers provide an example of the increasing number of electronic products in the waste stream. A recent study estimates that while about 35 million personal computers were sold in the United States in 1998, 20.6 million became obsolete. By the year 2002, the number of obsolete computers is projected to exceed the number sold.

Fortunately, environmentally preferable reuse and recycling options for old electronic appliances are becoming more available for businesses.

## Environmental Concerns

Electronic equipment and appliances may contain significant quantities of hazardous materials such as lead, mercury, cadmium and polychlorinated biphenyls (PCBs). If mismanaged, these materials can be harmful to human health and the environment. These materials may be found in batteries, cathode ray tubes, printed wire boards, switches, relays, position sensors, capacitors, transformers and the chassis of the equipment.

(The cathode ray tubes found in computer monitors and televisions may contain more than five pounds of lead!) Minnesota and federal laws prohibit disposal of hazardous materials in solid waste.

## Waste Prevention

Consider repairing or upgrading equipment when possible. Before buying new equipment, ask yourself: "Is this equipment really needed?" If it is, can you purchase equipment that is designed to promote easy repair, recycling or disposal? Can you purchase equipment that has been refurbished or that contains recycled materials? Can old equipment be traded in for new? Can new equipment be leased rather than purchased? If old equipment is still useable and useful, can you donate it to a school, charity, nonprofit or other organization? (If you donate equipment, it is wise to verify what is being done with it.)

## Waste Evaluation

Waste electronic equipment should be considered hazardous because of the presence of cathode ray tubes, printed wire boards, switches, relays, sensors, capacitors, transformers, and chassis containing various hazardous substances. Rather than incur the cost of testing individual equipment or components, businesses may manage electronic equipment according to the Special Waste Management Alternative discussed below.

A business becomes a "hazardous waste generator" of an electronic appliance when the appliance actually becomes a "waste." This is





not always at the time the business decides to get rid of the appliance.

You **are not** a generator if:

- you are a household.
- you are a business that uses electronic equipment and, when you no longer need it, have arranged for it to be reused or recycled, including disassembly of it.
- you are a business that repairs, rebuilds or services electronic equipment but does **not** generate waste electronic equipment or components. (Waste electronic equipment or components should not be returned to the owner in order to prevent waste generation.)
- you are a business that has tested or has knowledge that your electronic appliance is not hazardous.

You **are** a hazardous or special waste generator if:

- you arrange for your electronic equipment to be disposed of. (Electronic equipment and appliances cannot be disposed of in a solid waste landfill or incinerator. Equipment that is not reused or recycled must be disposed of in a hazardous waste facility.)
- you are a business that repairs, rebuilds or services electronic equipment and you end up with unusable electronic equipment or components.
- you are a business that takes electronic equipment from other businesses or households and you disassemble or otherwise cause the electronic appliance to be unusable.
- you collect and store electronic appliances from businesses and households.

### Special Waste Management Alternative\*

To make recycling easier, the Minnesota Pollution Control Agency has provided an alternative to full hazardous waste regulations. Electronic equipment generated by businesses and consolidated from household collections, abandoned waste or cleanups should be managed under the streamlined requirements outlined below.

The advantages of managing waste according to these requirements include:

- no requirement for hazardous waste generator license;
- no license fees for these wastes;
- no reporting requirements;
- wastes do not count toward generator size;

- often cheaper than managing under full hazardous waste requirements;
- self-transportation or hired transportation to in-state collection or recycling locations in accordance with DOT Hazardous Materials transportation requirements is allowed; and
- use of a waste-tracking invoice for most shipments (rather than a hazardous waste manifest and licensed hazardous waste transporter).

\*The Minnesota Pollution Control Agency (MPCA) anticipates adopting a final "Universal Waste Rule" by the end of 1999. Eligible wastes and management requirements are expected to remain essentially unchanged.

### Storage, Containment & Marking

Businesses discarding electronic equipment are prohibited from cutting open or disassembling it in any way except for these activities. They may

- accumulate or bulk wastes;
- discharge, remove and separate batteries by chemistry;
- shred or cut up printed wire (circuit) boards or
- respond to a release.

(Electronic repair services may remove and replace parts without being considered a recycler. Electronic waste-management companies may disassemble equipment but are required to meet more stringent recycler standards.)

**Store** large, intact electronic devices indoors in a manner that will prevent damage to them. Small devices and electronic components, such as printed wire boards and cathode ray tubes, should be stored in a container that is able to contain the waste at all times.

**Contain** devices stored outdoors by placing them on an impermeable surface and covering to protect them from wind, rain, snow, damage, etc.

**Mark** products or containers with a short description "Used \_\_\_\_ for Recycling" or "Waste \_\_\_\_ for Recycling" and the date it became a waste.

**Inspect** containers regularly to make sure they are adequate and the waste is contained. Inspection documentation is recommended but not required.

Businesses should ship waste within one year.



## Disposal & Recycling Options

Disposal of electronic devices and components in solid waste (trash) is prohibited. Minnesota law specifically prohibits the disposal in solid waste of:

- mercury-containing devices or components,
- nickel-cadmium, lead-acid, silver oxide and mercury oxide batteries and
- devices having a concentration of 50 parts per million or more PCBs.

Options for managing outdated electronic equipment include:

1. **Materials exchange:** The Minnesota Technical Assistance Program provides a medium for the exchange of materials that are no longer useable by one party, but can be used by another.
2. **Reconditioning/Refurbishing/Resale Programs:** These kinds of programs apply mostly to equipment that has resale value — such as computers. If using this type of service, ask what is being done with equipment that cannot be reconditioned, refurbished or resold. Also inquire about how unusable components are managed.
3. **Recycling:** Recyclers disassemble equipment, salvage parts and send unused materials to final processors. If using this kind of service, ask what percentage of the equipment is being recycled and what is being done with the unusable materials.
4. **Dealer/Manufacturer Take Back:** Some dealers or manufacturers will take back the old equipment when you purchase new.

Note: Some electronics-management services ship electronic devices and components overseas. The MPCA cautions generators to make sure they are aware of the final disposition of their waste electronic devices in order to limit their “cradle-to-grave” responsibilities for these wastes.

Businesses always have the option of disposal as a hazardous waste under the more stringent hazardous waste rules. A disadvantage is that the equipment is destroyed, preventing opportunities for recycling or reuse. For more information about the hazardous waste rules, see Waste fact sheet 1.00, *Summary of Hazardous Waste Requirements*.

## Shipping Requirements

If you are using a consolidation site located in Minnesota, you may transport waste electronics in your business vehicle as long as the load is secure and you follow any applicable DOT Hazardous Materials shipping requirements. (Contact the receiving site to determine whether they have additional requirements.) The waste must be accompanied by a waste-tracking invoice containing:

- the name and address of your business,
- a contact person at your business,
- the name and address of the facility to which you are shipping,
- the date the shipment is initiated,
- a description of the waste and
- the quantity or amount of waste shipped.

If shipping to a recycler out of state, you may use a shipping paper provided the waste does not pass through a state requiring a manifest.

If you are shipping to a hazardous waste disposal facility or if the waste will pass through a state requiring a manifest, you must use a hazardous waste manifest and a licensed hazardous waste transporter.

## Required Paperwork

Keep copies of documents showing evaluation (if needed) and disposition of waste for at least three years.



## More Information

The Twin-City Metropolitan Counties and Minnesota Pollution Control Agency (MPCA) have staff that can answer regulatory questions. Minnesota Technical Assistance Program (MnTAP) and Office of Environmental Assistance (OEA) staff can assist with options for reuse and recycling. See telephone numbers below.

**Minnesota Pollution Control Agency**

Toll free ..... (800) 657-3864  
Brainerd ..... (218) 828-2492  
Detroit Lakes ..... (218) 847-1519  
Duluth ..... (218) 723-4660  
Marshall ..... (507) 537-7146  
Rochester ..... (507) 285-7343  
Willmar ..... (320) 214-3786  
St. Paul ..... (651) 297-8363  
Web site ..... <http://www.pca.state.mn.us>

**Metro County Hazardous Waste Offices**

Anoka County ..... (612) 422-7093  
Carver County ..... (612) 361-1800  
Dakota County ..... (612) 891-7011  
Hennepin County ..... (612) 348-8100  
Ramsey County ..... (651) 773-4466  
Scott County ..... (612) 496-8177  
Washington County ..... (651) 430-6655  
Web sites .... [http://www.co.\[county\].mn.us](http://www.co.[county].mn.us)

**Minnesota Technical Assistance Program**

Minneapolis ..... (612) 627-4646  
Toll free ..... (800) 247-0015  
Web site ..... <http://www.mntap.umn.edu>  
Materials Exchange Web site:  
..... <http://www.mnexchange.org>

**Office of Environmental Assistance**

St. Paul ..... (651) 296-3417  
Toll free ..... (800) 657-3843  
Web site ..... <http://www.moea.state.mn.us>

*This fact sheet has been developed by the MPCA in cooperation with the Office of Environmental Assistance, the Minnesota Technical Assistance Program and Metropolitan County staff.*



## Electronic Management Companies

The MPCA maintains the following list of electronic management companies solely as a service to Minnesota generators of unusable or outdated electronic equipment. Information was voluntarily supplied by the companies and is not necessarily a complete list of available services. The MPCA, by providing this list, does not endorse specific services nor does it imply that the companies are in compliance with applicable laws. The MPCA cautions generators to personally evaluate the services and compliance status of any company they use to manage equipment. The MPCA periodically updates this list.

Here are some questions that may help you evaluate potential electronic management companies:

- Do they need a license or permit for their operation? Do they have one?
- Does the company accept the type of equipment you would like to recycle?
- What fee do they charge?
- How do they manage the equipment (disassemble, resale, etc.) and wastes?
- Does the company have contracts with smelters or scrap dealers for metals? With precious metal refiners for waste circuit boards? Has the company performed an environmental audit on the receiving companies?
- Does the company have a program for managing cathode ray tubes (CRTs)?
- Can they provide certification that explains the disposition of the equipment and its parts? If they cannot provide certification, do they have any references?

Company	Notes
<b>Asset Recovery</b> St. Paul (651) 602-0789	Accepts all types of electronics. Charges by pound. Drop off; charge for pick up.
<b>Charitable Organizations</b> (Local, Goodwill, Salvation Army)	Consult your yellow pages and call before delivering equipment. Goodwill only accepts computer processing units (CPUs) and printers — no monitors or televisions.
<b>Computers for Schools Program</b> Bayport (651) 779-2816	Only accepts 486 or faster computers and working color monitors. Drop off; will pick up if palletized and 10 or more complete systems. Makes available to schools at no charge.
<b>Computer Recyclers</b> St. Louis Park (612) 920-0850	Accepts all electronics. Charges by piece. Drop off; charge for pick up. Disassembles and recycles components in U.S.
<b>Green Lights</b> Blaine (612) 785-0456 (800) 208-8340	Accepts all electronics. Charges by pound. Drop off; pick up for a charge. Recondition or broker.
<b>Materials Processing Corp.</b> Eagan (651) 681-8099	Accepts all electronics. Charges by pound or piece. Drop off; charge for pick up. Recycled in U.S. unless customer authorized overseas recycling.
<b>Recyclights, Inc.</b> Bloomington (612) 948-0626 (800) 831-2852	Accepts all electronics that plug in. Charges by pound. Drop off; charge for pick up. Preliminary disassembly; on-site recycling of removed components.
<b>Retrofit Recycling, Inc.</b> Owatonna (507) 455-1258 (800) 795-1230	Accepts all types of electronics. Charges by pound or piece. Charges for drop off or pick up. Reconditions on site or broker.
<b>Waste Management Asset Recovery Group</b> Inver Grove Heights (651) 451-1145	Accepts all electronics that plug in. Charges by pound; buys select items. Drop off; charge for pick up. Some equipment resold "as is"; others disassembled.
<b>Zeros North USA, Inc.</b> Bemidji (218) 694-3300	Accepts circuit boards statewide in any quantity. Drop off at consolidation sites statewide or delivery to plant. Call for pricing and details.