

# The GREEN MACHINE Recycling Project – Fairchild AFB Youth Programs



## **The Project Overview**

At Fairchild AFB, our combined Torch and Keystone Club members created a project where we would recycle old computers in an environmentally safe manner. Since we were originally planning on disposing of computers that were Government purchased systems, our youth and staff quickly found out that this was not going to be such an easy project. During the course of this project we had to overcome many roadblocks and hurdles in order to accomplish our goals, while adhering to Air Force regulations, United States Environmental Protection Agency (EPA) regulations, as well as Washington State regulations. Through an educational outreach program aimed at the FAFB community and a concerted effort by our youth and staff, in the end we were able to recycle 8 Computers and 8 CRT monitors in an eco-friendly manner.

## **Why Recycle Old Computers?**

Obsolete computers are a valuable source for secondary raw materials, if treated properly; if not treated properly, they are a source of toxins and carcinogens. Rapid technology change, low initial cost, and even planned obsolescence, have resulted in a fast-growing surplus of computer components around the globe. Technical solutions are available, but in most cases a legal framework, a collection system, logistics, and other services need to be implemented before a technical solution can be applied. According to the U.S. Environmental Protection Agency, an estimated 30 to 40 million surplus PC's, which it classifies under the term "hazardous household waste", will be ready for end-of-life management in each of the next few years. The U.S. National Safety Council estimates that 75% of all personal computers ever sold are now surplus electronics.

Many materials used in the construction of computer hardware can be recovered in the recycling process for use in future production. Reuse of tin, silicon, iron, aluminum and a variety of plastics — all present in bulk in computers — can reduce the costs of constructing new systems. In addition, components frequently contain copper, gold, and other materials valuable enough to reclaim in their own right.

They also contain many toxic substances, such as dioxins, polychlorinated biphenyls (PCBs), cadmium, chromium, radioactive isotopes, and mercury. A typical computer monitor may contain more than 6% lead by weight, much of which is in the lead glass of the cathode ray tube (CRT). A typical 15-inch computer monitor may contain 1.5 pounds of lead, but other monitors have been estimated as having up to 8 pounds of lead. Circuit boards contain considerable quantities of lead-tin solders and are even more likely to leach into groundwater or to create air pollution via incineration. Additionally, the processing required to reclaim the precious substances (including incineration and acid treatments) may release, generate, and synthesize further toxic byproducts.



Computers turned into a Transfer Station before transport To a landfill (Note: These are File Photos used for reference)

A major computer recycling concern is export of waste to countries with lower environmental standards. Companies may find it cost-effective in the short term to sell outdated computers to less developed countries with lax regulations. It is commonly believed that a majority of surplus laptops are routed to developing nations as "dumping grounds for e-waste". The high value of working and reusable laptops, computers, and components (e.g., RAM) can help pay the cost of transportation for a large number of worthless "commodities". Broken monitors, obsolete circuit boards, and short-circuited transistors are difficult to spot in a container load of used electronics. (Source – Wikipedia.org, U.S. EPA, Washington State Department of Ecology).

#### **What Youth & Staff Learned About Electronic Recycling Options**

1. The U.S EPA has very strict rules governing the disposal of Cathode Ray Tube (CRT) monitors due to the high levels of lead. The disposal of these items are also regulated by the State of Washington. (See Attachment)
2. The U.S. EPA has very strict regulations governing the disposal of mercury (classified as a Universal Waste) and many computers contain trace amounts of mercury. The State of Washington also regulates the disposal of these items. See Attachment)
3. Spokane County, in the State of Washington has 21 recycling agencies that are certified by the state to properly dispose of computers, monitors and televisions. These sites include both for-profit companies (which charge a fee for recycling, & make a profit by selling component parts), non-profit agencies (such as the Goodwill or Salvation Army), and commercial business which have recycling programs as a part of their community service outreach (such as Staples or Office Depot).
4. Government-owned computers have regulations which determine how you can process computers for disposal. There are different rules depending on the source of funds used for the purchase (APF vs NAF), and whether the component is tracked on the unit's ADPE listing.

**FAB Pre-Teens & Teens Doing Work:**



**Torch Club Member Keyana K. researching Washington State disposal regulations.**



**Keystone Club Member Kellan L. Preparing to open a computer case & removing the Hard Drive**



**Kellan L. Destroying the Hard drive of one computer.**



**Keystone Member Chris A. preparing old CRT monitors on a pallet for delivery to the recycling center.**

**Agencies:**

United States Environmental Protection Agency (EPA): [www.epa.gov/waste/hazard/recycling](http://www.epa.gov/waste/hazard/recycling)

Washington State Department of Ecology: [www.ecy.wa.gov/](http://www.ecy.wa.gov/)

92<sup>nd</sup> Communications Squadron

92<sup>nd</sup> Force Support Squadron

Sunshine Disposal & Transfer Station

Goodwill Agencies of Spokane County

Earthwork's Recycling Center

**Attachments:**

EPA – Mercury Containing Equipment Classified as Universal Waste

EPA – Easier Recycling of Cathode Ray Tubes

**Additional Information:**

Washington State Department of Ecology

Public Law 70.95NRCW – Electronic Product Recycling

<http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95N>