

# 2011

## Comprehensive Program to Provide for the Proper Handling of Covered Electronic Devices



WV Solid Waste Management Board

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## INTRODUCTION

During the 2010 legislative session, Senate Bill 398 passed into law. The bill requires the WV Solid Waste Management Board (SWMB) to develop a Comprehensive Program to Provide for the Proper Handling of Covered Electronic Devices (CEDs), as per W.Va. Code § 22-15A-22(e).

The bill bans certain electronics, CEDs, from West Virginia landfills. CEDs include televisions, computers or video display devices with a screen that is greater than four inches measured diagonally. "Covered electronic device" does not include a video display device that is part of a motor vehicle, or that is contained within a household appliance or commercial, industrial or medical equipment.

A "Computer" as defined in W.Va. Code § 22-15A-2(4) means a desktop, personal computer or laptop computer, including a computer monitor. Computer does not include a personal digital assistant device, computer peripheral such as a mouse or other similar pointing device, a printer or a detachable keyboard.

Acknowledging that the issues surrounding the proper disposal of CEDs are evolving, the SWMB has created a website as a companion to this document. The website, <http://www.state.wv.us/swmb/RMDP/EWaste/Index.html>, should be considered a living document which will be updated as information presents itself and circumstances change.

This program was developed with the input and concerns of all stakeholders, (a list of which can be found in the acknowledgements) and with an understanding of the shared responsibilities of each party, both legally and environmentally.

The program and staff recommendations were written with the knowledge that they would be the framework for the Legislative Rule to be developed by the Department of Environmental Protection, as per W.Va. Code § 22-15A-22(f). In addition, although there are no specific recommendations from staff on the role of the Public Service Commission (PSC), it is acknowledged that they will have a role in the future of the recycling of CEDs. As landfills, haulers and transfer stations document the costs involved with this activity the PSC will determine on a case by case basis the validity of requests for landfill/transfer station rate increases and the tariffs of waste haulers.

This program is designed to address the issues as they exist at the time of publication and presentation to the 2011 Regular Legislative Session of the West Virginia Legislature. As technology, circumstances and issues change in the future, modifications will be made to the companion website and will be addressed in the subsequent West Virginia Solid Waste Management State Plans.

## EXECUTIVE SUMMARY

Due to the rapid growth in the sales of electronics and their relatively short life span, the nation is facing the increasing problem of how to dispose of these materials in an environmentally safe manner. Aware of this growing problem, the US Environmental Protection Agency (EPA) launched an electronics recycling pilot project in 2002 in Region III. Region III is comprised of West Virginia, Maryland, Delaware, Pennsylvania, Virginia and Washington D.C.

The electronics recycling, or e-cycling, program was designed to utilize a system of shared responsibilities to effectively address this growing environmental and social issue. In addition to collecting and recycling end-of-life electronics, a larger objective of the project was to gather data to assist with establishing electronics recycling programs in the future. Surveys were conducted at collection events to determine the costs involved and to define the roles and responsibilities of key stakeholders; government, consumers, electronics manufacturers, retailers, waste haulers, landfill operators, transfer station operators and electronic recyclers.

A series of bills passed by the WV Legislature and signed into law by the Governor have slowly built a framework in West Virginia to help facilitate electronics recycling. Senate Bill 746, passed in 2008 required all manufacturers of covered electronic devices (CEDs) to register with the WV Department of Environmental Protection (DEP) by January 1, 2009. CEDs are defined as computers, monitors, televisions and video display devices four inches or larger measured diagonally.

Manufacturers were required to pay an initial registration fee of \$10,000 or \$3,000. The lower fee applies to manufacturers who offer free take back programs to consumers. Each subsequent year fees drop to \$5,000 and \$500. The money from the registration fees goes into the "Covered Electronics Devices Takeback Fund", administered by the Secretary of the DEP and used for recycling grants for counties and municipalities for recycling and other programs that divert covered electronics devices from West Virginia's waste stream.

Senate Bill 398, signed into law in 2010, ban CEDs from being deposited of in solid waste landfills in West Virginia, effective January 1, 2011, as per W.Va. Code §22-15A-22(d). It also directed the SWMB to design a comprehensive program for the proper handling of covered electronics, W.Va. Code § 22-15A-22(e), and instructed the WV DEP to promulgate Rule for the implementation and enforcement of this E-Waste Program, W.Va. Code § 22-15A-22(f).

The SWMB, with input from a stakeholders group, developed this document to comply with the directives of the bill as a comprehensive program for the proper handling of covered electronic devices. The Staff Recommendations Section of this document addresses each stakeholder

separately, clearly defining each group's role in accomplishing the goals established by the legislation.

The success of this program hinges on the acceptance by the stakeholders of their individual responsibilities and the cooperation, communication and education of everyone involved to ensure the safe and environmentally sound handling of end-of-life electronics.

West Virginia has now joined 16 other states in imposing bans on electronics in landfills. Acknowledging that the issues surrounding the proper disposal of CEDs are evolving, the SWMB has created a website as a companion to this document. The website <http://www.state.wv.us/swmb/RMDP/EWaste/Index.html> should be considered a living document which will be updated as information presents itself and circumstances change.

Prior to the ban, obsolete electronics went from manufacturers or retailers to consumers, then from consumers to recyclers or waste haulers and ultimately from waste haulers to landfills. At the inception of the ban, waste haulers will still be required to pick up CEDs from their residential subscribers, as per the Public Service Commission's (PSC) Bulky Goods Rule, 150CSR9.6.6.c. Built into the Rule is the hauler's ability to charge each residential subscribing customer a \$1.00 per month surcharge to offset any additional costs incurred in handling "bulky" items.

Landfills and transfer stations are encouraged to accept CEDs, store them at their respective facilities and contract with an electronic recycler to properly dispose of the items. Landfill and transfer station operators choosing to accept CEDs should document any additional costs incurred in the handling of these items. Although there are no specific recommendations from staff on the role of the PSC, it is acknowledged that they will have a role in the future of the recycling of CEDs. As landfills, haulers and transfer stations document the costs involved with this activity the PSC will determine on a case by case basis the validity of requests for landfill/transfer station rate increases and the tariffs of waste haulers.

The Financial Analysis Section of this document seeks to illustrate the costs associated with the recycling of CEDs.

The SWMB believes that the information contained in this document will lead to the acknowledgement of shared responsibilities for all stakeholders. Also, that the framework contained in this program and the accompanying information included throughout this document and on the SWMB website will help in establishing "best practices" for the recycling of electronics in West Virginia.

## HISTORY OF ELECTRONICS RECYCLING

The US EPA has been tracking the purchase and disposal of electronics for well over a decade. Due to the rapid growth of electronic sales and the relatively short life of these products, it was apparent early on that the number of these items was quickly increasing in the waste stream.

The EPA's Municipal Solid Waste Characterization Report published in 1999 placed the number of selected consumer electronic products shipped by manufacturers to the US in 1984 at less than 150 million units. By 1999, that number had increased to more than 400 million units. Because of the escalation in the amount of electronics purchased, foretelling an increase in their disposal, in early 2000 the US EPA decided to launch an electronics recycling pilot project using Region III. Region III is comprised of West Virginia, Maryland, Delaware, Virginia and Washington D.C.

In 2002, the WV SWMB, DEP, and seven local WV Solid Waste Authorities (SWAs) teamed up with the EPA to initiate the first end-of-life electronics collection program in the nation. The electronics recycling or e-cycling program was designed to utilize a system of shared responsibility to effectively address what had become an important and growing environmental and social issue – what to do with obsolete electronics. (Attachment A)

In addition to collecting and recycling end-of-life electronics, a larger objective of the pilot project was to gather data to assist with establishing electronics recycling programs in the future. Surveys were conducted at collection events to determine costs involved, and to define the roles and responsibilities of government, consumers, electronics manufacturers, retailers, and recyclers. (Attachment B)

Participating SWAs collected almost 137 tons of obsolete electronics in a series of one and two day events. Waste Management Inc. and West Virginia University collected an additional 128 tons of material, bringing 2002's recycling totals to 264.90 tons. (Attachment C)

The initial pilot project was intended to be a three year study. Unfortunately after one year the project ended. Because of the costs associated with staging these events and the limited funds available, few events were held after the initial project. In 2003 and 2004, only three community events were held collecting 45.8 tons of electronics.

In 2005 Envirocycle, Inc., a full service e-waste recycling company established a facility in Jackson County, WV. Since that time two more electronics recyclers have started up in the state and Envirocycle has closed their facility.

The National Center for Electronics Recycling (NCER) was also established in 2005. This non-profit organization, doing business in Parkersburg, WV, acts as a third party organization serving state, regional and national interests on various electronic recycling issues.

Eight more community events were held in 2005, collecting 255.3 tons of electronics in the state that year.

In 2006, the West Virginia High Tech Consortium Foundation provided funding for a statewide electronics programs. The SWMB, DEP, NCER, SDR Plastics and Amandi Services, formerly Envirocycle, Inc., joined forces to organize and coordinate these events throughout the state. Between the 14 statewide events and tonnages from PC Renewal, a West Virginia based electronics recycler, West Virginia University and Waste Management, Inc., 787.51 tons of materials were collected that year.

Grant dollars provided by the SWMB and the DEP REAP Recycling Grant program funded some collection projects in 2007. With the help of these two agencies, PC Renewal, NCER and Amandi, Inc. a total of 595.29 tons of electronics were collected for recycling that year.

The 2008 Legislative session produced Senate Bill 746, creating the “Covered Electronics Devices Takeback Fund.” This bill required any manufacturer who marketed CEDs in West Virginia to register with the DEP, pay an initial registration fee and set up a free takeback program for their products. The registration fees and any penalties paid were used to develop a grant program which provides funds to municipalities and county entities to help support electronic recycling programs and events in the state.

In 2010, the West Virginia Legislature passed Senate Bill 398 prohibiting the disposal of covered electronic devices from West Virginia landfills effective January 1, 2011. As defined in W.Va. Code § 22-15A-2.6, a “covered electronic device” means a television, computer or video display device with a screen that is greater than four inches measured diagonally. “Covered electronic device” does not include video display device that is part of a motor vehicle or that is contained within a household appliance or commercial, industrial or medical equipment. In accordance with W.Va. Code § 22-15A-22(e), the West Virginia Solid Waste Management Board has developed this Comprehensive Program to Provide for the Proper Handling of Covered Electronic Devices.

## **ELECTRONIC WASTE: STATE LAWS**

Due to the rapid growth of electronic sales in the US and the relatively short life of these products, it has become apparent that disposal is quickly becoming a problem. Without nationwide standards regulating the disposal of electronics, states have begun to develop their own standards and procedures for dealing with electronic waste. What has resulted is a patchwork of laws and regulations which differ from state to state.

Following is a summary of electronic waste legislation for different states as it presently exists.

### **State Landfill Bans**

Massachusetts was the first state to ban electronic waste from landfills. The ban went into effect April 1, 2000. Since then, 17 states, including West Virginia, have banned electronic waste (e-waste) from disposal in landfills. Not all landfill bans are the same. The following list demonstrates some of the differences.

- Arkansas - Electronics and computer equipment (not defined), effective March 18, 2005.
- California – "All Electronic Devices" (televisions, computer monitors, computers, printers, cell phones, VCRs, telephones, radios, microwaves, etc.), effective 2002, expanded in 2006.
- Connecticut – Computers, laptops, monitors, TVs, effective January 1, 2011.
- Illinois – "Covered Electronic Devices" (CED): televisions, monitors, computers, laptops, printers, effective January 1, 2012.
- Indiana – Computers, laptops, monitors, TVs, printers, faxes, scanners, keyboards, mice, DVDs, VCRs, effective April 1, 2011.
- Maine – Cathode Ray Tubes (CRTs), effective July 20, 2006.
- Massachusetts - Cathode Ray Tubes (CRTs), effective April 1, 2000.
- Minnesota - Cathode Ray Tubes (CRTs), effective July 1, 2006.
- New Hampshire - Video display devices: devices that include a cathode ray tube, liquid crystal display, gas plasma, digital light processing, or other image projection technology, greater than 4 inches when measured diagonally, effective July 1, 2007.

- New Jersey - Computers, laptops, monitors, TVs, effective January 1, 2011.
- New York - Televisions, monitors, computers, laptops, printers, keyboards, mice, effective April 1, 2012.
- North Carolina - Computers, monitors, laptops, keyboards, mice, effective January 1, 2012.
- Oregon - Computers, laptops, monitor, TVs, effective January 1, 2010.
- Pennsylvania – TVs, computers, laptops, effective November 23, 2012.
- Rhode Island - CRT TVs, LCD TVs, plasma TVs, desktop monitors, LCD monitors, flat panel monitors, laptops, central processing units (CPU), effective January 1, 2008.
- West Virginia - TVs, computers or video display device with a screen that is greater than four inches measured diagonally, effective January 1, 2011.
- Wisconsin - Computers, laptops, monitors, TVs, printers, fax machines, keyboards, mice, DVDs, VCRs, effective January 1, 2010.

In addition to environmental benefits of recycling instead of landfilling electronics, some states have reported other positive outcomes as a result of e-waste landfill bans. The Massachusetts Department of Environmental Protection reported that after implementation of their ban, the following outcomes were observed:

- Processing cost for end-of-life electronics fell by 50% in the preceding 5 year period.
- The state collected 7,718 tons of e-waste in 2007 compared to 167 tons in 2000.
- In 1997 no companies were accepting consumer electronics for recycling, in 2010 there were 40+ companies serving Massachusetts and surrounding states in that capacity (MA, NH, CT, ME, RI).
- A noticeable increase in the number of recycling related job training and development programs in both nonprofits and vo-techs were observed.

## **State Producer Responsibility Laws**

At the time of publication, 23 states had passed legislation regarding the proper management of electronic waste. This means that approximately 62% of the population of the U.S. is now covered by a state e-waste recycling law. All 23 states either mandate or support statewide e-waste recycling in one form or another. All state's laws except California use the Producer Responsibility approach, where the manufacturers must pay for recycling. California passed the first e-waste legislation in 2003; Maine followed in 2004; Maryland in 2005; Washington in 2006; Connecticut, Minnesota, Oregon, Texas and North Carolina in 2007; New Jersey, Oklahoma, Virginia, West Virginia, Missouri, Hawaii, Rhode Island, Illinois and Michigan in 2008; Indiana and Wisconsin in 2009 and Vermont, South Carolina and New York in 2010. Producer responsibility laws vary from state to state. To date, only 17 of the 23 states have chosen to accompany these laws with a landfill ban on electronics and only 7 states chose to include goals or targets for removing electronic waste from their waste stream in their legislation.

In addition, 7 states chose to include language on toxic materials related to the European Union's "Restriction of Hazardous Substance" (RoHS) directive. State legislation varies in the scope of products covered. Some cover a wide variety of electronics while others are limited to just a few of the more hazardous. Funding for electronic recycling programs vary from state to state.

It should be noted that at the time of publication, state level legislation concerning electronics recycling and landfill bans on electronics are changing rapidly with new legislation both proposed and adopted every year.

## ELECTRONIC WASTE: FEDERAL REGULATIONS

### Regulation of CRTs

Many electronics, including CRT (cathode ray tubes) computer monitors, CRT TVs, and smaller items such as cell phones test “hazardous” under Federal law. As a result, they are subject to special handling requirements. At the same time, under certain circumstances, they may also be subject to exemptions. For example, computer monitors and televisions sent for continued use (i.e., resale or donation) or recycling are classified as Universal Waste and as such, are not considered to be hazardous wastes.

This situation was created under Federal Rule, 40 CFR Parts 9, 260, 261, et al, Cathode Ray Tubes, Final Rule, which streamlines management requirements for recycling of used CRTs and glass removed from CRTs under the Resource Conservation and Recovery Act (RCRA). The rule excludes these materials from the RCRA definition of solid waste if certain conditions are met. This is intended to encourage recycling and reuse of used CRTs and CRT glass.

**Export Requirements for CRTs:** Used CRTs *exported for recycling* must comply with requirements that are specified in detail in 40 CFR 261.39(a) (5). Exporters are required to notify EPA Office of Enforcement and Compliance Assistance (OECA) of an intended shipment 60 days before the shipment. Notification may cover exports extending over a 12 month or shorter period. Notification must include contact information about the exporter and recycler and must include an alternate recycler. It must also include a description of the recycling, frequency and rate of export, means of transport, total quantity of CRTs, and information about transit countries.

OECA will notify the receiving country and transit countries. When the receiving country consents in writing to the receipt of the CRTs, OECA will forward the consent to the exporter. The exporter may not ship the CRTs until they receive the consent. If the receiving country does not consent or withdraws a prior consent, EPA will notify the exporter in writing. Exporters must keep copies of notifications and consents for three years following receipt of the consent. Consent is not required from transit countries, but EPA will notify the exporter of any responses from these countries.

Persons *who export used, intact CRTs for reuse* must submit a one-time notification to the appropriate EPA Region with contact information and a statement that they are exporting the CRTs for reuse (see 40 CFR 261.41). They must keep copies of normal business records demonstrating that each shipment will be reused. Records must be retained for three years.

**Regulation of Circuit Boards:** According to the US EPA, circuit boards are subject to a special exemption from Federal hazardous waste rules.

- Whole unused circuit boards are considered unused commercial chemical products, which are unregulated.
- Whole used circuit boards meet the definition of spent materials but also meet the definition of scrap metal. Therefore, whole used circuit boards that are recycled are exempt from the hazardous waste regulations.
- Shredded circuit boards are excluded from the definition of solid waste if they are containerized (i.e., fiberpaks) prior to recovery. These shredded circuit boards cannot contain mercury switches, mercury relays, nickel cadmium batteries, or lithium batteries. If these materials are not treated this way, then they are considered hazardous waste and must be treated as such.

**Regulation of Mercury Containing Equipment:** Mercury can be found in small quantities in batteries, backlights of LCD screens, switches and printed circuit boards. Mercury containing equipment was added to the list of items identified as Universal Waste (40 CFR Parts 9, 260, 261, et al) under RCRA, on August 5, 2005 and may be subject to special handling but are generally not considered to be hazardous waste if they are to be reused or recycled.

**When E-Waste Tests “Hazardous”:** Wastes from facilities that generate over 100 kilograms (about 220 pounds) per month of hazardous waste are regulated under Federal law when the waste is disposed. CRTs from such facilities sent for disposal (as opposed to reuse, refurbishment or recycling) must be manifested and sent as “hazardous waste” to a permitted hazardous waste landfill.

Businesses and other organizations that send items for disposal (as opposed to reuse, refurbishment or recycling) less than 100 kilograms (about 220 pounds) per month of hazardous waste are not required to handle this material as hazardous waste. If a “small quantity generator” wishes to dispose of a small quantity of CRTs or other used electronics that test hazardous under Federal law, these materials can go to any disposal facility authorized to receive solid waste (e.g., a municipal landfill), unless state law requires more stringent management (e.g., West Virginia’s passage of SB 398 banning covered electronics from disposal in landfills after January 1, 2011).

Used computer monitors or televisions generated by households are not considered hazardous waste and are not regulated under Federal regulations. State laws may be more stringent in regards to electronics from households (e.g., WV SB 398).

## STAFF RECOMMENDATIONS

With the passage of SB 398, and after a thorough analysis of information gathered through research, historical data and input from stakeholders, the SWMB has developed the following program to facilitate the proper handling, recycling or reuse of CEDs in West Virginia. Each of the following groups has a responsibility to their customers and to the environment to strive to comply with this program to the best of their ability.

The SWMB recognizes that without the proper coordination, cooperation and education between the consumer, waste hauler, transfer station, landfill and all affected regulatory agencies, gaps in service could result in some areas of the state being underserved.

Because of a general confusion among stakeholders, the lack of a funding mechanism and an insufficient time frame for implementation and rule making, the SWMB recommends a delay in the implementation of the disposal ban to allow for a more coordinated effort between stakeholders.

### **Manufacturers Responsibility:**

- Comply with the requirements of Senate Bill 746, **West Virginia Electronics Manufacturer Registration and Takeback/Recycling Program. Details on this program are available at:** <http://www.dep.wv.gov/dlr/reap/cedprogram/Pages/default.aspx>.
- Manufacturers to date are responsible for managing their own products in house. There are no requirements based on WV law that mandates the manufacturer to recycle.
- Further information regarding this can be found on the SWMB website at: <http://www.state.wv.us/swmb/RMDP/EWaste/ManufacturesInformation.htm>.

*Manufacturers that produce an average of more than one thousand covered electronic devices (CEDs) per year for the previous three year period are required to register with the State of West Virginia's Department of Environmental Protection REAP Program. They must also pay a registration fee which ranges from \$10,000/\$3,000 for the initial registration to \$5,000/ \$500 for a renewal registration. Fees are set at a lower amount if the manufacturer provides a take back program that is free to the customer.*

### **Retailers Responsibility:**

- Retailers are encouraged to offer recycling services for their customers. For more information about e-cycling retailers should visit the SWMB website at: <http://www.state.wv.us/swmb/RMDP/EWaste/RetailersResponsibility.htm>.
- Implement a program to verify electronics manufacturer compliance with the WV CED Takeback/Recycling Program established by the West Virginia Department of Environmental Protection. Current compliance list is provided at <http://www.dep.wv.gov/dlr/reap/cedprogram/Pages/default.aspx>, click the CED Manufacturers Certification link located under *REAP E-Waste Program*.
- Establish a method for reporting noncompliant vendors to the WV DEP.
- Implement an in store public education program, including point of sale materials offering consumers purchasing CEDs information on the proper disposal of said items, including local, manufacturer and in store recycling opportunities.
- When retailers act as providers for take back programs, they should establish a system for tracking the quantities and types of CEDs collected. Tracking information should be made available to the WV SWMB and WVDEP upon request.

*Under Senate Bill 746, retailers selling covered electronic devices not authorized for sale in this state may be subject to penalties and fines not to exceed \$5,000 for the year.*

### **Haulers Responsibility:**

- The SWMB recommends that waste haulers continue to follow the provisions of the Public Service Commission's Bulky Goods Rule, WV Code Rules §150-9.6.6.c. and pick up CEDs from their residential subscribing customers under the guidelines they have set for pick up of all other bulky goods.
- Establish a program for the proper collection and handling of CEDs. More information regarding this can be found on the SWMB website at: <http://www.state.wv.us/swmb/RMDP/EWaste/WasteHaulers.htm>.
- The program should include instructions on how residential subscribing customers should handle the disposal of these items, including a schedule of pickup dates or a number to call for pickup and any special instruction such as protecting the CED from

weather, training for employees on the proper handling of CEDs and a public education program.

- The program should also include the haulers working arrangement with their ultimate disposal site, landfill and or transfer station, and the process for adhering to that plan.
- As an alternative, they may contact an electronics recycler to handle the CEDs instead of a landfill or transfer station. A list of recyclers and questions to ask vendors is available at: <http://www.state.wv.us/swmb/RMDP/EWaste/E-WasteContractor%20List.pdf>. or by contacting the WV SWMB at 866-568-6649.
- Establish a system for tracking costs associated with the collection and disposal of CEDs. Volumes and types of materials as well as additional costs incurred in the purchase of equipment, transportation and recycling/processing should be considered. Tracking information should be made available to the WV SWMB, WVDEP and the PSC upon request and should accompany any requests for increases in customer fees.

*Under the Public Service Commission's Bulky Goods Rule, WV Code Rules §150-9.6.6.c., waste haulers are required to pick up televisions, computers and other "bulky" items once a month from their residential subscribers. To help offset any additional costs incurred in providing this service they may impose a surcharge of up to \$1.00 per month, per residential subscriber. The Bulky Goods Rule will remain in effect, including the collection of televisions and computers, on January 1, 2011.*

*The \$1.00 per month surcharge presently imposed on each residential subscriber to service is intended to cover any costs associated with the haulers adherence to the ban. Nothing in the legislation allows for additional fees at this time.*

*Prior to establishing a relationship with a recycler the hauler is encouraged, but not required, to verify that the recycler has achieved and maintained third-party accredited certifications, including R2, Responsible Recycling Practices Standards, E-Steward Standards or Internationally accredited third-party environmental management standards for the safe and responsible handling of covered devices.*

### **Landfill Operators Responsibility:**

- The SWMB recommends that all landfills establish a plan for the proper handling, separation, recovery, and recycling of CEDs. This can be achieved through a coordinated effort between the landfill and a transfer station or by contracting individually with an electronic recycler. Any tracking of costs for the purpose of requesting rate adjustments may be done at the discretion of the facility.
  
- Establish a program for the proper collection and handling of CEDs. More information regarding this can be found on the SWMB website at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/LandfillOperators.htm>
  
- The program should include:
  - Public education
  - Signage on site
  - Modification to landfill operational plans to accommodate CEDs
  - Plans for managing broken CRT glass
  - Plans for storage of electronics
  - Employee training on environmental and health issues related to the handling of CEDs
  
- Establish a relationship with an electronics recycler for the recycling of CEDs. A list of recyclers and questions to ask vendors is available at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/E-WasteContractor%20List.pdf>. or by contacting the WV SWMB at 866-568-6649.
  
- Establish a system for tracking costs associated with the collection and disposal of CEDs. Volumes and types of materials as well as additional costs incurred in the purchase of equipment, transportation and recycling/processing should be considered. Tracking information should be made available to the WV SWMB, WVDEP and the PSC upon request and should accompany any requests for increases in customer fees.

*Prior to establishing a relationship with a recycler, the landfill operator is encouraged, but not required, to verify that the recycler has achieved and maintained third-party accredited certifications, including R2, Responsible Recycling Practices Standards, E-Steward Standards or Internationally accredited third-party environmental management standards for the safe and responsible handling of covered devices.*

### **Transfer Stations Responsibility:**

- The SWMB recommends that all transfer stations establish a plan for the proper handling, separation, recovery, and recycling of CEDs. This can be achieved through a coordinated effort between the transfer station and landfill or by contracting individually with an electronic recycler. Any tracking of costs for the purpose of requesting rate adjustments may be done at the discretion of the facility.
- Establish a program for the proper collection and handling of CEDs.
- The program should include:
  - Public education
  - Signage on site
  - Modification to transfer station operational plans to accommodate CEDs
  - Plans for managing broken CRT glass
  - Plans for storage of electronics
  - Employee training on environmental and health issues related to the handling of CEDs
- Further information regarding this can be found on the SWMB website at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/RecyclersCollectors.htm>  
<http://www.state.wv.us/swmb/RMDP/EWaste/RecyclingProcessors.htm>
- The program should also include the transfer stations working arrangement with their ultimate disposal site and the process for adhering to that plan.

Alternatively, transfer station management may establish a relationship with an electronic recycler for the recycling of CEDs. A list of recyclers and questions to ask vendors is available at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/E-WasteContractor%20List.pdf> or by contacting the WV SWMB at 866-568-6649.

- Establish a system for tracking costs associated with the collection and disposal of CEDs. Volumes and types of materials as well as additional costs incurred in the purchase of equipment, transportation and recycling/processing should be considered. Tracking information should be made available to the WV SWMB, WVDEP and the PSC upon request and should accompany any requests for increases in customer fees.
- Further information regarding this can be found on the SWMB website at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/TransferStationOperators.htm>.

*Prior to establishing a relationship with a recycler the transfer station operator is encouraged, but not required, to verify that the recycler has achieved and maintained third-party accredited certifications, including R2, Responsible Recycling Practices Standards, E-Steward Standards or Internationally accredited third-party environmental management standards for the safe and responsible handling of covered devices.*

#### **Electronic Recyclers Responsibility:**

- Provide the SWMB and DEP with documentation of any third-party accredited certifications, including R2, Responsible Recycling Practices Standards, E-Steward Standards or internationally accredited third-party environmental management standards for the safe and responsible handling of covered devices.
- Maintain an operational plan for the proper collection and handling of CEDs.
- The plan should include:
  - Collection options
  - Plans for managing broken CRT glass
  - Plans for storage of electronics
  - Employee training on environmental and health issues related to the handling of CEDs
  - Information on end markets
  - Reporting requirements - On a yearly basis electronics recyclers shall provide to the Solid Waste Management Board and West Virginia Department of Environmental Protection the following information: tonnage, quantities and types of CEDs collected, entities contracting for electronic recycling services and dates on which those services were provided.
  - Further information regarding this can be found on the SWMB website at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/RecyclersCollectors.htm>  
<http://www.state.wv.us/swmb/RMDP/EWaste/RecyclingProcessors.htm>

#### **Solid Waste Management Board's Responsibility:**

- Design a program for the proper handling of covered electronic devices (CEDs).
- Establish and maintain an internet website and toll-free telephone number for e-waste information in West Virginia.
- Provide technical assistance to local solid waste authorities, municipalities, retailers, haulers, landfill operators and other effected parties in the implementation of the plan.

- Further information regarding this can be found on the SWMB website at:  
<http://www.state.wv.us/swmb/RMDP/EWaste/Index.html>.

*The website will include information on recycling opportunities, collection events, registered CED manufacturers and other relevant information. For e-waste information in West Virginia, visit [www.state.wv.us/swmb/RMDP/EWaste](http://www.state.wv.us/swmb/RMDP/EWaste) or contact the WV SWMB at 866-568-6649.*

**Department of Environmental Protection's Responsibility:**

- Promulgate rules for the implementation of the enforcement of the program.
- Maintain the Covered Electronic Devices Manufacturer Compliance List. Update the list yearly as registration occurs. Allow retailers and consumers easy access to this list by posting it on the agency website. Further information regarding this can be found on the SWMB website at: <http://www.dep.wv.gov/dlr/reap/cedprogram/Pages/default.aspx>.
- Support the proper handling of covered electronics in West Virginia through the administration of the Covered Electronic Devices Grant Program.

## ALTERNATIVES TO LANDFILLING COVERED ELECTRONIC DEVICES

As part of the SWMBs “Comprehensive Program to Provide for the Proper Handling of Covered Electronic Devices” a website dedicated to electronic recycling has been developed. The website will be the live counterpart to this plan. It contains information and alternatives to land filling electronics. The website can be accessed at [www.state.wv.us/swmb/RMDP/EWaste/Index.html](http://www.state.wv.us/swmb/RMDP/EWaste/Index.html).

The SWMB urges all businesses and individuals to recycle end-of-life electronics. For individuals and businesses wishing to recycle their computers there are a growing number of businesses, non-profits and governmental entities providing recycling options. A list of those options is listed below.

**Collections Events:** Many of the state’s solid waste authorities collect electronics for recycling either through one or two day collection events or daily activities. Pending events are listed on the website under the “Pending Collection Events” link, [www.state.wv.us/swmb/RMDP/EWaste/PendingEvents.html](http://www.state.wv.us/swmb/RMDP/EWaste/PendingEvents.html).

**Retailer Take Back Programs:** Some retailers that sell electronics also act as an intermediary for electronics manufacturers, returning equipment to the manufacturers for consumers. There is often a small charge for this service depending on the arrangement the retailer has with the various manufacturers. Best Buy and Staples offer such programs. Consumers are encouraged to contact stores for more information.

**Non-profit Organizations:** Consumers are encouraged to check with non-profit organizations within their communities for reuse options. These organizations may specify what items they will accept for reuse or recycling. The Salvation Army and Goodwill are two such organizations.

**Manufacturer Take Back Programs:** Any electronics manufacturer selling products in the state of West Virginia is required to register with the West Virginia Department of Environmental Protection’s REAP program. These manufacturers pay a yearly registration fee. Initial registration fees are set at \$10,000 and \$3,000. Manufacturers pay the lower fee if they provide a free take back program to consumers. The renewal fees drop to \$5,000 and \$500, respectively, in subsequent years, thus diminishing the dollars in the grant fund. A list of those manufacturers can be accessed at <http://www.state.wv.us/swmb/RMDP/EWaste/ManufacturesInformation.htm>

**WV Recycling Directory:** The West Virginia Department of Commerce produces the WV Recycling Directory and updates its entries on a yearly basis. The directory provides information on recyclers listed by the item recycled and the location of the recycler. For more information, go to the “WV Recycling Directory” tab on the WV E-Waste website or <http://wvcommerce.org/directory/recycling/default.aspx>

**Earth 911 Recycling Directory:** Earth 911 connects individuals with electronic recyclers based on the consumers’ zip code. For more information go to the “Earth 911 Recycling Directory” tab on the WV E-Waste website or <http://search.earth911.com/?what=Electronics&where=WV>.

**E-Waste Contractors:** Waste Haulers, Transfer Stations and Landfill Operators wishing to contract with electronic recycles will find pertinent information at [www.state.wv.us/swmb/RMDP/EWaste/E-WasteContractor%20List.pdf](http://www.state.wv.us/swmb/RMDP/EWaste/E-WasteContractor%20List.pdf). This information will be updated as required.

Information on the E-Waste website will be monitored and updated as required.

## **E-WASTE MANAGEMENT: FINANCIAL ANALYSIS**

### **Introduction**

Since the recycling of electronic waste began in West Virginia in earnest during 2002, two methods of collecting and recycling electronics have emerged.

The first and most prevalent is the single or dual day collection event. These events are usually sponsored by a local solid waste authority, sometimes partnering with a County Commission, or by a non-profit organization. Once funding is obtained, normally through SWMB or REAP, an electronics recycling contractor is hired to manage the event. Contract items can include the personnel to package and load collected materials, the pallets and shrink wrap necessary for the proper packaging and shipping, equipment for loading materials, transportation to an appropriate recycling center and the dismantling of electronic waste into their individual components for recycling purposes. The contractor may choose to outsource one or more of these functions.

Advantages of this method are, the removal of substantial quantities of e-waste from the waste stream in a short period of time, allowing organizations not in the business of recycling to collect materials and significantly raise public awareness through a concentrated ad campaign. Disadvantages include high costs and sometimes public inconvenience because of the limited time frame.

The second method of collection and recycling is an ongoing or continuous collection. This is done almost exclusively by established recycling programs where storage space and storage options exist. Recycling centers collect materials for recycling and place them in storage in a building or enclosed trailer. When the trailer is filled or a truck load quantity is collected, usually 12 to 14 tons of material, the recycling contractor is contacted and arrangements are made for a pick-up.

The advantages of this method are public convenience and lower cost. The disadvantages are that additional storage space is required and the public is often less aware of the program. In addition, it is difficult for anyone other than an established community recycling center, or local solid waste authority to implement such a program.

### **Single Day Collection Event: Cost Analysis**

The cost for a single day collection event can be based on the tonnage collected on a per event basis. Historically, costs per ton have been approximately \$500 or about \$0.25 per pound and tonnage is dependent on the population of the area served. Costs include recycling, transportation, labor and supplies.

For 2010, the average collection event cost \$480 per ton with an average of 13.68 tons collected per event. The fees paid for e-cycling events breaks down to; 60.62% for recycling fees, 13.57% for transportation of materials, 17.59% for labor and 8.22% for equipment rentals.

Some contractors are willing to price their services on a per-ton basis or by charging a flat, per-event fee. For 2010, the average flat fee per-event cost \$5,171 which amounts to \$501 per ton. The average per-ton event charge was \$4,606 which amounts to \$420 per ton.

### **Continuous Collection: Cost Analysis**

Continuous collection is significantly different from single event e-cycling. Continuous collection transfers a significant part of the workload from a recycling contractor to recycling center staff, therefore costs tend to be lower. As of December 2010, only a few recycling centers were offering this service.

One center reported paying approximately \$40 per ton for the transporting and recycling while two others reported receiving the service free of charge. It should be noted that the cost of this service may be conditional. Costs tend to vary due to the location of the recycling center, location of the contractor, volume, type of material collected and a number of variables. One of those variables is the acceptance of televisions in the recycling mix. Most contractors are willing to manage televisions but will impose a charge for the service.

### **Waste Haulers: Cost Analysis**

Under the Public Service Commission's Bulky Goods Rule, WV Code Rules § 150-9.6.6.c, waste haulers are required to pick up televisions, computers and other "bulky" items once a month from their residential subscribers. To help offset any additional costs incurred in providing this service they may impose a surcharge up to \$1.00 per month, per subscriber.

The Bulky Goods Rule will not change with the inception of the ban on January 1, 2011. Haulers should track actual costs associated with their implementation procedures to determine the economic impact, if any, on their costs of doing business.

The Solid Waste Management Board has provided the haulers and others with a listing of qualified electronics recycling contractors that are either working within the state or wish to provide services here. They have also been provided with a comprehensive guide for choosing an electronics recycling contractor. This information can be viewed at [www.state.wv.us/swmb/RMDP/Ewaste](http://www.state.wv.us/swmb/RMDP/Ewaste).

### **Landfill and Transfer Station Operator's: Cost Analysis**

While municipal solid waste facilities can no longer put electronics in their landfills, they can collect the material for recycling. Problems associated with collecting the e-waste for recycling include storage and packaging and possibly the cost associated with recycling and transportation.

The SWMB recommends that all landfills and transfer stations devise a Plan for the Proper Handling of CEDs. The efforts of the landfills, transfer stations, and haulers can be a cooperative effort, but can be handled individually as provided for in this document. Landfill and transfer station operators should track actual costs associated with their implementation procedures to determine the economic impact, if any, on their costs of doing business.

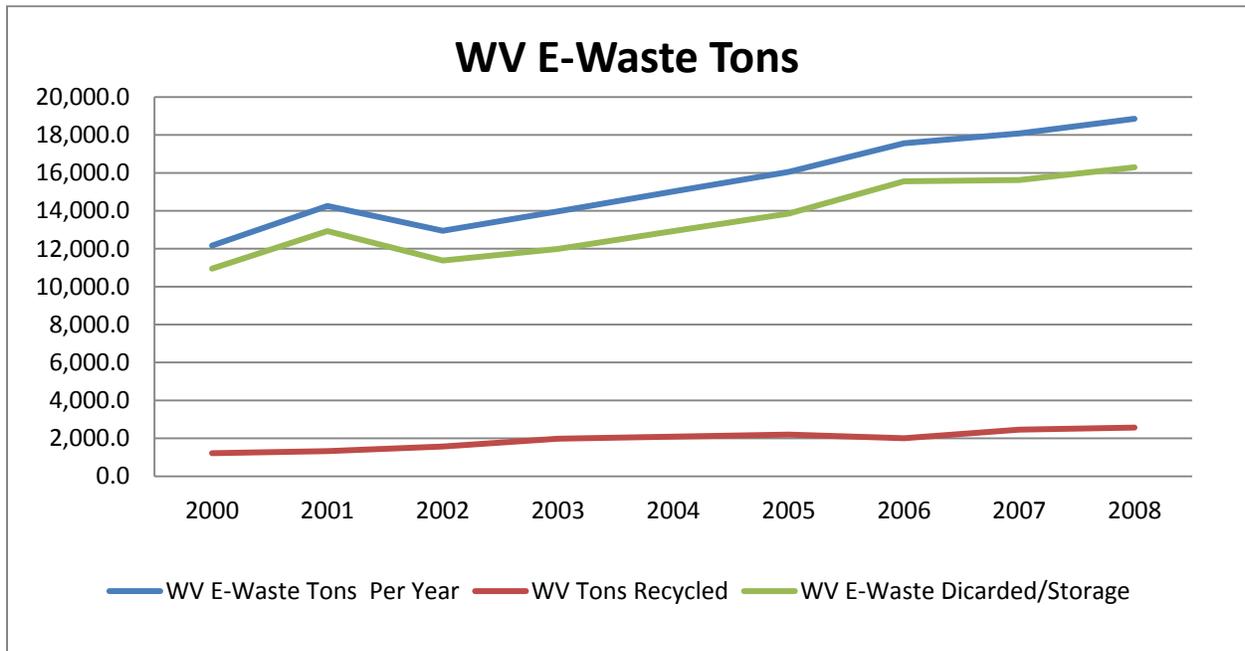
### **West Virginia E-Waste Volume**

Assuming West Virginians produce the same amount of electronic waste as everyone else, 20.8 pounds, the state produces around 18,857 tons of electronic waste per year. Of that, approximately 16,293 tons are either landfilled or put into storage and an additional 2,565 is recycled either through collection events, recycling centers or various mail-in collection services.

Data has been collected for the country as a whole by the US EPA on electronic waste since the year 2000. EPA findings indicate that between the years 2000 and 2008, the amount of e-waste that is either being put into landfills, storage or being recycled has increased by about 36%. During that same period, the amount being recycled has increased by about 53%. While the increase in recycling is significant, it should be noted that the amount being recycled is only about 13.6% of the total e-waste produced.

The amount of e-waste in West Virginia's waste stream is about 1.5% of the total amount of waste going into the state's 19 municipal solid waste landfills.

The following graph demonstrates the amount and increase of e-waste in West Virginia's waste stream during the period 2000 through 2008:



Source: US EPA, Annual Waste Characterization Studies, 2000 - 2008.

## ATTACHMENTS

## ATTACHMENT A

### **Whitman Recognizes Electronics Industry for Recycling Efforts**

Release date: 11/22/2002

Contact Information: Bonnie Smith 215-814-5543

Contact: Bonnie Smith 215-814-5543

**PHILADELPHIA** – U.S. EPA Administrator Christie Whitman joined Congressman Don Sherwood and other government officials at the Envirocycle recycling facility located in Hallstead, Pa. to recognize the cooperative efforts and continued commitment of electronics manufacturers and recyclers who have partnered with EPA and state environmental agencies in the mid-Atlantic regional pilot, *eCycling*.

This project is the nation's first-of-a-kind government-industry collaboration to promote reuse and recycling of outdated computer equipment, televisions, and other electronics.

"Through the *eCycling* partnership we have learned important lessons for creating sustainable multi-state electronics recycling. I am pleased that this partnership will expand to a second year, providing mid-Atlantic residents electronics reuse and recycling opportunities for another year, and offering the country an opportunity to advance further in this important area," said Administrator Whitman.

*eCycling*, which began in October 2001, encourages local residents and small businesses to drop-off used and outdated electronics at coordinated collection events throughout the region. During the first year, using funds from the U.S. EPA, mid-Atlantic state environmental agencies, and manufacturers Panasonic, Sharp, Sony and other members of the Electronic Industries Alliance, *eCycling* collected more than 2,100 tons of electronics from residents in the mid-Atlantic states and prevented more than 21,000 cathode ray tubes (CRTs) from going into regional landfills and incinerators.

"I applaud the efforts of all the partners involved and your commitment to continue this effort for another year. I encourage more electronics manufacturers and retailers to join us in our quest for the best national solution to this growing problem. I urge residents to take advantage of the electronic recycling opportunities scheduled in your areas," Whitman said.

Electronic equipment collected during the 45 *eCycling* drop-off events in 31 counties and cities included televisions, monitors, computers, printers, keyboards, and scanners. Both government and manufacturers shared the cost to transport and process the equipment collected through *eCycling*. Panasonic, Sharp, and Sony paid for the dismantling costs of their respective brands of equipment collected at the *eCycling* events. In addition, they, along with Canon U.S.A., Inc., Hewlett Packard, JVC, Kodak, Nokia, Philips Consumer Electronics - North America, and Thomson Multimedia contributed funds to pay for transportation and recycling efforts.

The Electronic Industries Alliance assisted EPA in soliciting partners to join the *eCycling* project, and collected funds from the partners to help offset program costs. The Polymer Alliance Zone of West Virginia paid for some of the data collection and analysis and assisted in the distribution of private sector funding for the project.

Technoglas, a national leader in the reuse or recycling of cathode ray tube (CRT) glass used in computer monitors and televisions, was able to recycle a significant amount of the CRT glass collected from *eCycling* events for reuse in manufacturing new products.

Electronics recyclers who helped to safely transport, recycle, and refurbish three million pounds of *eCycling* electronics were Envirocycle, Inc. of Hallstead, Pa. and Elemental, Inc. of Philadelphia.

In the pilot's second year, EPA, industry partners, and the mid-Atlantic state environmental agencies will continue to use different methods of collecting end-of-life electronics from residents and small businesses to determine the costs involved, and to define the roles and responsibilities of government, consumers, and electronics manufacturers, retailers, and recyclers. Additional partners from television and computer manufacturers are encouraged to join the *eCycling* effort.

State environmental agencies throughout the mid-Atlantic region participate in the *eCycling* pilot. The mid-Atlantic region comprises Delaware, Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia.

*eCycling* brings recycling into the electronic age. By safely recycling old computer and electronic equipment, this project is paving the way to sustainable *eCycling* – putting electronic components into effective reuse, instead of allowing them to take up already limited landfill space.

## ATTACHMENT B

### Participant Survey

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**1. How did you hear about this event?**

<input type="checkbox"/>	Email	<input type="checkbox"/>	TV Ad	<input type="checkbox"/>	Word of Mouth
<input type="checkbox"/>	Newspaper Ad	<input type="checkbox"/>	Web Page	<input type="checkbox"/>	Other:
<input type="checkbox"/>	Radio Ad	<input type="checkbox"/>	Flyer		

**2. How far did you travel today to recycle your electronics? (Give your best estimate)**

<input type="checkbox"/>	<5 Miles	<input type="checkbox"/>	5-10 Miles	<input type="checkbox"/>	11-20 Miles	<input type="checkbox"/>	>20 Miles
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**3. Are your electronics from a:**

<input type="checkbox"/>	Residence	<input type="checkbox"/>	Commercial	<input type="checkbox"/>	Other:
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**4. Who do you think should pay for the safe recycling of electronic products? (Choose one)**

<input type="checkbox"/>	Consumer / User	<input type="checkbox"/>	Retail Store	<input type="checkbox"/>	Electronics Manufacturer
<input type="checkbox"/>	Government	<input type="checkbox"/>	Other:		

**5. What is the most you would be willing to pay per item to recycle your electronics?**

<input type="checkbox"/>	\$2	<input type="checkbox"/>	\$5	<input type="checkbox"/>	\$10	<input type="checkbox"/>	Other:
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**6. What is the most convenient way for you to recycle your electronics?**

<input type="checkbox"/>	Take them to a municipal recycling center	<input type="checkbox"/>	Take them to a retail store
<input type="checkbox"/>	Mail them back to a manufacturer	<input type="checkbox"/>	Take them to a local charity
<input type="checkbox"/>	Other:		

**7. How many computer monitors and TVs do you have at home right now?**

<input type="checkbox"/>	0-2	<input type="checkbox"/>	3-4	<input type="checkbox"/>	5 or more
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**8. How many households does your vehicle represent?**

<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4 or More
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## ATTACHMENT C

### West Virginia E-Cycling Tonnage (2002 – 2010)

Event Sponsor	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTALS
Amandi, Inc. <sup>1</sup>				28.00	208.10					236.10
Berkeley SWA	20.30				8.98	26.05		37.00	56.84	149.17
Brooke SWA									19.05	19.05
Cabell Co. Best Buy						7.70				7.70
Greenbrier SWA					9.80		23.80			33.60
Gladesville Comm. Assoc.									22.62	22.62
Hancock SWA	10.80	13.90	16.80	17.70	12.70	18.03	20.62	23.34	14.39	148.28
Harrison SWA	30.00			38.00	34.00	34.00	21.00	45.94		202.94
Jefferson SWA									12.09	12.09
Kanawha SWA	23.30									23.30
WV DEP & SWMB					16.62					16.62
Marion SWA					12.65					12.65
Marion & Mon Co SWAs						3.50				3.50
Marshall SWA					6.07			6.69	7.38	20.14
McDowell SWA									9.98	9.98
Morgan SWA								15.15	21.37	36.52
Monongalia SWA	15.00		15.10	22.60	7.50	11.70	6.56	6.88		85.34
Monongalia Co. Best Buy					7.12					7.12
Monongalia United Way									6.96	6.96
NCER						7.47				7.47
Ohio SWA	8.40					23.59	21.30		27.12	80.41
Parkersburg, City of				16.00						16.00
PC Renewal <sup>4</sup>				3.00	296.60	408.00	668.90	278.90		1655.40
Putnam SWA					7.60	19.14	28.04	46.96	30.94	132.68
Raleigh SWA	29.10									29.10
Ritchie SWA						4.64			7.40	12.04
Taylor SWA					2.58					2.58
Upshur SWA					7.38					7.38
Waste Management, Inc. <sup>2</sup>	8.00	8.00	8.00	10.00	5.00					39.00
WVU Hospital									3.88	3.88
West Virginia University <sup>3</sup>	120.00	120.00	120.00	120.00	120.00				8.27	608.27
Wood SWA					24.81	31.47				56.28
<b>Annual Tonnage Totals<sup>4</sup></b>	<b>264.90</b>	<b>141.90</b>	<b>159.90</b>	<b>255.30</b>	<b>787.51</b>	<b>595.29</b>	<b>790.22</b>	<b>460.86</b>	<b>248.29</b>	<b>3704.17</b>

<sup>1</sup> Amandi's tonnage was reported on 7/15/06. The 208.1 tons reported for Amandi were collected, for the most part, from out-of-state sources and processed for recycling at the Amandi facility in Davisville, WV.

<sup>2</sup> Estimated - information obtained from Susan McCloud, Wood Co. SWA.

<sup>3</sup> Estimated - information obtained from Laura Stiller, Monongalia Co. SWA. WVU entered into an agreement with PC Renewal for the recycling of WVU obsolete electronics. From this point on, WVU tonnage will be posted under PC Renewal.

<sup>4</sup> PC Renewal's total for 2007 was 486.89. This amount was reduced by 78 tons to avoid double counting. The firm managed events from Hancock, Harrison, Monongalia, Marion and Ohio counties in 2007. PC Renewal's total for 2008 was 779.6. This was adjusted to reflect 110.7 tons reported by various West Virginia Solid Waste Authorities processed by PC Renewal.

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Ms. Carol Daub, Engineer, WV DEP Division of Water & Waste Management  
The Honorable Karen Facemyer, West Virginia Senate  
Mr. Bill Flenner, Utilities Analyst, Public Service Commission of West Virginia  
Mr. Roger Frame, Chairman, Association of West Virginia Solid Waste Authorities  
Mr. Ken Holliday, Envir. Resources Specialist II, WV DEP Division of Water & Waste Management  
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Ms. Iasia Ward, National Center for Electronics Recycling  
Mr. Michael Young, Nicholas Sanitation  
Mr. Joe Young, President, West Virginia Association of Waste Haulers & Recyclers

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