

# **Performance Requirements Excerpted from the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment®**

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# Performance Requirements Excerpted from e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment ®

July 22, 2009

## 1. Introduction

### Purpose

*The purpose of this excerpted version is to provide interested parties access to the industry specific performance requirements in the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment®. It is intended for information purposes only, as it does not contain the ISO 14001 language which is a critical part of the complete e-Stewards Standard. Therefore, this excerpt may not be used for any certification purposes. Any entity wishing to see the complete e-Stewards Standard must purchase a copy by contacting the Basel Action Network (BAN).*

The purpose of the e-Stewards Standard is to set appropriately rigorous, yet practical operational criteria for globally responsible practices for the electronics recycling and refurbishment industries in conjunction with the e-Stewards' accredited and independently audited certification program. It is intended to serve recyclers, refurbishers, asset managers, refiners, and re-deployment companies at this time.

The Standard is specifically designed with the Precautionary Principle, the principle of Cost Internalization ('polluter pays'), and the Environmental Justice Principle firmly in mind. To this end, practices which allow cost, liability and risk externalization, particularly to the general public, the global commons, to desperate or disadvantaged workers or communities are strongly discouraged, and upstream responsibility by consumers and manufacturers to prevent harm is encouraged.

The e-Steward Standard® addresses critical areas such as:

- Data security
- Worker protection;
- Minimum on-site practices, particularly for the toxic materials found in electronic waste;
- Parameters for legitimate reuse and refurbishment;
- Accountability for the entire Recycling Chain for toxic electronic waste, as defined internationally; and
- Export of toxic materials from electronic waste.

The health and safety section is particularly well defined because the Standard may be used in nations that do not have adequate worker protection laws and/or enforcement. The goal is to provide baseline performance requirements in this area for all e-Stewards in all countries. In addition, because there is little data on actual worker exposures in this industry, the Standard calls on e-Stewards to test and confidentially report actual test results, in order to support future revisions of the Standard, based on actual data aggregated from the industry.

Relative to export, the Standard requires an e-Steward to operate as if the countries in which all of their facilities are located have ratified both the Basel Convention and the Amendment to the Convention (also called the “Ban Amendment”), as is the case in all European Union nations. Hazardous Electronic Waste is defined by a plain reading of the Basel Convention definitions. Where there are gray areas in the definitions, a precautionary yet pragmatic approach is applied.

The complete Standard (and not this excerpted version) is designed for use as part of the Basel Action Network’s e-Steward Certification initiative -- a third-party audited, accredited certification program. Its use in any way other than for information purposes is not authorized.

### **Development**

The Standard builds upon the Basel Action Network’s experience with its original Electronic Recycler’s Pledge of True Stewardship; extensive negotiations undertaken in the US multi-stakeholder Responsible Recycling (R2) standard development; state efforts undertaken to define recycling standards; participation in Canada’s EPSC standards development; and negotiations at the international level within the Basel Convention/United Nations programs, including the Mobile Phone Partnership Initiative (MPPI) and the Partnership for Action on Computing Equipment (PACE).

Initially, the program will only be available to e-Steward candidate facilities located in Canada and the US, but it is expected that certification will be globally available, beginning in OECD countries. Therefore, the Standard is to the extent practicable, written to be applied internationally with a minimum of reference to any particular nation’s laws or regulations.

### **Governance**

The e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment® and its accompanying Guidance Documents have been defined and owned by BAN, but have been created with significant input from respected and responsible players in the recycling, auditing, occupational health, data security, and manufacturing industries, as well as from the accredited third party certification industry. It will be updated at appropriate intervals as the industry and technology advance.

An organization may only claim to meet the Standard and/or be an e-Steward if the organization is a) currently certified by an e-Stewards’ Accredited Certification Body to the complete Standard, and b) licensed to use the e-Steward name and logo by the Basel Action Network.

*This document, the excerpted e-Stewards Performance Requirements, is owned by the Basel Action Network. This document can be copied and distributed but must only be done so without cost and must be kept intact as a whole document.*

*The excerpted e-Stewards Performance Requirements is intended for information purposes only, in order to provide an understanding of e-Stewards industry specific requirements. e-Stewards certification is only possible based on the complete Standard, i.e. the e-Stewards Standard for*

***Responsible Recycling and Reuse of Electronic Equipment® and not based on this abridged Performance Requirements version.***

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Appendix B lays out the rules to be followed by qualified e-Stewards Certifying Bodies which conduct the audits and provide accredited certification.

### **How to Use This Document**

Wherever this document uses e-Stewards specific terms and requirements defined in the glossary, those terms are capitalized.

The term "shall" is used in this document to indicate those provisions which are mandatory. The term "should" is used in this document to indicate a recognized means of meeting the intended requirements of the Standard.

Where requirements in the complete e-Stewards Standard conflict with legal requirements, the latter will prevail.

### **Integration with ISO 14001**

The complete e-Stewards Standard fully incorporates the requirements of the Environmental Management Systems Standard, ISO 14001-2004 ©ISO, as well as performance requirements required by BAN (as found in this excerpt). The term "environmental management system", as used throughout the Standard, includes within its scope all of the environmental, occupational health and safety, data security, social responsibility, and all other performance requirements identified in the complete e-Stewards Standard. (For guidance on setting up an environmental management system, see Appendix A.)

**Bold-faced font in this excerpted version indicates the e-Steward electronics recycling industry-specific requirements throughout this document, while regular font depicts a paraphrased summary of the actual text and requirements of ISO 14001-2004 ©ISO. The font style does not infer greater or lesser importance of the text. Conformance with the complete e-Steward Standard requires that both sets of criteria be met in order to receive e-Steward Certification.**

Section 4 of the complete Standard (but not this excerpt) contains all of the performance and environmental management system requirements for certification to the Standard. The Guidance Document referred to in Appendix A is provided to aid in interpretation of requirements (but does not define requirements), as well as guidance in meeting the requirements, including what in some cases are considered best practices provided by industry. The Guidance Document resides in its most current form on the Worldwide Web in order to keep it more readily updated. For ease of use, the sub-clauses of Section 4 of the complete e-Stewards Standard and the Guidance Document have related numbers; thus, for example, 4.3.3 and A.3.3 both deal with objectives and targets, and 4.5.5 and A.5.5 both deal with internal audits.

## 2. Scope

The complete e-Stewards Standard (but not this excerpt) specifies requirements for an environmental management system which include both ISO 14001 requirements and health and safety system requirements, as well as more specific e-Stewards' requirements, often beyond legal requirements, including downstream accountability for toxic materials.

The e-Stewards Certification and the e-Stewards Standard are intended to provide electronics recyclers, refurbishers, asset managers, processors, refiners and others with a formal framework with which to:

- a) Implement, maintain and improve an environmental management system that includes accountability for toxic materials throughout the Recycling Chain, worker safety and protection, responsible reuse and data security;
- b) Assure itself and others of its conformity with the environmental and health and safety policy required in the complete Standard, as well as any additional stated environmental policy;
- c) Operate, with respect to export of Electronic Waste, as if their country has ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, and the Basel Ban Amendment (Decision III/1 [see A.4.6.7 in Appendix A]); and
- d) Demonstrate such conformity with the complete Standard by seeking certification/registration of its environmental management system by an external certifying body accredited to certify to the complete Standard.

Collectors, Brokers and transportation companies are currently not eligible for certification under the e-Stewards program.

The complete Standard (but not this excerpt) represents minimum requirements to attain e-Steward Certification. It is therefore a baseline and should not preclude individual companies from taking further steps that are more rigorous and more protective of the environment, occupational safety and health, community health, social welfare, and data security.

## 3. Glossary of Terms

Please refer to ISO 14001:2004 (E) Section 3 for a listing of unique terms definitions that are used within ISO 14001 and the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment.

### e-Stewards Standard Specific Terms and Definitions

#### 3.21 Basel Waste

**“Basel Waste” means any waste controlled by the Basel Convention. This includes any material or object listed in Basel Convention Annex I and VIII that is destined for a recycling or disposal destination listed in Annex IV of the Convention, unless it does not possess a hazardous characteristic listed in Annex III. It also includes any waste listed in Basel Annex II (other wastes) and any waste which during a specific actual or planned transboundary movement is considered hazardous wastes by any of the countries concerned (importing, exporting or transit countries.) For the purposes of this Standard, BAN has interpreted the Basel Convention as it applies to e-Waste in a precautionary, pragmatic way to create the working definition of Hazardous Electronic Waste (see paragraph 3.44). For a copy of the Basel Convention: <http://www.basel.int/text/documents.html>**

### **3.22 Broker**

**A “Broker” is an Intermediary in the Recycling Chain who buys and sells (or donates) Electronic Waste, without Recycling or processing the Electronic Waste. Brokers are currently not eligible to become certified e-Stewards.**

### **3.23 Certifying Body or Certification Body**

**See “e-Stewards Accredited Certification Body”**

### **3.24 Collector**

**“Collectors” are entities other than Recyclers that only serve as sites for receiving and possibly consolidating Electronic Waste prior to sending it to Recyclers. Collectors are currently not eligible to become certified e-Stewards.**

### **3.25 Commodity**

**For the purposes of this Standard and consistent with the Basel Convention, “Commodities” (as opposed to wastes) are materials derived from primary resources (mined or extracted from virgin raw materials) or from secondary raw materials that need no further processing, cleaning, separation, or recycling in order to be either sold directly on the retail market as new consumer products, or used as a direct feedstock in primary manufacturing processes (e.g. cannot be destined for a Basel Convention Annex IV destination). NOTE: The definition of commodity here does not parallel common usage of the term in countries such as the US, where a toxic Basel waste that has value in the marketplace is considered a ‘commodity’, e.g. shredded circuit boards.**

### **3.26 Competent Authority**

**The “Competent Authority”, as defined in the Basel Convention, “one governmental authority designated by a Party to be responsible, within such geographical areas as the Party may think fit, for receiving the notification of a transboundary movement of hazardous wastes or other wastes, and any information related to it, and for responding to such a notification, as provided in Article 6.” Article 6 explains the mechanics of such written, country-to-country notification and consent. The Competent Authority may either consent, consent with conditions, or reject the request, and sometimes asks for additional information prior to making such a written determination.**

To locate contact information for the Competent Authority in any Basel country, go to the Basel Convention website, and go to the “Country Contacts” webpage, at: <http://www.basel.int/contact-info/frsetmain.html>

### **3.27 Disposal**

See Final Disposal

### **3.28 Downstream Recyclers**

“Downstream Recyclers” are any Recyclers, End Refurbishers, and End Processors in the Recycling Chain who receive or control any Electronic Waste (including materials derived from it) after it has passed through the initial e-Steward’s facility or control. Downstream Recyclers do not include Intermediaries.

### **3.29 Due Diligence**

“Due Diligence” means the duty to gather necessary information on actual or potential risks involved in business relationships, both direct and indirect (i.e. throughout the entire Recycling Chain), and to verify the abilities of the other parties to fulfill the conditions and requirements of the agreement.

### **3.30 Electronic Equipment or Equipment and Components**

“Electronic Equipment”, also referred to in this document as “Electronic Equipment and Components”, is defined as electrical and electronic equipment or components which are dependent on electric currents or electromagnetic fields in order to fulfill their primary function, and which have never contained ozone depleting substances, combustible fuels, or gasses. This definition includes computers, central processing units (CPU’s), laptops, and their peripheral equipment, including monitors, display devices, printers, keyboards, scanners, storage devices, servers, networking systems, copiers, fax machines, control boxes, imaging systems, etc. It also includes communications equipment such as telephones, mobile phones, telecommunications equipment, and personal digital assistants (PDAs) as well as consumer electronic devices, such as televisions, recorders, DVD players, camcorders, digital cameras, stereo systems, compact disc players, radios, calculators, organizers, game systems and their accessories, and peripheral hardware, digital, cable and satellite receiving equipment, inverters and power controllers from solar panels and any solar panels with circuit boards, portable and non-portable audio equipment, microwave ovens, vacuum cleaners, etc.

Furthermore, components removed from the above, including circuit boards, batteries, bare CRTs, LED lamps, florescent lamps, and power supplies are also included in the definition, as well as materials and components derived from the above, such as shredded, crushed, or granulated electronics.

This definition does not include combustible-hydrocarbon powered vehicles, boats, or machinery (such as lawn mowers), Freon-containing equipment such as refrigerators, or appliances such as washing machines, dryers, stoves, etc.

### **3.31 Electronic Waste or e-Waste**

**“Electronic Waste” or “e-Waste” means used or new Electronic Equipment or components that are:**

- a) Destined, or are intended to be destined, all or in part (e.g. replaced parts during repair) for Materials Recovery, Energy Recovery, or Final Disposal; or**
- b) Destined for refurbishment, repair or Reuse but either are untested for full functionality, or, if tested, found to not be Fully Functional.**

### **3.32 End Processor**

**An “End Processor” is the final Downstream Recycler at the end of the Recycling Chain that turns a particular type of waste material into a Commodity. End Processors can also produce waste for Final Disposal, such as slag. These include smelters, mercury retorters, and others. End Processors do not include End Refurbishers.**

### **3.33 End Refurbisher**

**An “End Refurbisher” is a certified e-Steward that has ensured that all Electronic Equipment containing Hazardous e-Waste coming through their facilities and control is tested, repaired, refurbished and/or Repurposed prior to going for Reuse.**

### **3.34 End User**

**An “End User” is a recipient of Electronic Equipment that has been tested, repaired, and refurbished or Repurposed by an End Refurbisher, if that Electronic Equipment will be directly reused and not recycled or disposed of. The End User is not an acceptable recipient for untested or non-working equipment or parts, scrap, or Hazardous e-Waste generated during Reuse/refurbishment operations.**

### **3.35 Energy Recovery**

**“Energy Recovery” is a method of waste disposal or incineration that creates energy that is utilized later or immediately.**

### **3.36 e-Steward(s)**

**An “e-Steward” is a Recycler, End Processor representative or agent, and/or End Processor which is independently audited and registered by an e-Stewards Accredited Certification Body to this Standard. Prior to the deadline for all e-Stewards to be certified, a “Pledged e-Steward” is an organization that has been qualified by BAN as meeting the Electronic Recycler's Pledge of True Stewardship and licensed as an e-Steward.**

### **3.37 e-Stewards Accredited Certification Body**

**An “e-Stewards Accredited Certification Body” is a certifying body or registrar accredited by ANSI-ASQ National Accreditation Body (ANAB) or a Multilateral Cooperative Accreditation Agreement (MCAA) member, or an International Accreditation Forum (IAF-MLA) Signatory national accreditation body approved by and under contract with the Basel Action Network for oversight of registrars assuring conformance to the e-Stewards Standard ®.**

### 3.38 Final Disposal

“Final Disposal” means disposal not involving recycling or reuse, e.g. deposit in landfills, incinerators (including incinerators with energy recovery), or other forms of disposition, including storage prior to Final Disposal (e.g. Basel Annex IV Part A)

### 3.39 Final Disposition

“Final disposition” refers to the last point in the Recycling Chain at which time an e-Waste either ceases to be a waste by being processed into a Commodity; is fully tested, refurbished, labeled, packaged and sent for Reuse; or is finally disposed. These end points can include Final Disposal facilities (e.g. landfills or incinerators), End Processors (e.g. smelters making bullion commodity metals), or End Refurbishers for repaired, refurbished products destined for direct Reuse.

### 3.40 Fully Functional/Full Functionality

Electronic equipment or components are “Fully Functional” when they are capable of performing the essential functions they were designed to perform. If electronic equipment has been Re-purposed, that equipment is “Fully Functional” when it is capable of performing the new essential functions it needs to perform for the End User, in accordance with the definition of Re-purposing. In either case above, ‘Fully Functional’ also means the equipment or components do not contain any non-functional Hazardous Electronic Equipment or components, such as circuit boards, mercury lamps, batteries, or CRTs.

### 3.41 Halogenated Materials

“Halogenated Materials” contain compounds with atoms of the halogen group of elements including fluorine, chlorine, bromine and iodine. In Electronic Equipment these materials typically include all plastics, circuit boards, etc. that contain brominated flame retardants (BFRs), polyvinyl chloride (PVC) and components containing polychlorinated biphenyls (PCBs).

### 3.42 Hazard

A “hazard” is any situation, substance, object, activity, event, or environment that could potentially cause injury, ill health, or death.

### 3.43 Hazardous Electronic Equipment

“Hazardous Electronic Equipment” means Electronic Equipment, parts, and materials for which the constituents are unknown, or that consist of, or contain, or are derived from, all or in part:

- a. **Circuit boards, lamps, switches or other parts, components or assemblies containing intentional inputs of mercury (i.e. zero tolerance for intentional inputs of mercury);**
- b. **Circuit boards, lamps, switches, or any other parts, materials<sup>1</sup>, assemblies, housings, cables and wires which contain any of the substances listed below in levels exceeding the indicated thresholds. For the purposes of practicality, it can be presumed that all circuit boards will fail these levels and should be presumed hazardous unless they are tested and demonstrated to fall below these limits. These concentration and TCLP limits are applied to the circuit board, lamp, switch, part, component or assembly, not to the entire product from which they were removed. To be considered hazardous for the purposes of this Standard the concentrations must exceed one or more of the following concentration limits after applying the US EPA's Toxicity Characteristic Leaching Procedure (TCLP) as follows<sup>2</sup>:**

<b>Antimony</b>	<b>1.0 mg/L</b>
<b>Arsenic</b>	<b>5.0 mg/L</b>
<b>Barium</b>	<b>100 mg/L</b>
<b>Beryllium</b>	<b>0.007 mg/L</b>
<b>Cadmium</b>	<b>1.0 mg/L</b>
<b>Chromium</b>	<b>5.0 mg/L</b>
<b>Lead</b>	<b>5.0 mg/L</b>
<b>Selenium</b>	<b>1.0 mg/L</b>

**Polychlorinated biphenyls: Levels cannot exceed *actual* concentrations greater than 50 mg/kg.**

**The chemical elements listed include all compounds formed from these elements.**

**The definition of “Hazardous Electronic Equipment” will not include non-hazardous materials such as copper, aluminum, or steel alloys (waste streams listed in Annex IX of the Basel Convention), unless that material exceeds the threshold test levels above.**

- c. **Cathode ray tubes (CRTs), CRT glass, CRT cullet, and CRT frit and Phosphors from CRT glass or CRTs, (This does not include the metal band around the face plate or the shadow mask, unless they are contaminated with Phosphors or materials listed in a and b above);**
- d. **Leaded display glass of any kind, such as is found in some plasma screen glass;**
- e. **Batteries of any kind containing intentional inputs of lead, mercury, cadmium;**

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<sup>1</sup> NOTE: This may include shredded plastics contaminated with lead and other toxins, to the extent they fail the US EPA's Toxicity Characteristic Leaching Procedure (TCLP)

<sup>2</sup> This is a defined procedure that can be followed by any lab in the world, and will serve as a standard procedure, until there is a universally accepted one incorporated into this Standard.

- f. **Unsorted batteries or batteries of which the content is unknown;**
- g. **Lithium ion batteries and lithium ion battery packs or other batteries containing flammable organic solvents;**
- h. **Printer or copy drums containing selenium and/or arsenic; and**
- i. **Components containing radioactive substances.**

### **3.44 Hazardous Electronic Waste or Hazardous e-Waste**

**“Hazardous Electronic Waste” or “Hazardous e-Waste” means new or used Hazardous Electronic Equipment that:**

- a. **Is destined, or is intended to be destined, for Materials Recovery, Energy Recovery, or Final Disposal, all or in part (e.g. replaced parts during repair, and shredded material);**
- b. **Is destined for refurbishment, repair, or Reuse but is untested as to its Full Functionality and/or not yet repaired; and**

**For the purposes of exportation, the definition of Hazardous Electronic Waste also includes:**

- c. **Any Hazardous Electronic Equipment which is not Fully Functional or has not been tested to a degree where a determination can be made as to its Full Functionality; and**
- d. **Any Electronic Equipment that is deemed hazardous waste by the countries of import or transit.**

**NOTE: The term 'Hazardous Electronic Waste' as used in this Standard is not meant to pertain to, nor is synonymous with any current legal national, provincial/state, or local definitions of 'hazardous waste'. It is meant to be compatible with the Basel Convention, and is designed for the purposes of this Standard only.**

**The definition of “Hazardous Electronic Waste” does not include:**

- a. **Non-Hazardous Electronic Equipment or non- Hazardous e-Waste, (functional or not);**
- b. **Hazardous Electronic Equipment or Hazardous e-Wastes, including components, that are all fully tested, Fully Functional, and labeled/listed as being Fully Functional, and that are not intended for Final Disposal or Recycling, but rather for donation, Reuse or resale; or**

- c. For the purposes of exportation, if CRT cullet or glass, cleaned of all Phosphors and other particulates to the greatest extent feasible, is to be used as a direct feedstock in manufacturing new products without further processing or preparation (other than quality control screening), then the Competent Authority of the importing country and all transit countries may make a determination that the material is not a waste but rather a Commodity, and therefore not a Basel Waste (or a Hazardous Electronic Waste in this Standard). Such a determination provided in writing by the Competent Authority and provided to the e-Steward auditors will be required to exercise this exemption from what is otherwise a clearly listed Basel Convention hazardous waste (found on Basel Annex VIII), and therefore otherwise a Hazardous e-Waste in this Standard (See Appendix A).

### **3.45 Intermediary**

“Intermediary” means any entity within the Recycling Chain which holds, buys, sells, brokers, transfers, manages, represents, or facilitates transactions of any e-Waste (including material derived from it) that passes through the initial e-Steward’s facility or control. Intermediaries include: independent representatives, agents, independent managers, logistics (e.g. trucking) firms, brokers, cross-docking firms, etc.

### **3.46 Mass Balance Accounting**

“Mass Balance Accounting” is a method used to measure and reconcile the total weight of material coming into a facility and compare to total weight of materials leaving the same facility, typically after various types of processing have occurred (see Appendix A).

### **3.47 Materials Recovery**

“Materials Recovery” includes operations that are designed as part of a process to recapture elements or compounds in Electronic Waste and transform them into secondary raw materials (such as near pure copper, aluminum, platinum, etc.), e.g. Annex IV B of Basel, with the exception of energy recovery.

### **3.48 Organization for Economic Cooperation and Development (OECD)**

“Organization for Economic Cooperation and Development,” a group of countries “committed to democracy and the market economy”, and generally considered the more developed countries. This group of nations has adopted two relevant legally binding agreements pertaining to the trade in wastes (see Appendix A). For more information see [www.oecd.org](http://www.oecd.org)

### **3.49 Polychlorinated Biphenyls (PCBs)**

“Polychlorinated Biphenyls” are a class of organic compounds that were used as dielectric fluids in transformers, capacitors and light ballasts, as coolants, lubricants, stabilizing additives in flexible PVC coatings of electrical wiring and electronic components, pesticide extenders, cutting oils, flame retardants, hydraulic fluids, sealants (used in caulking, etc), adhesives, wood floor finishes, paints, de-dusting agents, and in carbonless copy paper

PCB production was banned in the 1970s by most countries due to the high toxicity of most PCB congeners and mixtures. Electronics Recyclers will find them most often in older telecommunications equipment, light ballasts, etc., and must learn to recognize components containing this highly toxic compound.

### 3.50 Phosphors

“Phosphors” are metal compounds which produce light when excited (i.e., are struck by a free electron). Phosphors are used inside of the face plate of Cathode Ray Tubes (CRTs) and in other lamps, such as fluorescent lamps with mercury. Phosphors in the current waste stream are likely to contain compounds of cadmium and rare-earth metals of varying or unknown toxicity (see Appendix A).

### 3.51 Problematic Components or Materials (PCMs)

“Problematic Components or Materials” are e-Wastes which may not be defined as Basel Wastes or Hazardous Electronic Wastes, but which may require special controls or attention in this Standard at end of life, due to desired recyclability or potential environmental or worker health and safety risks that may arise from recycling such components or materials. These include,

- a. Anti-freeze and coolant glycols;
- b. Toners and inks, and toner and ink containers and cartridges;
- c. Plastics containing PVC, brominated flame retardants or other halogens;
- d. All other batteries (due to recyclability); and
- e. Other components and materials identified by the e-Steward as problematic.

### 3.52 Potentially Hazardous Processing Technologies (PHPTs)

“Potentially Hazardous Processing Technologies” are those technologies, activities, or operations involving: Shredding, cutting, crushing, breaking, pulverizing, cracking, and chipping of Hazardous Electronic Wastes or Problematic Components or Materials; Using thermal or chemical processes of any kind for processing Hazardous e-Waste or Problematic Components or Materials, including smelting, refining, melting, dissolving, reacting or burning, with the exception of hand-held solder guns used for disassembly for which proper venting and personal protection equipment (PPEs) are used to prevent exposure to toxic or irritant fume.

### 3.53 Recyclers

“Recyclers” are entities that have facilities for and engage in Recycling. This term does not refer to those involved solely in acting as Intermediaries or Collectors.

### 3.54 Recycling

“Recycling” of e-Waste includes all forms of Materials Recovery, refurbishment, repair, Repurposing, End Processing, End Refurbishment or storage for such, but does not include Final Disposal or the actions of Intermediaries or Collectors. Specifically, Recycling includes

the physical alteration or manipulation of hardware or software for the purpose of Recycling, remanufacturing, repairing, refurbishing, Re-purposing, processing, End Processing, upgrading and redeploying Electronic Equipment.

### 3.55 Recycling Chain

“Recycling Chain” refers to all the entities that handle or are responsible for transactions that include transferring, processing, refurbishing, Recycling and disposing of Hazardous e-Waste that pass through an e-Steward’s facility or control, through but not beyond Final Disposition. The Recycling Chain includes Downstream Recyclers, Intermediaries, End Processors, End Refurbishers, Final Disposal facilities for residues and waste.

### 3.56 Repurposing

“Repurposing” is a form of Reuse that relies on the primary data processing function of Electronic Equipment but utilizes that function for another purpose or context than originally intended (e.g. combining CPUs or motherboards for use as a network server).

### 3.57 Reuse

“Reuse” means using used or surplus new Electronic Equipment, including parts, again for their primary, originally intended purpose or as Repurposed, including after repair, refurbishment, or upgrading.

### 3.58 Toxic Characteristic Leaching Procedure (TCLP)

For the purpose of this Standard, the “TCLP” is a sample extraction method for chemical analysis employed as an analytical method to simulate leaching through a landfill, defined in US law in 40 CFR Part 261, Appendix II, EPA Method 1311. This is a methodology that can be used anywhere in the world regardless of any one country’s legislation.

## 4. Environmental management system requirements with performance requirements

**Note:** Throughout the remainder of this excerpted document, the non-bold text is a paraphrasing of actual requirements for the environmental management system in the complete e-Stewards Standard. The **bold** text is as found in the complete e-Stewards Standard.

### 4.1 General requirements

An e-Steward shall create and maintain a documented environmental management system (EMS) in conformance with the complete e-Stewards Standard, and document the scope of their EMS.

See ISO 14001 para .4.1

**4.1.1 An e-Steward's environmental management system shall include or make reference to an occupational health and safety system in accordance with the requirements of this e-Stewards Standard, as well as all other industry specific performance requirements in this Standard.**

#### 4.2 Environmental policy

An e-Steward's highest level of management shall document, implement, and maintain its environmental and health and safety policy, ensuring that it is scaled appropriately to the impacts of its activities, addresses the need for continual improvement and pollution prevention, and commits to compliance with all legal and other requirements that are applicable.

See ISO 14001 para. 4.2.

**4.2.1 An e-Steward's environmental policy shall also include top management's commitment to the following:**

- a) Accountability for all Hazardous e-Waste throughout the Recycling Chain to Final Disposition;**
- b) Prohibition of exports of Hazardous Electronic Waste throughout the Recycling Chain which violate the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the Basel Convention Decisions (including Decision III/1, the 'Basel Ban Amendment'), the OECD Decisions, and national laws pertaining to exporting, importing and transiting this waste stream (see A.4.6.7 in Appendix A);**
- c) Social accountability values within its organization consistent with the principles of SA 8000 (certification to SA 8000 is encouraged but not required). The e-Steward shall encourage all Downstream Recyclers to operate consistent with the principles of SA 8000;**
- d) Prohibition of the use of prison labor for the processing of Hazardous e-Waste throughout the Recycling Chain; and**
- e) Make customers aware of data security issues and address their data security and privacy requirements through the secure destruction of data contained in e-Waste in accordance with this Standard throughout the recycling chain.**

#### 4.3 Planning

4.3.1 An e-Steward shall manage and document a process to define its environmental and safety aspects, as well as impacts upon the environment and upon workers that could result from each, prioritize those aspects considered to be significant, and require operational control.

See ISO 14001 para 4.3.1

#### 4.3.2 Legal and other requirements

An e-Steward shall provide an effective process to identify legal requirements applicable to its organization, assure access to those requirements, and consider legal requirements in the determination of its significant environmental aspects and impacts.

See ISO 14001 para. 4.3.2.

**4.3.2.1 An e-Steward shall obtain and maintain required state/provincial and local permits covering specific operations, limitations and controls.**

**4.3.2.2 When Hazardous Electronic Waste is exported as provided for in this Standard, an e-Steward shall assure conformance with the applicable domestic legal requirements, as well as those of the importing, transit and exporting countries, throughout the Recycling Chain. Records shall be maintained, including copies of Competent Authority notification and consents, if applicable (see Appendix A).**

**4.3.2.3 An e-Steward shall identify applicable data security and privacy requirements as required by law or contract when managing data storage devices in Electronic Equipment.**

#### 4.3.3 Objectives, targets and programme(s)

Environmental management system objectives shall be documented, including those pertaining to health and safety, and responsibilities and methods for achieving targets and goals shall be defined, including timing for such achievement.

Objectives shall be measurable whenever practical, and shall be consistent with the e-Steward's Policy.

See ISO 14001 para. 4.3.3

#### 4.4 Implementation and operation

##### 4.4.1 Resources, roles, responsibility and authority

An e-Steward's management shall provide resources (human, technical and financial) for the effective and efficient operation of the environmental management system and achievement of its goals.

For human resources, roles shall be clearly defined, including responsibilities and authorities assigned to each. An Environmental Management System Representative shall be designated by the highest level of management, and their role shall include:

- a) Ensuring the environmental management system functions effectively and efficiently in conformance with the complete e-Stewards standard, and
- b) Access to and reporting to the highest level of management on the performance of the EMS against its objectives.

See ISO 14001 para. 4.4.1

#### 4.4.2 Competence, training and awareness

An e-Steward's highest level of management shall ensure that all personnel involved in the operations of the company/organization are qualified on the basis of job training, work experience, and/or education.

Awareness training shall be provided and documented for employees whose jobs relate to identified significant environmental and health and safety aspects and impacts. This training shall address the critical nature of conformance with Policy and Procedures, identification of those aspects and impacts which may be associated with their jobs, their specific roles in achieving conformity, and the potential results of not achieving conformity.

See ISO 14001 para. 4.4.2

**4.4.2.1 An e-Steward shall identify the organization's health and safety training needs and conduct health and safety awareness and training (see A.4.6.1.1 h in Appendix A).**

**4.4.2.2 Training shall be conducted with employees/staff to assure conformity with the export requirements in this Standard (see A.4.6.7 in Appendix A).**

#### 4.4.3 Communication

An e-Steward shall effectively communicate internally regarding its defined environmental aspects and impacts and the requirements of its environmental management system.

External communications about its significant environmental aspects and conformity to the complete e-Stewards Standard shall be considered, and a method for this transparency shall be implemented, as appropriate.

See ISO 14001 para. 4.4.3

#### 4.4.4 Documentation

An e-Steward's EMS shall, beyond the requirements for documentation elsewhere made in the complete e-Stewards Standard, also document:

- a) A description of the interaction between the core elements of its system and reference related procedures
- b) Records which provide evidence of conformance with the complete e-Stewards Standard
- c) Procedures and records that may be necessary to ensure effective planning, implementation, and control of its significant environmental aspects and impacts

See ISO 14001 para. 4.4.4

#### 4.4.5 Control of documents

Where documentation is a requirement of the complete e-Stewards Standard and/or the EMS, documentation (including externally generated) shall be controlled including an effective process to:

- a) Approve documented procedures and revisions
- b) Ensure that current revision levels are identified and relevant versions are available wherever required to assure conformity
- c) Ensure document identification, legibility, and known distribution
- d) Prevent the unintentional use of superseded documents

See ISO 14001 para. 4.4.5

#### 4.4.6 Operational control

An e-Steward shall identify, plan and perform operations essential to the effective implementation of the environmental management system by:

- a) Utilizing and documenting procedures, including operating criteria, where the lack of procedures could lead to nonconformance with the e-Steward's EMS Policy and Objectives, and
- b) Communicating any relevant process requirements to customers or suppliers, related to significant environmental aspects.

See ISO 14001 para. 4.4.6

##### 4.4.6.1 Health and Safety in the Workplace

**An e-Steward shall establish, implement, and maintain the following plans and procedures, to reduce or eliminate workplace hazards and exposure to hazardous materials, maximize injury and illness protection, and protect worker rights relative to health and safety, commensurate to the types of processing technologies in use. These requirements are**

applicable to all workers, including volunteer and temporary workers. Specifically, an e-Steward shall:

- a) Fully implement all local, state/provincial, and national requirements for worker health and safety, including obtaining and maintaining all required state/provincial and local permits covering specific operations, limitations and controls (see Appendix A);
- b) Conduct a full occupational health and safety inspection and evaluation on all company operations, at least every 3 years. This may be accomplished by qualified personnel or staff, the local governmental agency responsible for overseeing worker safety and health, loss control insurance carriers, or third party consultants;
- c) Obtain and maintain available information and documentation to ascertain what hazardous substances may be present in the e-Waste, non-conforming materials (see Appendix C), and in other products or processes used in operations (such as solvents, cleansers, and using solder guns) in order to identify potential worker exposures that must be controlled;
- d) Create and implement a plan for managing the specific Electronic Waste accepted by the e-Steward as assessed per letter c) above, based on the specific Recycling activities and technologies utilized, and the performance requirements and guidelines for Hazardous e-Wastes contained in this Standard, with a goal to reduce and eliminate workplace exposures and physical hazards that might be encountered during the e-Steward's management of Electronic Waste; and
- e) Conduct an ergonomic evaluation by a qualified professional, e.g., ergonomist (see Appendix A) to determine the potential for work-related musculoskeletal disorders (MSDs, see Appendix A), e.g. from heavy lifting, repetitive tasks, awkward positions, vibration, and excessive force. The evaluation shall also evaluate lighting and design considerations for workstations and machinery/equipment. All reasonable efforts will be made by the e-Steward to implement the recommendations identified during the course of the ergonomic evaluation, and if past injury reports and activities identify a strong likelihood that workers have suffered or will suffer MSDs, the e-Steward shall take further steps to prevent MSDs.

**4.4.6.1.1 In addition to 4.4.6.1, e-Stewards utilizing Potentially Hazardous Processing Technologies (PHPTs) shall (see Appendix A):**

- a) Obtain and maintain available information and documentation to ascertain what hazardous substances may be present in the Electronic Waste before Recycling activities are initiated (if not already) and Potentially Hazardous Processing Technologies are utilized, and what additional hazards may be introduced as a result of the specific processes utilized (see Appendix A);

- b) **Air Testing: Identify, quantify, report and compare workers' actual exposures to hazardous materials with relevant existing standards. This shall involve conducting air monitoring by a certified industrial hygienist (CIH),<sup>3</sup> or other professional health & safety personnel, for exposures, as follows (see Appendix A):**
1. **Calibrate air monitoring equipment in accordance with manufacturer's specifications, and analyze samples by an ISO17025 Certified Laboratory or by a nationally accredited laboratory;<sup>4</sup>**
  2. **Conduct baseline air testing in all areas where Potentially Hazardous Processing Technologies activities occur, including worker breath zone air monitoring to ensure adequate dust and fume collection system controls are in place. As a result of these tests, identify high hazard risk areas;**
  3. **Repeat air monitoring, including worker breath zone air monitoring, with any change in process, controls, equipment, or tasks, as appropriate;**
  4. **Conduct semi-annual air monitoring of high hazard risk areas by qualified personnel. If, after three years of testing no standards/exposure limits are exceeded, then tests can be curtailed until and unless the process or the inputs substantially change. Tests shall be conducted as follows:**
    - A. **If an e-Steward is breaking, cutting, crushing, shredding, or pulverizing CRTs, (no exceptions regardless of technologies employed) it shall perform semi-annual air testing for silica dust, lead, beryllium, and cadmium including compounds containing the heavy metals;**
    - B. **If an e-Steward has any workers removing mercury-containing components (such as small fluorescent lamps from LCD screens), it shall perform semi-annual air monitoring for mercury and mercury compounds, including worker breath zone and the area around and below the mercury-removal and storage operation;**
    - C. **If an e-Steward is using power machinery to shred, cut, grind, or shear Electronic Equipment, it shall perform semi-annual exposure monitoring for lead, beryllium, cadmium, mercury, including compounds of these, as well as fiberglass and brominated flame retardants<sup>5</sup>; (see Appendix A). An e-Steward only using a**

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<sup>3</sup> Some government agencies charged with occupational health and safety will provide this service at no charge.

<sup>4</sup> For example, in the US, the American Industrial Hygiene Association (AIHA).

<sup>5</sup> An e-Steward should test pre-employment baseline levels and subsequent exposure levels for at least the following specific congeners of Polybrominated Diphenyl Ethers: 183 (a congener of Octabrominated Diphenyl Ether) and 209

shredder dedicated to hard drives shall do likewise but need not test for mercury;

**D. If an e-Steward is using thermal processes for melting, smelting, or combustion of Electronic Equipment, it shall perform tests for inhalable hydrocarbons, brominated flame retardants, and the elements beryllium, lead, mercury, and cadmium and all compounds of these elements;**

**E. If an e-Steward uses acids or solvents for precious metals or plastic materials recovery or cleaning procedures, it shall perform workplace exposure tests for any acid or solvent that is indicated as an inhalation hazard in the relevant MSDSs. Additionally, related digestive acid gases such as hydrogen sulphide, nitrous oxide, and other identified chemical hazards shall be tested;**

**5. The results of the air monitoring accomplished in 1-4 of this subsection shall be compared by qualified personnel to the most stringent regulatory exposure limits within their jurisdiction with the immediate requirement of not exceeding these levels.**

**A. Where legal levels do not exist or where levels fall below established legal levels, a precautionary approach shall be employed, with the goal of implementing procedures and practices for eliminating, further reducing, or preventing worker exposures and risks (see Subsection g, below); and**

**B. If air monitoring indicates the permissible exposure limits (PELs), threshold limit values (TLVs), Short Term Exposure Limits (STELs), or other regulatory exposure limits within the e-Steward's jurisdiction have been exceeded, workers shall be so informed at once and control measures shall be taken as a matter of urgency, under the direction of qualified personnel, to reduce and maintain worker exposures below the allowable limits (see subsection g, below);**

**6. All air monitoring results shall be shared with workers.**

**c) Create and implement an injury and illness prevention program (IIPP) (see Appendix A);**

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(a congener of Decabrominated Diphenyl Ether), as these appear to be the two PBDEs found at the highest levels in e-waste processing facilities in studies cited in Appendix A, in A.4.6.1.1b)4C.

- d) **Establish a health and safety committee within the e-Steward's organization, including worker/labor and management representatives with the authority to implement actions for workplace health and safety. The committee shall establish a schedule of regular meetings and encourage two-way communication on health and safety matters without fear of reprisal;**
- e) **Establish and maintain a formal process for investigation and resolution of health and safety complaints filed by workers, including follow up actions that shall be implemented when a complaint is filed;**
- f) **Establish and maintain an ongoing process for identifying and assessing occupational hazards and risks for injury or illness (see Appendix A);**
- g) **Manage possible exposures of their workers to hazardous materials, and physical hazards, ergonomic and other workplace hazards by engineering, administrative, and personal protective equipment controls (in that order) (see Appendix A);**
- h) **Provide a training program for workers (see Appendix A). This training shall include an orientation for new workers and additional training for workers as new hazards are identified, new processes or materials are implemented, and new methods of protection are instituted. All training and other communications to workers on health and safety topics (e.g., training, air monitoring results, medical surveillance) shall be made in a language and format understandable by the employee (e.g., tailored to literacy level, etc.);**
- i) **Establish and maintain workplace hygiene and cleaning procedures to minimize exposures (both to workers as well as that taken home to family members) and have the necessary equipment on-site to implement these procedures (see Appendix A);**
- j) **Have a written plan and procedures for responding to and reporting emergency situations, and identify the personal protection and safety devices that are required on-site to deal with these emergencies (see Appendix A for information on general emergency plans and procedures, and Appendix C for two different sample procedures for clean-up of accidental CRT breakage);**
- k) **Have a designated occupational health provider for medical surveillance (bio-monitoring) of workers, consult with the occupational health provider regarding recommendations for medical surveillance, and develop and implement a medical surveillance program:**
  - 1. **All medical surveillance (biological monitoring) shall be provided annually without cost to the employee and with cooperation of the workers concerned in the areas determined to be high risk areas based on air monitoring program;**
  - 2. **Workers are entitled to a second medical opinion at expense of e-Steward for workplace exposures, injuries or illness, within reasonable**

**and competitive costs;**

- 3. All biological analyses shall be performed by an ISO 17025 Certified Laboratory or by a nationally accredited laboratory;<sup>6</sup> and**
- 4. The e-Steward shall instruct the occupational health provider to maintain the confidentiality of the e-Steward's personnel on non-work related medical issues by not revealing in the written opinion of the employee's fitness for duty (or in any other means of communication with the employer) the findings, laboratory results, or diagnoses unrelated to the employee's workplace exposures.**

#### **4.4.6.2 Reuse and Refurbishment of Electronic Equipment**

**An e-Steward shall only donate or sell for Reuse, Electronic Equipment and components (which contain or consist of Hazardous Electronic Equipment or Problematic Components or Materials) that are Fully Functional, and shall ensure that all scrap/waste generated during refurbishment operations is managed according to this Standard. An e-Steward shall meet the following requirements<sup>7</sup> for Electronic Equipment in their facilities and under their control (see Appendix A) that is going for Reuse:**

- a) Fully test all Electronic Equipment and/or components containing or consisting of Hazardous Electronic Equipment, consistent with Appendix A. Results of tests shall be recorded;**
- b) Repair, Repurpose, or refurbish, if needed, to ensure that they are Fully Functional;**
- c) Eradicate data stored in memory devices, as applicable, in conformity with Section 4.4.6.3 of this Standard;**
- d) Label or list identifying records of all Electronic Equipment and components going for Reuse in a manner that is accessible to customers, auditors, and officials (e.g. customs officers), including:**
  - 1. Type of device or component;**
  - 2. Identification number of the item (on whole devices, and parts if they have identification numbers);**
  - 3. Year of production (if available) and model number;**
  - 4. Manufacturer or brand name;**

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<sup>6</sup> e.g. in the US, a laboratory accredited by the American Industrial Hygiene Association (AIHA)

<sup>7</sup> These reuse and refurbishment requirements are based in large part on recent changes to the WEEE Directive in Europe.

5. **Type of evaluation or testing accomplished on equipment or components as required in letter a) above, also indicating the testing protocol used to determine key functions are functioning;**
  6. **Result of tests performed in letter a) above (condition of the device or part);**
  7. **Name and address of the e-Steward responsible for evidence of functionality; and**
  8. **These identifying records shall be available without unpacking the equipment;**
- e) **Package refurbished Electronic Equipment and components for shipment in a manner that will protect them from damage during transit (see Appendix A);**
- a) **Assure that Electronic Equipment and components are destined for Reuse and not Recycling or Final Disposal (see Appendix A), by providing evidence of reuse markets, including:**
1. **A copy of the invoice or contract relating to the sale and/or transfer of ownership of the tested and Fully Functional equipment or components, which states that the equipment is for Reuse, is Fully Functional, and indicates the customer receiving equipment and parts; and**
  2. **Bills of lading with the buyer and seller both listed. If the buyer is a resale broker of tested working equipment, there must be further documentation from the resale broker verifying the resale of tested working equipment and components to reuse customers;**
- g) **Ensure that all scrap, waste, and materials resulting from the repair and refurbishment operations are managed according to the requirements in this Standard, including Section 4.4.6.5, throughout the Recycling Chain;**
- h) **Provide a Mass Balance Accounting for all materials and equipment in the refurbishment operations, to be included in the overall Mass Balance Accounting for the overall operation (See Appendix A);**
- i) **Offer a take-back service, if practicable and desirable, for end-of-life equipment and components originally sold or donated for Reuse<sup>8</sup> (See Appendix A); and**
- j) **If a first tier certified e-Steward wishes to outsource any refurbishment tasks, it must be in conformity with Section 4.4.6.7 if exported, or involve a domestic only a certified e-Steward with whom the first e-Steward maintains and enforces a contract for such services.**

#### **4.4.6.3 Data Security**

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<sup>8</sup> The goal is to return reused equipment to e-Stewards for responsible recycling or further refurbishment.

An e-Steward shall make customers aware of concerns over loss of data, and must offer data security services in-house or under their control (see Appendix A). An e-Steward shall identify in writing their explicit service obligations and agreements regarding data security for every customer. In addition:

- a) If an e-Steward does not provide data security services to a customer, that customer shall sign a waiver indicating the e-Steward is not responsible for data security (see Appendix A);
- b) If an e-Steward does provide data security services for a customer, the following shall be provided to the customer:
  1. The specific terms of such services shall be explicitly defined in a written notification to or contract with the customer, including the specific data security liabilities that the e-Steward is and is not accepting;
  2. The e-Steward shall establish, implement, and maintain procedures to assure that all data retained in memory devices in Electronic Equipment is protected from theft or loss and shall not be released to unauthorized parties, from the moment they take control of the Electronic Equipment through final data destruction;
  3. Data shall be destroyed according to the requirements of and procedures set forth by the NIST 800-88 Guidelines for Media Sanitization, with additional procedures implemented to address imperfections in hard drives which may cause overwrite sanitization applications to be unable to write obliterating data (see Appendix A);
  4. The e-Steward shall create and document a process to demonstrate how it has met its data security obligations; and
  5. Regarding customer indemnification, the e-Steward shall provide customers with information about what specific liability for the data the e-Steward accepts, and if that liability is limited, the e-Steward shall define the amount of liability it accepts for data security services (see Section 4.4.8 Insurance Requirements).

#### **4.4.6.4 Managing Hazardous e-Waste and Problematic Components and Materials**

An e-Steward shall plan for disposition of Electronic Equipment, components and materials based on the following priorities for management strategies (see Appendix A), listed in order of most preferred to least preferred:

- I. Direct reuse of tested, working equipment and parts;
- II. Refurbishment and repair for Reuse;
- III. Materials Recovery (including plastics);
- IV. Disposal in Landfills or Incinerators. Waste-to-energy facilities are considered Disposal. Solid Waste systems should not be used for Hazardous e-Waste.

**An e-Steward shall ensure management of Hazardous e-Waste and Problematic Components and Materials on-site and under their control with practices and procedures that are protective of human health and the environment, in accordance with this Standard, including, but not limited to:**

- a) Safely remove<sup>9</sup> and separate the following components and materials from e-Waste so they are not recycled or disposed of using Potentially Hazardous Processing Technologies (such as shredding). The e-Steward shall teardown equipment to the smallest size components that still safely contain the toxic items listed below, and then ship those components to an appropriate processor for each toxic material, as defined in this Standard (see Appendix A):**
- 1. Mercury-containing components including batteries, lamps, switches, and subcomponents;**
  - 2. Cathode ray tubes (CRTs);**
  - 3. All nickel-cadmium batteries;**
  - 4. All lead-acid batteries;**
  - 5. All lithium-ion batteries;**
  - 6. Batteries containing lead, cadmium or other hazardous substances, or which fail the threshold levels indicated in 3.42(b)<sup>10</sup> (see Appendix A);**
  - 7. All other Batteries including alkaline batteries;**
  - 8. Toners, inks, and toner and ink cartridges (liquid, pasty and powder);**
  - 9. Printer and copier drums and other components containing selenium and/or arsenic (see Appendix A);**
  - 10. Components containing polychlorinated biphenyls (PCBs);**
  - 11. Radioactive devices or materials; and**
  - 12. Glycolant-based coolants (e.g. in rear-projection CRT display devices).**

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<sup>9</sup> End Processors for some of these materials will use PHPTs for final processing, but the e-Stewards Certification program is not currently covering End Processors for these toxic materials.

<sup>10</sup> Code of Federal Regulations, Title 40, Part 266. Appendix VII. "Health-Based Limits for Exclusion of Waste-Derived Residues". Testing need only be accomplished for all listed metals and PCBs.

- b) **All removed items listed in 4.4.6.4(a) shall be consolidated, stored, accurately labeled, transported, and managed as toxic, hazardous, or dangerous wastes, as appropriate, in conformance with all local, state/provincial, and federal/national requirements for these consolidated materials, and with downstream requirements in this Standard. Removed materials shall be stored and transported in a manner that:**
- 1. Protects them from adverse atmospheric conditions and floods including shelter from wind and rain, and a rain-water catchment system, if appropriate;**
  - 2. Minimizes accidental spills or breakage;**
  - 3. Is secure from unauthorized entrance or access;**
  - 4. Includes clearly labeled containers and/or storage areas appropriate for the materials stored; and**
  - 5. Batteries at risk for heat discharge or explosion must be stored and transported in a way that keeps them separated to avoid unintentional discharges (see Appendix A).**
- c) **Hazardous e-Wastes shall not be stored for a period of more than 12 months prior to disposition, and stored for shorter periods if dictated by legal requirements.**

#### **4.4.6.5 Accountability for Downstream Recycling Chain**

**An e-Steward shall be accountable for management of Hazardous e-Waste in conformance with this Standard throughout the entire Recycling Chain to Final Disposition. The e-Steward shall establish, implement and maintain a documented system of direct controls and accountability for the Recycling Chain of Hazardous e-Waste, which will include, a) performing initial Due Diligence, b) contracting with next tier Downstream Recyclers, c) assuring on-going conformance, d) verifying Intermediaries are directing shipments to intended destinations, and e) providing transparency to customers (when asked), as follows:**

- a) **Perform initial Due Diligence on all Downstream Recyclers in the Recycling Chain prior to allowing any Hazardous e-Waste to be transferred to them, in order to determine that they will manage Hazardous e-Waste in conformance with the applicable requirements in this Standard, including:**
- 1. For all Downstream Recyclers in the Recycling Chain (including downstream certified e-Stewards), the e-Steward shall:**
    - A. Determine that they (Downstream Recyclers) have the in-house technical capability and operational capacity to further process**

**Hazardous e-Waste originating from the initial e-Steward (see Appendix A for guidance);**

**B. Require that they (Downstream Recyclers):**

- i. Provide full transparency of (i.e. disclose) their own Downstream Recyclers and End Processors in the e-Steward's Recycling Chain;**
- ii. Maintain on-going records/evidence (12 months/year) of all their shipments to their Downstream Recyclers (with or without Intermediaries involved);**
- iii. Will provide the e-Steward with verifiable records of shipments of materials (as required in this section, 4.4.6.5) containing the initial e-Steward's Hazardous e-Waste, in evidence of conformity to applicable requirements in this Standard (e.g. export requirements);**
- iv. Allow both scheduled and unscheduled audits of their facilities; and**
- v. Hold accountable their Downstream Recyclers and Intermediaries to meet these requirements, who in turn are required to provide the same through Final Disposition;**

**2. For Downstream Recyclers that are not certified e-Stewards, in addition to the above, the e-Steward shall:**

- A. Require them to fill out a detailed vendor site evaluation form, documenting their operations (see Appendix C for an example) and conformance to requirements in this section (4.4.6.5);**
- B. Perform an initial second or third<sup>11</sup> party on-site audit(s) of the next tier Downstream Recycler(s), verifying they will meet applicable requirements of this Standard, including holding their Downstream Recyclers and Intermediaries accountable for the entire Recycling Chain for the e-Steward's Hazardous e-Waste, to Final Disposition; and**
- C. Contact all of the Downstream Recyclers' Downstream Recyclers, including End Processors, for all Hazardous e-Waste throughout the Recycling Chain to verify the receipt and processing of a minimum of 3 months' random sampling of shipments described in 4.4.6.5a)1B above (see Appendix A);**

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<sup>11</sup> A second party audit is an audit conducted by a customer on its vendor. A third party audit is performed by an independent party who is neither customer nor vendor. If a third party auditor is utilized, auditor qualifications and the audit program shall be consistent with ISO 19011.

**b) Sign and enforce a contract with all next tier Downstream Recyclers receiving Hazardous e-Waste from the e-Steward's control, requiring them to conform to EITHER of the following set of requirements, depending on whether they are a certified e-Steward or not:**

- 1. If the next tier Downstream Recycler is a certified e-Steward, the contract shall require, at a minimum:**
  - A. The downstream certified e-Steward to provide the upstream certified e-Steward with documents and records of shipments of Hazardous e-Waste as required in 4.4.6.5 c) 1 and 2 below;**
  - B. The downstream certified e-Steward to provide the upstream certified e-Steward with written notification within 6 months if there has been a change in their Downstream Recyclers for Hazardous e-Waste throughout the Recycling Chain; and**
  - C. The downstream certified e-Steward to provide the upstream certified e-Steward with any material fine or regulatory order imposed upon them or their Downstream Recycler(s) within the previous 3 years;**

**OR**

- 2. If the next tier Downstream Recycler is not a certified e-Steward, the e-Steward's contract shall require them (all next tier Downstream Recyclers of Hazardous e-Waste) to:**
  - A. Manage all Hazardous e-Waste received from the e-Steward in conformance with the following sections:**
    - i. 4.3.2.1 under Legal and Other Requirements;**
    - ii. 4.4.6.4 Managing Hazardous e-Waste and PCMs;**
    - iii. 4.4.6.5 Accountability for Downstream Recycling Chain;**
    - iv. 4.4.6.6 Materials Recovery and Final Disposition;**
    - v. 4.4.6.7 Exportation of Hazardous e-Waste;**
    - vi. 4.4.7 Emergency Preparedness; and**
    - vii. 4.4.8 Insurance Requirements;**
  - B. Disclose all of their Downstream Recyclers and Intermediaries throughout the Recycling Chain for Hazardous e-Waste originating from the e-Steward's facilities or control;**

- C. **Hold their Downstream Recyclers and Intermediaries accountable for managing the Hazardous e-Waste in conformance with all requirements in 4.4.6.5, throughout the Recycling Chain, including with enforced contracts, service agreements, audits, and documentation;**
  - D. **Provide the e-Steward with on-going verifiable documentation required in 4.4.6.5 c) 4 below, including for their Downstream Recyclers of Hazardous e-Waste to Final Disposition;**
  - E. **Allow access to their facilities for the e-Steward to perform both scheduled and unscheduled on-site audits of their facilities;**
  - F. **Provide the e-Steward with written notification within 15 days (preferably in advance) of any changes in their Downstream Recyclers for Hazardous e-Waste throughout the Recycling Chain;**
  - G. **Provide the e-Steward with written notification of any violation of contractual requirements within 15 days; and**
  - H. **Provide the e-Steward with written notification of any material fines or regulatory orders imposed upon them or their Downstream Recyclers within the previous 3 years;**
- c) **Assure on-going Downstream Recycler conformance to this Standard for all Hazardous e-Waste throughout the Recycling Chain, by EITHER:**
- 1. **Utilizing only certified e-Stewards in the downstream Recycling Chain (except for End Processors), and obtaining a copy of their current accredited certification(s) on an annual basis; and**
  - 2. **Annually obtain and maintain from all next tier certified e-Steward Downstream Recyclers (with or without Brokers involved) a minimum of 3 months random sampling of a year's verifiable shipping and other records (including corresponding Acknowledgements of Receipt from their Downstream Recyclers/End Processors), documenting the receipt and processing of all Hazardous e-Waste originating from the upstream e-Steward (even though they may be consolidated by the Downstream Recyclers);**
- OR**
- 3. **If/where not using certified e-Stewards in the Recycling Chain for Hazardous e-Waste, perform at least bi-annual second or third party scheduled or unscheduled on-site and documentation (see 4.4.6.5c 4 below) audits of those Downstream Recyclers to assure conformance to all applicable requirements in this Standard, as required in the contract. It is not necessary to audit the End Processors, but only to verify shipping and other records required in 4.4.6.5c)4 below confirming materials derived from Hazardous e-Waste in the Recycling**

Chain were actually received and processed in-house by the End Processor(s) (see Appendix A); and

4. **Annually obtain and maintain from all non-e-Steward Downstream Recyclers in the Recycling Chain (with or without Brokers involved) verifiable shipping and other records (including corresponding Acknowledgements of Receipt – see Appendix A) of 12 months of shipments documenting the receipt and processing of Hazardous e-Waste materials received from the initial e-Steward (even though they may be consolidated by the Downstream Recyclers). The e-Steward shall obtain and maintain such on-going documentation for all Hazardous e-Waste through each tier of the Recycling Chain, to Final Disposition, if not using certified e-Stewards downstream.**
- d) **Verify that all Intermediaries in the Recycling Chain are facilitating the transfer of Hazardous e-Waste only to Downstream Recyclers that have been approved by the initial e-Steward in conformance with this Standard, and that Hazardous e-Waste is not being diverted away from these Downstream Recyclers;**
- e) **Take full responsibility for ensuring that on-going tasks required in the Reuse and Refurbishment section of the Standard (4.4.6.2) are completed prior to leaving a certified e-Steward's control even if outsourced. Therefore, the e-Steward should either complete the refurbishment tasks in-house or at another (downstream) certified e-Steward's facility, where policies and procedures are designed to meet this threshold (4.4.6.2). If a downstream certified e-Steward is used for refurbishment, the first tier e-Steward retains responsibility to the customer to ensure this Standard is met; and**
- f) **Provide customers with access to information, including documentation and records, if they request it, regarding the entire Recycling Chain for the customers' Hazardous e-Waste going for Recycling, and e-Waste going for Reuse, including which Downstream Recyclers and End Processors are used through Final Disposition.**

#### **4.4.6.6 Materials Recovery and Final Disposition**

**An e-Steward shall ensure that Hazardous e-Wastes and Problematic Components and Materials that are destined for Materials Recovery or Final Disposition are processed in licensed and permitted facilities using technologies that minimize releases, and are not permitted to enter solid waste landfills<sup>12</sup> or incinerators for Final Disposal, throughout the Recycling Chain. For many of these materials special export restrictions apply (see Section 4.4.6.7). Specific Hazardous e-Wastes and Problematic Components and Materials shall be managed, treated and disposed of as follows:**

- a) **Removed and separated mercury-containing devices shall be contained, labeled, and transported to licensed and permitted mercury retort operations, in accordance with requirements of the mercury retort operations. After processing in retort**

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<sup>12</sup> The only exception currently allowed is for legal disposal of cleaned CRT glass in solid waste landfills.

- facilities achieving a minimum of 99.99% mercury capture and recovery, the mercury should be destined for a monitored, secure, retrievable long term mercury storage facility and retired in perpetuity, if possible. Until or unless such long term mercury storage is available, mercury retort will be considered Final Disposition;
- b) Printed circuit boards or equipment containing printed circuit boards which themselves contain leaded solders, Halogenated Materials (e.g. flame retardants) or which fail the threshold levels listed in 3.43(b)<sup>13</sup> must be managed by smelting in an integrated copper smelter or utilizing other effective and safe technology, in a manner which removes and recovers as many and as much of the metals as possible, and that controls emissions and disposition of lead, tin, mercury, cadmium, arsenic, chromium, beryllium, and Halogenated Materials;
  - c) Cathode ray tubes (CRTs), CRT cullet/glass, or equipment containing CRTs or CRT glass that have not been cleaned of phosphors and CRT fines shall always be considered Hazardous e-Waste, shall always be handled and transported in a manner which completely seals the unit to avoid leakage of phosphors and shall only be directed to a lead smelter, integrated copper smelter, or other smelting technology capable of recovering lead, cadmium, barium and silica for further use or safe disposal, in a manner which prevents harmful emissions and manages residues, including slag as hazardous waste if they fail the threshold levels listed in 3.43(b) for Final Disposition;
  - d) CRT cullet and CRT glass that is thoroughly cleaned of all phosphors, coatings, and fines in a manner which prevents occupational exposure and environmental releases can be permitted in the following types of facilities for Final Disposition:
    - 1. Facilities utilizing a process that makes further use of the lead/barium or glass cullet in new glass products that will not be subject to leaching of metals during their useful life, and in a manner which prevents harmful emissions and manages residues including slag as hazardous waste if they fail the threshold levels listed in 3.43(b)<sup>14</sup>;
    - 2. In a lead smelter, integrated copper smelter, or other smelting technology capable of recovering lead, barium and silica for further use or safe disposal, in a manner which prevents harmful emissions, and manages residues including slag as hazardous waste if they fail the threshold levels listed in 3.43(b); or
    - 3. In a lined, leachate-controlled solid or hazardous waste landfill, unless forbidden by law;
  - e) CRT Phosphors, coatings, and CRT fines, and waste streams contaminated with these shall not be allowed in solid waste landfills or incinerators, and must be managed as a hazardous waste, and sent only to facilities that are licensed and permitted to manage such wastes;

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<sup>14</sup> If exporting to another country, additional export requirements apply.

- f) Batteries shall be recycled in properly licensed and permitted facilities designed for battery recycling (see Appendix A);**
- g) Toner and ink cartridges shall always be managed in a manner which prevents dispersal of toner/inks and that minimizes worker exposure, and then shall be managed according to the following hierarchy of preference, after removing them from devices whole and intact:**
  - 1. Refill and reuse cartridges, refurbishing or remanufacturing them;**
  - 2. Remove color inks and toners and dispose of these in hazardous waste landfills. Black toners can remain in cartridges and be disposed of in a solid waste landfill. Emptied and fully cleaned cartridges can be remanufactured, recycled or reused; or**
  - 3. Dispose of entire unit including inks and toners in hazardous waste landfills or incinerators;**
- h) Plastics and resin materials containing or consisting of Halogenated Compounds, including brominated flame retardants or PVC (both Problematic Components and Materials) (See Appendix A for information on distinguishing halogenated material from non-halogenated), shall not be allowed to be incinerated by solid waste incineration operations but may be smelted in an integrated copper smelter or other metals smelter, or disposed of in a hazardous waste incinerator in a manner which prevents harmful emissions and controls residues including slag as hazardous waste if they fail the threshold levels listed in 3.43(b). Such halogenated waste can also be deposited in a solid waste landfill;**
- i) Bag house dust, filter residues, sweeps, slag, other residuals shall be managed as hazardous wastes in licensed and permitted facilities if they meet the definition of Hazardous e-Waste in this Standard and in accordance with relevant national and local law;**
- j) Components containing selenium, including printer drums typically found in, older analog copiers, solar panels and other photovoltaics, shall be removed intact (not shredded) and sent to a facility licensed and permitted to recycle and manage selenium (See Appendix A);**
- k) Polychlorinated biphenyl (PCB)-containing components shall not be recycled or opened up (if in a unit containing PCB liquid material) or shredded, and must be destroyed either by a Stockholm Convention-compliant facility<sup>15</sup> utilizing de-chlorination or high-temperature, pollution controlled incineration (see Appendix A); and**

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<sup>15</sup> compliant with the Toxic Substances Control Act in the US

- l) Glycolant-based coolants<sup>16</sup> should be removed from Electronic Equipment, collected, transported and managed (recycling preferred) as specially controlled liquid waste, as may be required by national and/or local law.**

#### **4.4.6.7 Exportation of Hazardous Electronic Wastes**

**An e-Steward shall only permit exports of Hazardous Electronic Wastes that are consistent with the decisions and agreements of the Organization for Economic Cooperation and Development (OECD), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (including Decision III/1, also known as the Basel Ban Amendment), and other applicable national and international laws regarding trade in Hazardous Electronic Waste. This requirement applies throughout the entire Recycling Chain, including all Intermediaries. An e-Steward shall assure that:**

- a) Hazardous Electronic Waste shall only be exported from OECD/EU countries and Liechtenstein to and through other countries in that same group (Basel Ban Amendment prohibition) (see Appendix A);**
- b) Hazardous Electronic Waste shall not be traded (imported, exported or transited) between any Basel Party and the United States or any other non-Party to the Basel Convention (non-Party/Party prohibition<sup>17</sup>) unless all countries concerned are Member states of the OECD or have concluded a special bilateral or multi-lateral agreement as allowed under Article 11 of the Basel Convention (see Appendix A); and**
- c) Hazardous Electronic Waste which is not prohibited in (a) and (b) above, shall be approved by the “competent authority” of the importing and transit countries and only accomplished in full conformity with OECD Council Decision C(2001)107/FINAL, and/or the Basel Convention or other relevant international agreements or national legislation implementing these agreements (Implementing requirements for non-prohibited waste trade)<sup>18</sup> (see Appendix A)**

#### **4.4.6.8 Site Closure Plans**

**All e-Stewards shall create and maintain a site closure plan which stipulates how all electronic equipment will be properly managed in accordance with this standard and regulations in the event of sale, closure, abandonment, bankruptcy or any form of dissolution of the company. The plan must stipulate that all facilities which have ever utilized PHPT indoors, must conduct indoor dust sampling for all heavy metals, brominated flame retardants, and polycyclic aromatic hydrocarbons as part of the closure process. The closure plan must ensure remediation of any contamination above established levels for workplace dust. The closure plan must also stipulate that any e-Steward that has ever operated a PHPT**

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<sup>16</sup> Typically found in rear-projection CRT displays

<sup>17</sup> Article 4, Paragraph 5 of the Basel Convention, [www.basel.int](http://www.basel.int)

<sup>18</sup> Subparagraph (c) is primarily for exports from non-OECD to OECD countries, and for exports from non-OECD to non-OECD countries.

**or stored or managed Hazardous Electronic Equipment or Problematic Components or Materials outside of fully contained, impermeably floored buildings, must complete facility soil and groundwater testing for threshold levels listed in 3.43(b). A third party must conduct all testing and analysis indicated above, and sign an affidavit asserting that nothing remaining on the site indoors or out exceeds either the threshold levels listed in 3.43(b) or applicable occupational limits (see Appendix A).**

#### 4.4.7 Emergency preparedness and response

An e-Steward shall provide for emergency preparedness within its environmental management system and specify how it will respond to them. Periodic drills to test emergency preparedness shall be conducted, where safe and practical.

Response to actual emergencies shall prevent or remediate adverse environmental or health and safety impacts.

See ISO 14001 para. 4.4.7

#### 4.4.8 Insurance Requirements

**An e-Steward shall maintain insurance adequate to cover the potential risks and liabilities of its operations, commensurate with the nature and size of its operations and the indemnification offered to the e-Steward's customers (if any), i.e., its aggregate liability, including liability for data destruction and environmental risks, as well as legal and financial assurances for the proper closure of its facilities (see Appendix A). An e-Steward shall:**

- a) Clearly specify to customers what indemnification is or is not being offered to its customers;**
- b) If indemnification is offered, retain the appropriate insurance to underwrite it; and**
- c) An e-Steward utilizing Potentially Hazardous Processing Technologies (PHPTs) shall have Pollution Liability Insurance at a level commensurate with the nature and size of their operations (see Appendix A).**

#### 4.5 Checking

##### 4.5.1 Monitoring and measurement

An e-Steward shall monitor, measure, and document appropriate operational characteristics related to significant aspects and impacts to the environment and worker health and safety. Properly calibrated or otherwise verified equipment shall be used and maintained for required monitoring and measurement.

See ISO 14001 para. 4.5.1

**4.5.1.1 An e-Steward shall implement and maintain a tracking system for controlling, weighing, and documenting total incoming Electronic Equipment, and total outgoing materials, wastes, and equipment and components going for reuse, at each e-Steward location, including materials in off-site storage or locations. An e-Steward shall:**

- a) Calculate a Mass Balance Accounting of all incoming and outgoing Electronic Equipment and resulting materials (including for Reuse), on a six-monthly basis at a minimum, preferably on a monthly basis (see Appendix A);**
- b) Monitor and control the destinations of 100% of outgoing materials containing, consisting of, or derived from Hazardous e-Waste, in conformance with this Standard (see Appendix A);**
- c) Provide customers (if customers request) verifiable records and contact information regarding Downstream Recyclers throughout the Recycling Chain (including End Processors) for the customers' Hazardous e-Waste, including refurbished equipment and parts up to the point of being sold or donated for Reuse; and**
- d) Create and maintain an up-to-date downstream flow chart of what materials/outputs are generated by the e-Steward from each site, for all Hazardous e-Wastes, all Problematic Components and Materials, as well as all refurbished equipment and parts going for Reuse, and exactly where they all go downstream of the e-Steward, through Final Disposition, including approved vendors who may or may not be in use.**

**4.5.1.2 An e-Steward shall accurately quantify, record, and provide the following data to a central database<sup>19</sup> on an annual basis, for each and all certified sites within the scope of the certificate:**

- a) Site description**
- b) Number of employees, contractors, and temporary employees (total number) of individuals who worked for more than one week during the 12 month period;**
- c) Number of volunteers who volunteered for more than one week during the 12 month period;**
- d) Types of process(es) taking place at each e-Steward site:**

**1. De-manufacturing of e-Waste for materials recovery and/or disposal, in one of more of the following categories:**

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<sup>19</sup> The data base is located at [www.e-stewards.org/database](http://www.e-stewards.org/database), and will securely collect data regarding impacts and outcomes of e-Stewards activities associated with each certified site and linked to the date and sequence of the audit report. Data from individual e-Stewards will be kept completely confidential (unless the individual e-Steward agrees to allow any individual information to become public), and will be consolidated with data from all other certified e-Stewards, and publicly reported in the aggregate only.

- Manual disassembly
- Shredding
- Other

**2. Refurbishment or repair for reuse**

**3. Metals refining**

**4. Other**

**e) Amounts of material received, processed and supplied on an annual basis, as follows:**

- 1. Total weight of incoming Electronic Equipment, components, and materials received and under organizational control;**
- 2. Total amounts of outgoing materials and equipment, by weight, for each category listed below and managed in conformance with this Standard:**

- **CRT glass or any Hazardous e-Waste containing or consisting of CRT glass, or other leaded glass, such as plasma screen glass;**
- **Mercury containing devices (such as circuit boards with mercury relay switches, LCD screens with mercury lamps, separated mercury devices, etc.);**
- **Batteries that contain mercury, cadmium or lead;**
- **Lithium ion batteries;**
- **All other batteries;**
- **Printer or copy drums or any other components or materials containing selenium and/or arsenic;**
- **Polychlorinated biphenyls, or any equipment containing PCBs;**
- **Radioactive materials;**
- **Toners and inks, and toner and ink containers and cartridges;**
- **Plastics containing PVC, brominated flame retardants or other halogens;**
- **Anti-freeze and coolant glycols;**
- **Other components and materials identified by the e-Steward as problematic; and**
- **Total weight of all equipment and parts going for Reuse;**

- 3. For all outputs, both total weight and percentage by weight of each of the following destination categories of electronic equipment, components and materials leaving the e-Steward's facilities and direct control:**

- **Reuse/refurbishment**
- **Materials Recovery/Recycling**
- **Disposal in solid waste facilities**
- **Disposal in hazardous waste facilities**
- **Other (specify)**

- f) **Semi-annual and other required tests results from monitoring worker exposures to heavy metals and chemicals, as listed in 4.4.6.1 Health and Safety in the Workplace. Such information will be kept proprietary, except in aggregate form:**
- 1. If an e-Steward is breaking, cutting, crushing, shredding, or pulverizing CRTs, (no exceptions regardless of technologies employed) it shall report the results of semi-annual air testing for silica dust, lead, beryllium, and cadmium including compounds containing the heavy metals;**
  - 2. If an e-Steward has any employees removing mercury-containing components (such as small fluorescent lamps from LCD screens), it shall report the results of semi-annual air monitoring for mercury and mercury compounds, including worker breath zone and the area around the mercury-removal / storage operation;**
  - 3. If an e-Steward is using power machinery to shred, cut, grind, or shear Electronic Equipment, it shall report the results of semi-annual exposure monitoring for lead, beryllium, cadmium, mercury, including compounds of these, fiberglass and brominated flame retardants; (see Appendix A). An e-Steward only using a shredder dedicated to hard drives shall do likewise but need not test for mercury;**
  - 4. If an e-Steward is using thermal processes for melting, smelting, or combustion of Electronic Equipment, it shall report the results of tests for inhalable hydrocarbons (See Appendix A), brominated flame retardants, beryllium, lead, mercury, and cadmium and all compounds of these elements;**
  - 5. If an e-Steward uses acids or solvents for precious metals or plastic materials recovery or cleaning procedures, it shall report the results of workplace exposure tests for any acid or solvent that is indicated as an inhalation hazard in the relevant MSDSs. Additionally, the results of testing for related digestive acid gases such as hydrogen sulphide, nitrous oxide, and other identified chemical hazards shall be reported.**

#### 4.5.2 Evaluation of compliance

Implement and maintain a process for regularly monitoring its compliance with applicable legal and other requirements, including occupational health and safety requirements, and record its results.

See ISO 14001 para. 4.5.2

#### 4.5.3 Nonconformity, corrective action and preventive action

An e-Steward shall implement and maintain a process for addressing non-conformities discovered and correcting non-conformities with closed loop corrective action.

Implement and maintain a system for taking preventive action for the purpose of preventing non-conformities from occurring in the first instance.

See ISO 14001 para. 4.5.3

#### 4.5.4 Control of records

An e-Steward shall maintain and control legible and verifiable records to demonstrate conformity with documented requirements. Records control shall include processes for protected storage and retrieval, retention, and disposal of records.

Establish and maintain records as necessary to demonstrate conformity to all performance requirements in the Standard.

See ISO 14001 para. 4.5.4

##### **4.5.4.1 The e-Steward shall establish and maintain records as necessary to demonstrate conformity to all performance requirements in this Standard (see Appendix A)**

#### 4.5.5 Internal audit

An e-Steward shall conduct internal audits of its management system at regularly scheduled times to check for initial implementation and continuing conformity with system requirements. Results shall be reported to top management.

The audit program shall be conducted taking into account the relative importance of each element of the system and previous audit and performance results, as well as the proper qualification and impartiality of auditors involved.

See ISO 14001 para. 4.5.5

#### 4.6 Management review

The highest level of management shall review the performance of the environmental management system at regularly scheduled times and take appropriate action to correct or improve the system based upon results.

Consideration shall be given to internal system audit results, input (including complaints) from customers or other outside parties, the degree to which system objectives (including legal objectives) are met, the status of nonconformities and corrective actions, opportunities for improvement and preventive action, and action items from previous reviews.

Records of reviews and actions to be taken shall be maintained.

See ISO 14001 para. 4.6

END OF REQUIREMENTS SECTION

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## APPENDIX A

The Guidance Document for the complete e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment® is a work in progress which will be updated on a continuous basis as new information becomes available on best practices. The guidance document is not binding on e-Stewards but is for guidance and explanation purposes. However, this document is an essential adjunct for implementation and understanding of the complete e-Stewards Standard and its placement on the Worldwide Web is only to facilitate fluid improvement and updating. It will be located in its most current version on the Worldwide Web at:  
[www.e-Stewards.org/Library/e-StewardsStandardGuidanceDocument.html](http://www.e-Stewards.org/Library/e-StewardsStandardGuidanceDocument.html)

## APPENDIX B

### Rules for e-Stewards Certification Bodies

The following requirements are applicable for all Certification Bodies which are performing audits and certifying e-Stewards in accordance with the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment.

#### 1. Accreditation

Only Certification Bodies which have been accredited under the ANAB e-Stewards Program or another BAN approved accreditation program are eligible to participate in the Basel Action Network's (BAN) e-Steward certification program.

#### 2. Copyrights

Accredited e-Steward Certification Bodies shall be granted the rights to use the e-Stewards® mark and Standard(s) in conjunction with their marketing and certification programs. A Licensing Fee may be applicable and levied upon accredited CBs in accordance with BAN's License Fee structure. Participating CBs shall strictly observe the copyright restrictions related to the e-Stewards Standard(s) which are described in Section 1 of the complete e-Stewards Standard, and the copyrighted restrictions related to the e-Stewards mark, which are described in the BAN licensing agreement.

#### 3. Certification Body Applications for e-Steward Certification

Applications provided by CBs to potential e-Stewards shall include a request for specific recycler information necessary to properly determine the scope of the certification and planning of the audits. Applicant e-Stewards provide a range of recycling services which must be understood and considered during the preparation of a quotation for auditing and certification, and subsequent audit planning. Applications which are provided or taken by Certification Bodies shall specifically request information needed to identify the scope of services provided by each applicant e-Steward, relative to the Standard, including:

- Are data destruction services provided by the applicant?
- What Potentially Hazardous Processing Technologies are employed?
- Provide a description or diagram indicating the extent of the Recycling Chain that begins with the applicant e-Steward and ends with Final Disposition of e-Waste and Hazardous Electronic Waste processed.
- Describe any exportation of Hazardous Electronic Equipment or Hazardous Electronic Waste currently employed.

Applications shall also include a request for each applicant's total annual gross revenues from the most recent fiscal year, for all sectors of company dealing with Electronic Equipment falling under the scope of the e-Steward Standard. An explanation of how this determination was made by the e-Steward is also required. This information will be verified during the initial certification audit and each subsequent audit and will remain confidential.

#### 4. Audit Man-days

When quoting e-Steward certification services, the Certification Body shall quote not less than 20% nor more than 30% of audit days than would be quoted for simple, accredited ISO 14001 certification of the same organization. International Accreditation Forum (IAF) Mandatory Document for Duration of QMS and EMS Audits, IAF MD 5:2009 (See [www.iaf.nu](http://www.iaf.nu)), shall be the basis for this determination.

If the organization requesting e-Steward certification services is already ISO 14001 certified, the Certification Body may reduce the audit man-days calculated for the initial e-Stewards certification audit by no more than 50% from the above calculated man-days to account for this existing certification.

Certification Bodies are encouraged to respect the work of and certifications issued by other accredited Certification Bodies, relevant to the e-Stewards Standard. Evidence of certification to ISO 14001 by another accredited Certification Body shall be considered in the planning of an e-Steward audit and associated quotation for services with the intention of minimizing redundancy and maximizing value for the e-Steward.

#### 5. Contracting with the applicant e-Steward

The contract for auditing and certification services with an applicant e-Steward shall include provisions which allow all records and documentation of the audit and certification process including audit findings to be shared with BAN upon request, but shall be kept confidential.

#### 6. Multi-site Certification

When a multi-site organization requests certification, the Certification Body shall not permit certification unless all sites are included in the environmental management system to be certified, and all are in conformance with the e-Stewards Standard. Otherwise, the requirements of IAF Mandatory Document for the Certification of Multiple Sites Based on Sampling, IAF MD 1:2007, shall apply.

Sampling may be conducted in accordance with sampling methodology in ISO 17021 when multi-site certification is requested.

#### 7. Transfer of Accredited Certification

When an e-Steward candidate that is already certified to ISO 14001 by another accredited CB requests a quotation for certification to the e-Stewards Standard by an accredited e-Stewards CB, the quotation and, if applicable, the transfer process shall be in accordance with IAF Mandatory Document for the Transfer of Accredited Certification of Management Systems, IAF MD 2:2007.

#### 8. Data Collection and Reporting

The Certification Body shall verify and collect both employee head count and annual revenue figures reported at the application phase at the initial certification audit and each subsequent routine audits. During surveillance visits following initial certification, the Certification Body shall

confirm that the certified e-Steward has a current licensing agreement in place with BAN, and that use of the e-Stewards logo by the e-Steward is in accordance with the licensing agreement.

This information shall be made available to BAN upon request but shall be kept confidential.

The Certification Body shall report all e-Steward certifications and pertinent information, in a format to be provided, to the BAN designated data repository. Any changes to certification status (i.e., suspension, withdrawal, cancellation) shall be reported within 30 days.

The Certification Body audit teams shall verify, as an element of each audit, that the e-Steward has reported all required performance data to the designated data repository and shall verify the veracity of reported data during each audit, as appropriate.

#### 9. Certificate Issuance

The Certification Body shall issue a certificate(s) indicating full conformance of the e-Steward with all applicable requirements of the Standard when, and only when the Certification Body has confirmed that the e-Steward has a valid and current Licensing Agreement in place with BAN for the use of the e-Stewards name and logo, and all non-conformances have been cleared.

The certificate issued shall bear the logo of the Certification Body and the Accreditation Body and the e-Stewards logo (as provided by BAN to the Certification Body in conjunction with its Licensing Agreement). No unaccredited e-Steward certificates may be issued by a Certification Body.

The certificate issued by the Certification Body may also reference conformity with ISO 14001. Alternatively, separate certificates may be issued for the e-Stewards Standard and the ISO 14001 Standard.

#### 10. Agreement to Oversight of the Certification Process by BAN

The Certification Body shall agree to a reasonable level of oversight by BAN or a BAN designated third party. This overview may include witnessing of the initial accreditation office audit and witnessed audit, review of Certification Body documents and procedures related to the e-Stewards program, witnessing of Certification Body audits of e-Steward applicants and/or certified e-Stewards, and review or witnessing of other accreditation or certification body events that BAN considers to be relevant to its oversight of the e-Stewards program, and may also include participation in training or updates by BAN or its designated third party, from time to time.

END OF APPENDIX B

## APPENDIX C

### Tools for the e-Steward

Appendix C for the complete e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment® is a work in progress which will be updated on a continuous basis as new information and tools become available on best practices, much of it from the recycling industry. This document is not binding on e-Stewards but provides tools for implementing the Standard. Its placement on the Worldwide Web is only to facilitate fluid improvement and updating. It will be located in its most current version on the Worldwide Web at:  
[www.e-Stewards.org/Library/e-StewardsStandard/ToolsFore-Stewards.html](http://www.e-Stewards.org/Library/e-StewardsStandard/ToolsFore-Stewards.html)

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