THE FOLLOWING DOCUMENTS APPLY TO ELECTRONIC RECYCLING AND/OR E-WASTE DISPOSAL SERVICES

e International
e-Stewards®
Certification Program

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Background
In 2002, the Basel Action Network (BAN) and the Silicon Valley Toxics Coalition released the report and film entitled *"Exporting Harm,"* exposing the horrific 'recycling' of toxic electronic waste ("e-waste") in China. A year later the groups launched a program designed to identify globally responsible recyclers, known as "The Electronics Recycler's Pledge of True Stewardship," and in 2005 BAN documented the dumping of equipment supposedly exported for reuse and repair to Nigeria, in a film and report entitled, *"The Digital Dump: Exporting Reuse and Abuse to Africa,"* where 75% of 'reusable' equipment received was useless waste. In 2008, BAN revisited China with CBS TV News magazine "60 Minutes," and the resulting program revealed that the situation there had become far worse, with the deadly toxic e-waste processing and dumping operations spread even further into farmlands.

Unfortunately, the e-waste export crisis has been worsening steadily as it continues to not only victimize communities and environments in developing countries, but also hurts the truly responsible recyclers in the industry through cost externalization and the resulting unfair competition. While the Pledge program was successful in diverting toxic e-waste away from developing countries, it became clear that a more rigorous, comprehensive program was needed to truly differentiate the recycling industry leaders from those less scrupulous – an independent certification program that all stakeholders can rely on.

e-Stewards: *The Highest Standard*
In answer to this pressing need, the Basel Action Network created an electronics recycling standard in conjunction with some of the best companies in the industry, experts in occupational health and safety, certification, and data security. Already hailed as the 'gold standard', the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment® is written for international use and is consistent with international waste trade rules, social accountability, and international environmental management system norms. Imbedded within the e-Stewards Standard is the complete set of requirements of ISO 14001 (for environmental management systems), occupational health and safety system requirements, Basel Convention and OECD trade rule compliance requirements, and industry-specific performance requirements. It is designed to be a *"one stop shop"* for conscientious recyclers wishing to differentiate themselves
from unscrupulous operators that have unfortunately dominated the industry landscape to date.

The e-Stewards initiative is also a *program*. Only e-Stewards recyclers benefit from extensive sales and marketing support of the e-Stewards programs.

A guidance document is provided with the Standard to facilitate understanding and implementation of a management system that meets world class standards. Here is a sampling of some key requirements of the e-Stewards Standard, which must be met for certification:

1. The requirements of ISO 14001 must be met in full;
2. Health and safety system requirements, comparable to OHSAS 18001, specific to managing e-waste;
3. The principles in the global social accountability standard, SA 8000, must be observed;
4. Electronics recycling industry performance requirements must be met, including:
    - Strict control of exportation of hazardous electronic wastes, in conformance with the Amendment to the Basel Convention and other existing laws;
    - Safe on-site handling of hazardous e-waste and other problematic components and materials, as well as workplace toxins monitoring;

- Accountability for the entire downstream recycling chain for the toxic materials;
- When data security services are offered, they must meet specified guidelines for media sanitization**,** and provide customers with agreed upon indemnity;
- Legitimate re-use and refurbishment of tested and fully functional equipment only;
- Restrictions on disposal options for toxic materials and prohibition on use of prison and child labor;
- Requirements for insurance provisions;
- Collection and reporting of data relative to the industry for benchmarking and improvement; and
- Provision of site closure plans when potentially hazardous processing technologies have been used.

Independent Accreditation & Certification

BAN has developed a global standard that raises the bar for the electronics recycling industry, and requires those who meet it to be formally recognized by the established, accredited third party certification system. This certification will initially be offered in the 38 OECD/EU/EFTA countries, and eventually globally.

Accreditation of the e-Stewards Certification Bodies is currently provided by ANSI/ASQ National Accreditation Board (ANAB), which is internationally recognized through its membership and leadership within the International Accreditation Forum and through bilateral and multi-cooperative agreements with other leading national accreditation bodies.

The certification bodies that are authorized to participate in the e-Stewards program are all ISO 14001 accredited and have demonstrated background in both the electronics and recycling industries. All have capacity, capability and qualification to operate globally.

Certified e-Stewards Recyclers can distinguish themselves in the industry, providing customers with a high level of confidence that they operate in conformity with the world's highest principles of environmental stewardship, social responsibility, and international law.

For more information visit: www.e-stewards.org

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e-Stewards Certification introduction

What is the e-Stewards Certification program?

e-Stewards Certification is rapidly emerging as the leading global program designed to enable individuals and organizations who dispose of their old electronic equipment to easily identify recyclers that adhere to the highest standard of environmental responsibility and worker protection. e-Stewards Certification is open to electronics recyclers, refurbishers and processors in all developed countries.

Certified e-Stewards recyclers adhere to the *e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment*®; written by the environmental community with leaders in the industry to protect human health and the global environment. While there are other guidelines written for the recycling industry, the e-Stewards Standard is the only e-waste standard that:

- Requires a certified ISO 14001 environmental management system that builds in occupational health and safety requirements specific to the electronics recycling industry, minimizing exposure of recycling workers to hazards
- Prohibits all toxic waste from being disposed of in solid waste landfills and incinerators
- Requires full compliance with existing international hazardous waste treaties for exports and imports of electronics, and specifically prohibits the export of hazardous waste from developed to developing countries
- Prohibits the use of prison labor in the recycling of toxic electronics, which often have sensitive data embedded
- Requires extensive baseline protections for and monitoring of recycling workers in every country, including developed nations where toxic exposures are routinely taking place
- Is written for international use

For more details, see How to Become an e-Stewards Recycler, FAQs on its background, FAQs on how it works, and primer on the e-Stewards Standard.

The e-Stewards certification program provides a high level of confidence that a recycler consistently conforms to the e-Stewards Standard. Recyclers must be certified by accredited, independent and specially trained e-Stewards certification bodies, via rigorous, on-site audits that are performed at least once a year.

- e-Stewards certification bodies are fully accredited by the ANSI-ASQ National Accreditation Board (ANAB).
- A high standard of consistent auditor performance is assured across the program through a rigorous, professional auditor training program covering the certification program and requirements, international law and a recycling industry primer.

In addition, BAN provides constant oversight of all levels of the program (recyclers, auditor training, certification and accreditation bodies) to ensure on-going integrity of the certifications.

Here is an overview of how the certification process works.

Additional reasons to choose the e-Stewards program

Here are a few reasons that e-Stewards Certification is the industry's highest assurance that e-waste is disposed of the right way:

- **Top-to-bottom designed to solve the e-waste problem:** e-Stewards Certification provides an end-to-end accountability trail that proves e-waste recycling is performed in a manner consistent with the core objectives of data security, health and worker safety, no export of toxic materials to developing countries, no prison labor and no dumping or incineration.
- **Independent of industry interest groups:** The e-Stewards Initiative is managed by an independent organization committed to solving the e-waste crisis. While the engagement and support of leading recycling companies and industry experts helps ensure that the Standard remains practical and economically viable, the ultimate litmus test for every aspect of the Standard is the environmental and health goals that drive the need to have a standard in the first place. The other major e-recycling standard in the United States is a much looser set of guidelines written to a large extent by the very industry that is at the core of the existing crisis.
- **Rigorous verification system:** Both the certification and accreditation programs were built with strong controls and oversight in order to create the highest level of confidence that a service provider consistently meets the e-Stewards Standard.

As our comparisons of e-Stewards and competitive certification programs show, other standards simply do not adequately address the foundational issues of export, and environmental, worker, and data protection. Only e-Stewards Recyclers meet the highest standard and can prove it!

How to become an e-Stewards Recycler

The e-Stewards Certification program combines a highly rigorous, mainstream verification system with the highest standard for electronics recycling. This standard (the e-Stewards Standard for Responsible Recycling and Reuse of Electronics®) fully incorporates ISO 14001, *the* global standard for environmental management systems. All Certified e-Stewards Recyclers will therefore be both ISO 14001 certified and meet industry-specific requirements for globally responsible recycling and refurbishment of electronic equipment.

If a company or organization wishes to become certified, the following are steps typically taken to achieve e-Stewards certification. Details follow:

- Review the Standard and Sanctioned Interpretations which are important interpretations of and changes to the Standard that have been made since its inception
- Obtain and review the Marketing & Licensing Agreement by contacting inform@ban.org
- Get quotes from Certifying Bodies to conduct the audits
- Evaluate costs and investigate avenues for financial assistance
- Prepare – Appendix A of the Standard is a Guidance Document, and Appendix C provides tools and resources to help you implement the Standard. e-Stewards Management System Implementation Training is also available for certifying recyclers.
- Schedule Stage 1 audit
- Address any issues identified
- Schedule Stage 2 audit
- Execute BAN's Marketing and Licensing agreement
- Receive Certification
- Promote your company as a Certified e-Stewards Recycler!

Here are the details:

1. Review the e-Stewards Standard and supporting materials. This should include reviewing the current Sanctioned Interpretations of the Standard, to understand any clarifications or changes to the Standard. Note: there is a fee for the full standard although you may view the free, non-ISO version for information which is for information purposes only.
2. Review the requirements for multi-site organizations (see below), if applicable, and the e-Stewards Recycler Licensing Agreement with BAN, which is signed after the completion of the audit process
3. Optional: conduct a gap analysis between your current system and operations and what is needed to operate in conformance with the e-Stewards Standard.
4. Set up, document, and internally evaluate your environmental management system to operate in conformance with the e-Stewards Standard including ISO 14001. Operate your EMS long enough to obtain necessary records.
5. 3-6 months prior to readiness for auditing, request bids from one or more e-Stewards Certification Bodies (CB) for auditing services, including all e-waste locations in developed countries, and the 3 year audit cycle (see "Multi-site e-Stewards Recyclers" below). If your organization is already ISO 14001 certified, request information on transferring your existing ISO 14001 certification and therefore reduced costs for your initial e-Stewards audit.
6. Contract with a CB of choice and schedule the Stage 1 audit, to determine readiness for the Stage 2 audit.
7. Schedule and complete the Stage 2 audit, and resolve all non-conformities identified during the audit. This may require a return audit.
8. Sign a marketing and licensing agreement with BAN, and pay an annual fee based on annual revenue generated by e-waste operations. Plan your marketing strategy, with support from BAN.
9. Receive accredited certification of operations to ISO 14001 and e-Stewards Standard.

10. Begin marketing your operation(s) as a certified e-Stewards company.

After initial certification, auditors return annually at a minimum, to perform surveillance audits (at lower costs) and to ensure consistent conformity with the Standard over time. The certification is for a three years period, as is typical for ISO certifications. After this, a new 3 year audit cycle begins.

Multi-site e-Stewards Recyclers:

Companies/organizations with e-waste recycling operations at multiple locations are required to have all locations certified to the standard within 18 months of the issuance of the first certificate for any individual site, and must commit to and contract with its certifying body for certification of all its operational sites at the outset. This certification can be held either in the form of individual site certificates or in a single multi-site certificate which encompasses all sites.

e-Stewards program costs

There are three costs associated with e-Stewards Certification:

1. Internal preparation costs
2. Contracting with a Certifying Body for the audits
3. The Marketing and Licensing Fee required to use the e-Stewards brand

For complete information on evaluating costs, see e-Stewards Recycling Certification Costs.

R2:2013



THE RESPONSIBLE RECYCLING

("R2")

STANDARD

For

ELECTRONICS RECYCLERS

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Effective Date: SEPTEMBER 1 2014

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INTRODUCTION

This document – the R2:2013 Standard – establishes responsible recycling ("R2") practices for the recycling of electronics globally. By certifying to this Standard through an accredited third-party Certification Body, electronics recyclers[1] can help prospective purchasers of their services (customers) make informed decisions and have increased confidence that used and end-of-life electronic equipment are managed in an environmentally responsible manner, protective of the health and safety of workers and the public, and that all data on all media devices is secure until destroyed. Thus, certification to R2:2013 allows electronics recyclers to highlight their value to customers, employees, their community and the public.

R2:2013 was developed by a multi-stakeholder group – the R2 Technical Advisory Committee (TAC) – through an open, transparent, and consensus-based approach in conformance with generally accepted principles for consensus-based standards. The TAC itself consists of representatives from key stakeholder groups, including: recyclers, customers/users of recycling services, regulatory and procurement agencies, manufacturers of electronic equipment, downstream vendors of recyclers, and international trade experts. The process for development of R2:2013 included public comment, response to comments, and an appeals opportunity so that all interested parties had the ability to participate in the revision process. Following completion of this process, R2:2013 was reviewed and adopted by the SERI Board of Directors.

Comprehensive

The requirements contained within R2:2013 are comprehensive, covering environmental, health and safety, and data security practices. To further ensure the integrity and strength of the Standard, R2:2013 now requires facilities to obtain certification to one or more generally-accepted environmental, health and safety management systems.

Legal

The R2:2013 Standard specifically requires that international trade in used and end-of-life electronics be conducted legally and responsibly. This requirement is made explicit in R2:2013, by requiring compliance (including documentation) with the laws and regulations of all importing, transit, and exporting countries. Further, if a requirement of this document conflicts with an applicable legal requirement, the recycler must adhere to the legal requirement.

Conformance

All the provisions of this R2:2013 Standard shall be conformed to by R2:2013 electronics recyclers. Whether conformed to directly, or through a contracted third party, the burden of proof resides with the R2:2013 electronics recycler to demonstrate conformity to each requirement. It is acceptable to outsource certain activities and requirements under the Standard to partners or downstream vendors. However, it is the responsibility of the R2:2013 electronics recycler to ensure that these downstream partners and vendors conform to the requirements of the R2:2013 Standard.

[1] When referred to in this Standard, the term "recycler" encompasses all entities in the recycling chain, including brokers, refurbishers, collectors, resellers, etc. The term "recycler" is used for simplicity of language throughout. "Recycler" is defined in the Definitions Section at the end of this document.

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Applicability
The R2:2013 Standard is applicable to all organizations within the recycling chain, regardless of their size or location.

R2:2013 certification is specific to a facility, and not to a company. The R2:2013 Standard shall apply to all electronics recycling related activities at a physical address. It may be extended to multiple physical addresses through a multi-site certificate or additional individual certificates. It may also be extended as a multi-site sampling certificate when the management system is shared by multiple locations in accordance with the International Accreditation Forum Mandatory Documents 1 and 5.

Related Document – R2 Code of Practices
The R2 Code of Practices is a supporting document defining the processes used in applying and administering the R2:2013 Standard. It contains requirements designed to facilitate R2:2013 audit consistency, including requirements related to SERI's oversight of the R2:2013 certification process. Allowances for certain requirements are specifically defined in the R2 Code of Practices. Allowances will only be made where provisions are clearly not applicable to the facility within the recycling chain, and where allowances will not negatively impact the validity of the certification.

About SERI
SERI is the non-profit organization established to administer and promote the R2 Standard. It consists of an independent Board of Directors and a staff. In addition, the R2 Technical Advisory Committee is a voluntary group of concerned stakeholders appointed by the SERIBoard and charged with the responsibility for maintaining the integrity and effectiveness of the R2 Standard and related guidance. SERI is the authoritative administrator and owner of the R2:2013 Standard. Additional resources and information are available at http://www.sustainableelectronics.org.

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THE R2:2013 REQUIREMENTS

1. **Environmental, Health, and Safety Management System**

General Principle – *An R2:2013 electronics recycler shall possess and use an Environmental, Health, and Safety Management System (EHSMS) to plan and monitor its environmental, health, and safety practices, including the activities it undertakes to conform to each requirement of the R2:2013 Standard. This EHSMS shall be certified to an accredited management system standard.*

Requirements:

(a) An R2:2013 electronics recycler shall document the scope of activities included in the R2:2013 and EHSMS certifications, including any allowance to the R2:2013 standard expressly listed in the R2 Code of Practices and authorized in writing by the Certification Body.

(b) An R2:2013 electronics recycler shall be certified, throughout the duration of its R2 certification, to one or more environmental, health and safety management system standards (EHSMS) that have been approved by SERI[2]. The R2:2013 electronics recycler shall be certified to the standard(s) and R2:2013 by an independent, Accredited Certification Body.

(c) An R2:2013 electronics recycler shall develop, document, fully implement, review at least annually through internal audits, and update as needed (e.g., as operations, products and/or technologies change) this written EHSMS, which shall include:

(1) Written goals and procedures covering, and requiring the organization to systematically manage, its on-site and downstream environmental, health, safety, and data security matters in a manner consistent with each requirement of the R2:2013 Standard, and

(2) A list of the activities necessary to conform to each requirement of R2:2013, a list of the documentation necessary to show conformity with these requirements, and a commitment to take corrective action to address any issues of non-conformance.

2. **"Reuse, Recover, ..." Hierarchy of Responsible Management Strategies**

General Principle – *An R2:2013 electronics recycler shall develop and adhere to a policy for managing used and end-of-life electronic equipment that is based on a "reuse, recover…" hierarchy of responsible management strategies.*

Requirements:

(a) An R2:2013 electronics recycler shall develop in writing and adhere to a policy stating how it manages used and end-of-life electronics equipment, components, and materials – with respect to both on-site activities and the selection of downstream vendors – that is based on a hierarchy of responsible management strategies:

(1) Reuse – An R2:2013 electronics recycler shall take all practical steps to direct tested equipment and components to reuse and resale, and to direct equipment capable of repair to qualified refurbishers, unless a customer directs otherwise (See Provision 6 for further

[2] As of July 1, 2013, SERI has approved RIOS™, or a combination of both ISO 14001 and OHSAS 18001, to fulfill this requirement. In the future, additional EHSMS standards may be approved. At such time, they will be listed on the SERI website (SERIwww.sustainableelectonics.org).

discussion).

(2) Materials Recovery – An R2:2013 electronics recycler shall take all practical steps to separate as appropriate, through manual dismantling and/or mechanical processing, the materials in equipment and components that are not directed to reuse or refurbishment and direct them to properly-equipped materials recovery facilities.

(3) Energy Recovery or Land Disposal – An R2:2013 electronics recycler shall not direct material[3] to incineration, energy recovery, or land disposal facilities unless no reuse or recycling options are viable. (See Provision 5(d) for the relevant requirements.)

(b) This policy shall incorporate and be consistent with the Focus Material (FM) Management Plan that the R2:2013 electronics recycler develops in accordance with Provision 5.

3. **Legal Requirements**

General Principle – *An R2:2013 electronics recycler shall comply with all applicable environmental, health and safety, and data security legal requirements and shall only import and export equipment and components containing Focus Materials in full compliance with all applicable importing, transit, and exporting countries' laws.*

Requirements:

(a) An R2:2013 electronics recycler shall develop a legal compliance plan to maintain full compliance with all environmental, health, safety, and data security legal requirements applicable to its operations, as well as full compliance with all applicable import and export laws covering shipments of FMs and shipments of untested or non-functioning equipment or components containing FMs. This plan shall be included as a section of its EHSMS.

(1) Facility Compliance: The plan shall identify and document the environmental, health, safety, and data security legal requirements that cover the recycler's operations.

(2) Import/Export Compliance: The plan also shall identify and document the legality – under the laws of the exporting, transit, and importing countries – of all international shipments of FMs and untested or non-functioning equipment or components containing FMs, that have passed through the R2:2013 electronics recycler's facility or control[4]. Prior to shipment, the recycler shall identify the countries that are receiving or transferring such shipments, obtain documentation demonstrating that each such country[5] legally accepts such shipments, and demonstrate compliance of each shipment with the applicable export and import laws.

The documentation shall be in a language understandable to the electronics recycler, and consist of original documentation from the importing or exporting country's Competent Authority or a copy of a law or court ruling, that demonstrates the import country legally accepts such imports, and the export country legally allows such exports.

(3) The recycler shall keep the legal compliance plan up to date, identify and implement the steps necessary to comply with each requirement, and document the implementation of these steps. It shall also periodically audit its compliance with legal requirements, and take corrective action to address any issues of non-compliance.

[3] This includes materials with substances identified in the R2 recyclers' risk assessment of potential hazards in compliance with provision 4(c).
[4] This includes shipments made by any downstream vendors.
[5] This includes both OECD (Organization for Economic Co-operation and Development) and non-OECD countries.

4. **On-Site Environment, Health, and Safety**

General Principle – An *R2:2013 electronics recycler shall use practices and controls at its facilities that protect worker and public health and safety and the environment under both normal and (reasonably foreseeable) exceptional circumstances.*

Requirements:

General

(a) An R2:2013 electronics recycler shall demonstrate the expertise, knowledge, and technical capability to process each type of equipment, component, and material it accepts in a manner that is legal and protective of worker safety, public health, and the environment.

(b) An R2:2013 electronics recycler shall adhere to good housekeeping standards, including keeping all work and storage areas clean and orderly. Housekeeping for all areas of the facility shall be planned, regularly implemented, and monitored.

Workforce and Environmental Protection

(c) An R2:2013 electronics recycler shall conduct on an ongoing basis (e.g., as new types of materials are processed or new processes are used) a hazards identification and assessment of occupational health and safety and environmental risks that exist or could reasonably be expected to develop at the facility. Such risks could result from any sources, including but not limited to emissions of and/or exposure to substances[6], noise, ergonomic factors, thermal stress, substandard machine guarding, cuts and abrasions, etc. The hazards identification and assessment shall be captured in writing and incorporated as a component of the recycler's EHSMS.

(d) An R2:2013 electronics recycler shall manage the environmental, health and safety hazards, minimize the risks it identifies, and prioritize the use of appropriate strategies to implement and maintain controls, including but not limited to:

(1) Engineering controls such as:

(A) Substitution (e.g., replacing a toxic solvent with one less toxic)
(B) Isolation (e.g., automating a process to avoid employee exposure)
(C) Ventilation and, if appropriate, capture (e.g., fume hood)
(D) Dust control, capture, and clean up
(E) Emergency shut-off systems
(F) Fire suppression systems

[6] Risks posed by exposure to substances may arise in a variety of situations – sometimes involving substances that do not under ordinary conditions pose a risk to worker safety or the environment. Such substances may include mercury, lead, beryllium, cadmium, PCBs, some phosphor compounds, certain brominated flame retardants (i.e., polybrominated biphenyls, pentabrominated diphenyl ether, and octabrominated diphenyl ether), silica dust, chlorinated or brominated dibenzodioxins and dibenzofurans, and hexavalent chromium. Special attention should be given to potential lead and cadmium exposures during the creation or handling of broken CRT glass, as well as where lead solder is melted during chip recovery.

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(2) Administrative and work practice controls, including appropriate combinations of:

(A) Regular, documented environmental, and health and safety training that covers information from the hazards assessment, as well as safe management handling, spill prevention, engineering controls, equipment safety, and use and care of personal protection equipment along with training for new hires and refresher courses for all employees that is understandable to them given language and level-of-education considerations; and
(B) Job rotation as feasible given workforce size, and
(C) Safe work practices, and
(D) Medical surveillance, and
(E) Safety and environmental meetings.

(3) Personal protective equipment, including respirators, protective eyewear, cut-resistant gloves, etc., as appropriate for the risks involved in the tasks being performed.

(e) An R2:2013 electronics recycler shall use monitoring and sampling protocols as applicable to provide assurances that the practices and EHSMS controls it employs are effectively and continuously managing the risks it has identified. This includes complying with all applicable environmental and health and safety regulations and permissible exposure limits (PELs) for sampling and/or monitoring.

(f) An R2:2013 electronics recycler shall treat its entire workforce, including volunteer workers, consultants, temporary workers, and anyone else performing activities under its direction, using the standard of care established pursuant to Section (d) of this provision.

(g) An R2:2013 electronics recycler shall designate a qualified employee(s) or consultant(s) to coordinate its efforts to promote worker health and safety and environmental protection. This designated individual(s) shall be identified to all employees and two-way communication shall be encouraged between employees and this individual regarding potential hazards and how best to address them.

(h) An R2:2013 electronics recycler shall identify probable emergency situations and exceptional circumstances. R2:2013 electronics recyclers shall prepare, periodically test, and update, as appropriate and necessary, an emergency plan(s) for responding to the identified emergency situations and exceptional circumstances to protect workers (subject to Section (f)), the public, and the environment. Occurrence of emergency events, including exceptional releases, accidents, spills, fires, and explosions shall be reported to the required authorities.

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5. **Focus Materials**

General Principle – *An R2:2013 electronics recycler shall manage – both on-site and in the selection of downstream vendors – the Focus Materials that pass through its facility or control in a manner protective of worker health and safety, public health, and the environment. An R2 electronics recycler also shall perform due diligence on downstream vendors to which it ships these materials.*

Requirements:

Development and Adherence to an FM Management Plan

(a) An R2:2013 electronics recycler shall analyze, plan, regularly review, and update as necessary how the FMs that pass through its facility or control will be properly managed both on-site and down the Recycling Chain (and include this analysis and plan as the "FM Management Plan" section of its EHSMS). The FM Management Plan shall state how the recycler and its downstream vendors shall conform to the requirements set forth in the rest of this Provision 5.

Removal of FMs

(b) Prior to shredding or materials recovery of equipment or components, FMs (as well as print cartridges) shall be removed using safe and effective[7] mechanical processing or manual dismantling, with two exceptions:

(1) Items containing mercury if:

(A) They are too small to remove safely at reasonable cost, and
(B) Workers are protected from the potential risks of handling mercury, and
(C) The materials recovery occurs in facilities that meet all applicable regulatory requirements to receive and process mercury, and that use technology designed to safely and effectively manage equipment or components containing mercury.

(2) CRTs, batteries, and circuit boards contained in equipment or components destined for materials recovery need not be removed prior to shredding and/or materials recovery if the shredding and/or materials recovery occurs in facilities that meet all applicable regulatory requirements to receive these FMs, and that use technology designed to safely and effectively manage equipment or components containing these FMs.

Processing, Recovery, and Treatment of FMs

(c) An R2:2013 electronics recycler shall send removed FMs to processing, recovery, or treatment facilities that meet all applicable regulatory requirements to receive the FMs, and that use technology designed and operated to safely and effectively manage the FMs. This shall include:

(1) For items containing mercury – mercury retorting or other legal methods, excluding incineration,

(2) For circuit boards – removal of batteries and mercury, and processing for metals recovery, and

(3) For items containing polychlorinated biphenyls (PCBs) – technology specifically designed for PCB destruction, occurring in facilities that meet all applicable regulatory requirements, and that use technology designed to safely and effectively manage equipment or components containing these FMs.

[7] See Provision 4 for a discussion of "safe and effective" practices and controls.

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Prohibition on Energy Recovery, Incineration, and Land Disposal of FMs

(d) An R2:2013 electronics recycler shall not use energy recovery, incineration, or land disposal as a management strategy for FMs or equipment and components containing FMs unless applicable law requires the use of a specific technology (e.g., thermal destruction of PCBs). However, if documented extreme and rare circumstances beyond the control of the R2:2013 electronics recycler disrupts its normal management of an FM, it may consider using these technologies to the extent allowed under applicable law until normal management is again possible.

Selection and Ongoing Due Diligence of Downstream Vendors for FMs[8]

(e) For shipments of removed FMs, and shipments of equipment and components containing FMs, an R2:2013 electronics recycler shall select both domestic and international downstream vendors that:

(1) Conform to the R2:2013 electronics recycler's FM Management Plan (developed in accordance with and including the requirements set forth in Sections (b) - (d) above), and

(2) Adhere to a documented system to manage environmental, health, and safety risks and legal requirements. The management system shall include at a minimum the components of Provision 3 (Legal Requirements and Provision 4 (On-Site Environmental, Health, and Safety), and

(3) Comply with all applicable environmental and health and safety legal requirements and maintain a current list of its environmental permits and copies of each, and

(4) Conform to this Section (e) and Section (f) below, or allow the R2:2013 electronics recycler to confirm this information with each of its relevant downstream vendors, thereby establishing that each facility in the Recycling Chain conforms to these subsections, and

(5) Conform to Provision 6 (Reuse), if applicable, and

(6) Conform to Provision 7 (Tracking Throughput), documenting the flow of all FMs down the Recycling Chain, and

(7) Conform to Provision 10 (Physical Security), ensuring security of the equipment down the recycling chain.

(f) An R2:2013 electronics recycler shall confirm at least annually and document, through audits or other similarly effective means, that each downstream facility to which Section (e) applies continues to conform to the requirements of Section (e) for as long as it receives FMs directly or indirectly from the R2:2013 electronics recycler.

(g) If the R2:2013 electronics recycler uses an R2:2013 certified downstream facility, then verification of conformance to 5(e)(1) and 5(e)(6) satisfies the due diligence requirements of 5(e) and 5(f).

Non-Focus Materials Requiring Specific Management

(h) An R2:2013 electronics recycler shall manage print cartridges in accordance with Provision 2 through print cartridge remanufacturers, recyclers, or Original Equipment Manufacturers (OEM), in facilities that meet all applicable regulatory requirements to receive these print cartridges, and

[8] The R2:2013 electronics recycler is only responsible for due diligence related to the Focus Materials shipped by the R2:2013 electronics recycler.

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that use technology designed to safely and effectively manage print cartridges, including both ink and toner.

6. **Reusable Equipment and Components**

General Principle: *An R2:2013 electronics recycler shall repair and refurbish as needed, properly test, and adequately package equipment and components going to reuse to ensure continued use of the equipment and, ultimately, responsible recycling of Focus Materials.*

Requirements:

(a) An R2:2013 electronics recycler shall not allow equipment or components to be sold or donated for reuse if contrary to commercial agreements with those from whom the equipment or components were received.

(b) An R2:2013 electronics recycler shall, with respect to equipment and components it ships downstream:

(1) Label and sort each shipment in a manner sufficient to track throughput in conformity with Provision 7, and

(2) Ensure that all data is sanitized in conformity with Provision 8, and,

(3) Handle and package shipments to prevent damage in conformity with Provision 12.

(c) An R2:2013 electronics recycler shall, prior to shipping used electronics equipment and components that contain FMs, either domestically or internationally, assure and identify each shipment as either: *(1) Tested for Full Functions, R2/Ready for Reuse; (2) Tested for Key Functions, R2/Ready for Resale; and/or (3) Evaluated and Non-Functioning, R2/Ready for Repair*.

(1) Tested and Full Functions, R2/Ready for Reuse[9]

An R2:2013 electronics recycler, prior to shipping equipment and components that contain FMs to an end user, and that will be identified and shipped as Tested for Full Functions, R2 /Ready for Reuse shall:

(A) Use effective test methods to confirm that all functions for equipment and components are working properly and ready for reuse, including properly configured with appropriate legally licensed software where required for operation of equipment and components, and device specific drivers within the product's hardware, and
(B) Implement a written Quality Assurance Plan and policy (or maintain current certification to ISO 9001 or RIOS) to verify the accuracy of test methods, testing equipment (e.g., calibration) and maintain records of effective testing methods, equipment and results, and
(C) Implement a written Product Return Plan and policy appropriate for the final destination of the equipment and components, and
(D) Ensure that all equipment and components are clean and free of major cosmetic defects, as defined in Section (c)(1)(B), and
(E) Ensure that the equipment or components meet the requirements of the recipient.

[9]Tested, fully functioning used equipment that is "out-of-the-box" ready for use by end-users.

(2) Tested for Key Functions, R2/Ready for Resale[10]

An R2:2013 electronics recycler, prior to shipping equipment and components that contain FMs to a recipient vendor or end user, and that will be identified and shipped as Tested for Key Functions, R2/Ready for Resale shall:

(A) Use effective test methods and testing equipment to confirm that the Key Functions of the equipment or components are working properly, and
(B) Implement a written Quality Assurance Plan and policy (or maintain current certification to ISO 9001 or RIOS) to verify the accuracy of test methods and testing equipment (e.g., calibration), and maintain records of effective testing methods, equipment and results as appropriate, and
(C) Disclose in writing to buyers any functions that are not working properly and provide a description of cosmetic defects and missing components for each shipment as applicable, and
(D) Implement a written Product Return Plan and policy appropriate for the final destination of the equipment and components, and
(E) Ensure that the equipment or components meet the specifications of the recipient vendor or the end user.

(3) Evaluated and Non-Functioning, R2/Ready for Repair[11]

An R2:2013 electronics recycler, prior to shipping equipment and components that contain FMs to a recipient vendor, and that will be identified and shipped as Evaluated and Non-Functioning, R2/Ready for Repair shall:

(A) Implement a written Quality Assurance Plan and policy to evaluate equipment and components to ensure the condition, functionality, and sales price of the unit or component is capable of repair and refurbishment in the destination market, and
(B) Confirm through an appropriate combination of contractual agreements, detailed materials tracking, recordkeeping, and auditing that equipment and components containing FMs are only shipped to:
    (i) Electronics recycler(s) that are certified to R2:2013 and verified in accordance with Provision 5(g), or
    (ii) Recipient vendor(s) that can assure that all equipment and components shall be resold in conformance with Section (c)(1), R2/Ready for Reuse or Section (c)(2), R2/Ready for Resale, and
    (iii) Recipient vendor(s) that can manage all equipment and components containing FMs and residual FMs resulting from repair and refurbishing operations in conformance with Provision 3 and 5,

    and,
(C) Ensure that the equipment or components meet the specifications of the recipient vendor.

[10] Tested to assure that key functions are working and that non-functioning attributes are clearly documented for customers.
[11] Evaluated to assure that equipment is repairable for key functions and suitable for its intended market.

(d) An R2:2013 electronics recycler need not conform to Section (c) for sales of "Collectible Electronics" and their associated components or "Specialty Electronics" that the R2:2013 electronics recycler does not possess the technical capability to test or repair. Such sales are restricted to 1% of total individual units by quantity sold on a rolling 12 month average. Sales under this provision must include returns at no cost to the buyer.

(1) An R2:2013 electronics recycler shall conform to the legal requirements (including export) in Provision 3 for these sales/shipments.

(2) An R2:2013 electronics recycler need not conform to the downstream requirements of Provision 5 for these sales/shipments.

(e) An R2:2013 electronics recycler need not conform to the downstream requirements of Provision 5 and the exporting requirements of Provision 3 for shipments that are Tested/Full Function, R2:2013/Ready for Reuse in Section (c)(1), or Tested/Key Functions, R2:2013/Ready for Resale in Section (c)(2), or are new and in original packaging.

7. **Tracking Throughput**

General Principle – *An R2:2013 electronics recycler shall maintain business records sufficient to document the flow of equipment, components, and materials that pass through its facility.*

Requirements:

(a) An R2:2013 electronics recycler shall maintain for at least three years commercial contracts, bills of lading, or other commercially-accepted documentation for all transfers of equipment, components, and materials. An R2:2013 electronics recycler does not need to track non-FMs beyond the first tier downstream vendor.

(b) An R2:2013 electronics recycler shall provide, to each customer that is R2 certified or in the process of R2:2013 certification, upon request and with appropriate intellectual property and commercial controls as legally appropriate and required by the discloser, the names and locations of all downstream vendors in the recycling chain that handle said customer's FMs.

8. **Data Destruction**

General Principle – *An R2:2013 electronics recycler shall be responsible for data destruction of all media it handles using generally-accepted data destruction procedures.*

Requirements:

(a) An R2:2013 electronics recycler shall sanitize, purge, or destroy data on hard drives and other data storage devices (the National Institute of Standards and Technology's (NIST's) Guidelines for Media Sanitization – Special Publication 800-88[12] lists categories of devices which need sanitization consideration), unless otherwise requested in writing by the customer. The R2:2013 electronics recycler shall adhere to the data sanitization, purging, or destruction practices described in the NIST Guidelines for Media Sanitization: Special Publication 800-88 (rev. 1) or another current generally-accepted standard[13], or be certified by a generally-accepted certification program.

[12] See current link to NIST Special Publication 800-88 rev.1 at www.sustainableelectronics.org
[13] Examples include National Association for Information Destruction (NAID) and Asset Disposal & Information Security Alliance (ADISA).

(b) An R2:2013 electronics recycler shall document its data destruction procedures and include this documentation as part of its EHSMS.

(c) Employees involved in data destruction shall receive appropriate training on a regular basis and be evaluated for competency in data destruction processing.

(d) Data destruction processes shall be reviewed and validated by an independent party on a periodic basis as defined in the documentation called for in Section (b).

(e) Quality controls shall be documented, implemented, and monitored internally to ensure effectiveness of data sanitization, purging, and destruction techniques.

(f) Security controls that are appropriate to the most sensitive classification of media accepted at the facility shall be documented, implemented and maintained. Security controls shall consider physical security, monitoring, chain-of-custody, and personnel qualifications.

(g) Adequate records of data destruction shall be maintained by the R2:2013 electronics recycler and each downstream vendor conducting data destruction.

(h) If data destruction is handled by a downstream vendor:

(1) The R2:2013 electronics recycler shall maintain responsibility for data destruction and ensure appropriate security, controls, and processing techniques continue to conform to Provision 8 through audits or other similarly effective means.

(2) Media or devices containing media with data must be tracked and secured during transportation, storage, and processing.

(3) Each downstream vendor must adhere to the requirements of Provision 8.

9. **Storage**

General Principle – *An R2:2013 electronics recycler shall store items and materials that may cause risk to worker health and safety or the environment if inappropriately stored, and equipment and components going to reuse, in a legal and appropriate manner.*

Requirements:

(a) An R2:2013 electronics recycler shall store items removed pursuant to Provision 5, and equipment and components destined for reuse, in a manner that:

(1) Protects them from reasonably foreseeable adverse atmospheric conditions and floods and, as warranted, includes a catchment system, and

(2) Is in full legal compliance, and

(3) Is secure from unauthorized access, and

(4) Is in clearly labeled containers and/or storage areas.

10. **Security**

General Principle – *An R2:2013 electronics recycler shall employ security measures appropriate for the equipment it handles and customers it serves.*

Requirements:

(a) An R2:2013 electronics recycler shall maintain a security program that controls access to all or parts of the facility in a manner and to a degree appropriate given the type of equipment handled, sensitivity of media containing data, and the needs of the customers served.

(b) An R2:2013 electronics recycler shall consider and include necessary controls to secure electronic equipment upon acceptance of said equipment.

11. **Insurance, Closure Plan, and Financial Responsibility**

General Principle – *An R2:2013 electronics recycler shall possess insurance that is adequate to cover the potential risks and liabilities associated with the nature and size of the facility's operations, and shall have adequate legal and financial assurances in place for the proper closure of its facility.*

Requirements:

(a) The R2:2013 electronics recycler shall be able to demonstrate that it has evaluated the risks arising from its certification activities and that it has adequate insurance or reserves to cover liabilities, including environmental pollution and worker health and safety, arising from its operations in each of its fields of activities and the geographic areas in which it operates.

(b) An R2:2013 electronics recycler shall develop and maintain a current, written plan and a sufficient financial instrument that assures proper closure of the facility and assures against abandonment of any electronic equipment, and components and materials from such equipment.

(1) Financial instruments must be assigned to an independent party or corporate parent with responsibility for closure, and the assignment must be consistent with applicable law, and

(2) Financial instruments shall consider the risks identified in Section (a) and applicable law, including reasonably foreseeable costs of processing remaining inventory, sampling for environmental contamination, and site remediation to restore premise to sellable condition, and

(3) Closure plans shall consider the risks identified in Section (a) including details assigning responsibility for closure, funding information, and plans for inventory processing, environmental sampling, and site remediation as needed.

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12. **Transport**

General Principle – *An R2:2013 electronics recycler shall transport all equipment, components, and materials using entities that have the necessary regulatory authorizations and in a manner protective of security, public health and the environment.*

Requirements:

(a) An R2:2013 electronics recycler must ensure that all equipment, components, and materials to be transported are packaged appropriately in light of the risk they could pose during transportation to public health or the environment and the level of care warranted by its intended use and secured in accordance with Provision 10.

(b) An R2:2013 electronics recycler must verify that its transporters, including its own fleet, have all the necessary regulatory authorizations, maintain adequate insurance coverage consistent with the material and method of transportation, and maintain an acceptable vehicle and driver safety record during the previous 3 years.

13. **Documentation and Recordkeeping**

General Principle – *An R2:2013 electronics recycler shall maintain all the documentation necessary to demonstrate conformance to the R2:2013 Standard.*

Requirements:

(a) An R2:2013 electronics recycler shall have access at the certified facility to documents and records necessary to demonstrate conformity to each requirement of this document.

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DEFINITIONS

Accredited Certification Body

An "Accredited Certification Body" is accredited by an International Accreditation Forum member body under the current ISO/IEC Standard 17021.

Collectible Electronics

"Collectible Electronics" includes items that are rare, vintage, and that are no longer manufactured or supported by original manufacturers.

Downstream Vendors

"Downstream vendors" include any entity to which a recycler transfers used or end-of-life electronic equipment, components, or materials including reuse, refurbishing, demanufacturing, processing, materials recovery, energy recovery, incineration, and disposal facilities.

Electronic Equipment

"Electronic equipment", also referred to as "equipment and components", includes computers and peripheral equipment – central processing units (CPU's); monitors; printers; keyboards; scanners; storage devices; servers; networking systems; copiers; fax machines; imaging systems; printing systems; telephones; televisions; video cassette recorders; camcorders; digital cameras; control boxes; stereo systems; compact disc players; radios; cell phones; pagers; personal digital assistants (PDAs); calculators; organizers; and game systems and its accessories. It furthermore includes any types of equipment that are designed primarily to store or convey information electronically, and any accessories to such equipment.

Focus Materials

"Focus Materials", also referred to as "FMs", are materials in end-of-life electronic equipment that warrant greater care during recycling, refurbishing, materials recovery, energy recovery, incineration, and/or disposal due to their toxicity or other potential adverse worker health and safety, public health, or environmental effects that can arise if the materials are managed without appropriate safeguards.

Focus Materials contain:

(1) Polychlorinated biphenyls (PCBs), or
(2) Mercury, or
(3) CRT glass, except for glass with lead content less than 5 parts per million, and clean of phosphors, CRT fines, coatings, and frit, or
(4) Batteries, or
(5) Whole or shredded circuit boards, except for whole and shredded circuit boards that do not contain lead solder, and have undergone safe and effective mechanical processing, or manual dismantling, to remove mercury and batteries.

Equipment, components, or materials (whole or shredded) that have undergone safe and effective mechanical processing or manual dismantling to remove FMs, yet still retain de minimus amounts of FMs, are not subject to the R2:2013 requirements that are triggered by the presence of FMs.

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Key Functions

"Key Functions" are the originally-intended functions of a unit of equipment or component, or a subset thereof, that will satisfactorily serve the purpose(s) of someone who will reuse the unit.

Recyclers

"Recyclers" includes, but need not be limited to organizations that perform the following related to electronics:

(1) Collect
(2) Refurbish
(3) Recycle
(4) Resell
(5) Demanufacture
(6) Recover Assets
(7) Broker

As well as leasing companies that engage in these activities.

Recycling Chain

"Recycling Chain" refers to all the downstream vendors that handle end-of-life equipment, components, or materials that have passed through an R2:2013 electronics recycler's facility or control. It includes, but does not extend beyond materials recovery facilities, and conforms to Provision 5(c) or 5(d). For equipment and components that are sold or donated for reuse, it does not extend beyond the entity that conforms to Provision 6 (c) or (d).

Specialty Electronics

"Specialty Electronics" are rare and specialized equipment that is not generally available in retail. For example, medical, diagnostic, laboratory, or other devices, which are customized for a specific purpose.

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