

**Preliminary  
Draft  
Guidance**

**R2 Standard**

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**Public Release for Comment DRAFT 12-01-2011**

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## Introduction

The R2 Guidance Document has been developed to provide clarification on conformance to the R2 Standard. This document has been designed as a tool that can aid recyclers in both the preparation for an R2 audit and in maintaining ongoing conformance. Specifically, the guidance offers explanation about how the Provisions of the R2 Standard can be put into practice and what activities constitute conformance. While auditors can only audit to the language of the R2 Standard, it is expected that auditors will also use this document to assist in determining if recyclers have met the practices required in the Standard.

Offering guidance about the interpretation and implementation of the R2 Standard is an important part of the R2 Quality Assurance Program. Because electronics recycling operations can vary widely based on services and size, implementation of the principles of the Standard will look different from operation to operation. However, each facility is expected to operationally apply the principles of the Standard with the same rigor. This guidance document provides further information about what conformance may look like under different conditions and what the expectations for demonstrating conformance are for all R2 certified facilities. This guidance can be used by recyclers to prepare for audits and as a reference while they strive to maintain conformance. Auditors and consultants preparing recyclers for their audit will find the explanations and examples helpful as they evaluate recycler performance. OEMs, businesses, and other clients of recyclers may use the guidance document to better understand industry best practices implemented by R2 certified recyclers, such as downstream due diligence.

This document was designed to be an accessible reference tool. Guidance is laid out in a table format to make information relevant to specific areas of the Standard easy to locate. The guidance is organized according to each provision of the R2 Standard and two forms of guidance are offered throughout this document. The first form is *General Guidance*, which provides background and intent of the whole provision. The second form is *Clarifications*, which address specific sections of the provisions.

This is official Guidance developed by the R2 Technical Advisory Committee and adopted by R2 Solutions. Any other guidance offered outside of this document is not official guidance. While all recyclers are encouraged to follow the best practices provided by the R2 Standard and enumerated in this guidance, only recyclers that have been audited and certified by an accredited certification body may claim to be “R2 certified” or “R2 compliant”. Any other use of this term shall be considered fraudulent.

## Guidance for Introduction of the R2 Standard

Introduction - Clarification		
Comment No.	Area of the Standard	Guidance
I.1	The R2 Practices are not legal requirements	The R2 Standard requires certified recyclers to abide by all applicable state, local, national, and international laws. The requirements in the R2 Standard are not legal requirements and do not override the legal requirements that recyclers may be subject to. However, the R2 Standard requires many activities which go beyond mere legal compliance and are best practices. Complete and continuing conformance with these activities is required, except in the unlikely case that they conflict with a legal requirement.
I.2	Scope of the “electronics recycling industry”	Reference to “recyclers” and the “recycling industry” includes all organizations that are performing recycling, refurbishing, reselling, asset recovery, brokering, demanufacturing, and general IT asset disposal (ITAD) activities.
I.3	Accredited certification program	The R2 Standard is an ANAB recognized standard. Only ANAB accredited certification bodies (CB) may award certification.
I.4	Facility certification	R2 certification is facility-specific. Award of certification to a company with more than one site does not apply to any site other than the facility listed on the certificate. Companies claiming multi-site certifications must have had each location audited and separately approved by an accredited CB. Furthermore, certification only applies to the approved scope on the certificate, which may not encompass all activities at the facility.
I.5	Intentionally Broad in Scope	The R2 Standard is intentionally broad rather than prescriptive. It provides for wider applicability to varying degrees of organizations and countries within the electronics recycling industry. Furthermore, it is flexible to incorporate changing technology, techniques, and legal requirements

## Guidance for Provision 1 – Environmental, Health and Safety Management Systems (EHSMS)

Provision 1 - General Guidance		
Comment No.	Area of the Standard	Guidance
1.1	Provision 1 plays a central role in R2	Provision 1 provides the foundation upon which the rest of the R2 Standard is built. It provides the framework for conforming with, and auditing to, the Standard. The requirement for the EHSMS is not just that it be established, but that it be used – thus generating documented evidence of both the ongoing conformance and effectiveness of controls for each requirement of R2. The EHSMS will articulate a set of activities that take place on a continuous basis.
1.2	Management system need not be ISO or RIOS	<p>The EHSMS does not need to conform or be certified to another standard such as RIOS or ISO. Its complexity may vary to some extent depending on the size of the facility and the types of activities undertaken at the facility. Rigor of process and level of programmatic detail shall be similar to that found in a typical ISO or RIOS program. It should also be noted that the following examples of management system standards could be used to address the management system requirements in R2.</p> <ul style="list-style-type: none"> <li>• RIOS (a QEH&amp;S management system standard in the scrap industry);</li> <li>• ISO 14001 (a standard for environmental management systems for all types of organizations), with health and safety added;</li> <li>• OSHAS 18001 (a standard for Health and Safety for all types of organizations) with environment added in.</li> </ul> <p>Fortunately, many auditors are trained in ISO and/or RIOS. Recyclers need to be prepared to meet auditors' expectations regarding the breadth, depth, and role of the EHSMS.</p>

Provision 1 – Clarifications		
Comment No.	Area of the Standard	Guidance
1.3	(a)(1) – Meaning of the phrase “written goals”	In (a)(1), “written goals” includes “objectives” and “targets”. Goals will be developed based on your identified environmental impacts and health and safety risks. Goals are not created to simply meet conformance to the R2 Standard or compliance with laws. They should be reflective of your continuous improvement efforts. Although not required to be quantitative, it is desired that they can be measured. For example, a health and safety goal might be to achieve 12 quarters with no recordable injuries.

Provision 1 – Clarifications		
Comment No.	Area of the Standard	Guidance
		Provision 1(a) calls for an R2 recycler to “fully implement” its EHSMS while (a)(1) calls for it to “systematically manage its environmental, health, and safety matters.” Documented procedures must be created to manage changes and proactively evaluate EH&S matters. Procedures must be created for all areas where deviation from the process could lead to an environmental impact or health and safety risk. All activities must generate records as evidence that procedures are in place and used on an ongoing basis, thereby making the EHSMS systematic. This includes documented evidence of the ongoing use of each element of the “Plan, Do, Check, Act” (PDCA) model for continual improvement encompassing all areas within the scope of the EHSMS.
1.4	(a)(2) - the “Plan-Do-Check-Act” footnote	<p>The footnote sets forth elements included in a PDCA model for a management system. These elements listed must be construed broadly. The terms “Document Control”, “Records”, “Internal Audits”, and “Preventative and Corrective Action” are not used. However, each of these concepts is alluded to in this footnote, and these concepts are implicit expectations of a management system capable of meeting the requirements. Consider the footnotes call to:</p> <ul style="list-style-type: none"> <li>• “monitor key activities and track performance” -</li> <li>• “identify and correct problems and prevent recurrence”, and</li> <li>• “Conduct annual progress reviews.”</li> </ul> <p>The facility needs to spell out how it will undertake activities in each of these areas including, for example, review processes, identified internal management audiences, key improvement metrics, and frequency of reviews.</p> <p>RIOS or a combination of ISO 14001 and OHSAS 18001 are examples of management systems robust enough to meet the requirements of the R2 Standard.</p>
1.5	(a)(3) – integrate plans, etc. into sections of EHSMS	Each of the sections described in (3)(A)-(F) needs to be explicitly included in the EHSMS.
1.6	(a)(3)(A) –inclusion in EHSMS of the “reuse, recover, dispose” hierarchy	The EHSMS policies and procedures need to reflect this hierarchy in the detail necessary to implement it consistently in the recycler’s processes.
1.7	(a)(3)(B) – scope of the “plan”	In (a)(3)(B), the “ <i>plan</i> for complying...” needs to spell out <i>procedures</i> and <i>activities</i> employed to assure legal compliance, with corresponding evidence for each. <a href="#">[See</a>

Provision 1 – Clarifications		
Comment No.	Area of the Standard	Guidance
		<p><a href="#">Guidance 3.2 (Provision 3(a)(1))</a> for discussion of documenting legal compliance in the EHSMS plan and <a href="#">Guidance 4.7 (Provision 4 (e))</a> for sampling and monitoring activities.]</p> <p>The basic tenants of this plan may include:</p> <ol style="list-style-type: none"> <li>1. <i>Plan</i> – identify and document all applicable legal requirements. Evaluation should include OSHA regulations, RCRA, TSCA, CERCLA, SREA, CAA, CWA, etc. including relevant federal, state, and local laws.</li> <li>2. <i>Do</i> – procedures and training to ensure legal compliance with the identified laws.</li> <li>3. <i>Check</i> – monitoring and measurements such as water or air sampling, noise monitoring, and regular compliance audits.</li> <li>4. <i>Act</i> – corrective action reporting to manage non-conformances.</li> </ol> <p>For those using a management system standard such as RIOS, ISO 14001, or OSHAS 18001, the plan for complying may be imbedded in the management system as follows:</p> <ul style="list-style-type: none"> <li>• The identification and updating of legal requirements is required under the Legal and Other Requirements element/section of these Standards.</li> <li>• The implementation of the legal requirements is managed within the Resources element (includes engineering controls, PPE), Communication Training and Competency (administrative controls), and Operational Control (procedures and work instructions).</li> <li>• Monitoring required by legal requirements is addressed under the Monitoring and Measurement element/section.</li> <li>• Compliance auditing to check compliance is addressed within Evaluation of Compliance.</li> <li>• The nonconformance element is used to address any noncompliance identified within the audit or otherwise identified.</li> <li>• During Management Review the results of the compliance auditing are discussed with top management.</li> </ul> <p>For organizations that use these Standards, it is sufficient to refer to these sections/elements of the management system where these components of compliance are implemented to demonstrate the compliance plan.</p>
1.8	(a)(3)(C) – scope of the “FM Management Plan”	The “FM Management Plan” needs to include a description of how the FMs will be managed by downstream vendors, as well as a description of how that information is

Provision 1 – Clarifications		
Comment No.	Area of the Standard	Guidance
		effectively communicated to/from downstream vendors. The plan may include information on how and where the FMs are removed and how they are managed upon removal. [For additional guidance on downstream vendors of FMs, see <a href="#">Guidance 5.13 - 5.14 (Provision 5(e) and (f))</a> ]
1.9	(a)(3)(E) – characterizing “exceptional releases”	In (a)(3)(E), “exceptional releases” need to be identified and analyzed by the facility based on its own specific activities and risks. There is not a single definition of what constitutes an “exceptional release,” however each facility needs to identify the events which would trigger an emergency response in the EHS plan. Additionally, a recycler shall include the response and communication plan that covers exceptional releases and/or industrial accidents. EHS contingency plans shall outline all reasonably foreseeable release scenarios and appropriate response and reporting procedures.
1.10	(a)(3)(F) – scope of the “list of activities”	The list of activities must include each activity that will be performed to ensure ongoing conformity to the R2 Provisions. This may be a documented plan describing how each R2 Provision is documented and managed in your system, including the specific named documents addressing each. Also, the list of activities may be a cross-reference of the R2 Provisions to each document that satisfies the Provision. The auditor should be able to reference this list of activities to find conformance to the R2 Provision. [For additional guidance on the “list of activities”, see <a href="#">Guidance 1.5 (Provision 1 (a)(2) footnote)</a> , <a href="#">Guidance 4.4 (Provision 4(c), and guidance for Provision 13.)</a> ]
1.11	(b) –auditability of section (b)	Provision 1’s section (b) is not, technically speaking, auditable. The <i>result</i> of the R2 audit should be confirmation that the facility being audited conforms to (b)(1) and (2).  Furthermore, the Certification Body conducting the audit must be accredited under ISO/IEC Standard 17021:2006 to certify electronics recyclers to the R2 Standard. Self-declaration or un-accredited 3 <sup>rd</sup> party certification indicating conformance with the R2 Standard (without also having certification by an accredited certification body) is a non-conformance with Provision 1(b).

## Guidance for Provision 2 – “Reuse, Recover, . . .” Hierarchy for Responsible Management Strategies

Provision 2 - General Guidance		
Comment No.	Area of the Standard	Guidance
2.1	This Provision describes what is needed in a section of the EHSMS	Provision 2 explains the contents of the section of the EHSMS described in Provision 1 (a)(3)(A).

Provision 2 – Clarifications		
Comment No.	Area of the Standard	Guidance
2.2	(a) - evidence of conformity	Evidence of conformity to Provision 2(a) will include the written section of the EHSMS that includes this Reuse, Recover, Dispose (RRD) hierarchy policy. The policy may stand-alone or be included as part of another policy. To demonstrate adherence to the written policy, documentation should also include a flow chart or procedure that shows how electronic equipment, managed on-site and by downstream vendors, is sorted and directed to reuse and various types of materials recovery. This section needs to be revisited on a regular basis, or when downstream vendors change, to ensure currency and accuracy. Records of shipment, receipt, and/or processing by downstream vendors are one example of proof of adherence. [For information on the treatment of FMs and the RRD hierarchy, see <a href="#">Guidance 5.4 – 5.6 (Provision 5(b))</a> ]
2.3	(a)(1) – regarding “reuse” activities	<p>(a)(1) requires an R2 recycler to take “all practical steps” to reuse “properly functioning” equipment. This sentence does not demark a clear line between equipment that should go to reuse and equipment that should go to materials recovery. That is a judgment call on the part of the recycler. However, “properly” functioning equipment should go to reuse unless a customer directs otherwise.</p> <p>For recyclers who lack the capabilities to perform refurbishing, reuse, or remanufacturing activities, the refurbishing processes may be subcontracted to a refurbisher or the equipment may be sold to a refurbisher. Similarly, for refurbishers who lack the capabilities to be recyclers, the recycling processes may be subcontracted to a recycler or the equipment may be sold to a recycler. Note however, that these situations do not relieve the R2 recycler or refurbisher of the requirements of R2 (especially Provisions 3, 5, and 6)</p>

Provision 2 – Clarifications		
Comment No.	Area of the Standard	Guidance
		<p>relating to the equipment and associated materials transferred to a refurbisher or recycler, including all subsequent tier downstream recyclers.</p> <p>Equipment that is determined to be too costly to repair or where the economic value is too low to justify restoring the unit for reuse, can be diverted for recovery.</p> <p>Recyclers shall be able to produce a recovery rate of material that enters the facility or otherwise provide evidence of their focusing on reuse. Evidence could come in the form of aggregated trend data, routing instructions, description of the rigor used for reuse evaluation, etc.</p> <p>It should be recognized that the ratio of reuse to recovery will vary greatly from R2 recycler to R2 recycler (and even month to month within the same R2 recycler’s operation) based on the quality and type of incoming streams of equipment. Thus comparison of ratios is not a valid method of determining conformance to this provision.</p>
2.4	(a)(2) – assumptions about “technically and economically feasible”	(a)(2) states that equipment not going to reuse shall be directed to materials recovery “when technically and economically feasible.” “Materials recovery” is synonymous with recycling. R2 presumes, given the current state of recycling technology and best practices, that it is technically and economically feasible to recover most of the materials in electronics equipment. Where a recycler claims that it is not “technically and economically feasible” to recover a type of material, documented evidence shall be provided to show that no options for recovery in compliance with the R2 standard were available and/or feasible.
2.5	(a)(3) assumptions about “Energy Recovery and Disposal”	<p>R2 presumes that virtually no material derived from electronic equipment needs to go to incineration-type energy recovery or to disposal. An exception would be based on customer requirements for destruction through incineration-type energy recovery. The only other exceptions for disposal of non-Focus Materials (non-FMs) are chemically treated and/or plastic laminate wood, non-refillable ink cartridge plastics contaminated with ink residue, or certain types of data storage media requiring secure destruction. If a recycler sends no materials for energy recovery or to disposal, this shall be stated in the EHSMS plan.</p> <p>It is not acceptable for FMs to be managed through energy recovery or disposal. As noted in</p>

Provision 2 – Clarifications		
Comment No.	Area of the Standard	Guidance
		Provision 5(d), in the event of circumstances beyond the control of an R2 recycler, FMs may be required by regulatory officials to be disposed in properly permitted hazardous waste facilities or landfills. Again, this is not to be a normal management strategy for FMs and is to only be used in the event of an unforeseeable event or accident and not for economic feasibility. [See <a href="#">Guidance for Provision 5</a> for additional information about acceptable management methods for FMs]

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## Guidance for Provision 3 – Legal requirements

Provision 3 - General Guidance		
Comment No.	Area of the Standard	Guidance
3.1	This provision contains the key requirements on exports of Focus Materials (FM)	Among other items, Provision 3 is home to the requirements on exporting of Focus Materials, which is one of the central requirements of the R2 Standard.
3.2	This provision requires compliance with legal requirements	As referenced in the Introduction, an R2 recycler must comply with all applicable legal requirements, especially as they relate to the environment, worker health & safety, and export. As laws do change from time to time, the R2 recycler must not assume that compliance with the law and best practices at one point in time assures compliance at a later time.

Provision 3 - Clarifications		
Comment No.	Area of the Standard	Guidance
3.3	(a)(1) document requirements	<p>A comprehensive registry (list) of legal requirements shall be kept up to date and included as part of the facility's EHSMS. It shall cover national, state/regional, and local legal requirements as well as the importing legal requirements of countries to which the facility ships Focus Materials. Evidence shall show efforts to keep the registry up to date as well as periodic evaluations of compliance (i.e. compliance audits) based on the registry. Compliance audits by the R2 recycler shall be conducted at least annually.</p> <p>The list shall not consist solely of the titles of the regulations, but document them in sufficient detail to indicate the activities required by the recycler. Additional information for each legal requirement might include required training, reporting, and applicable operations.</p>
3.4	(a)(2) demonstrating the legality of shipments	<p>(a)(2) requires that a recycler:</p> <ul style="list-style-type: none"> <li>• Not ship, nor utilize any downstream vendor (or any downstream vendor that utilizes a downstream vendor, etc.) who ships FMs to a non-OECD<sup>1</sup> country that has laws prohibiting such imports.</li> </ul>

<sup>1</sup> A list of OECD countries can be found at the OECD website, [http://www.oecd.org/document/58/0,3746,en\\_2649\\_201185\\_1889402\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/58/0,3746,en_2649_201185_1889402_1_1_1_1,00.html)

Provision 3 - Clarifications		
Comment No.	Area of the Standard	Guidance
		<ul style="list-style-type: none"> <li>• Document the legality of all shipments of any FMs to non-OECD countries that have passed through its facility or control.</li> <li>• Includes whole equipment, components, or materials containing FM's. See <a href="#">Appendix A Example Focus Material Components</a></li> </ul> <p>A recycler shall be able to produce up-to-date documentation consisting of the records required under 2(A), 2(B), or 2(C) and must make this documentation available for each non-OECD importing (and transit) country.</p> <p>Although shipments of FMs to OECD countries are assumed to be legal (see Provision 3(a)(2) footnote 4), the R2 recycler should exercise care to assure that legal requirements related to export, import, and transportation of those FMs are followed.</p>
3.5	(a)(2)(A) regarding documentation from the U.S. EPA	Documentation must be current and valid. All export letters from the USEPA shall be for the recycler that possesses them, for the materials or equipment exported, and shall be valid for the time period in which the exports occur.
3.6	(a)(2)(b) Documenting the legal acceptance of exports	Letters received from Competent Authorities <sup>2</sup> must be current and valid for the materials or equipment exported, for the time period in which the exports occur, and be in a language, or translated to a language, that the auditor can clearly understand (see Provision 3(a)(2)(B) footnote 6).
3.7	(a)(2)(c) using a law or court ruling to demonstrate legality of imports	Any law or court ruling referenced for the purpose of demonstrating legal exports must be current and applicable to the type of materials in question and to the destination in question.

<sup>2</sup> A list of Competent Authorities can be obtained at the Basel Convention website, [www.basel.int/Parties%20\(CA\).doc](http://www.basel.int/Parties%20(CA).doc).

## Guidance for Provision 4 – On-Site Environmental, Health, and Safety

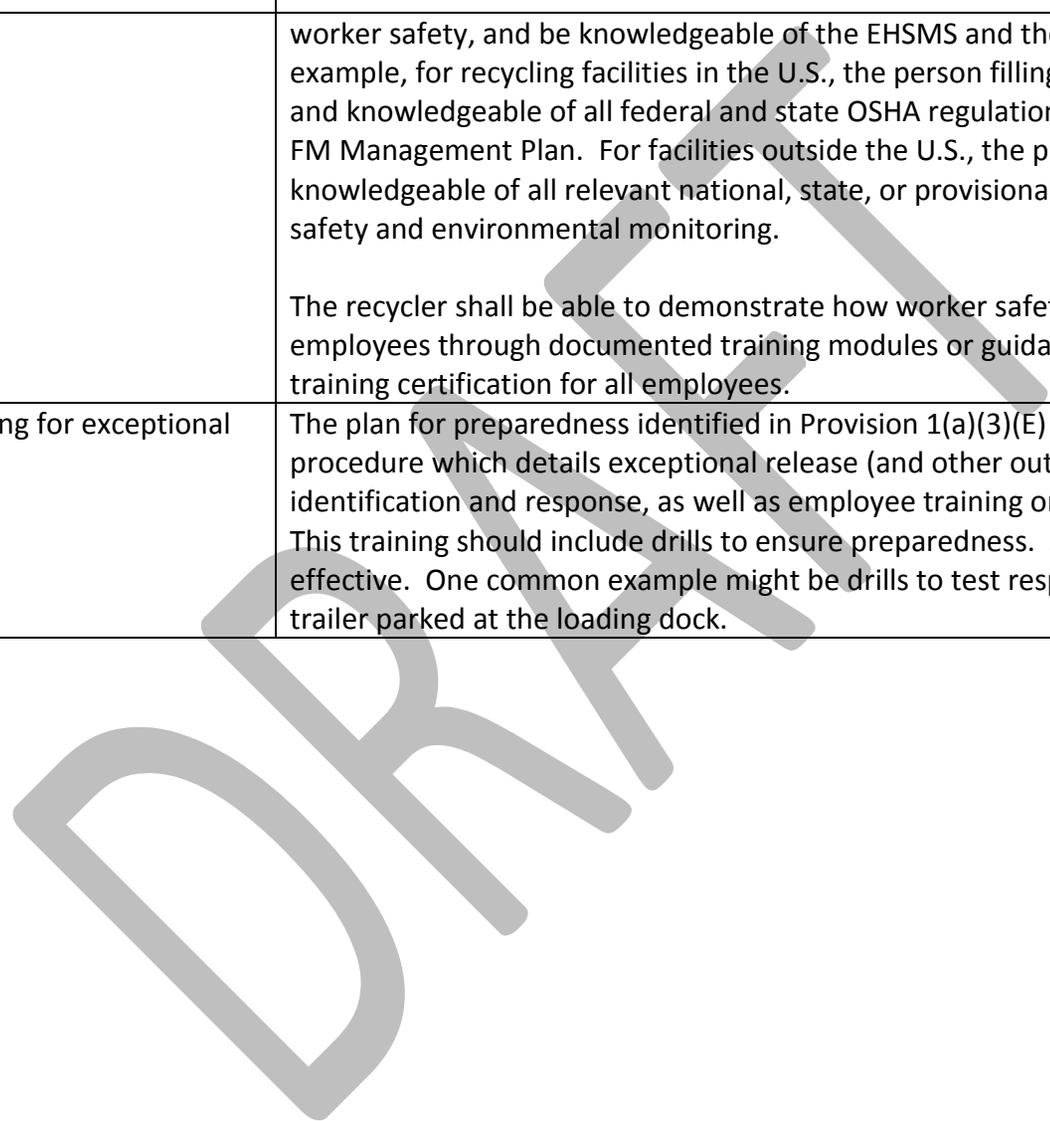
Provision 4 - General Guidance		
Comment No.	Area of the Standard	Guidance
4.1	Workforce and Environmental Protection	<p>A recycler must demonstrate knowledge of the EHS risks associated with the materials, equipment, location, and processing techniques being managed on-site, as well as the relevant legal and regulatory requirements.</p> <p>The recycler shall provide all applicable permitting and oversight records required by local, state, and national law based on the type of operations being performed in the facility. Staff must be familiar with these requirements and have a process to monitor changing obligations.</p>

Provision 4 - Clarifications		
Comment No.	Area of the Standard	Guidance
4.2	(a) regarding a recycler’s “technical capability to process” equipment	The word “process” in this context includes the receipt, storage, treatment, and shipment to a downstream processor. Treatment may include, but is not limited to, testing, refurbishing, repairing, demanufacturing, shredding, and data destruction. Equipment and processing techniques will evolve with time, and so must a recycler improve by obtaining the training and expertise to properly manage new technology.
4.3	(b) cleanliness of operations	<p>Facilities must conform to storage requirements for all hazardous and universal waste regulations.</p> <p>All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition. The floor of every workroom should be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage should be maintained and false floors, platforms, mats, or other dry standing places shall be provided where practicable. To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.</p>
4.4	(c) hazards identification	The hazards identification and assessment shall include all reasonably foreseeable potential hazards that can arise from any activities taking place. Recyclers should document job hazard analysis reviews for all work and storage areas. A Material Safety Data Sheet (MSDS) is an important method in the management system for hazard communication of

Provision 4 - Clarifications		
Comment No.	Area of the Standard	Guidance
		<p>certain substances.</p> <p>To meet the requirement of “ongoing”, job hazard analysis shall be an integrated part of managing change. As an example, MSDS sheets should be procured with the acceptance of new materials or the use of new chemicals in processing. Furthermore, the MSDS may necessitate the evaluation of current processes in order to plan for the EHS risks introduced.</p>
4.5	(d) managing hazards and minimizing releases	Demonstration of minimizing releases of hazardous materials could be done through benchmarking and/or reduction targets. Recyclers becoming certified for the first time might not have a history of information for hazards management, but shall have a plan for collecting the information. Recyclers seeking to renew a certification shall have a record of this information.
4.6	(d)(1) downstream vendors as an engineering control	The use of downstream recyclers for whole intact equipment constitutes an engineering control of isolation under (d)(1)(B) that would not require analytical monitoring/sampling under (e). For example, if CRT Monitors are sent to a specialized downstream vendor to separate the panel from funnel glass instead of processing at the R2 recycler’s facility, then the safety hazard would be isolated by externalizing the process.
4.7	(e) enumerating sampling and monitoring practices	<p>The recycler in the EHSMS section responding to Provision 1 (a)(3)(B) must identify and list the applicable federal or state OSHA standards the recycler is required to meet and must describe how each requirement is being met at the facility. As part of the Provision 1 footnote the recycler must also identify the health and safety and environmental risks, including some that may not be regulated. Provision 4 identifies the options, engineering controls, administrative controls, and finally PPE, the recycler must consider to ensure EHS regulatory compliance and control of the identified EHS risks. These controls must be implemented and documented. To ensure that these controls have been properly implemented the recycler must identify and implement monitoring, which may or may not be required by law or regulation. Monitoring will be facility specific and depend on the operations performed and equipment used at the facility. The recycler must identify the necessary monitoring and describe how it is being conducted at the facility.</p> <p>The EHSMS shall include a protocol stating what sampling and monitoring records are collected and the frequency of data collection. Examples of testing and monitoring that are</p>

Provision 4 - Clarifications		
Comment No.	Area of the Standard	Guidance
		<p>commonly applicable in recycling facilities are:</p> <ul style="list-style-type: none"> <li>• Storm water sampling and monitoring during storm events if process related materials are stored outside, uncovered, or in a known flood plain;</li> <li>• Bio-monitoring of employees where workers are required to wear respirators;</li> <li>• Air monitoring for facilities with processes that emit dust, heavy metals such as lead, cadmium and mercury, gas, fumes, vapors, etc.;</li> <li>• Noise monitoring for high exposure of noise that may exceed regulatory limits;</li> <li>• Monthly inspections of fire extinguishers;</li> <li>• Routine inspections of power tools; and</li> <li>• Daily forklift inspections.</li> </ul> <p>Procedures for sampling for exposure levels, the permissible exposure limits (PELs), and how the facility and workers are monitored must also be described in the EHSMS. The recycler should have information demonstrating that worker and facility conditions are consistent with OSHA and/or PELs. As noted above in Guidance 4.5 for Provision 4(d), for cases in which the hazard has been eliminated through engineering controls, no ongoing sampling would be needed. However, the recycler should have records of monitoring and/or maintenance for the engineering controls to demonstrate effective ongoing operations. For example, a dust collection system should be monitored to change filters as prescribed by the equipment manual. Periodic, although less frequent, sampling may be an effective method to prove ongoing abatement of the hazard.</p> <p>The recycler shall be able to demonstrate sampling and monitoring in the initial audit consistent with what is identified in the required protocol. There may not be an extensive history of sampling and monitoring data. However, a recycler performing ongoing conformance reviews and subsequent audit renewals will begin to develop a history of monitoring and sampling data consistent with the protocol described in the EHSMS.</p>
4.8	(f) protection of personnel	The plan shall identify all safety and environmental risks, personal protective equipment needed in all works areas, and engineering controls in place to prevent worker exposure to these risks.
4.9	(g) demonstrating promotion of worker health and safety	The person designated for promoting worker health and safety must be competent and knowledgeable of all applicable national and local laws and regulations designed to protect

Provision 4 - Clarifications		
Comment No.	Area of the Standard	Guidance
		<p>worker safety, and be knowledgeable of the EHSMS and the FM Management Plan. For example, for recycling facilities in the U.S., the person filling this role must be competent and knowledgeable of all federal and state OSHA regulations, PELs, the EHSMS plan, and the FM Management Plan. For facilities outside the U.S., the person filling this role must be knowledgeable of all relevant national, state, or provisional regulations pertaining to worker safety and environmental monitoring.</p> <p>The recycler shall be able to demonstrate how worker safety information is conveyed to employees through documented training modules or guidance documents and retaining training certification for all employees.</p>
4.10	(h) preparing for exceptional releases	<p>The plan for preparedness identified in Provision 1(a)(3)(E) and <a href="#">Guidance 1.9</a> shall describe a procedure which details exceptional release (and other out-of-the-ordinary events) identification and response, as well as employee training on identification and response. This training should include drills to ensure preparedness. Scenario based training is most effective. One common example might be drills to test response to leaking oil from a tractor trailer parked at the loading dock.</p>



## Guidance for Provision 5 – R2 Focus Materials

Provision 5 - General Guidance		
Comment No.	Area of the Standard	Guidance
5.1	The FM Management Plan – tracking and illustrating the flow of FMs through to final disposition	<p>The FM Management Plan must indicate how FMs are identified and tracked from entry into, and movement through the facility, and through each downstream vendor in the Recycling Chain (see definition of “Recycling Chain” in the Definitions Section of the Standard).</p> <p>A flow chart, or similar methodology, should be included as part of the plan and should reflect all subcontractors and downstream vendors’ facilities used for the entire audit period.</p> <p>When the following FMs have reached the state described below, they may be interpreted as having completed the recycling process:</p> <ul style="list-style-type: none"> <li>• CRT Glass – requires no further processing (final form) to be used as an effective substitute for a commercial product or as an ingredient in a new product in accordance with the following:                             <ul style="list-style-type: none"> <li>– If CRT Glass is being disposed of, then it is a FM through final disposal.</li> <li>– If CRT Glass is being processed to separate lead and other composites, then it is a FM until separated at a lead smelter or similar operation.</li> <li>– If CRT Glass is being remanufactured in a glass-to-glass recycling operation, then it is a FM until frit, panel glass, and funnel glass are separated and cleaned of phosphors.</li> <li>– Final products from recycled CRT Glass should be evaluated for consistency with the recycler’s FM management plan.</li> </ul> </li> <li>• Mercury containing items – recovered commodity grade liquid mercury from mercury retort (unless alternative management is required by law). Although additional distillation of liquid mercury may be performed, it is not cause for continuing to track mercury beyond the retort process.</li> <li>• Circuit Board – metals recovered and refined to a state that makes them sellable for remanufacturing (which could include additional steps of refining the metals to meet particular commodity specifications). This is commonly in a bar or ingot form comprised of precious metals.</li> </ul>

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		<ul style="list-style-type: none"> <li>Batteries - metals and other materials recovered and refined to a state that makes them sellable for remanufacturing (which could include additional steps of refining the metals to meet particular commodity specifications). Common metals recovered include Cadmium, Nickel, Cobalt, and Lead.</li> <li>Polychlorinated biphenyl-containing items (PCBs) – destruction in accordance with regulatory requirements. Processors may recover the metals in the housing of products, but the PCB material must be tracked to incineration or landfill.</li> </ul> <p>As stated above, tracking throughput shall extend for FMs through the entire Recycling Chain, not just through the R2 facility’s own processing. Although order-by-order or source specific tracking of material flow through downstream vendors is not required, recyclers shall demonstrate there is a process in place for throughput tracking of FMs through the Recycling Chain.</p>
5.2	Downstream requirements outlined in this provision are not required in some instances for reuse equipment as described in Provision 6	Equipment that is diverted for reuse and satisfies Sections (c) or (d) of Provision 6 does not need to conform to the downstream requirements of this provision (see Provision 6, section (e)). However, this must not be construed to mean that all equipment sent to a certified R2 electronics recycler is exempt. As stated in Provision 6, this only applies to equipment legitimately sent for reuse, repair, refurbishment, or remanufacturing. If equipment condition or packaging is consistent with material recovery rather than reuse, then all requirements of Provision 5 shall apply.

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Comment No.	Area of the Standard	Guidance
5.3	(a) what the FM Plan must cover	<p>The FM Management Plan must describe the mechanisms and procedures that assure FMs are properly managed on site and by each downstream vendor throughout the Recycling Chain.</p> <p>The FM Management Plan may reference relevant portions of the EHSMS, for example work instructions and procedures for processing FMs.</p>
5.4	(b) describing the steps taken to effectively protect	Steps required to remove FMs using safe and effective mechanical processes, or manual processes prior to shredding, need to be spelled out in the FM Management Plan. Focus

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Comment No.	Area of the Standard	Guidance
	employees during shredding or prior to removal of FMs for shredding	materials should be individually identified and referenced in the Standard Operating Procedures (SOP’s) for both mechanical processes and material tear down processes and referenced to the applicable section in the FM plan where removal procedures, associated hazards, and proper handling procedures are described.
5.5	(b)(1) in the rare event that mercury-containing devices cannot be removed	<p>If mercury-containing devices are deemed to be too small or fragile to remove safely, in the FM plan the recycler shall:</p> <ul style="list-style-type: none"> <li>• Identify and document which devices qualify for this exemption, why they qualify, and describe the process used to assure conformance with all the requirements of Provision 5(b)(1). Examples of documentation could include a time study demonstrating how long it would take to remove that device and why that makes it economically unfeasible.</li> <li>• Describe and document how workers are protected from the risks posed by the mercury.</li> <li>• Present evidence that the devices are being processed downstream by mercury retorters that are properly licensed and have the appropriate technology for managing the mercury.</li> </ul> <p>Evidence can be presented through downstream vendor audit reports that include process flow summaries and compliance review.</p>
5.6	(b)(2) with respect to shredding CRTs	<p>“Shredding and/or materials recovery” as used in the context of (b)(2) include any form of breakage, cutting, and separation of the glass in CRT monitors.</p> <p>Recyclers shall demonstrate what type of controls and monitoring is in place that is commensurate with the risks of the activities performed.</p>
5.7	(c) use of licensed vendors for FMs	<p>Recyclers shall request and retain copies, of all necessary permits and operating licenses as well as evidence that appropriate procedures and technologies required in (c) (1-4) are utilized. These permits and licenses must be current and valid.</p> <p>It is recommended that recyclers establish a system, or designate a timeframe, for regularly checking-in with downstream vendors to obtain updated permits to ensure all records continue to be current.</p>

<b>Provision 5 – Clarifications</b>		
<b>Comment No.</b>	<b>Area of the Standard</b>	<b>Guidance</b>
5.8	(c)(1) destination of mercury-containing equipment and components	All mercury-containing equipment and components shall be recycled at a licensed mercury retorter (unless otherwise required by law).
5.9	(c)(2) treatment of small fractions of circuit boards	Sometimes small fractions of circuit boards remain in shredded plastics and shredded steel, and it is not always economically feasible to remove all circuit board fractions. The presence of small amounts of shredded circuit boards in other non-FM commodity streams is acceptable so long as the commodities are being handled at a processor that can safely and legally consume the de-minimis amount of shredded circuit boards in new product manufacturing. For example, steel mills which consume ferrous metals can usually consume de-minimis amounts of circuit board fragments. “De-minimis” is defined as the amount that is not removed by an acceptable circuit board removal/processing technology. See the guidance for the definition of “Focus Material” for further information.
5.10	(c)(3) management of PCB containing items	<p>Items containing polychlorinated biphenyl, also known as PCBs, shall be separated from all other materials at the facility and managed appropriately according to the FM Management Plan and applicable law.</p> <p>Polychlorinated biphenyls may be found in products such as cooling fluids, light ballasts, capacitors and older types of computer equipment.</p>
5.11	(c)(4) treatment of toner and toner cartridges	<p>R2 presumes that toner and toner cartridge recycling is economically feasible. The recycler shall provide documented evidence as to why it has made the determination not to recycle toner or toner cartridges. This shall include an economic evaluation of recycling versus other management options, or demonstration in other forms that would support this decision.</p> <p>Toner and toner cartridges are not considered FMs for purposes of 5(e) and (f).</p>
5.12	(d) disruption of normal FM management practice	If extreme disruption in the marketplace has occurred, a recycler must provide documentation showing they have exhausted all recovery options before seeking disposal options allowable under the law. If it can be determined that a disruption in the marketplace is likely short-term, recyclers should temporarily store FMs on site, if possible and to the extent allowable under the law, until recovery options become available.

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Comment No.	Area of the Standard	Guidance
		<p>If a recycler is forced to dispose of FMs because recovery options become unavailable for the long-term, recyclers need to demonstrate they exhausted all known recovery options. This includes retaining documentation of efforts to find alternative downstream vendors for the material.</p>
5.13	(e) selection of downstream vendors	<p>For an R2 recycler to show that it is conforming to Provision 5 (e), it needs to obtain from its 1<sup>st</sup> tier FM vendors documentation that will enable its R2 auditor to reasonably conclude that each 1<sup>st</sup> tier vendor possesses or conforms to (e) (1)-(7). Note that a completed questionnaire alone is not sufficient evidence of “auditing” a downstream vendor.</p> <p>Also, an R2 recycler needs to provide its R2 auditor with evidence that will enable the auditor to reasonably conclude that each 2<sup>nd</sup>, 3<sup>rd</sup>, (and 4<sup>th</sup>, etc.) tier downstream vendor for FMs possesses or conforms to Provision 5 (e) (1)-(7). This can be demonstrated by having a system in place ensuring all downstream vendors are contractually required to apply the R2 principles, including the requirements for auditing their downstream vendors for FMs. If using this method, language in the contracts must trigger a “trickle down” effect which will require all contracted downstream vendors to hold their downstream vendors to the principles of the R2 Standard. Use of such language must ensure that R2 Standard requirements are enforced throughout the downstream, but is not alone sufficient evidence of downstream due diligence to meet Provision 5(e).</p> <p>To audit that such a procedure is in place for ensuring downstream vendor conformance to R2, the auditor should request copies of the downstream audit reports to verify that the audits have occurred, review the audit protocol used, and ensure contracts with reference to adherence to R2 are in place. The scope of the downstream vendor audits should include a robust EHS compliance review, elements of the Focus Material requirements (and other R2 requirements as applicable), and evidence that similar subsequent downstream auditing is required and actually occurs. This intent and goal is to ensure that all tiers of downstream vendors are audited to the R2 Standard.</p> <p>Downstream vendor audits or desk reviews for Tier 1 vendors must be reviewed by the CB auditors for conformance to the FM Management Plan. If less than 100% of the</p>

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		downstream audits or desk reviews of Tier 1 FM vendors have been completed this would result in a major nonconformance, and the company could not be recommended for certification to the R2 standard until these were completed [ <a href="#">See Appendix B, Example Onsite Audit Decision Tree</a> , for an example of when onsite audits of downstream vendors might be necessary]
5.14	(e)(1) conform to the R2 Recycler’s FM Management Plan	<p>R2 recyclers shall select downstream vendors that conform to the recycler’s FM Management Plan. For example, a recycler’s FM Management Plan (FMMP) may state that the recycler only uses CRT Glass-to –Glass recycling. An R2 Certified Recycler may use other forms of CRT glass processing which conform to their own FMMP. Thus, in the due diligence of that downstream vendor processing CRT glass (or Tier 2, Tier 3, etc.) a recycler cannot accept R2 Certification of the downstream vendor alone as conformance to their own FMMP.</p> <p>As evidence of consistency with the FMMP, an up-to-date material flow chart may be used to show the management of all FM’s handled by the recycler and its downstream tiers throughout the Recycling Chain. R2 recyclers shall also demonstrate how they monitor downstream vendor performance.</p>
5.15	(e)(2) A documented environmental, health, and safety management system	<p>Downstream vendors handling FMs must have a documented EH&amp;S Management System. The EHSMS does not need to be certified, but must contain sufficient elements of an EHSMS to adequately mitigate EH&amp;S risks appropriate to the vendor’s operation. The vendor should have the following:</p> <ol style="list-style-type: none"> <li>1. Documented applicable EH&amp;S legal requirements which might include storm water, air, RCRA, CERCLA, SREA, and other applicable requirements.</li> <li>2. Copies of all required permits.</li> <li>3. Emergency Response Plans</li> <li>4. Health &amp; Safety Programs</li> <li>5. Environmental Management Programs</li> <li>6. Assigned responsibilities for EH&amp;S elements.</li> </ol>
5.16	(e)(7) Provision 7 (Tracking Throughput)	One of the more difficult provisions is (7), which simply states “Provision 7 (Tracking Throughput)”. The R2 recycler must demonstrate that each 1 <sup>st</sup> Tier vendor and its subsequent tier vendors handling focus materials, per Provision 7(a) on tracking throughput,

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Comment No.	Area of the Standard	Guidance
		“maintains for at least three years commercial contracts, bills of lading, or other commercially-accepted documentation for all transfers of equipment, components, and materials into and out of its facility, as well as for any brokering transactions.”
5.17	(f) regarding R2 certified downstream vendors	If a downstream vendor holds a current R2 certificate, downstream due diligence still needs to be performed, though the process may be greatly expedited. The R2 recycler must conduct a thorough review of an R2 certified downstream vendor’s own FM Management Plan, downstream due diligence audits, and legal documentation regarding exporting, as applicable and reasonably determine that the recycler is in compliance with the R2 Standards.

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## Guidance for Provision 6 – Reusable equipment and components

Provision 6 - General Guidance		
Comment No.	Area of the Standard	Guidance
6.1	Legitimate reuse	Handling, packaging, and price are key differentiators between legitimate “reuse” and “recycling”. Equipment destined for reuse will be handled with extra care to avoid breakage throughout the recycler’s process. Additional protection and individual packaging is visible on reuse equipment. Also, the price paid by the recycler for equipment purchased and the price received for reuse equipment sold by the recycler must be in line with market conditions for similar equipment. Reusable equipment is typically priced by unit, whereas recyclable material is priced by weight.
6.2	Testing for functionality as it relates to 6(c)(1)	<p>All equipment destined for reuse must be properly tested prior to shipping or selling the equipment with the appropriate documentation to ensure the key functions of the unit are working properly, unless the shipment meets the qualifications under (d).</p> <p>6(c)(1) requires effective testing methods for all types of electronic equipment. Simply powering-on the equipment may be a test of some key functions, but alone it is not testing for all key functions. For example, it would be inadequate as a test for a complete desktop or laptop computer. However, a simple power-on test may be effective for some component parts, such as memory. A recycler or downstream refurbisher shall be able to provide records that indicate both the test procedures used, and the results of those procedures on all equipment resold or sent for reuse. The exception to the testing requirements of Provision 6 applies only to products sold under the volume exemption of 6(d) with a practical return policy to an end user, such as for memory (<a href="#">See Guidance 6.9</a> and <a href="#">6.11</a>).</p>
6.3	“Key Functions functioning/working properly”	<p>“Key Functions” is defined in the R2 Standard as “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. “Functioning (or working) properly” describes product attributes or performance characteristics that are equivalent to the originally intended use for the product in question.</p> <p>If the primary function of the equipment is not working as originally intended, then the secondary function(s) must be fully working in accordance with the buyer’s intention for reuse. The seller must clearly understand the buyer’s reuse intention and maintain records demonstrating tests to show functions working in accordance with the buyer’s requirements</p>

Provision 6 - General Guidance		
Comment No.	Area of the Standard	Guidance
		<p>in order to satisfy Provision 6(c)(1).</p> <p>For example, a smart phone that has all functions critical to communication in working order, but lacks some secondary function like a camera, would be considered to have key functions functioning properly. Conversely, a phone where only the secondary functions are working, like the camera, but no communication ability would not be considered to have “key functions functioning properly” (unless a buyer would purchase the smart phone solely for the capability to take pictures).</p> <p>Parts which are tested for key functions and are suitable for use in refurbished equipment may be considered as meeting the requirements of 6(c)(1) as components which work properly. For example, laptop batteries may be classified as working if each passes individual load testing.</p> <p>The recycler shall be able to show documentation describing what the appropriate functionality testing is, by product type, and what a passing result would be to determine the “key functions are functioning properly”. An example includes a table similar to the PACE draft guidance document for <i>Functionality tests for used computing equipment</i>.<sup>3</sup> Also see Comment Number 6.2 for discussion of testing for functionality.</p>

Provision 6 Clarifications		
Comment No.	Area of the Standard	Guidance
6.4	(a) customer elected restrictions on reuse	Recyclers shall be able to show where in the EHSMS client restrictions on reuse are tracked and how those restrictions are executed.
6.5	(b) no mixed shipments	Equipment and components that have met all criteria of this provision and are being shipped for reuse shall not be shipped in the same box, Gaylord, pallet, or other form of packaging as non-reusable items. The labeling scheme for the control of equipment that has been tested and diverted for reuse shall be distinctly different from the labeling used for non-tested

<sup>3</sup> PACE document on functionality tests for used computing equipment, pg. 45-46 . See <http://www.r2solutions.org> for the most current link to this document.

Provision 6 Clarifications		
Comment No.	Area of the Standard	Guidance
		equipment.
6.6	(c)(2) when the recipient vendor is R2 certified	If the recipient vendor of equipment for reuse, repair, refurbishment, or remanufacturing is an R2 certified electronics recycler, the shipper will be exempt from the requirements of (c)(1) and (c)(3). Note that this only applies under the scope of the transaction. When equipment condition, handling, packaging, and pricing is not consistent with potential reuse, then this exclusion will not apply. For example, equipment loosely packaged in Gaylords with no individual protection would most likely not qualify for reuse.
6.7	(c)(3) treatment of equipment for reuse and documentation	<p>Recyclers shall maintain a list of companies the recycler sells untested, potentially reusable equipment and components to, and documentation verifying requirements of (c)(3)(A) thru (c)(3)(C).</p> <p>Recyclers must also produce contractual agreements such as purchase orders, bills of sale, or statements of work from the entities receiving shipments of untested reusable equipment and components. This only refers to the untested equipment and components that are going to be repaired or refurbished offsite.</p> <p>Recalled equipment may appear to be in original packaging. If a recycler takes in what is known to be recalled equipment, all reuse testing and screening procedures must be followed.</p>
6.8	(c)(3)(c) management of residual FMs resulting from refurbishing	R2 recyclers need to confirm that the recipient vendor performing reuse and refurbishing activities manage all FMs that result from those activities in accordance to FM management requirements detailed in Provision 5 and through subsequent tier vendors throughout the Recycling Chain.
6.9	(d) definition of “practical return policy”	R2 recyclers need not conform to section (c) if less than fifteen units of equipment reasonably believed to be reusable are being sold to an end user with a practical return policy. A practical return policy is one that allows the buyer to return the product within a reasonable time frame, for example 30 days, if key functions are not working. The customer should not be paying shipping costs that exceed the value of the units. If any or all of the equipment is found to have no reuse value, the shipping cost to return the item(s) should be covered by the R2 certified recycler.

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Comment No.	Area of the Standard	Guidance
		Also note that the transaction only qualifies with a practical return policy if it is less than 15 units and is sold directly to an end user. One test of “end user” is whether sales tax was charged. A buyer with a valid resale tax certificate would not be an end user. See below for details on the 15 unit requirement with regard to multiple sales.
6.10	(d) to a new vendor as a sample for purposes of evaluation of whether to purchase larger quantities for refurbishment	<p>Small, sample shipments (15 units or less) of equipment may occasionally need to be made to a non-end user in order to secure larger purchasing agreements or for testing. However, in order to qualify such a shipment, or shipments, for exclusion to Provision 6(c), a recycler must be able to document:</p> <ul style="list-style-type: none"> <li>• Who is receiving the shipment,</li> <li>• The reason for the shipment,</li> <li>• How the recipient of the shipment will test and qualify the equipment,</li> <li>• How the material will be handled after testing,</li> <li>• That the material will be handled in a manner fully consistent with the R2 Standards, and</li> <li>• The timeframe for the sample shipments to be made if multiple shipments are, or have occurred (i.e., beginning and end date).</li> </ul>
6.11	(d) multiple sales and shipments within a “proximate timeframe”	Recyclers must establish a reasonable period of time based on frequency and volume of sales, by which the cumulative sales will not exceed the 15 unit limit and will have a practical return policy in order to qualify for the exemption. For example, if untested memory is sold weekly on eBay and a buyer purchases 10 units this week and 10 more units 3 weeks from the first sale, this would exceed the 15 unit limit and the buyer would need to conform to the R2 Standard. Although not prescribed by the R2 Standard, a reasonable timeframe for cumulative purchases would be 90 days.
6.12	(e) exception to Provision 5’s downstream due diligence	Equipment and components that will be diverted for reuse and satisfy Sections (c) or (d) of Provision 6 does not need to conform to the downstream requirements for Provision 5. Packaging, handling, and pricing of this equipment must be consistent with reuse in order to qualify.
6.13	(f) exception to Provision 3(a)(2) exporting documentation requirements	R2 recyclers will not have to conform to the documentation requirements for the export of FMs (Provision 3(a)(2)) for reusable equipment that meets the requirements of Provision 6 (c)(1) or (d). Recalled equipment in the original packaging does not qualify for this exclusion since it is known to be defective.

## Guidance for Provision 7 – Tracking throughput

Provision 7 - General Guidance		
Comment No.	Area of the Standard	Guidance
7.1	The intended outcome of tracking throughput	Tracking throughput shall provide evidence to substantiate the flow and legitimacy of equipment/materials through the recycler’s business and downstream vendors. Although order-by-order or customer specific tracking of material flow through a recycler and subsequent downstream vendors is not required, the total volume flow must prove that the recycler is not diverting material to other sources. Furthermore, the tracking must show evidence clearly differentiating between working equipment, equipment for reuse, and recycled materials.

Provision 7 - Clarifications		
Comment No.	Area of the Standard	Guidance
7.2	(a) maintenance of throughput records	<p>One way recyclers can demonstrate conformance is by producing a mass balance report for the material that moves through the facility during the specific audit period. If a mass balance is used, it should include weights of all materials received and weights of all materials that left the facility and the destination of those materials. The calculation should also account for material diverted for resale/reuse. Material leaving the facility for a specific audit period should be the control total for identifying and balancing the FM material flow. An alternative method of demonstrating conformance (especially for recyclers that do not demanufacture or shred equipment) may be a rigorous inventory system tracking serial numbers of all equipment coming in and going out of the facility. This could also be paired with mass balance for a hybrid system demonstrating thorough control and tracking throughput.</p> <p>It is expected that records of material will clearly demonstrate the flow of material is valid and not diverted in whole or part. Shipping and delivery records to the first tier vendor will be consistent with the R2 recycler’s inventory records. R2 recyclers should be able to demonstrate receipt of material by the downstream vendor consistent with the volume and type shipped. Furthermore, the R2 recycler should be able to show proof of processing and outputs from processing by downstream vendors consistent with the material shipped.</p>

<b>Provision 7 - Clarifications</b>		
<b>Comment No.</b>	<b>Area of the Standard</b>	<b>Guidance</b>
		The recipients declared on all bills of lading for FMs leaving the recycling facility shall match all of the downstream vendors declared for Provision 5. Likewise, all recipients declared on bills of lading for reused equipment shall match the customers declared for Provision 6.

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## Guidance for Provision 8 – Data Destruction

Provision 8 - General Guidance		
Comment No.	Area of the Standard	Guidance
8.1	What constitutes data destruction	<p>Recyclers must ensure electronically-stored information is being handled in accordance with all federal and state laws governing data destruction that apply to the recycler’s operation. Recyclers in the United States may also need to manage personal information in accordance with federal regulations, such as the Health Insurance Portability and Accountability Act (HIPPA), the Gramm-Leach-Bliley Act (GLBA), and the Identity Theft Penalty Enhancement Act (ITPE) which create safeguards to protect private information. Recyclers shall provide documented proof that they are familiar with state laws that govern data management and destruction, which in some cases can have stronger data management requirements than the federal regulations.</p> <p>In addition, recyclers need to conform to the data sanitization, purging, and destruction practices for all defined media as listed in NIST Special Publication 800-88<sup>4</sup>, or its most current iteration. It is also acceptable to meet this Provision’s requirements with a generally –accepted data destruction certification program, such as provided by NAID Certification<sup>5</sup>. Recyclers shall validate data destructions methods and security controls used through independent verification. Verification is commonly performed by external parties. However, it may be achieved with internal resources in an organization large enough to substantiate independence of the review process.</p>

Provision 8 – Clarifications		
Comment No.	Area of the Standard	Guidance
8.2	(a) acceptable data destruction practices	Acceptable practices for the destruction of data depend on the type of media, the sensitivity of data, customer requirements, and the methods used. For example, it would not be acceptable to shred security video tapes through an equipment shredder that leaves an intact ball of tape instead of small separate pieces of tape. Nor would it be acceptable to

<sup>4</sup> See [http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88\\_rev1.pdf](http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf)

<sup>5</sup> See <http://www.naidonline.org/nitl/en/certification.html>

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Comment No.	Area of the Standard	Guidance
		<p>only remove the circuit board from a hard drive without impaling the platters. NIST Special Publication 800-88 specifies acceptable methods for data destruction by media type and classification (sensitivity). As new technologies emerge, generally accepted and published industry techniques may be acceptable through the validation process in 8(d).</p> <p>It is acceptable to outsource data destruction or wiping down one tier in the Recycling Chain (i.e. to the first downstream vendor to receive the electronics data storage devices). However, the security control between the recycler and the first tier vendor shall be appropriate and clearly documented to establish chain of custody. Appropriate security controls for the transport of devices that still contain electronically stored data could include the use of one or more of securable transport containers tamper evident seals, shipment tracking, etc. The nature and sensitivity of the data should be considered when determining adequate security measures during transport. If recyclers receive electronic data storage devices that are supposed to already be sanitized, the recycler shall be able to provide documentation of data destruction prior to receipt and conduct periodic testing of previously sanitized devices to ensure data destruction has been performed.</p>
8.3	(a) customer requests to avoid data destruction	All data storage devices shall be treated in accordance with Provision 8 unless the processor can provide documented proof that a customer requires in writing alternative data treatment or no sanitization at all. However, that requested treatment must not be in violation of state or federal laws governing the management of electronic information.
8.4	(b) documenting data destruction procedures	All activities involved in data destruction shall be clearly described and conveyed to employees. All information pertaining to data destruction procedures shall be documented. Documentation should include material handling, labeling, processing, storage, physical security, and validation of results. In addition, certain methods of destruction like degaussing may require equipment calibration and maintenance to ensure effectiveness. Evidence must be generated and maintained to show conformity to the data destruction procedures and effective processing.
8.5	(c) ensuring adequate employee training	All employees involved in the data destruction procedures shall be fully trained. As part of the “training on a regular basis”, employees shall receive information about updated data destruction methods and regulatory requirements as they become available. All applicable employee training documentation shall be part of the recordkeeping that is maintained in

Provision 8 – Clarifications		
Comment No.	Area of the Standard	Guidance
		accordance with Provision 13.
8.6	(d) review and validation of document destruction procedures	<p>The independent review of data destruction procedures shall include validation of the procedures, quality of employee training, calibration and maintenance of equipment, and performance of data destruction methods. The review could be conducted by an independent third-party who has demonstrated expertise in NAID and NIST Guidelines, comparable international data destruction guidelines, or data forensics methods. Reviews should specifically include competency evaluations of employees, attempts at data recovery from sanitized devices, verification of calibration schedules, and verification of data sanitization records.</p> <p>Alternatively a recycler could internally perform the review but must thoroughly document the review process and the frequency of the review. However, the person performing the internal review shall not be involved in the daily data destruction process, nor in any way be accountable to the management responsible for data destruction, so that the review can be truly independent. Depending upon the sensitivity of data being destroyed, methods used, type of equipment, and level of expertise in-house, an outside review may be necessary.</p> <p>Recyclers shall produce certificates, or evidence of regular review of data destruction procedures and validation of data destruction methods. For example, disk wiping methods may be validated using commercial software for data recovery.</p>

## Guidance for Provision 9 – Storage

Provision 9 - General Guidance		
Comment No.	Area of the Standard	Guidance
9.1	Appropriate storage of potentially harmful materials	The provision pertains to the storage of all FMs and reusable equipment as well as potentially harmful products that might be used in the recycling process.

Provision 9 – Clarifications		
Comment No.	Area of the Standard	Guidance
9.2	(a) regarding storage requirements for materials that may cause risk to worker health or safety or the environment	<p>The storage methods for potentially harmful material shall be adequate to prevent the release of any material which could harm worker safety and/or the environment. Storage methods and precautions shall be equal to the threat posed by the material being stored and be performed in accordance with all federal and state regulation. Regulations to consider for storage requirements include national and state/provincial/territory regulations. States may have the option to modify federal regulations and add additional universal wastes and additional requirements. Recyclers shall review and document state universal waste regulations and demonstrate they are in compliance with those regulations.</p> <p>For all R2 recyclers, common storage practices for material can include but are not limited to, storage containers compatible with the contents and kept closed; equipment, components, materials or wastes stored in designated or isolated areas not exposed to potential adverse weather; and be labeled in a way that identifies the contents and/or waste classification, and tracks accumulation time and volume.</p>
9.3	(a) regarding storage requirements for equipment and components going to reuse	Reuse equipment and components will be clearly labeled as to the condition of equipment to separate reuse electronics from recycled material. Equipment destined for reuse must also be stored to protect it from damage. For example, it would be more appropriate to store LCD monitors for reuse in a small box with each screen protected by cardboard or bubble wrap, than it would be to store like LCD monitors for recycling in a large Gaylord box. Equipment destined for reuse must never be stored outside where it is further subjected to environmental conditions like rain, heat, cold, snow, etc.

## Guidance for Provision 10 – Facility security

Provision 10 - General Guidance		
Comment No.	Area of the Standard	Guidance
10.1	Adequate security	Electronics recyclers shall provide facility security that is commensurate with the risk associated with the equipment being handled and the information stored on the devices. High value parts, FMs, and all data-containing devices in particular must have appropriate security controls in place. Minimum security controls shall include a controlled access area, or off-limits area accessible only by authorized employees, or visitors escorted by an authorized employee. The controlled access area may be the entire facility or a physically separated and secured portion of the facility. Evidence is required to document access in and out of controlled areas. All devices containing electronically stored information shall be kept in the controlled access area(s). Additional security measures should be taken based on the identified level of risk.

Provision 10 - Clarifications		
Comment No.	Area of the Standard	Guidance
10.2	(a) controlled access	<p>Controlled access requires intentional barriers to entry and documenting of entry/exit by personnel and visitors. Security controls will consist of both engineered and administrative techniques. Examples include:</p> <ul style="list-style-type: none"> <li>• Badge access systems</li> <li>• Security logs</li> <li>• Visitor passes</li> <li>• Video surveillance</li> <li>• Dock door gates</li> <li>• Locked doors</li> <li>• Security fence</li> <li>• Metal detectors</li> <li>• Dedicated security personnel</li> <li>• Employee background checks</li> </ul> <p>If a security breach does occur, the recycler shall document and evaluate if the current security program is adequate and shall take appropriate steps to prevent future compromises.</p>

<b>Provision 10 - Clarifications</b>		
<b>Comment No.</b>	<b>Area of the Standard</b>	<b>Guidance</b>
10.3	(a) a degree appropriate given the type of equipment handled and the needs of the customers served	Recyclers shall secure all data containing devices from theft by both internal and external parties. Recyclers should also consider the value of reusable equipment and the security appropriate to protect valuable equipment from theft. Additional security will largely be determined by requirements of customers served. Multiple levels of security within the facility may be one method for meeting varying degrees of security. Consider access to the property, the facility, rooms within the facility, and storage cabinets within the rooms as points to differentiate security.

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## Guidance for Provision 11 – Insurance, closure plan, and financial responsibility

Provision 11 - General Guidance		
Comment No.	Area of the Standard	Guidance
11.1	Evaluating risk assessment	Provision 11 is designed to create a mechanism to mitigate the consequences of on-site accidents, or unforeseen closure of the facility. To determine how to adequately provide for these situations, a thorough risk assessment shall be conducted to determine sufficient insurance coverage and assets required to perform actions in the closure plan. This evaluation shall be clearly documented. The closure plan shall contain a clear, written timeline and tasks with a clear, written outline of the persons responsible for each action in the event of a closure/abandonment.

Provision 11 – Clarifications		
Comment No.	Area of the Standard	Guidance
11.2	(a) adequate insurance coverage	<p>Insurance levels shall be adequate to cover injury that might result from any, and all, activities that take place on site. The minimum “adequate” level of Commercial Liability Insurance shall be considered \$1,000,000 per occurrence.</p> <p>Recyclers shall possess valid certificates of insurance, with explanation of coverage, for all applicable coverage. It is recommended that the R2 recycler’s policies also name downstream vendors as “additionally insured” entities.</p>
11.3	(b) considerations for a sufficient financial instrument	A closure plan shall contain an estimate of what it would cost to close the facility, and show a mechanism for covering that cost outside of insurance. A sufficient financial instrument must be adequate to cover the calculated costs to close the facility and return the building and site to a sellable or leasable state. This includes providing for the removal, and appropriate management (to R2 Standards), of all end-of-life equipment and materials resulting from recycling activities using an assumption that they have zero value. If there is known on-site environmental contamination which has not been addressed, the financial instrument shall be appropriately funded to cover the cost of this clean up. Examples of financial instruments include a trust fund, surety bond, letter of credit, or financial test (reference US RCRA financial assurance requirements). Someone other than the owners must have access to this financial instrument as abandonment assumes the owners are not part of the closure process.

Provision 11 – Clarifications		
Comment No.	Area of the Standard	Guidance
		Assets intrinsic in the facility (not customer equipment/materials) can be considered sufficient to finance the closure so long as the recycler has detailed the market value of the equipment (less the remaining book value), the determination is updated annually and determined to continue to be adequate to cover the closure costs, and the recycler has designated who would be responsible for the liquidation of assets in the event of site abandonment (i.e., a third party separate from the recycler). If this mechanism is used the closure plan must state that all money from the sale of assets shall first be put toward returning the facility to the original state, and it must identify the responsible party that will facilitate the closure process.
11.4	(c) elements of a closure plan	<p>In addition to the overall plan for shuttering and removing all equipment being stored for recycling and the materials resulting from recycling activities, the closure plan shall include the following:</p> <ul style="list-style-type: none"> <li>• Contact information for those responsible charged with performing duties outlined in the closure plan.</li> <li>• Description and evidence of assets and resources to cover all financial obligations resulting from closure activities.</li> </ul>

## Guidance for Provision 12 – Transport

Provision 12 - General Guidance		
Comment No.	Area of the Standard	Guidance
12.1	Transportation requirement	The same transportation requirements shall apply to all shipments being arranged by the recycler or being made by a third-party transporter, as well as those shipments being arranged and carried out by the recycler. Shipments include both customer pickups and outbound shipments.

Provision 12 – Clarifications		
Comment No.	Area of the Standard	Guidance
12.2	(a) appropriate packaging methods	All equipment and materials shall be packed and stacked in a manner that prevents them from falling over, or breaking apart during transit. Some materials (e.g. certain loose rechargeable batteries) pose particular hazard for transporters if not packaged appropriately and in accordance with regulations. Reusable equipment shall be packaged appropriately to protect it from damage during shipment. There should be a clear difference between the packaging of recyclable and reusable equipment.
12.3	(b) ensuring transporters meet all legal requirements	<p>For each third-party transporter used by the recycler, or on behalf of the recycler documentation demonstrating adherence to regulations and any records of violation shall be obtained during each contract renewal. One starting point to validate this information is through the U.S. Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA), Safety and Fitness Electronics Records (SAFER) system<sup>6</sup>.</p> <p>If recyclers require commodity buyers to arrange for transportation, and buyers take control for the material at the seller’s dock (aka “FOB Origin” or “FOB Shipping Point”), a recycler would not be subject to Provision 12.</p> <p>Recyclers shall have all necessary records for each third-party transportation service provider. If the recycler provides transportation services, the recycler shall also produce records demonstrating no significant violations of relevant legal requirements during the past 3 years.</p>

<sup>6</sup> SAFER can be accessed at <http://safersys.org>. “Company Snapshot” is the standard search for general information about a transporter.

Provision 12 – Clarifications		
Comment No.	Area of the Standard	Guidance
		<p>The recycler shall demonstrate awareness and adherence to all regulations covering the transportation of materials received and shipped by the recycler. For U.S. recyclers this includes awareness and knowledge of federal Department of Transportation regulations.</p> <p>If logistics brokers are used to transport materials and the recycler is responsible for material during transportation (FOB Destination), then the recycler is still responsible for ensuring 3<sup>rd</sup> party transporters hired by the logistics brokers meet all legal requirements. Through a contract with a logistics broker and a review of the broker’s records and procedures, a recycler could outsource to a broker this function. However, it is the responsibility of the recycler to ensure and provide evidence that the broker is performing the necessary checks to meet the requirement.</p>
12.4	“No significant violations”	<p>One way to measure a transporters compliance with regulations is through the statistics provided on the Safer website. The inspection records will provide an out of service percentage which should be below the national average. You may also look at the safety rating if one has been provided, and evaluate the number and severity of crashes. This is a subjective measurement that will be evaluated by each recycler.</p>

## Guidance for Provision 13 – Recordkeeping

Provision 13 - General Guidance		
Comment No.	Area of the Standard	Guidance
13.1	Centralized recordkeeping	<p>Any combination of electronic and hard documents can be maintained in a centralized recordkeeping system and can be used to demonstrate conformance to the provisions of the Standard.</p> <p>Records must provide evidence of ongoing conformance to each Provision of the Standard, including use of the EHSMS and FM Management Plan.</p>

Provision 13 – Clarifications		
Comment No.	Area of the Standard	Guidance
13.2	(a) regarding centralized recordkeeping	<p>Records must be accessible from one location, whether in hard copy or electronic form. Files may be maintained on remote networks and drives; however access to that information must be possible from the designated recordkeeping location. Documentation of effective dates and revision tracking must be clearly identified on all electronic and hard copy files. Auditors must pay close attention to the document modification dates on all supporting documents to prevent inappropriate post-dating of the documented content.</p> <p>The auditor shall be able to perform all necessary document review to verify conformance to the R2 Standard from one location.</p>

## Definitions

Definitions – Clarifications		
Comment No.	Area of the Standard	Guidance
D.1	Accredited Certification Body	This means a Certification Body (CB) that has been accredited by ANAB in North America, or another accreditation body elsewhere in the world that meets ISO/IEC Standard 17021:2006. A list of Accredited Certification Bodies for R2 can be found on the R2 website. <sup>7</sup>
D.2	Downstream Vendors	Though not discussed in the definition, it is important to note that when “downstream vendor” is used in the Standard, it refers to all tiers of downstream vendors in the Recycling Chain. This includes vendors performing reuse and refurbishing activities.
D.3	Electronic Equipment	The scope of the R2 Standard does not reach to white goods, household appliances, medical equipment, or automobiles that may contain electronic equipment. However, if electronic equipment is removed from those goods at an R2 certified facility, or are accepted at an R2 certified facility, these electronic components shall be handled in accordance with the R2 Standard.
D.4	Key Functions	An example would be a cell phone where the phone works but the camera does not. The “someone” referred to in the definition is a typical, reasonable, average end consumer.
D.5	R2 Focus Materials “de-minimis”	<p>The term “de-minimis” in the last sentence of the definition does not refer to an absolute or specific amount. Rather, it refers to the amount one would reasonably expect to remain following the utilization of “safe and effective mechanical processing or manual dismantling”. This will vary based on the technology employed. The conditions for acceptable de-minimis amounts of FM’s in a non-Focus Material product are:</p> <ul style="list-style-type: none"> <li>• Technology or technique of separation is determined to be practicable and effective in removing Focus Material.</li> <li>• Non-Focus Material product, such as metal or plastic, can be consumed directly into the manufacturing process without further separation of the de-minimis FM’s.</li> <li>• De-minimis amounts of FM’s are not intentionally combined with Non-Focus Materials.</li> <li>• The general ratio of FM fragments remains in line with machine or industry standards.</li> </ul>

<sup>7</sup> [www.r2solutions.org](http://www.r2solutions.org)

<b>Definitions – Clarifications</b>		
<b>Comment No.</b>	<b>Area of the Standard</b>	<b>Guidance</b>
		<p>Examples of such technologies that can practicably and effectively remove circuit boards from mixed shredded material include optical sorting systems, shaker screens, eddy currents, and other automated sorting technologies that create a nearly circuit board-free stream of material. Minor fragments of circuit boards may not be registered by sensors in this equipment. Alternatively, mechanical breaking systems or manual breaking may leave small corner fragments of circuit boards attached at the screws. This can also yield a nearly circuit board free stream of material that would meet the “de-minimis” threshold for FMs.</p> <p>It is also important to note that all FMs removed during recycling and refurbishing activities remain FMs throughout the Recycling Chain until they are transformed into a commodity ready for remanufacturing.</p>

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## Appendix A: Example Focus Material Components

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM) <sup>8</sup>
Desktop	Power Supply		X					
	Sister Cards		X					
	Motherboard		X	X				
	Optical/floppy drive		X					
	On/Off switch (light) on computer		X					
	Hard drive		X					
Peripherals	Keyboard	circuit board powers and operates	X					
	Speakers	circuit board powers and operates	X					
	Mouse	circuit board powers and operates	X					
	Printer		X	X				X
	Multi-function Printer/Fax/Copier		X	X		X		X
	External Hard Drive		X					
	Uninterrupted Power Supply (UPS)	Lead Acid Battery	X	X				
Monitor	Monitor CRT	circuit board powers and operates plus leaded glass	X		X			

<sup>8</sup> Toner and ink is not a Focus Material, but does require specific handling under R2 Provision 5(c)(4)

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM) <sup>8</sup>
	Monitor LCD	May also have switching power supply (AC Adapter) that is external and has circuit board	x			x		
<b>Laptop</b>	Chassis	May contain battery on circuit board in addition to laptop battery.	x	x				
	Screen	May have Mercury back lights in display (not applicable for newer LED screens)	x			x		
	AC Adapter	May also have switching power supply that is external and has circuit board	x					
	Optical/Floppy Drive		x					
	Laptop Docking station	May also have switching power supply (AC Adapter) that is external and has circuit board	x					
<b>Telecom</b>	Switches	Circuit board, may include battery, older may have mercury switch	x	x		x	x	
	PBX	Lead acid battery for backup systems; may have mercury backlights in screens	x	x		x		
<b>Point of Sale (POS) equipment</b>		Much like computers and monitors with same constituent parts	x	x	x			x
<b>Copier</b>	Sub-Assemblies	Circuit boards w/ battery on board, hard drive w/ board, mercury light	x	x		x		x
	Hard Drive	Contained in some models	x					
	Adapters	Proprietary adapters external to the copier may be part of the device	x					
<b>Hand-Held Devices</b>	Cell Phone/Smart Phone/Pager	May also have switching power supply that is external and has circuit board	x	x				

Equipment	Components	Notes	Circuit Board	Battery	CRT Glass	Mercury	Polychlorinated Bi-Phenyls (PCB)	Toner/Ink (Not FM) <sup>8</sup>
	PDA	May also have switching power supply that is external and has circuit board	x	x				
	Cordless Phone & Base	May also have switching power supply that is external and has circuit board	x	x				
Television	TV CRT	Rear Projection TV's will also contain a Glycol coolant.	x		x			
	TV LCD (CCFL)		x					
	TV LCD (LED)	No mercury backlights	x					
	TV Plasma		x					
Consumer Electronics	Stereo equipment	DVD, amps, speakers, etc	x	x				
	Electric kitchen items	blenders, toaster ovens, crock pots, food processors, microwaves, etc. with electronic displays	x					
	Electric personal items	hair dryers, curling irons, razors, etc	x	x				
	Satellite equipment	circuit boards and battery on board	x	x				
	Telephones and answer machines	circuit boards and battery on board	x	x				

## Appendix B: Example On-Site Audit Decision Tree

The below diagram is an example of logic that may be suitable for determining when to perform an onsite audit. This decision tree does not consider discrepancies or concerns found during the audit process that may require further onsite due diligence. On-site auditing is determined by the analysis of evidence provided in the due diligence process. This is only a guideline and adherence to this process flow alone will not ensure conformance to the R2 Standard.

