



Lawrence Berkeley National Laboratory
Environment, Waste & Radiation Protection Department

Classification and Handling of PCB Waste

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1 OVERVIEW

1.1 Scope

This technical directive provides the LBNL process for *identifying and characterizing* PCB waste that may be found at LBNL including:

1. Electrical equipment containing or contaminated by PCBs such as transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cables.
2. Other equipment such as microwave ovens, electronic and laboratory equipment, and fluorescent light ballasts and fixtures, containing or contaminated by PCBs
3. PCB containers and PCB article containers
4. PCB remediation and bulk product wastes
5. PCB-contaminated oils
6. PCB/radioactive waste

Also provided are specific directions for Waste Generator and Waste Services Team on how to manage PCB wastes in a way that facilitates timely off-site shipment for treatment and disposal.

Management of discarded PCB-containing/contaminated materials generally follows the same process outlined in Chapter 20 “Waste Management” of the ES&H Manual for generating and managing wastes at LBNLs:

1. Determining when the material becomes a waste
2. Characterizing the waste
3. Labeling
4. Storing in proper containers
5. Accumulation
6. Process for acceptance at the on-site HWHF and/or
7. Shipping off-site to an acceptable facility

However, due to limited permitted storage capacity for PCB wastes in the on-site Hazardous Waste Handling Facility (HWHF) and the strict 30 day accumulation limit (40 CFR 761.65) for most TSCA-regulated PCB wastes generated at LBNL, careful planning and waste management - based on early and complete identification and characterization - is needed

1.2 Discussion

PCBs were banned from manufacture as of July 2, 1979 (TSCA, (15 U.S.C. 2601 et seq.)). Before then, PCBs were used in numerous industrial applications and continued use of PCB's is allowed under certain limited conditions. PCB oils, electrical, laboratory and other equipment manufactured before the ban, as well as, legacy PCB contamination may still be found at LBNL.

Definitions relating to PCB wastes and regulatory terms are provided in Section 3. TSCA regulations use very specific definitions and terminology for different categories of regulated

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PCBs, which must be understood in order to manage PCB wastes in compliance with the law. General California and TSCA regulatory waste classifications based on PCB concentration are as follows:

1. Non-RCRA Hazardous: ≥ 5 ppm in liquids and/or ≥ 50 ppm in non-liquids.
2. TSCA-regulated PCB-Contaminated: ≥ 50 ppm and < 500 ppm (in both liquids and non-liquids) or non-porous surface contamination with PCBs at $\geq 10 \mu\text{g}/100 \text{ cm}^2$ and $< 100 \mu\text{g}/100 \text{ cm}^2$.
3. TSCA-regulated PCBs: ≥ 500 ppm or non-porous surface contamination with PCBs at $\geq 100 \mu\text{g}/100 \text{ cm}^2$.

TSCA regulations broadly define anything containing or having PCBs as a component a PCB item. PCB items include PCB articles, which are more specifically defined as manufactured items containing PCBs such as electrical equipment, pipes, cables, and other types of equipment. The regulations provide specific definitions for other categories of PCBs, such as PCB containers and PCB/radioactive waste, as well.

2 ROLES AND RESPONSIBILITIES

2.1 Facilities Division

- Develops and implements, with assistance from the Waste Management Group (WMG), Environment Services Group (ESG) and Waste Generators, coordinated planning and compliance strategies for timely identification and management of PCB wastes, including contaminated soils, at LBNL.
- Identifies all PCB-containing/contaminated equipment that is to be removed from service. Prior to removal initiates coordination with the Waste Services Team (WST) and ESG to ensure that when the equipment is removed from service, activities are in compliance with applicable regulations.
- Manages PCB-containing/contaminated equipment in service at LBNL in compliance with applicable regulations including those for marking, storage, use and record keeping.
- Provides a facility Project Manager (PM) or facility Work Supervisor (WS) to oversee and coordinate activities involving PCBs or PCB waste with and WMG. The personnel needed (e.g. PM/WS vs WS) will be dictated by the scope and complexity of the planned activity.
- Retains and maintains all records related to: 1) PCB waste characterization involving process, knowledge; 2) plans, procedures and regulatory correspondence related to PCB cleanup activities; and 3) storage of PCB wastes in a Satellite Accumulation Area (SAA) or Waste Accumulation Area (WAA), including any waste accumulation logs and spill cleanup logs.

2.2 Facility Project Manager or Facility Work Supervisor

- Notifies the Waste Services Team (WST) and ESG when it is first recognized that an activity may involve PCBs or PCB waste.

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- Prepares or ensures preparation of wither a *Waste Management Plan* or *Work Plan* to identify requirements applicable to the PCBs and PCB wastes and implementation strategies for ensuring compliance. NOTE: A *Waste Management Plan* typically prepared by the project team for large or complex activities or projects detailing work to be performed by a subcontractor. A *Work Plan* is typically prepared by the facility Project Manager or facility Work Supervisor outlining the waste generation and handling process to support LBNL activities managing the PCB waste.
- Provides the assigned ESG subject matter expert, WST Generator Assistant (GA) with all available information on the potential PCBs and PCB wastes and an anticipated schedule and quantity of PCBs and PCB waste involved.
- Directs assigned personnel (i.e. the Waste Generator) to perform waste identification and characterization activities as outlined in this directive, and as directed by the WST.
- Ensures all required permits and authorizations are in place prior to beginning work activities.
- Schedules and holds a work scoping and a work kick-off meeting with all involved personnel.
- Ensures at all times work activities are performed under the direct supervision a qualified person.
- Directs assigned personnel to contain, store and otherwise manage the generated PCB waste as outlined in this guideline, and as directed by the WST.
- Provides materials needed to manage PCB wastes such as absorbent and containers.
- Ensure containers to be used for the storage and transportation of PCB wastes are received, stored, inspected and used in compliance with applicable regulations.
- Ensures all PCB wastes are removed from temporary storage (e.g. from the WAA) in compliance with applicable regulatory time limits.

2.3 Waste Generator

- Completes all required training necessary to safely and compliantly manage PCB wastes to be generated including EHS-604 and EHS-622, if the waste is radioactive.
- Arranges, as needed, WST GA assistance in characterizing waste, procuring waste containers, and for compliantly accumulating and dispositioning PCB waste.
- Labels all non-RCRA hazardous PCB waste and containers with a HAZARDOUS WASTE label (see example in Attachment A) that has been completely and accurately filled out with required information.
- Marks all TSCA-regulated PCB wastes and containers with a PCB mark (see example in Attachment A) and the out-of-service date.
- Initiates, prepares and submits disposal requisitions for all PCB wastes.
- Ensures disposal requisitions are submitted in a timely manner so PCB waste in accumulation areas does not exceed applicable quantity and time limits, with focus on the 30 day temporary storage time limit for most TSCA-regulated PCB wastes.

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2.4 EHS Environmental Services Group

- Identifies applicable regulatory drivers and requirements applicable to PCBs at LBNL to ensure compliant activities.
- Works with Facilities Division and the WST to develop compliance strategies for management of PCBs at LBNL.
- Identifies applicable PCB remediation requirements and coordinates any necessary regulatory negotiations and preparation of environmental sampling and analysis and PCB remediation plans.

2.5 Generator Assistants

- Assist waste generators in all matters regarding PCB waste including identification, characterization, labeling, storage, packaging, and safe and compliant management in the workplace.
- Provide hazardous waste labels and PCB marks to Waste Generators (see examples in Attachment A).
- Ensure generators have properly characterized requisitioned PCB wastes by reviewing requisitions and supporting documentation (e.g., accumulation log sheets, photographs, manufacturer's information and analytical data).
- Identify and initiate needed sampling and analysis for PCB wastes so that generators can sufficiently characterize materials for disposal and evaluate the laboratory analytical data generated from the waste analysis.
- Initiate quality assurance (QA) verification of PCB waste handling operations.
- As necessary, initiate QA Exception Reports and follows up nonconformance and works with generators to resolve any discrepancies or issues.
- Maintain and archive WMG generated PCB waste records.

3 DEFINITIONS

3.1 Capacitor:

A device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric. Types of capacitors are as follows:

- A small capacitor - contains less than 1.36 kg (3 lb) of dielectric fluid.
 - A capacitor whose total volume is $\leq 1,639$ cubic centimeters (100 cubic inches) may be considered to contain < 1.36 kgs (3 lb) of dielectric fluid.
 - A capacitor whose volume is between 1,639 and 3,278 cubic centimeters may be considered to contain < 1.36 kg (3 lb) of dielectric fluid if the total weight of the capacitor is < 4.08 kg (9 lb).
 - A capacitor whose total volume is $\geq 3,278$ cubic centimeters (200 cubic inches) must be considered to contain ≥ 1.36 kg (3 lb) of dielectric fluid.
- A large high voltage capacitor means a capacitor which contains ≥ 1.36 kg (3 lb) of dielectric fluid and which operates at 2,000 volts or above.

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- A large low voltage capacitor means a capacitor which contains ≥ 1.36 kg (3 lb) of dielectric fluid and which operates below 2,000 volts.

3.2 Combined Waste:

Radioactive waste that also contains a non-RCRA hazardous waste. This includes a radioactive liquid waste containing PCBs ≥ 5 ppm or a radioactive non-liquid waste containing PCBs ≥ 50 ppm. (TSCA-regulated levels of PCBs also make the waste "PCB/radioactive").

3.3 Discarded material:

Material that has been relinquished, recycled, or is inherently waste-like, including electrical equipment with PCBs taken out of service and having no future planned use.

3.4 Fluorescent light ballast:

A device that electrically controls fluorescent light fixtures and that includes a capacitor which contains 0.1 kg or less of dielectric fluid.

3.5 Hazardous waste:

Solid wastes designated hazardous by California regulations (CCR Title 22, Section 66261.3). Hazardous waste includes acutely hazardous waste, extremely hazardous waste, non-RCRA hazardous waste, RCRA hazardous waste, special waste, and universal waste. PCB wastes are regulated as non-RCRA hazardous waste when PCB concentrations are ≥ 5 ppm in liquids and ≥ 50 ppm in non-liquid wastes. PCBs at ≥ 5000 ppm are an extremely hazardous waste under California regulations.

3.6 Non-PCB:

Under TSCA regulations is a waste containing ≤ 50 ppm PCBs and/or < 10 $\mu\text{g}/\text{cm}^2$ non-porous surface contamination.

3.7 Non-PCB Transformer:

A transformer that contains ≤ 50 ppm PCB; except any transformer that has been converted from a PCB Transformer or a PCB-Contaminated Transformer cannot be classified as a non-PCB Transformer until reclassification has occurred in accordance with TSCA regulations.

While *still in service* a transformer may be assumed to contain < 50 ppm PCBs if the transformer contains < 1.36 kg (3 lb) of fluid and the PCB concentration in the fluid has not been established.

NOTE: For disposal purposes the concentration of PCBs in transformer oils must be tested and cannot be assumed to be < 50 ppm.

3.8 Non-RCRA hazardous waste:

Also referred to as a California-only hazardous waste. A waste that does not meet the federal criteria for a hazardous waste but which meets California specific state regulatory criteria for

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a hazardous waste. Persistent and bio-accumulative toxic substances including PCBs are defined as a characteristically toxic waste in the California Code of Regulations (CCR) Title 22, Section 66261.24.

3.9 Out-of-service date:

The date that a waste is determined to be regulated for disposal under TSCA and a decision is made to dispose of it. TSCA requires disposal within 1 year of the out-of-service date and allows for temporary storage (e.g. in a WAA) of the waste for only 30 days from the out-of-service date.

3.10 PCB and PCBs:

Acronyms standing for polychlorinated biphenyls, a group of toxic, persistent chemical substances with a biphenyl molecule that has been chlorinated.

As defined under TSCA, PCBs are any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. For any purposes under the regulations, inadvertently generated non-Aroclor PCBs are defined as the total PCBs calculated following division of the quantity of monochlorinated biphenyls by 50 and dichlorinated biphenyls by 5.

NOTE: Also under TSCA, for the purposes of defining applicable regulatory requirements, PCBs refers to PCB items containing > 500 ppm PCBs or having non-porous surface contamination >100 µg/100 cm².

3.11 PCB Article:

A manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes and any other manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have no commercial purpose separate from that of the PCB Article.

3.12 PCB Article Container:

A package or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.

3.13 PCB bulk product waste:

Waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal was ≥ 50 ppm PCBs. PCB bulk product waste includes, but is not limited to:

- Non-liquid bulk wastes and debris from demolition man-made structures manufactured, coated, or serviced with PCBs.

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NOTE: This does not include building materials contaminated from spills of PCBs which have not been decontaminated or cleaned up in compliance with TSCA.

- Plastics (such as plastic insulation from wire or cable; radio, television and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; adhesives; paper; Galbestos; sound deadening or other types of insulation; and felt or fabric products such as gaskets.
- Fluorescent light ballasts containing PCBs in the potting material.

3.14 PCB Capacitor:

Any capacitor that contains ≥ 500 ppm PCB.

- A capacitor manufactured prior to July 2, 1979 or whose date of manufacture is unknown, and whose PCB concentration is not established is assumed to contain ≥ 500 ppm PCBs.
- A capacitor manufactured after July 2, 1979 or a capacitor marked the time of manufacture with the statement "No PCBs" in accordance with §761.40(g) is assumed to contain < 50 ppm PCBs.

3.15 PCB Cleanup waste:

Non-liquid cleaning materials and personal protective equipment waste at any PCB concentration. Examples are rags, gloves, booties, and other disposable items, cleaning solvents, abrasives, and equipment used in cleanup.

3.16 PCB Container:

A package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs.

3.17 PCB-Containing/Contaminated

For the purposes of this document meaning containing or contaminated with detectable concentrations of PCBs.

3.18 PCB-Contaminated:

Non-liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm or a liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm or where insufficient liquid material is available for analysis a non-porous surface having a surface concentration $\geq 10 \mu\text{g}/100 \text{ cm}^2$ but $< 100 \mu\text{g}/100 \text{ cm}^2$.

3.19 PCB-Contaminated Electrical Equipment:

Electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, electromagnets, and cable, that contain PCBs at concentrations of ≥ 50 ppm and < 500 ppm in the contaminating fluid. In the absence of liquids, electrical

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equipment is PCB-Contaminated if it has PCBs at $\geq 10 \mu\text{g}/100 \text{ cm}^2$ and $< 100 \mu\text{g}/100 \text{ cm}^2$ as measured by a standard wipe test (as defined in §761.123) of a non-porous surface.

3.20 PCB-Contaminated oil:

Oil with a PCB concentration ≥ 2 ppm. These may include immersion oil, transformer oil, hydraulic or other oils from electrical or other equipment manufactured before 1980.

NOTE: Non-PCB oils used in PCB contaminated equipment may also be classified as PCB-contaminated oil.

3.21 PCB Equipment:

Manufactured items, other than PCB Containers or PCB Article Containers, which contain a PCB Article or other PCB Equipment; includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

3.22 PCB Item:

PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCB or PCBs.

3.23 PCB/radioactive Waste:

PCBs regulated for disposal under subpart DTSCA of this part which also contain source, special nuclear, or byproduct material subject to regulation under the Atomic Energy Act of 1954, as amended, or naturally-occurring or accelerator-produced radioactive material.

3.24 PCB Remediation Waste:

Waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations:

- Materials disposed of prior to April 18, 1978, that are currently at concentrations ≥ 50 ppm PCBs, regardless of the concentration of the original spill;
- Materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCBs beginning on April 18, 1978, or ≥ 50 ppm PCBs beginning on July 2, 1979; and
- Materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part.

Examples of PCB remediation waste include environmental media containing PCBs such as soil, sediment and gravel; man-made materials such as concrete and wood floors, walls and other porous and non-porous surfaces contaminated by spills of PCBs; and soil, rags, and other debris generated as a result of a PCB spill cleanup.

If the original source and date of PCB contamination cannot be determined for a spill or release the remediation waste may be assigned the highest “as-found” concentration of PCB present.

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3.25 PCB Transformer:

A transformer containing ≥ 500 ppm PCB. While a transformer is *still in service* the PCB concentration may be assumed

- A transformer manufactured prior to July 2, 1979, and containing ≥ 1.36 kg (3 lb) of fluid other than mineral oil and whose PCB concentration is not established is assumed to contain ≥ 500 ppm PCBs.
- A transformer whose date of manufacture and the type of dielectric fluid are unknown and whose PCB concentration is not established is assumed to contain ≥ 500 ppm PCBs.

NOTE: For disposal purposes the concentration of PCBs in transformer oils must be tested and cannot be assumed to be < 50 ppm.

3.26 PCB Waste:

For the purposes of this technical guideline means any discarded liquid or solid containing PCBs at detectable concentrations.

NOTE: Under TSCA, PCB Waste is defined as "PCBs and PCB Items that are subject to the disposal requirements of 40 CFR 761 Subpart D."

NOTE: Spills and other uncontrolled discharges of PCBs at concentrations of ≥ 50 ppm constitutes disposal under TSCA. TSCA specifically prohibits dilution when determining applicable regulatory provisions. Therefore, unless as specifically provided in the regulations, materials on which PCBs are spilled (e.g., soil, concrete, and debris) are wastes regulated at the same concentration as the spilled material.

3.27 Process knowledge:

Also referred to as acceptable knowledge and is that body of information used in addition to or in place of sampling and analysis to determine concentrations of regulated constituents, including PCB, in a waste and to classify it in order to meet treatment, storage, and disposal requirements.

Process knowledge must be adequate to ensure the characterization is sufficient to withstand scientific and legal challenges relative to management of the waste. Types of process knowledge information for characterization of potential PCB-containing materials include, but are not limited to:

Manufacturer's information: Labels on equipment, especially electrical equipment may include information showing the equipment contains PCBs at < 50 ppm. Post ban manufacture date, date of manufacture (before August 1979) and serial numbers and producer is information that may be useful when it is necessary to contact a manufacturer to try and identify PCB concentration information. The equipment may also list a trade name for PCBs (see list in Attachment B).

Analytical results: PCB testing results for other materials associated with the waste (e.g. accessible oils). Analytical results from a non-required method for waste characterization or

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from a noncertified laboratory, but having adequate procedures and records available for review by the GA.

3.28 Used (Waste) Oil:

Oil that has been used and as a result of use, extended storage, spillage or is contaminated with physical or chemical impurities within certain concentrations. **In California, oil fitting the definition of ‘used oil’ is regulated as a hazardous waste. Used oil containing ≥ 2 ppm PCBs is NOT ‘used oil’ and cannot be mixed with other used oils.**

3.29 Waste Accumulation Area (WAA):

A regulated area designed for the accumulation of hazardous wastes, including PCBs for up to 90 days (by regulation; 60 days per LBNL policy) in quantities that can exceed the quantities allowed for storage in a satellite accumulation area (SAA). **Most TSCA-regulated PCB wastes with ≥ 50 ppm are only allowed accumulation in a WAA for 30 days or less, depending on the out-of-service date.**

3.30 Waste Characterization:

The identification of waste components and properties through a review of process knowledge or by nondestructive examination, nondestructive assay, or sampling and analysis, as necessary to comply with applicable storage, treatment, handling, transportation, and disposal requirements.

3.31 Waste Generator:

Any person, by site, whose act or process produces reusable property, recyclable material or waste, or whose act first causes a hazardous waste to become subject to regulation. It is the individual responsible for the process that generates the waste, typically the principle investigator, project manager, or qualified designee. The generator brings a waste stream to the attention of the Generator Assistant and provides waste process knowledge information to that person. Generally, the Waste Management Group then assumes many of the responsibilities of the generator as defined in the Resource Conservation and Recovery Act (RCRA) regulations RCRA, TSCA and the state of California regulations. Where subcontractors are performing work at LBNL, the facility or project manager who requested the work assumes responsibilities of the generator, and assumes ownership of all waste generated by the subcontractor as a result of that work.

4 IDENTIFICATION AND CHARACTERIZATION PROCESS

When the potential or presence of PCBs in items to be discarded, notify the WST and provide the assigned GA with all available information on the:

- materials,
- anticipated schedule, and
- quantities of waste to be generated.

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The sections below discuss the materials and equipment associated with PCBs waste at LBNL.

4.1 TRANSFORMERS

Transformers are manufactured in a variety of shapes and sizes and are either dry-type or liquid-filled. See Attachment C for photographs showing examples of transformers. Transformers are classified based on the concentration of PCBs in the transformer oil and are regulated accordingly.

Transformers containing ≥ 500 ppm PCB oil are regulated under TSCA as PCB Transformers.

Transformers containing oil with between 50 and 500 ppm PCBs are regulated under TSCA as PCB-Contaminated. If they do not contain liquid, a transformer is considered PCB-contaminated if it has PCBs at $\geq 10 \mu\text{g}/100 \text{ cm}^2$ and $< 100 \mu\text{g}/100 \text{ cm}^2$ as measured by a standard wipe test (defined in 40 CFR §761.123) of a non-porous surface. Additionally there are restrictions on how oils and other liquids containing any detectable PCBs must be managed and disposed.

TSCA defines a Non-PCB transformer as one that contains < 50 ppm PCBs in the oil or with a non-porous surface contamination $< 10 \mu\text{g}/100 \text{ cm}^2$. However in California PCBs ≥ 5 ppm in oil (and other liquids) is regulated as a hazardous waste.

While a transformer is **in use or being stored for reuse**, certain assumptions can be made regarding the concentrations of PCBs present:

1. Transformers with < 1.36 kg (3 lb) of fluid are assumed to contain PCBs at < 50 ppm.
2. A transformer manufactured prior to July 2, 1979, that contains ≥ 1.36 kg (3 lb) of fluid other than mineral oil is assumed to be a PCB Transformer (i.e., ≥ 500 ppm).
3. If the date of manufacture and the type of dielectric fluid are unknown, it must be assumed that the transformer is a PCB Transformer.
4. Mineral oil-filled electrical equipment that was manufactured before July 2, 1979 is PCB-Contaminated Electrical Equipment (i.e., contains ≥ 50 ppm PCB, but < 500 ppm PCB).
 - a. All pole-top and pad-mounted distribution transformers manufactured before July 2, 1979, must be assumed to be mineral-oil filled containing ≥ 50 ppm PCB, but < 500 ppm PCB).
 - b. Electrical equipment manufactured after July 2, 1979, can be assumed to be non-PCB (i.e., < 50 ppm PCBs).
 - c. If the date of manufacture of mineral oil-filled electrical equipment is unknown, it must be assumed it to be PCB-Contaminated containing ≥ 50 ppm PCB, but < 500 ppm PCB).

During its **useful life**, a transformer may be stored for reuse for no more than five years after the date it was originally removed from use (e.g., disconnected electrical equipment), as long as applicable regulations are followed. Once a PCB or PCB-Contaminated Transformer has reached the end of its useful life or it has been in storage for reuse for five years¹ it becomes

¹ Storage for reuse for more than 5 years is allowable under defined regulatory scenarios not considered here.

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a discarded material. It must then be assigned an out-of-service date, and the concentrations of the PCBs established for disposal purposes (i.e. the “in-use” concentration assumptions no longer apply).

BEFORE removing a transformer from service:

- Visually examine the transformer and note any evidence of present or past leakage or external contamination.

NOTE: Spills of PCBs must be cleaned up within 48 hours. Contact the Environmental Services Group for more information.

- Check the transformer for labels (e.g. PCB mark or “No PCB” label) indicating if it does or does not contain PCBs.
- Check the transformer name plate (see Attachment C for an example of a name plate) and obtain all available information from it, such as:
 - manufacturer
 - date and location of manufacturer
 - number, model and other identifiers
 - name of the dielectric fluid
 - weight and/or the amount of dielectric fluid
 - presence of words “PCB” or “No PCB”

NOTE: A “no PCB” label indicates that the dielectric fluid contains < 50 ppm PCBs, and is not, therefore, regulated under TSCA. Dielectric fluid in a transformer marked “No PCB” must be tested to establish the PCB concentration to determine if it meets the definition of a non-RCRA hazardous waste (i.e. a PCB concentration \geq 5 ppm).

- If the name of the dielectric fluid is known, check it against the list of PCB trade names in Attachment B to see if it may be a product known to contain PCBs.
- Evaluate any existing service records or other documentation for the transformer to find any information on the PCB concentrations in dielectric fluids used in or to service the transformer.
- Document physical information on the transformer using photographs and make copies of any other process knowledge obtained.
- Document (i.e. photograph) or make copies of any available information on the transformer itself, such as weight, dimensions, construction, location, etc.
- Provide all documents, photographs, and information to the assigned GA.
- Work with the GA to obtain any additionally required information or sampling and analysis.

4.2 CAPACITORS

Capacitors are devices for accumulating and holding a charge of electricity and consist of conducting surfaces separated by a dielectric fluid. Capacitors come in a variety of sizes (see Attachment D for examples). The PCB concentration and the size of the capacitor determine which management and disposal requirements apply.

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As defined under TSCA there are essentially two categories of capacitors; small and large. A small capacitor contains < 1.36 kg (3 lb) of dielectric fluid. Large capacitors contain ≥ 1.36 kg (3 lb) dielectric fluid. Small capacitors are allowed more flexibility under TSCA (i.e. disposal in some municipal landfills). However California regulations consider dielectric fluid in small capacitors as hazardous waste containing ≥ 5 ppm PCB.

Capacitors are normally sealed and do not allow for sampling and testing. Capacitors that do not have sufficient oil or access to sample oil (without destroying the item) may be classified based on generator knowledge, information obtained from labels and other manufacturer's information. If no information is available assign a PCB concentration, as follows:

1. A capacitor manufactured prior to July 2, 1979 or whose date of manufacture is unknown, and whose PCB concentration is not established is assumed to contain ≥ 500 ppm PCBs.
2. A capacitor manufactured after July 2, 1979, or a capacitor marked at the time of manufacture with the statement "No PCBs" in accordance with §761.40(g), is assumed to contain ≥ 5 ppm PCB and < 50 ppm PCBs.

BEFORE removing a capacitor from service:

- Visually examine the capacitor and document any evidence of present or past leakage or external contamination.

NOTE: Spills of PCBs must be cleaned up with 48 hours. Contact the Environmental Services Group for more information.

- Determine and document the weight and physical dimensions of the capacitor; if it is a small or large capacitor; and if it is high or low voltage:
 - A capacitor whose total volume is $< 1,639$ cm³ (100 in³) is considered to contain < 1.36 kg (3 lb) of dielectric fluid (i.e. a small capacitor).
 - A capacitor whose volume is $\geq 1,639$ and $< 3,278$ cm³ is considered to contain < 1.36 kg (3 lb) of dielectric fluid if the total weight of the capacitor is < 4.08 kg (9 lb) (i.e. a small capacitor).
 - A capacitor whose total volume is $\geq 3,278$ cm³ (200 in³) is considered to contain ≥ 1.36 kg (3 lb) of dielectric fluid (i.e. a large capacitor).
 - A large high voltage capacitor means a capacitor which contains ≥ 1.36 kg (3 lb) of dielectric fluid and which operates at 2,000 volts or above.
 - A large low voltage capacitor means a capacitor which contains ≥ 1.36 kg (3 lb) of dielectric fluid and which operates below 2,000 volts.
- Examine the capacitor and any labels present and document available information such as
 - Manufacturer name and location and date of manufacture.
 - PCB labels and marks (e.g. PCB mark or "No PCB" or "Non-PCB Capacitor" label).
 - Size, serial number or any identifying information.
 - Name of the dielectric fluid (see Attachment B for a list of PCB trade names).
 - Weight and/or quantity of dielectric fluid.

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NOTE: Capacitors containing the dielectric fluids WEMCOL, FARADOL 100, DIELEKTRO II or DPO do not contain PCBs.

NOTE: Capacitors manufactured from 1979 to 1992 that do not contain PCBs may contain Di-(2-ethylhexyl) phthalate, a regulated chemical.

- If the manufacturer and serial number are known, the manufacturer may be able to provide PCB information. Document any contact with the manufacturer and any information obtained about a capacitor.
- Document physical information on the capacitor using photographs and make copies of any process knowledge information obtained.
- Document or make copies of any available information on the capacitor itself, such as weight, dimensions, construction, location, etc.
- Provide all documents, photographs, and information to the assigned GA.
- Work with the GA to obtain any additionally required information or sampling and analysis.

4.3 FLUORESCENT LIGHT BALLASTS (FLB)

If a FLB contains PCBs, they are usually inside the small capacitor located within the FLB or in the potting material (a black, tar-like substance that encapsulates the internal electrical components). If the capacitor has leaked, the FLB may be contaminated with PCBs. FLB are a regulated hazardous waste in California if the potting material contains ≥ 50 ppm PCB and/or the dielectric fluid in the capacitor contains ≥ 5 ppm PCBs. These FLBs are not TSCA-regulated if the PCB concentration in the capacitor is < 50 ppm. **Non-leaking** FLBs with ≥ 50 ppm in the capacitor and < 50 ppm in the potting material are regulated in California as a hazardous waste. **Leaking** FLB with ≥ 50 ppm in the capacitor or ≥ 50 ppm in the potting material are TSCA-regulated as well as a non-RCRA hazardous waste.

BEFORE removing a FLB from a light fixture:

- Visually examine the FLB and document any evidence of leakage.
- Obtain and document all available information on the light fixture and FLB, such as presence or absence of a “No PCB” label, the light fixture brand name, model number, and the FLB serial number.
- If the FLB does not have a “No PCB” label and the date of manufacturer is before 1979 or is unknown, contact the manufacturer for additional information on the PCB concentrations in the capacitor and potting material.
- If the manufacture cannot provide definitive information on the PCB concentrations assign the potting material and dielectric fluid a PCB concentration of ≥ 50 ppm.
- Document physical information on the FLB using photographs and make copies of any process knowledge information obtained.
- Also document or make copies of any available information on the FLB, such as weight, dimensions, construction, location, etc.
- Provide all documents, photographs, and information to the assigned GA.

Classification and Handling of PCB Waste

- Work with the GA to obtain any additionally required information or sampling and analysis.

4.4 OTHER EQUIPMENT (ELECTRICAL AND OTHER)

Other electrical equipment (see Attachment E for an example) includes but is not limited to circuit breakers and bushings, reclosers, voltage regulators, switches, electromagnets, and cable. Older equipment including, for example, heating systems, air conditioners, microwaves, refrigerators, and television sets may contain capacitors with PCBs. Air compressors, cutting oil in lathes, and door closers may contain PCB oils. Older laboratory research equipment and microscopy mounting fluids may contain PCBs.

TSCA allows for the use of PCBs in scientific instruments indefinitely (e.g. in oscillatory flow birefringence and viscoelasticity instruments for the study of the physical properties of polymers), as microscopy mounting fluids, as microscopy immersion oil, and as optical liquids. However, once no longer in use, these instruments and laboratory materials must be characterized to determine PCB concentrations, assigned an out-of-service date and managed accordingly.

BEFORE removing potentially PCB equipment from service:

- Identify the type of equipment and PCB concentration by obtaining all available information on the age, make, model and equipment use.
- Provide all documents, photographs, and information to the assigned GA.
- Work with the GA to obtain any additionally required information and sampling and analysis.

4.5 PCB-CONTAMINATED OIL

PCBs were widely used in many different types of oil until they were banned in the 1970s. Used (waste) oils collected from equipment that was put into service many years ago may contain PCBs and when consolidated with other used oils, generate additional PCB-contaminated oil.

Oil containing PCB are subject to requirements under the Anti-dilution Rule [40 CFR 761.1(b)], which states that it is prohibited to dilute PCB waste in order to reduce the concentration in the resultant mixture. For example, solvents that have been used to flush a PCB transformer that contained 500 ppm PCB must be disposed of as PCB liquid waste containing >500 ppm, even though the actual concentration of PCBs in the solvent may be lower.

Until the oil removed from equipment is determined not to contain PCBs it should not be mixed with other waste or used oils. TSCA defines quantifiable concentrations of PCBs in oil as 2 ppm (40 CFR 261.20 (e)) and specifies how used oils containing ≥ 2 ppm PCBs may be disposed. Any waste or used oil containing ≥ 2 ppm PCBs is considered PCB-contaminated under TSCA and if containing ≥ 5 ppm PCBs is also a non-RCRA hazardous waste.

Classification and Handling of PCB Waste

BEFORE generating waste oil (i.e., removing it from equipment):

- Identify the type of equipment containing the oil and evaluate the PCB concentration by obtaining all available information on the age, make, model and equipment use.
- Obtain manufacturer and serial number as the manufacturer may be able to provide PCB information.. Document any contact with the manufacturer or information found during research on the equipment..
- Document physical information on the equipment using photographs; document or make copies of any other process knowledge on the equipment such as weight, dimensions, construction, location, etc. and on the quantity of oil generated.
- Provide all documents, photographs, and information to the assigned GA.
- Work with the GA to obtain any additionally required information and sampling and analysis.

4.6 PCB CONTAINERS

PCB containers are containers with a surface that has directly contacted materials containing PCBs ≥ 50 ppm. TSCA regulates how containers holding or that held PCBs must be managed and disposed. The disposal requirements are dependent on if the concentration of PCBs is ≥ 50 ppm or ≥ 500 ppm (all must be managed as a TSCA-regulated PCB waste during storage). PCB containers that held PCBs ≥ 500 ppm must be sent to a TSCA-regulated facility for incineration or disposal.

When empty, containers are also regulated by the State of California. **Empty** containers with a capacity ≥ 5 gal that held liquid PCBs ≥ 5 ppm and non-liquid PCBs ≥ 50 ppm must be managed as a hazardous waste. Empty containers that held PCBs ≥ 5000 ppm, regardless of capacity must be managed as an extremely hazardous waste.

BEFORE generating an empty container:

- Using available information for the PCB material or waste inside the container, determine the concentration of PCBs that apply to the empty container for management and disposal purposes.
- Provide this information to the assigned GA.

4.7 PCB BULK PRODUCT WASTE

Prior to 1979 PCBs were once widely used in the manufacture of many building products and components. When these products or components become wastes they are classified as PCB bulk product waste if the PCB concentration at the time of designation for disposal is ≥ 50 ppm. The largest source of PCB bulk product waste is renovation and demolition of older buildings. Potential PCB bulk product wastes include:

- Applied dried coatings (e.g., paints; sealants; varnishes; protective lacquers; cable coatings; waxes; epoxy resin metal coatings; coal-tar enamel or a black tarry compound on pipes, tanks, or stacks; Amercoat protective coatings; chlorinated rubber-based paint such as "Tile-Clad")
- Caulking, joint filler, (e.g., Polysulfide or "Thiokol Rubber" sealant/caulk/joint filler; expansion joints)

Classification and Handling of PCB Waste

- Rubber products (e.g., gaskets; rubber-based coatings; synthetic rubbers)
- Electrical cabling (e.g., wire; plastics; small rubber parts; adhesive tape and insulating materials)
- Felt, paper and related products (e.g., washable wall coverings)
- Textiles (e.g., upholstery; delustered rayon; textile fireproofing compounds)
- Ventilation duct gaskets and insulation in HVAC systems for “large facility” (i.e., multi-story facility or requires high air flow volumes, such as for purposes of controlling radioactive contamination)
- Plastics, Resins and Adhesives (e.g., plastic bottles; resins; insulating tapes; floor tiles; epoxy resins; plasticizers for plastic materials; putty for concrete and asphalt; adhesives for waterproof wall coatings).

TSCA regulations specifically address the management and disposal of PCB bulk product waste. Characterization of PCB concentrations in these wastes may be based on the application of a general knowledge of the waste stream or similar material. Typically knowledge of the waste stream is obtained through characterization of the facilities scheduled to undergo renovation or demolition. If there is not adequate general knowledge of the PCB concentration, analysis of representative samples of the PCB-containing materials may be necessary.

BEFORE generating PCB bulk product waste:

- Compile and evaluate all available historical information, sampling and analysis results, and other process knowledge.
- Perform additional facility characterization as necessary to identify PCB bulk product waste streams.
- Based on the results of the process knowledge evaluation and facility characterization determine estimated quantities of PCB bulk product wastes to be generated.
- Work with the ESG and WMT to determine the most cost effective and compliant management strategy for all anticipated PCB bulk product wastes to be generated.

4.8 PCB REMEDIATION WASTE

PCB remediation waste are wastes generated in PCB clean ups and include environmental media containing PCBs such as soil, sediment and gravel; man-made materials such as concrete and wood floors, walls and other porous and non-porous surfaces contaminated by spills of PCBs; and rags, equipment and other debris generated as a result of a PCB spill cleanup. PCB remediation waste differs from PCB bulk product waste in that remediation wastes are contaminated by PCBs from spills, releases or illegally disposed PCBs; PCB bulk product waste are materials that contain PCBs as part of the manufacturing process (e.g. paint). PCB remediation waste does include building materials and environmental media containing ≥ 50 ppm PCBs contaminated by leaching from PCB bulk product wastes.

The classification of a PCB remediation waste is dependent on the source of the PCBs present in the contaminated media as well as when the PCB spill or release occurred. Classification of a PCB cleanup waste as a non-RCRA hazardous waste is based on the

Classification and Handling of PCB Waste

concentration of PCBs present. How to determine if a PCB cleanup waste is a PCB remediation waste and/or a hazardous waste is given in the table below.

Date of PCB Spill/Release	“As Found” PCB Concentration	PCB Concentration of Source	TSCA and/or CA-only Hazardous?
Before 4-18-1978	≥ 50 ppm	Any	Both
On or after 4-18-1978 and before 07-02-1979	Any	≥500 ppm	TSCA ¹
On or after 07-02-1979	Any	≥50 ppm	TSCA ¹
Any ²	Any ²	Any ²	TSCA ²
Unknown or Any	Liquid: ≥ 5 ppm and < 50 ppm Non-liquid: < 50 ppm	Unknown	California-only Hazardous
Unknown or Any	≥ 50 ppm	Unknown or Any	Both

1. Also non-RCRA hazardous if “as found” concentration is ≥ 5 ppm (liquid) or ≥ 50 ppm (non-liquid).
 2. Cleanup waste from any spill or release of PCBs from a source not authorized for use under TSCA are regulated as PCB remediation waste.

Determining if PCBs found in contaminated man-made structures and the environment are PCB remediation waste may be difficult since determining when and what was originally released, spilled or disposed may not always be possible. In cases where the original source and date of PCB contamination cannot be determined the PCB cleanup waste may be assigned the highest “as-found” concentration of PCB present (i.e., the in-situ concentration before any mixing has occurred). An example is soil that becomes contaminated from a leaking capacitor. Even though some of the soil may contain < 50 ppm PCB, all removed soil must be disposed of as if it contains the PCB concentration of the oil in the PCB capacitor. This ensures compliance with the TSCA anti-dilution provision.

BEFORE generating a potential PCB remediation waste:

- Collect and evaluate all available information on the PCB spill or release and determine the probable PCB remediation waste and non-RCRA hazardous waste classification and quantities of PCB cleanup wastes that may be generated.
- Contact the GA and provide the all available information regarding the PCB spill or release.

4.9 PCB/RADIOACTIVE WASTE

PCB/radioactive is a TSCA term used for waste containing PCBs at a concentration ≥ 50 ppm and which also contains source, special nuclear, or byproduct material subject to regulation. As well as being regulated under TSCA, PCB/radioactive wastes at a concentration ≥ 50 ppm are also regulated as a non-RCRA hazardous waste, as are all radioactive wastes containing PCBs at ≥5 ppm in liquids and ≥ 50 ppm in non-liquids.

Due to the lack of treatment and disposal capacity TSCA regulations have been promulgated specifying different storage and management requirements for PCB/radioactive wastes. To address some of the same issues as related to non-RCRA hazardous and radioactive wastes, the State of California and the Department of Energy negotiated a Memorandum of Agreement (MOA) that addresses how these wastes, defined as “combined waste” in the MOA, will be managed at LBNL.

Classification and Handling of PCB Waste

Identification and characterization requirements for the PCB component of PCB/radioactive and combined wastes is the same as it is for all potentially PCB-containing materials. Additionally the waste must be radiologically characterized, as outlined in PUB-3092 “Generator Guidelines.”

BEFORE generating a radioactive waste containing PCBs:

- Identify and characterize the waste as outlined in this technical guideline for the applicable category of PCB waste.
- Radiologically characterize the waste as outlined in PUB-3092 “Generator Guidelines.”

5 PCB WASTE MANAGEMENT PROCESS

5.1 PCB Waste Planning and Preparation

1. Project Manager, Work Supervisor and Waste Generator:

- a. Complete ESH-604 Hazardous Waste Generator Training, EHS-622 Radioactive and Mixed Waste Generator Training, and EHS-610 WAA Supervisor Training, as applicable.
- b. Ensure identification and characterization requirements in this technical directive have been completed.
- c. Identify the planned SAA or WAA where the waste will be accumulated.
- d. As necessary, set up a SAA or WAA as outlined in PUB-3092 “Generator Guidelines.”
- e. Identify and obtain the container(s) that will be used for the PCB waste.
 - i. Seek assistance of GA to identify and obtain required containers.
 - ii. Notify GA of specific dates/schedule of waste generating activities.
- f. For objects such as transformer carcasses that will not be put inside another container, identify how openings will be secured from leaking once liquids are removed and absorbent is added, if needed).
- g. Involve the WST in the planning of all PCB characterization, cleanup, demolition and waste collection activities:
 - i. Include the WST during the development of work plans for remediation, soil management, building renovation, equipment disposal/maintenance, or demolition, etc. that may involve PCBs.
 - ii. Seek Waste Management Group (WMG) input when developing scopes of work for PCB remediation, renovation/demolition and soil/waste management and disposal contracts.
 - iii. Ensure all PCB wastes are addressed in a written plan and WST notice and approval of the planned PCB waste management strategy is documented by WST acceptance of the plan.
 - iv. Provide the WST with any approved plans that include waste generation.
 - v. Contact the WST if work changes from the plan and new or unexpected waste will be generated or if unanticipated maintenance will be performed in a PCB contaminated area.

Classification and Handling of PCB Waste

2. Waste Services Team:

- a. Assist in preparation and review of PCB characterization, cleanup, demolition and waste management plans as needed. Approve prepared plans, as needed.

NOTE: For some PCB characterization, cleanup, demolition and waste management activities the following steps may be performed by contracted personnel. For most LBNL work these activities will be performed by the WST.

- b. Review generator's characterization information to determine required packaging, labeling, and storage and disposal options.
- c. Assist generator in identifying and procuring required containers, and other supplies (e.g. absorbent and labels) for the PCB wastes.
- d. Provide required support for identifying a SAA or WAA to use (including updating the WAA contingency plan) or for setting up a SAA or WAA, if needed.
 - i. As necessary, request sampling and analytical testing for PCBs. Ensure samples will be analyzed for PCBs using EPA test method 8082. All oils to be, or removed from equipment must be tested for PCBs if analytical data do not already exist.
- e. Determine and request turn-around time for analytical results based on available handling time within the 30 day time frame if the oil is known or suspected of containing PCBs.
- f. Communicate results of laboratory analytical data generated in the waste analysis and assist the generator in classifying the PCB waste and identifying any additional hazard classifications.
- g. For large pieces of equipment (e.g. a large transformer) or large volumes of PCB wastes, determine if the waste will be shipped from the generation site or will be processed through the HWHF.
 - i. Verify if adequate storage capacity exists at HWHF for the waste.
 - ii. As necessary, complete contacting and profiling arrangements with an off-site receiving facility for PCB waste to be shipped directly from the generation site.

5.2 PCB Waste Generation

1. Project manager, supervisor or work lead and waste generator:

- a. Remove all free-flowing liquids from electrical equipment being taken out of service.
 - i. Drain or pump oil from transformers and other oil filled equipment into acceptable containers. NOTE: If draining is carried out by a contractor, the project manager or work supervisor must oversee the work.
 - ii. Notify the GA prior to completing the draining or at other times as needed for assistance.
 - iii. Add absorbents to the equipment carcass as directed by the GA
- b. Ensure that all capacitors (including non-PCB capacitors) are de-energized, terminals discharged, shorted and wired together; and certified as such.
 - i. Ensure certification documentation is available to provide to the GA, if needed.
- c. Label all PCB waste with a properly completed hazardous waste label and a PCB mark (see Attachment A).

Classification and Handling of PCB Waste

NOTE: PCB wastes classified as combined waste or PCB/radioactive wastes do not need to be labeled with a hazardous waste label as long as it is marked with the start date of accumulation; the chemical composition and physical state of the waste, and the name and address of the generator.

- d. If the PCB wastes being generated contains ≥ 50 ppm PCBs:
 - i. Mark the PCB waste or container with an out-of-service date.
 1. For a transformer or other electrical equipment the out-of-service date is the date the transformer is taken out of service permanently and placed into storage for disposal (e.g., following removal of free-flowing oils and after being de-energized, if needed).
 2. For oils, the out-of-service date is the date the oil was drained from a piece of equipment.
 3. For a FLB or capacitor, the out-of-service date is the date the FLB or capacitor was removed from the equipment or location where it was being used.
 - e. Mark the PCB waste item or container with the gross weight (preferably in kg).
 - f. Move the PCB waste into the previously identified SAA or WAA.

NOTE: Alternatives to container accumulation in an SAA or WAA for PCBs wastes (such as PCB remediation waste) that may be negotiated with regulatory agencies (e.g. a risk-based clean up and disposal alternative approved by EPA pursuant to 40 Code of Federal Regulations Section 761.62(c)) are not considered in this directive.

2. Waste Services Team (WST):

- a. Provide oversight and assistance during waste generating activities as needed to ensure PCB wastes are compliantly generated (including verification that electrical equipment is de-energized) and accumulated until off-site shipment.

5.3 PCB Waste Accumulation

1. Waste Generator, WAA Supervisor, SAA Owner:

- a. Segregate PCB waste from other type of wastes present.
- b. Place waste containers in secondary containment.
 - i. Ensure the containment volume is equal to at least two times the internal volume of the largest PCB Container or 25 percent of the total internal volume of all PCB Containers stored there, whichever is greater.
- c. Ensure the all PCB waste containers containing liquids ≥ 5 ppm or solids ≥ 50 ppm are marked with a PCB mark, a properly completed hazardous waste label and an out-of-service date.

NOTE: PCB waste classified as combined waste or PCB/radioactive wastes does not need to be labeled with a hazardous waste label as long as it is marked with the start date of accumulation; the chemical composition and physical state of the waste, and the name and address of the generator.

- d. Ensure the entrance to the accumulation area is marked with the PCB mark.

Classification and Handling of PCB Waste

- e. Ensure PCB waste containers are placed so labels are visible for inspection.
- f. Maintain SAAs, WAAs, MWSAAs as specified by the WST and as required by the Division responsible for the waste area.
- g. Requisition PCB waste in a timely manner to ensure that
 - i. PCB wastes with ≥ 50 ppm are removed from the SAA or WAA within 30 days of the out-of-service or accumulation start date.
 - ii. All other PCB wastes are removed from an SAA within 275 days of the accumulation start date and from a WAA within 60 days of the date they were moved into the WAA.

2. Waste Services Team:

- a. Provide oversight and assistance during waste generating activities as need to ensure PCB wastes are compliantly accumulated.
- b. Schedule and perform required accumulation area and quality assurance inspections.

5.4 PCB Waste Disposal

1. Waste Generator, WAA Supervisor, SAA Owner:

- a. Requisition PCB waste for disposal.
 - i. Use the Electronic Hazardous Waste Requisition System to initiate waste disposal.
 - ii. For PCB/radioactive or PCB Combined Waste, use the Radioactive/Mixed Waste Disposal Requisition Form.
 - iii. Ensure all PCB wastes with ≥ 50 ppm are removed from the SAA or WAA within 30 days of the out-of-service or accumulation start date.
 - iv. Ensure all PCB wastes are removed from an SAA within 275 days of the accumulation start date and from a WAA within 60 days of the date they were moved into the WAA.

2. Waste Services Team:

- a. Review and approve disposal requisition and supporting documentation.
 - i. Review and assign waste code, HWHF storage area, and other information as directed by EHS procedure 820 "Hazardous, Radioactive and Mixed Waste Acceptance Criteria: Characterization and Compliance."
- b. Arrange for direct shipment if waste is not going to the HWHF.
- c. Determine receiving facility for the PCB waste.
 - i. Ensure the facility is acceptable for use.
 - ii. Ensure a contracting mechanism is in place for use of the facility.
 - iii. Ensure a waste profile is prepared and approved for the waste.
- d. Prepare or ensure preparation of a Uniform Hazardous Waste Manifest (UHW) for direct shipments of non-RCRA hazardous and TSCA-regulated PCB wastes.
 - i. Record the waste weight in kilograms.
 - ii. For a PCB waste ≥ 50 ppm, include, as part of the additional description:
 - 1. The type of PCB (for example, "contains PCB ballasts")
 - 2. PCB concentrations ≥ 50 ppm.
 - 3. The out-of-service date.
- e. Ensure waste containers are securely closed in accordance with manufacturer's instructions.

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- f. As needed, perform container and transport vehicle marking, labeling, placarding and inspections for the PCB waste shipment.
- i. Mark the transport vehicle on each side and each end with a PCB mark when the shipment contains either
 - 1. 45 kg (99.4 lb) of liquid PCBs at concentrations ≥ 50 ppm
 - 2. One or more PCB transformers.
- g. If a receiving facility signed and completed UHWM is not received within 30 days of the shipping date, contact the facility (and transporter if necessary) to determine the status of the PCB waste shipment and the UHWM and request a copy of the signed UHWM.
- h. Prepare an exception report(s) for transmittal to the California Department of Toxic Substance Control (DTSC) and EPA (for PCB waste containing ≥ 50 ppm PCB) if a copy of the signed UHWM is not received within 35 days of the shipping date.

NOTE: The exception report must be submitted to DTSC/EPA, as appropriate no later than 45 days from the date the generator should have received the UHWM.

- i. Ensure for all PCB wastes containing ≥ 50 ppm PCBs that a certificate of disposal (CoD) is received from the receiving facility within 13 months of the out-of-service date.
- j. If a copy of the CoD is NOT received within 12 months of the out-of-service date, contact the receiving facility and request a copy of the CoD.
- k. If a CoD is NOT received within 13 months, OR if the CoD received indicates a disposal date of more than 12 months after the out-of-service date, prepare an exception report prepare and submit an exception report to the EPA.

NOTE: The exception report must be submitted to EPA no later than 45 days from the date the generator should have received the CoD.

NOTE: Steps 2.g through 2.i do not apply to PCB/radioactive waste which is exempt from the 1-year storage for disposal time limit pursuant to 40 CFR 761.65(a)(1).

6 SOURCE REQUIREMENTS AND REFERENCES

15 United States Code (USC), Chapter 53, 2601-2692, *Toxic Substances Control Act*

DOE Order 435.1 "*Radioactive Waste Management*"

40 CFR 761, Subpart D, *Polychlorinated Biphenyls*

49 CFR 171, 172 and 173 *Hazardous Materials Transportation*

California Code of Regulations Title 22, Division 4.5, *Environmental Health Standards for Management of Hazardous Waste*

California Health and Safety Code, Division 20, Chapter 6.5, *Hazardous Waste Control*

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Hazardous Waste Treatment and Storage Permit Application for the Lawrence Berkeley Laboratory Hazardous Waste Handling Facility (also known as the Part B Permit)

DTSC/DOE Combined Waste MOA, California Department of Toxic Substances Control and United States Department of Energy Governing the Regulation of Combined Waste at Department of Energy Facilities in California, May 25, 1999

LBNL ES&H Manual, Chapter 20, Waste Management

LBNL PUB-3092 "Generator Guidelines"

LBNL PUB-5352 "Waste Management Quality Assurance Plan"

LBNL EHS Procedure 820, "Hazardous, Radioactive and Mixed Waste Acceptance Criteria: Characterization and Compliance."

Waste Treatment, Recycling and Disposal Facilities Waste Acceptance Criteria

U.S. Department of Energy, DOE, TSCA Information Brief EH-231-056/1294, December 1994, "Disposal Requirements for PCB Waste."

DOE, Guidance Booklet DOE/EH-413-9914, November 1999, "Storage and Disposal of Polychlorinated Biphenyl (PCB) Waste."

Environmental Protection Agency (EPA) PCB Q and A Manual, June 2014

7 RECORDS

7.1 Records Created

- Documentation related to PCB waste characterization including process knowledge and sampling and analysis information and data.
- Uniform Hazardous Waste Manifests
- Land Disposal Restriction Certifications
- Off-site receiving facilities profile shipping documentation and correspondence.
- Plans, procedures and regulatory correspondence related to PCB cleanup activities.
- QA sampling and analysis data performed for PCB wastes
- PCB waste and accumulation area inspection checklists and documentation of deficiency identification and corrects.
- Documentation of any agency communication and directives.

7.2 Who Retains Records

The Division of facility generating PCB waste is responsible for retaining and maintenance of all records related to

- PCB waste characterization involving process knowledge
- Plans, procedures and regulatory correspondence related to PCB cleanup activities
- Storage of PCB wastes in an SAA or WAA, including any waste accumulation logs and spill cleanup logs.

Classification and Handling of PCB Waste

The WST is responsible for retaining and maintaining all records related to

- Waste Management Group sampling and analysis of PCB wastes.
- Waste Management Group off-site disposal and shipment of PCB wastes.
- Waste Management Group generated inspection and quality assurance records related to PCB waste storage and characterization.

7.3 Records Care and Maintenance

The WST is responsible for caring for, maintaining, and archiving of Waste Management Group generated PCB waste records. The generating Division or facility is responsible for PCB waste records generated by the Division or facility.

Records related to PCB waste must be retained and available for inspection for a minimum of three years following off-site disposition of a PCB waste. Waste Management Group generated records are retained for three years in accordance with the Waste Management Quality Assurance Plan” (PUB-5352), before being sent to the LBNL Archives and Records Office.

8 REVISION LOG

Date, Revision #	Brief Description of Revision / Changes	Pg. #, Sec. #, Parag.
August 7, 2015 Revision 00	New document.	All

9 ATTACHMENTS

Attachment A, Examples of a PCB Mark and Hazardous Waste Label

Attachment B, PCB trade names

Attachment C, Photos - transformers, name plate

Attachment D, Photos - capacitors, name plate

Attachment E, Photos - fluorescent light ballasts

Attachment F, Photos - other PCB equipment

Classification and Handling of PCB Waste

Attachment A, Examples of a PCB Mark and Hazardous Waste Label



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Attachment B, PCB trade names

PCB Trade Names

Aceclor	Dicolor	PCB
Adkarel	Diconal	PCB's
ALC	Diphenyl, chlorinated	PCBs
Apirolio	DK	Pheaoclor
Apirorio	Duconal	Phenochlor
Arochlor	Dykanol	Phenoclor
Arochlors	Educarel	Plastivar
Aroclor	EEC-18	Polychlorinated biphenyl
Aroclors	Elaol	Polychlorinated biphenyls
Arubren	Electrophenyl	Polychlorinated diphenyl
Asbestol	Elemex	Polychlorinated diphenyls
ASK	Elinol	Polychlorobiphenyl
Askael	Eucarel	Polychlorodiphenyl
Askarel	Fenchlor	Prodelec
Auxol	Fenclor	Pydraul
Bakola	Fenocloro	Pyraclor
Biphenyl, chlorinated	Gilotherm	Pyralene
Chlophen	Hydol	Pyranol
Chloretol	Hyrol	Pyroclor
Chlorextol	Hyvol	Pyronol
Chlorinated biphenyl	Inclor	Saf-T-Kuhl
Chlorinated diphenyl	Inerteen	Saf-T-Kohl
Chlorinol	Inertenn	Santosol
Chlorobiphenyl	Kanechlor	Santotherm
Chlorodiphenyl	Kaneclor	Santotherm
Chlorphen	Kennechlor	Santovac
Chorextol	Kenneclor	Solvol
Chorinol	Leromoll	Sorol
Clophen	Magvar	Soval
Clophenharz	MCS 1489	Sovol
Cloresil	Montar	Sovtol
Clorinal	Nepolin	Terphenychlore
Clorphen	No-Flamol	Therminol
Decachlorodiphenyl	NoFlamol	Therminol
Delor	Non-Flamol	Turbinol
Delorene	Olex-sf-d	
Diaclor	Orophene	

Any of the above names shown on equipment labels may indicate PCB content. Misspelled trades names are included.

<http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/aroclor.htm#tradenames>

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Attachment C, Photos - transformers, name plate

Photo 1 - Transformers



Photo 2 -



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Classification and Handling of PCB Waste

Attachment D Photos - capacitors, name plate

Photo 1 - large capacitor name plate

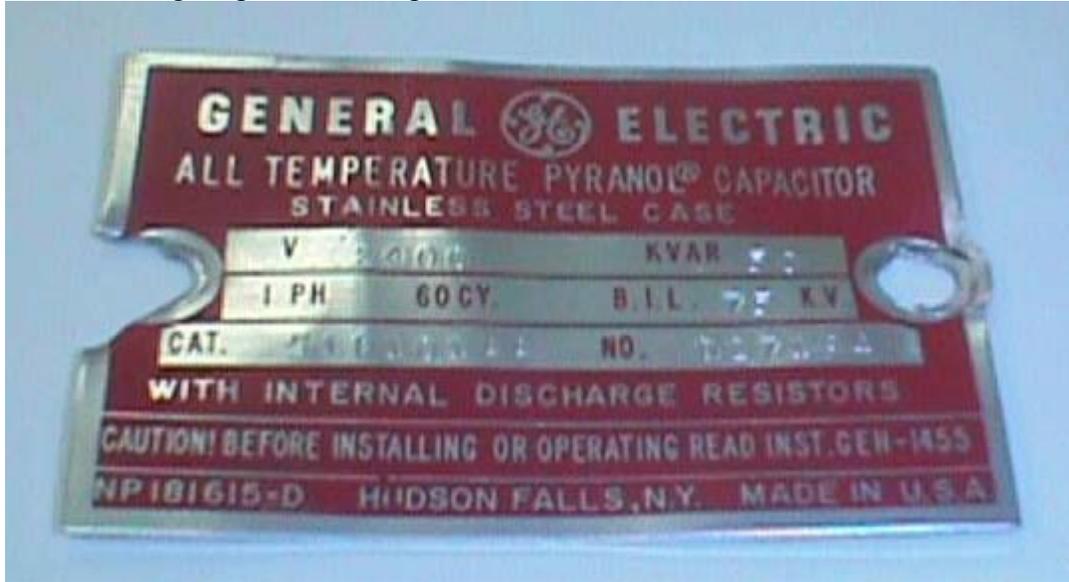
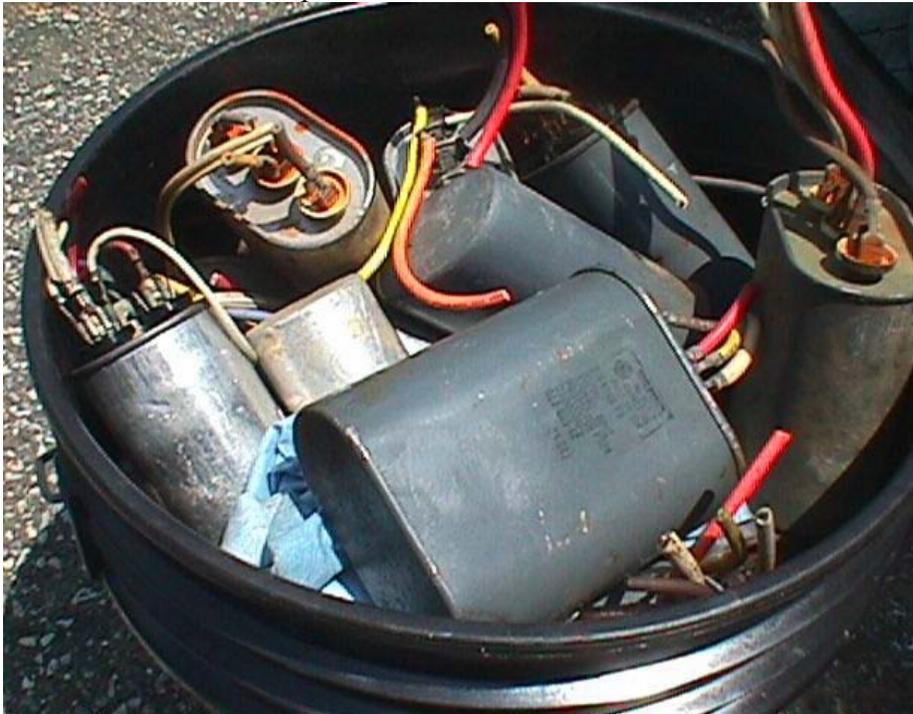


Photo 2 - PCB small capacitors



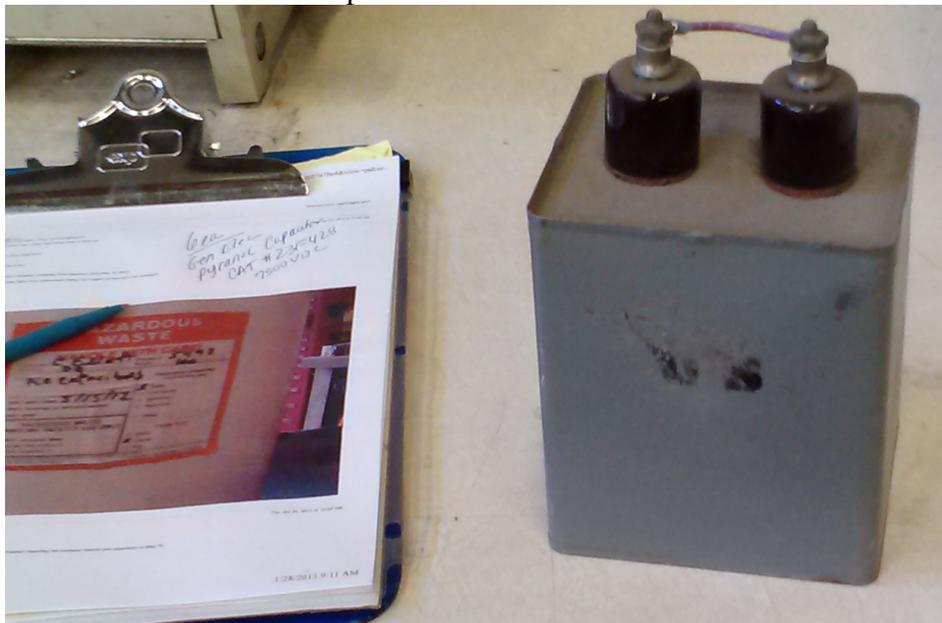
Note: The official version of this document is on the Waste Management Web page. Printed copies are not official versions of the document. Before using the printed copy, verify that it is the most current version.

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Photo 3 - miscellaneous capacitors



Photo 4 - miscellaneous capacitor



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Photo 5 - Small capacitor in equipment



Photo 6 - capacitor name plate



Note: The official version of this document is on the Waste Management Web page. Printed copies are not official versions of the document. Before using the printed copy, verify that it is the most current version.

Classification and Handling of PCB Waste

Attachment E, Photos - fluorescent light ballasts

Photo 1 - fluorescent light ballasts



Photo 2 - fluorescent light ballasts



Classification and Handling of PCB Waste

Attachment F, Photos -other PCB equipment

Photo 1 – power supply equipment

