

Toxic Substances

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Toxic Substances

Notice

This guidebook is intended to aid regulated entities in developing programs at individual facilities to evaluate their compliance with environmental requirements under federal law. The statements in this book are intended solely as guidance. While the American Water Works Association (AWWA) has made every effort to ensure the accuracy of the statements herein, the regulated entity's legal obligations are determined by the terms of its applicable environmental facility-specific permits, underlying statutes, and applicable state and local laws. Nothing in this book alters any statutory, regulatory, or permit requirements. In the event of a conflict between federal, state, or local regulations, the most stringent prevails. AWWA may decide to revise this book without notice to reflect changes in USEPA's regulations or to clarify and update the text.

7.1 Introduction

Purpose

Chapter 7 is dedicated to the management of toxic substances, as governed by the Toxic Substances Control Act (TSCA). The Toxic Substances Control Act of 1976 provides USEPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics, and pesticides. TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint.

This chapter will focus on the applicable requirements under Section 18, Toxic Substances Control Act as further described in Section 7.2 and will discuss requirements for polychlorinated biphenyl compounds (40 CFR 761), asbestos (40 CFR 763), and lead-based paint (40 CFR 745), which are substances most commonly encountered by drinking water and wastewater utilities. Note that the management and disposal of asbestos-containing material is outside the scope of this guidebook.

Applicability

This section summarizes the potential applicability of this chapter as it relates to drinking water and wastewater utilities.

Does the facility have equipment or fluids on-site that contain PCBs?

Does the facility have floor tiles, caulk, pipe insulation, or other construction materials that contain asbestos?

Does the facility have equipment, tanks, or pipes that are coated with lead-based paint?

Activity	Waste Stream(s)	Characteristic
Insulating pipe	-Pipe wrap	-Asbestos
Painting/paint stripping	-Paint waste/chips	-Lead-based paint
Transformers or capacitor maintenance	-Dielectric fluid	-Polychlorinated biphenyls

Common Regulatory Findings

Table 7.1 identifies some common regulatory findings as well as examples that are often associated with the operations of drinking water and wastewater utilities. This chapter will provide the knowledge and direction on how to manage a compliant toxic substances program and assist in avoiding these common pitfalls.

Table 7-1. Common Regulatory Findings and Examples

Common Finding	Example
Failure by the facility to ensure PCB waste is disposed within one year	The waste is picked up by the TSDF hauler on the one-year anniversary of the waste becoming a waste
Failure of the facility to register with the USEPA as a generator of PCB waste	Maintenance purchased three used light fixtures and installed them without notifying the person responsible for environmental compliance that they contained or potentially contained PCBs
Failure by the facility to register transformers owned by the facility	Many facilities assume that all transformers are owned and maintained by the local utility company
Fluorescent light ballasts are not properly disposed	Ballasts are placed in general trash or are disposed in roll-offs containing demolition debris
Waste oil with detectable concentrations of PCB is used as a dust suppressant	A facility's oil that contains solvent is applied on the drive between buildings to suppress the dust from vehicular traffic
Failure to ensure that a trained asbestos representative is on-site during asbestos demolition or renovation	General contractor is hired for a demolition without an asbestos survey being completed and suspected asbestos-containing material (ACM) being verified
Failure by the facility to control discharges of visual asbestos emissions to outside air	Asbestos removed has not been adequately wetted or is not sufficiently covered
Failure by the facility to properly dispose of painted items that have lead-based paint	Disposal of construction, renovation, or demolition solid wastes that contain articles with lead-based paint

Note: PCB = Polychlorinated biphenyl; TSDF = treatment, storage, or disposal facility

7.2 Regulatory Authorities

Federal Legislation

The Toxic Substances Control Act (TSCA) is the federal legislation that addresses the control of toxic substances. TSCA was developed to ensure the following:

- Adequate data should be developed with respect to the effect of chemical substances and mixtures on health and the environment, and the development of such data should be the responsibility of those who manufacture and those who process such chemical substances and mixtures.
- Adequate authority should exist to regulate chemical substances and mixtures that present an unreasonable risk of injury to health or the environment and to take action regarding chemical substances and mixtures.
- Authority over chemical substances and mixtures should be exercised in such a manner as not to impede unduly or create unnecessary economic barriers to technological innovation while fulfilling the primary purpose of this act to ensure that such innovation and commerce in such chemical substances and mixtures do not present an unreasonable risk of injury to health or the environment.

State and Local Government

Under most circumstances, Section 18 of TSCA allows states and smaller governmental entities to establish or enforce their own regulations governing chemical substances, mixtures, or articles containing a chemical substance or mixture. However, TSCA is different from other federal statutes and programs (e.g., the Resource Conservation and Recovery Act [RCRA]) where states are authorized by USEPA to operate a regulatory program in lieu of the federal program after the state demonstrates equivalence. These differences between individual state regulations and the federal program require that a utility check the status of the state's authorization and determine whether additional regulations apply, as well as any local ordinances.

For example, the TSCA PCB program is not delegated to the states. In accordance with Section 18 of TSCA, states may develop their own PCB regulations providing they are consistent with the Section 18 preemption provisions. In some cases, state regulations have been developed that regulate PCBs more stringently than the federal program. State PCB regulations may provide additional regulatory requirements beyond those in the federal program to address a specific concern or activity sensitive in that state.

Many state and local governments have enacted standards more stringent than the federal requirements concerning certification of asbestos workers and disposal of asbestos waste. Similarly, states and local authorities may also impose more stringent requirements for the use and removal of lead-based paint. These differences between individual state regulations and the federal program require that a utility check the status of the state's authorization and determine whether additional regulations apply, as well as any local ordinances.

Did You Know?

As a best management practice, agencies should have up-to-date inventories of toxic substances and review/revise/update them at least annually.

7.3 Essential Program Elements

For the purposes of this chapter, the essential program elements consist of understanding the PCB, asbestos, and/or lead-based paint components or fixtures located within the utility. A best management practice (BMP) is to conduct a survey to identify the locations of the aforementioned and to update the surveys, at least annually. The Occupational Safety and Health Administration (OSHA) has some requirements for the identification and management of toxic substances; however, that discussion is not within the scope of this guidebook. The following sections detail specific and pertinent information as related to PCBs, asbestos, and lead-based paint.

7.4 Polychlorinated Biphenyl Compounds

Polychlorinated biphenyl (PCB) compounds are a class of synthetic organic chemical known as chlorinated hydrocarbons. PCBs were manufactured in the United States from 1929 until 1979 when their manufacture was banned. They are considered toxic and vary in consistency from thin, light-colored liquids to waxy yellow or black solids. Because of their chemical characteristics and insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments and dyes; and in many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before their manufacture was banned in 1979. Products that may contain PCBs include

Did You Know?

If the product/equipment does not state NO PCBs, you must assume it contains PCBs.

- Transformers
- Oils
- Heat transfer fluids
- Paints or coatings
- Slurries
- Dredge spoils
- Dielectric fluid
- Voltage regulators
- Switches
- Fluorescent light ballasts
- Plastics
- Capacitors
- Waste oils
- Hydraulic fluids
- Sludges
- Sediments
- Soils
- Solvents
- Electromagnets
- Cable insulation
- Caulking

Materials containing PCBs that are generated during the cleanup of a spill—and any by-product, intermediate, or impurity manufactured at any point in a process—may also contain PCBs. Requirements listed in 40 CFR 761 apply to all persons who manufacture, process, distribute in commerce, use, or dispose of PCBs or PCB items.

In the United States, PCBs or PCB items, regardless of concentration, must be used in a totally enclosed manner, unless

- The PCBs or PCB items consist of excluded PCB products
- PCBs or PCB items are used that have resulted from an excluded manufacturing process
- The PCBs or PCB items use recycled PCBs
- The PCB items have surfaces that have been in contact with excluded PCB products
- The PCBs or PCB items are a sewage sludge where the uses are regulated at 40 CFR 257, 258, and 503

Excluded PCB products are products that contain less than 50 ppm PCBs.

Concentration Determination for Items in Use

PCB concentrations of items in use must be established one of the following ways:

- By testing the equipment
- From a permanent label, mark, or other documentation from the manufacturer of the equipment indicating its PCB concentration at the time of manufacture
- By service records or other documentation indicating the PCB concentration of all fluids used in servicing the equipment since it was first manufactured

Table 7-2 gives the PCB concentration assumptions that may be used while an item or article is in use. The concentration assumptions do not apply for disposal. At the time of disposal, the item or article must either be tested to determine the actual PCB concentration, or the worst-case scenario of greater than or equal to 500 ppm may be assumed to ensure that the item or article is properly disposed.

Did You Know?

The utility can only assume PCB concentrations when an item is in use—the actual concentration must be determined prior to disposal.

Table 7-2. PCB Concentration Assumptions While Item Is in Use

Item/Article	Condition	Assumption	Standard From 40 CFR
Transformers	<3 lb of fluid	50 ppm	761.2(a)(1)
	Manufactured before 07/02/1979	≥500 ppm	761.2(a)(3)
Circuit breakers	<3 lb of fluid	<50 ppm	761.2(a)(1)
Reclosers	<3 lb of fluid	<50 ppm	761.2(a)(1)
Oil-filled cable	<3 lb of fluid	<50 ppm	761.2(a)(1)
Rectifiers	<3 lb of fluid	<50 ppm	761.2(a)(1)
Mineral oil-filled electrical equipment (includes all pole-top and pad-mounted)	Manufactured before 07/02/1979	≥50 ppm but <500 ppm	761.2(a)(2)
	Manufactured after 07/02/1979	<50 ppm	761.2(a)(2)
	Manufacturing date unknown	≥50 ppm but <500 ppm	761.2(a)(2)
Capacitors	Manufactured before 07/02/1979	≥500 ppm	761.2(a)(4)
	Manufactured after 07/02/1979	<500 ppm	761.2(a)(4)
	Manufacturing date unknown	≥500 ppm	761.2(a)(4)

Compliance Checklist for Concentration Determination for Items in Use

	Was the facility constructed or equipment for the facility purchased before 1979?
	Has the concentration been determined or estimated for all PCB items in use at the facility?

Storage Room and Equipment Marking

Storage rooms and certain equipment that contain PCBs must be labeled with a PCB marking.¹ All markings should be placed in a position on the exterior of the PCB items, storage units, or transport vehicles so that they may be easily read by any person inspecting or servicing those items.

The marking format is Large PCB Mark (ML) letters and striping, on a white or yellow background, sufficiently durable to equal or exceed the life of the PCB article. The ML marking should be a square label from 5.08 cm (2 in.) to 15.24 cm (6 in.) on each side. The largest size that will fit on the item should be used. If the article is too small to accommodate this size, a Small PCB Mark (Ms) label may be used. The Ms marking should be rectangular in shape and be 1.016 cm (0.4 in.) by 2.032 cm (0.8 in.) to 2.54 cm (1 in.) by 5.08 cm (2 in.) in size.

The following equipment must be labeled with an ML marking:

- PCB containers (50 ppm to 500 ppm)
- PCB transformers (500 ppm or greater)
- PCB large high-voltage capacitors
- Equipment containing a PCB transformer (500 ppm or greater)
- Equipment containing a PCB large high-voltage capacitor
- PCB large low-voltage capacitors
- Electric motors using PCB coolants (50 ppm to 500 ppm)
- Hydraulic systems using PCB hydraulic fluid (50 ppm to 500 ppm)
- Heat transfer systems (50 ppm to 500 ppm)
- PCB article containers containing any of the above
- Each storage area used to store PCBs and PCB items for disposal
- Transport vehicles loaded with PCB containers that contain >45 kg (99.4 lb) of liquid PCBs (greater than or equal to 50 ppm) or with one or more PCB transformers (>500 ppm)
- Vault doors, machinery room doors, fences, hallways, or other access, except a manhole or grate cover, to a PCB transformer (500 ppm or greater)
- Voltage regulators that contain 1.36 kg (3 lb) or more of dielectric fluid (greater than or equal to 500 ppm—individually)
- Vault doors, machinery room doors, fences, hallways, or other access, except grates or manhole covers, to voltage regulators that contain 1.36 kg (3 lb) or more of dielectric fluid (greater than or equal to 500 ppm).

If one or more PCB large high-voltage capacitors is installed in a protected location such as a pole, structure, or behind a fence, then the pole, structure, or fence may be marked and a record or procedure identifying the PCB capacitor should be maintained.

¹ 40 CFR 761.40 and 40 CFR 761.45

All PCB large low-voltage capacitors must be marked individually. Inaccessible capacitors may be marked on the outside of the equipment instead of on each individual capacitor. If a capacitor is located in a protected location such as on a power pole, in a structure, or behind a fence, then the pole, fence, or structure may be marked.

All PCB equipment containing a PCB small capacitor should be marked at the time of manufacture with the statement “This equipment contains PCB capacitor(s).”

Marking of PCB-contaminated electrical equipment (50 to 500 ppm) is not required.

Compliance Checklist for Storage Room and Equipment Marking

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Have ML or Ms markings been used on storage rooms and required equipment? |
| <input type="checkbox"/> | Are the markings easy to read and easily located on the item? |
| <input type="checkbox"/> | Do the markings incorporate the correct colors, size, and wording? |

Record Keeping

USEPA Identification Number

Generators, commercial storage facilities, transporters, and disposers of PCB waste are required to have a USEPA identification (ID) number (40 CFR 761.202). Some facilities are exempt from the notification requirement if they do not have a specified PCB storage area as regulated by 40 CFR 761.65 and temporarily store the waste (less than 30 days) before they transport for disposal.

Compliance Checklist for USEPA ID Number

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Has the facility completed the USEPA Form 7710-53 to obtain a USEPA ID number? |
|--------------------------|--|

Annual PCB Document Log and Records

A written annual document log² must be prepared by July 1 of each calendar year, covering the previous year, when any of the following are stored at any time:

- 45 kg (99.4 lb) or more of PCBs contained in PCB containers
- One or more PCB transformers (500 ppm or greater)
- 50 or more PCB large high- or low-voltage capacitors

The annual document log, manifests, records of inspections and cleanups, and certificates of disposal (CODs) must be kept for at least three years after PCBs and PCB items are no longer used or stored in the listed quantities. The written annual document log and report must include the requirements under 40 CFR 761.180.

² 40 CFR 761.180(a)(2)

Compliance Checklist for Annual PCB Document Log and Records

<input type="checkbox"/>	Has the facility included all of the necessary information, as discussed in this section, to ensure that the annual PCB document log and report are accurate and complete?
<input type="checkbox"/>	Has the facility retained all required records, including manifests, CODs, and inspection documentation?
<input type="checkbox"/>	Has the facility prepared and submitted an annual report to the USEPA by July 15th of each year?
<input type="checkbox"/>	Are copies of all documentation readily available in the event of a USEPA inspection or request for records?

PCB Transformers**Registration**

All PCB transformers, including those in storage for reuse, must be registered³ with the USEPA with the following information:

- Name and address
- Contact name and telephone number
- Address where transformers are located; for mobile sources such as a ship, provide the name of the ship
- Number of PCB transformers and total weight in kilograms of PCBs contained in the transformers
- Whether any transformers at the location contain flammable dielectric fluid (optional)
- Signature of the owner, operator, or other authorized representative certifying the accuracy of the information submitted

Records for each registration (i.e., a copy of the registration and the return receipt signed by USEPA) must be retained with the required inspection records.

Compliance Checklist for PCB Transformers: Registration

<input type="checkbox"/>	Has the facility registered all PCB transformers located at its facility?
<input type="checkbox"/>	Has the facility retained adequate records of the registration?

Did You Know?

Transformers that contain greater than 500 ppm of PCBs must be inspected at least once every three months.

Inspections

Inspections must be performed once every three months for all in-use or stored-for-reuse PCB transformers with PCB concentration greater than 500 ppm.⁴ These inspections may take place any time during the three-month periods January–March, April–June, July–September, and October–December as long as there is a minimum of 30 days between inspections. The visual inspection must include investigation for any leak of dielectric fluid on or around the transformer. The extent of the visual inspections will depend on the physical constraints of each transformer installation and should not require an electrical shutdown of the transformer being inspected.

³ 40 CFR 761.30(a)(1)(i)

⁴ 40 CFR 761.30(a)(1)

The following information should be recorded for each PCB transformer inspection:

- Location of transformer
- Dates of each visual inspection
- Date when any leak was discovered
- Name of person conducting inspection
- Location and estimate of the dielectric fluid quantity for any leaks
- Date and description of any cleanup, containment, or repair performed
- Results of any containment daily inspections for transformers with uncorrected active leaks
- Registration of the PCB transformer
- Records of transfer of ownership

Did You Know?

Inspections of oil-containing transformers are required as part of a facility's SPCC plan (see Chapter 3) regardless of whether they contain PCBs.

Compliance Checklist for PCB Transformers: Inspections

- | | |
|--|--|
| | Has the facility conducted inspections once every three months of all in-use or stored-for-reuse PCB transformers? |
| | Has the facility retained adequate records of the inspections? |

Leakage

PCB transformers with PCB concentrations of 500 ppm or greater found to be leaking during an inspection must be repaired or replaced to eliminate the source of the leak.⁵ Cleanup and/or containment of released PCBs must be initiated within 48 hours of the detection of the release or as soon as possible. Leaking PCB transformers must be inspected daily, and the material generated during the cleanup must be disposed of according to appropriate requirements.

Did You Know?

Combustible materials, such as paints, solvents, plastic, and paper, must not be stored within 16 feet of a PCB transformer.

Compliance Checklist for PCB Transformers: Leakage

- | | |
|--|--|
| | Does the facility have transformers that were leaking? |
| | Has the facility taken actions to repair or replace the transformer to eliminate the source of the leak? |
| | Has the leaking transformer been inspected daily? |
| | Has the material that was generated during the cleanup been disposed of appropriately? |

Servicing

Transformers classified as PCB-contaminated electrical equipment must be serviced (including rebuilding) only with dielectric fluid containing less than 500 ppm PCBs.⁶ PCB transformers may be serviced (including topping off) with dielectric fluid at any PCB concentration. Servicing may not be performed if it requires the removal of the transformer coil from the transformer casing.

PCBs removed during any servicing activity must be captured and either reused as dielectric fluid or disposed of in accordance with the requirements

⁵ 40 CFR 761.30(a)(1)(x)
⁶ 40 CFR 761.30(a)(1)(xv)

Did You Know?

If the facility does not own the transformers, it should contact the owner to ensure proper regulations are being followed.

of 40 CFR 761.60. PCBs from PCB transformers must not be mixed with or added to dielectric fluid from PCB-contaminated electrical equipment.

Any dielectric fluid containing 50 ppm or greater PCB used for servicing transformers must be stored in accordance with 40 CFR 761.65 requirements regarding storage for disposal.

Compliance Checklist for PCB Transformers: Servicing

<input type="checkbox"/>	Does the facility have transformers that are classified as PCB-contaminated electrical equipment?
<input type="checkbox"/>	Are the transformers that are classified as PCB-contaminated electrical equipment serviced with dielectric fluid containing less than 500 ppm PCBs?
<input type="checkbox"/>	Does the facility service transformers by removing the transformer coil from the casing?
<input type="checkbox"/>	Are the PCBs that are removed during servicing captured and reused or disposed of as required?

Fire and Other Incidents

If any PCB transformers are involved in any incident where sufficient heat and/or pressure is generated to result in the violent or nonviolent rupture of a PCB transformer and the release of PCBs, the National Response Center (NRC) must be notified immediately.⁷ The following measures must be taken:

- Blocking of the floor drains
- Containing water runoff
- Controlling and treating (prior to releasing) any water used in subsequent cleanup operations

Combustible materials, including but not limited to paints, solvents, plastics, paper, and sawn wood, must not be stored within 5 m (16.4 ft) of a PCB transformer.

Compliance Checklist for PCB Transformers: Fire and Other Incidents

<input type="checkbox"/>	Has the facility experienced a PCB transformer rupture due to heat or pressure that was generated due to a fire or other incident?
<input type="checkbox"/>	Did the facility take appropriate measures to prevent the release of PCBs?
<input type="checkbox"/>	Does the facility ensure that combustible materials are not stored within 5 m (16.4 ft) of a PCB transformer?

Storage for Disposal

PCB transformers removed from service can be temporarily stored up to 30 days on pallets as long as they are not leaking. If the disposal requires storage of a PCB transformer for longer than 30 days, the transformer must be stored for disposal⁸ in an area that meets the following requirements:

- The roof and walls of the building in which the PCBs are stored are constructed so as to exclude rainfall from contacting PCBs and PCB items.

⁷ 40 CFR 761.30(a)(1)(xi)

⁸ 40 CFR 761.65

- The floor is adequate and has continuous curbing with a curb at least 21.24 cm (6 in.) high. The curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container or 25 percent of the total internal volume of all PCB articles or PCB containers stored there, whichever is greater.
- The area must not have drains, valves, floor drains, expansion joints, sewer lines, or other openings that would allow liquids to flow from the curbed area.
- The floors and curbing are constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface that prevents or minimizes penetration of the PCBs.
- The location is not below a 100-year flood water elevation.
- The storage area is marked with the ML label.

PCB waste must be removed from storage and disposed of within one year from the date it was determined to be PCB waste and the decision was made to dispose of it.

Compliance Checklist for PCB Transformers: Storage for Disposal

<input type="checkbox"/>	Does the facility have transformers that will be disposed?
<input type="checkbox"/>	Has the facility determined if the transformers will be in storage for longer than 30 days?
<input type="checkbox"/>	Does the facility have an area to store the transformers that conforms to the requirements for the storage of PCBs?
<input type="checkbox"/>	Has the facility offered the transformers for disposal and received the COD within one year after removing them from service?

Disposal

PCB transformers with PCB concentrations of 500 ppm or greater must be decontaminated or disposed.⁹ Transformers should be disposed of in either a USEPA-approved incinerator or a chemical waste landfill. If a chemical waste landfill will be used for disposal, the transformer must be drained of all free-flowing liquids, filled with solvent, allowed to stand for at least 18 hours, and then drained thoroughly.

Compliance Checklist for PCB Transformers: Disposal

<input type="checkbox"/>	Does the facility have transformers that will be disposed?
<input type="checkbox"/>	Has the facility determined whether the transformers will be disposed of in an incinerator or a chemical waste landfill?
<input type="checkbox"/>	If the transformer will be sent to a chemical waste landfill, has the transformer been drained, filled with solvent for 18 hours, and drained again to ensure that PCBs have been adequately removed?

⁹ 40 CFR 761.60(b)(1)

Did You Know?

No routine inspections are required for in-use capacitors, but it is recommended they be inspected at least once per year as a best management practice.

Capacitors

Capacitors may contain PCBs at any concentration.¹⁰ All PCB large high- and low-voltage capacitors must be in use only in restricted-access electrical substations or in contained and restricted-access indoor areas. Large capacitors that are not located in restricted areas are prohibited. All capacitors must be free from leaks of dielectric PCBs.

Inspections

No routine inspection requirements apply to capacitors unless they are stored for disposal, but it is recommended that capacitors be inspected at least annually as a best management practice (BMP).

Compliance Checklist for Capacitors: Inspections

N/A	No routine inspection requirements apply to capacitors.
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Sampling

Most capacitors cannot be sampled for analysis of PCB concentration. In most cases, the presence of PCBs can be determined directly from information on the capacitor or from the manufacturer. All capacitors are assumed to contain PCBs unless the label or nameplate information, manufacturer's literature, or chemical analysis states that the capacitor does not contain PCBs.

Compliance Checklist for Capacitors: Sampling

	Does the facility have capacitors that will be disposed?
	Has the facility determined the PCB concentration of the capacitors from the associated paperwork (such as the literature supplied by the manufacturer) or by assuming the worst-case scenario of greater than or equal to 500 ppm?

Storage

Capacitors in storage must be placed in containers approved by the Department of Transportation (DOT) with absorbent material. These capacitors should be stored in designated storage areas.¹¹ See Storage for Disposal in this chapter for further information.

Nonleaking and structurally undamaged PCB large high-voltage capacitors that have not been drained of free-flowing dielectric fluid may be stored on pallets next to a storage area that complies with the storage area requirements.

The unfilled storage space in the storage area must be equal to at least 10 percent of the volume of capacitors and electrical equipment stored outside.

¹⁰ 40 CFR 761.30(l)

¹¹ 40 CFR 761.65(c)(2)

The capacitors stored on pallets outside the storage facility must be inspected at least weekly.

Compliance Checklist for Capacitors: Storage

<input type="checkbox"/>	Are the capacitors that are placed in storage contained in DOT-approved containers with absorbent material?
<input type="checkbox"/>	Are nonleaking and undamaged PCB large high-voltage capacitors stored on pallets?
<input type="checkbox"/>	Is the unfilled storage space in the storage area equal to at least 10 percent of the volume of the PCB items stored outside?
<input type="checkbox"/>	Are the capacitors stored on pallets outside the storage facility inspected weekly?

Disposal

Disposal of PCB capacitors¹² is required as follows:

- PCB small capacitors (less than 1.36 kg [3 lb] of PCBs) may be disposed of in a solid waste landfill.
- PCB large high- or low-voltage capacitors (greater than 1.36 kg [3 lb] of PCBs) containing a concentration of more than 500 ppm must be incinerated in a USEPA-approved incinerator.
- PCB large high- or low-voltage capacitors may be disposed of in a chemical waste landfill upon approval of the USEPA.
- PCB large high- or low-voltage capacitors having concentrations between 50 ppm and 500 ppm must be disposed of in an approved disposal facility.

Compliance Checklist for Capacitors: Disposal

<input type="checkbox"/>	Are capacitors offered for adequate disposal as required?
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PCB Articles

PCB articles not otherwise addressed in this chapter must also be decontaminated or disposed of properly. PCB articles with concentrations greater than or equal to 500 ppm may be disposed of in either a USEPA-approved incinerator or a chemical waste landfill as long as all free-flowing liquids have been removed. PCB articles with concentrations between 50 and 500 ppm must also be drained of all free-flowing liquids before disposal. All free-flowing liquid must be disposed of as required under 40 CFR 761.60(a).

PCB-contaminated articles (PCB concentration less than 50 ppm) with no free-flowing liquids may be disposed of by one of the following methods:

- In accordance with 40 CFR 761.79
- In a facility that is permitted, licensed, or registered to manage municipal solid waste or nonmunicipal, nonhazardous waste (excluding thermal treatment units)
- In a scrap metal recovery oven or smelter operating in compliance with 40 CFR 761.72
- In an approved disposal facility

¹² 40 CFR 761.60(b)(2)

Compliance Checklist for PCB Articles

- Are PCB articles drained of all free-flowing liquids before they are offered for disposal?
- Are all free-flowing liquids disposed of as required under 40 CFR 761.60(a)?
- Are PCB-contaminated articles disposed of by one of the methods listed in this section?

Fluorescent Light Ballasts

Light ballasts are the primary electric components of fluorescent light fixtures. Fluorescent light fixtures that were manufactured before 1978 contain PCBs. The PCBs are located in the light ballast’s small capacitor or in the potting (insulating) material inside the ballast. The ballast is typically located inside the fixture under a metal cover plate.

In the years following 1978, USEPA required manufacturers of fluorescent light ballasts to mark ballasts that did not contain PCBs with the statement “No PCBs.” After July 1998, fluorescent light ballast manufacturers were no longer required to mark fluorescent light ballasts with the statement “No PCBs”; however, many manufacturers incorporate the manufacturing year into the serial number located on the ballast. If the date of manufacture is not known or cannot be determined, it must be assumed that the ballasts contain PCB small capacitors and must be disposed of as PCB waste.

The USEPA allows continued use of nonleaking PCB and PCB-contaminated fluorescent light ballasts. When these ballasts are taken out of service, they must be disposed of properly¹³ and must not be sold to subsequent users. Table 7-3 lists the disposal requirements for fluorescent light ballasts.

Compliance Checklist for Fluorescent Light Ballasts

- Was the facility constructed before 1978?
- Does the facility have light fixtures that do not have a “No PCBs” label?
- Does the light fixture have a serial number that can be used to determine the manufacture date of the ballast?

Figure 7-1. Disposal Requirements for Fluorescent Light Ballasts

PCB Capacitor	PCB Potting Material	Labeling, Transportation, and Manifesting Disposal	Disposal Reference (40 CFR 761. ____)	Disposal Options
“No PCBs” label		Not regulated under TSCA	N/A	Not regulated under TSCA
None	<50 ppm	Not regulated under TSCA	N/A	Not regulated under TSCA

(continued)

¹³ Requirements for fluorescent light ballasts are listed in 40 CFR 761.60(b)(2)(ii) for ballasts containing PCBs only in an intact and nonleaking PCB small capacitor and in 40 CFR 761.62 for ballasts containing PCBs in the potting material.

Figure 7-1. Disposal Requirements for Fluorescent Light Ballasts (continued)

PCB Capacitor	PCB Potting Material	Labeling, Transportation, and Manifesting Disposal	Disposal Reference (40 CFR 761. ____)	Disposal Options
Intact and nonleaking or none	≥50 ppm	Is a PCB bulk product waste? No labeling is required. Manifesting is required for disposal in accordance with 40 CFR 761.62(a); is not required under 40 CFR 761.62(b); may be required under 40 CFR 761.62(c).	.50(b)(2)(ii) .62(a)-(c)	TSCA incinerator, TSCA/RCRA landfill, alternate destruction method, decontamination (40 CFR 761.65(d) [storage approval may be required]), coordinated approval, state-approved landfill (leach test required), risk-based approval.
Intact and nonleaking	<50 ppm	No labeling or manifesting required	.50(b)(2)(i) .60(b)(2)(ii)	As municipal solid waste, 40 CFR 761 Subpart D options
Leaking	<50 ppm or ≥50 ppm	Disposal as PCB bulk product waste. No labeling is required. Manifesting is required for disposal in accordance with 40 CFR 761.62(a); may be required under 40 CFR 761.62(c).	.62(a) or (c)	TSCA incinerator, TSCA/RCRA landfill, alternate destruction method, decontamination (40 CFR 761.65(d) [storage approval may be required]), coordinated approval, risk-based approval.

Note: N/A = not applicable; PCB = polychlorinated biphenyl; TSCA = Toxic Substances Control Act; RCRA = Resource Conservation and Recovery Act

Heat Transfer and Hydraulic Systems

PCBs may be used in heat transfer and hydraulic systems in a manner other than a totally enclosed manner at concentrations less than 50 ppm.¹⁴ No fluid containing greater than 50 ppm PCB should be added to heat transfer or hydraulic systems, and they should only be serviced with fluids containing less than 50 ppm PCB. Any PCBs removed during any servicing activity must be captured and either reused as dielectric fluid or disposed of in accordance with the requirements of 40 CFR 761.60.

PCB hydraulic machines containing PCBs at concentrations greater than or equal to 50 ppm must either be decontaminated or be disposed by one of the following methods:

- In accordance with decontamination standards and procedures in 40 CFR 761.79
- In a facility that is permitted, licensed, or registered to manage municipal solid waste or nonmunicipal, nonhazardous waste (excluding thermal treatment units)
- In a scrap metal recovery oven or smelter operating in compliance with 40 CFR 761.72
- In an approved disposal facility

¹⁴ 40 CFR 761.30(d) through 761.30(e)

All free-flowing liquid must be disposed of as required under 40 CFR 761.60(a). If the PCB concentration in the liquid is greater than or equal to 1,000 ppm, the hydraulic machine must be decontaminated or flushed with a solvent that contains less than 50 ppm PCBs.

Compliance Checklist for Heat Transfer and Hydraulic Systems

	Does the facility have heat transfer or hydraulic systems that are periodically serviced?
	Does the facility ensure that those systems do not have fluids added to them that would contain concentrations greater than or equal to 50 ppm PCBs?
	Does the facility capture and reuse or dispose of any PCBs that are removed during servicing activities?
	Does the facility decontaminate any hydraulic machine that is found to contain concentrations greater than or equal to 1,000 ppm?

Electromagnets, Switches, and Voltage Regulators

Electromagnets, switches, and voltage regulators may contain PCBs at any concentration for the remainder of their useful lives (40 CFR 761.30(h)).

The use or storage of a PCB electromagnet (concentration greater than or equal to 500 ppm) in a location where human food or animal feed could be exposed to PCBs released from the electromagnet is prohibited. Weekly inspections are required for electromagnets with PCBs if they are in use or stored for reuse, contain concentrations between 50 ppm and 500 ppm, and pose an exposure risk to food or feed.

The use and storage for reuse of voltage regulators that contain 1.36 kg (3 lb) or more of dielectric fluid with a PCB concentration of greater than or equal to 500 ppm must meet the following requirements:

- Regulators must be marked.
- Report any fire-related incidents immediately to the NRC.
- Inspections must be conducted as applicable.
- The record-keeping and reporting requirements of 40 CFR 761.180 must be met.

If the owner of a voltage regulator assumes that it contains less than 500 ppm PCBs but discovers by testing that it is contaminated at greater than or equal to 500 ppm PCBs, the owner must do the following immediately upon discovery:

- Mark the regulator as required.
- Report any fire-related incidents immediately to the NRC.
- Conduct inspections as applicable to PCB transformers.
- Comply with the record-keeping and reporting requirements of 40 CFR 761.180.

Electromagnets, switches, and voltage regulators must be inspected once per quarter with at least 30 days between inspections. These inspections should be documented.

Servicing (including rebuilding) of any electromagnet, switch, or voltage regulator with a PCB concentration of 500 ppm or greater that requires the removal and reworking of the internal components should not be performed. Any PCBs removed during any servicing activity must be captured and either reused as dielectric fluid or disposed of in accordance with the requirements of 40 CFR 761.60.

Electromagnets, switches, and voltage regulators that are classified as PCB-contaminated electrical equipment must be serviced (including rebuilding) only with dielectric fluid containing less than 500 ppm of PCBs.

Compliance Checklist for Electromagnets, Switches, and Voltage Regulators

<input type="checkbox"/>	Has the facility marked all electromagnets, switches, and voltage regulators as required?
<input type="checkbox"/>	Does the facility conduct monthly inspections of these items and document the inspections?
<input type="checkbox"/>	Does the facility prohibit servicing of electromagnets, switches, and voltage regulators that requires the reworking or removal of the internal components?
<input type="checkbox"/>	Are electromagnets, switches, and voltage regulators that are classified as PCB-containing electrical equipment serviced with dielectric fluid that contains less than 500 ppm PCBs?
<input type="checkbox"/>	Are the PCBs that are removed during servicing captured and reused or disposed?

Circuit Breakers, Reclosers, and Cables

Circuit breakers, reclosers, and cables may contain PCBs at any concentration for the remainder of their useful lives (40 CFR 761.30(m)). These items may be serviced using only dielectric fluid that contains less than 50 ppm PCBs. Any circuit breaker, recloser, or cable found to contain at least 50 ppm PCBs must be serviced according to the requirements for electromagnets, switches, and voltage regulators.

Compliance Checklist for Circuit Breakers, Reclosers, and Cables

<input type="checkbox"/>	Does the facility service circuit breakers, reclosers, and cables using a fluid that contains less than 50 ppm PCBs?
<input type="checkbox"/>	Are any circuit breakers, reclosers, or cables (greater than or equal to 50 ppm PCBs) serviced according to the requirements for electromagnets, switches, and voltage regulators?

Electrical Equipment

Nonleaking and structurally undamaged pieces of electrical equipment that have not been drained of free-flowing dielectric fluid may be stored on pallets next to a storage area that complies with the storage area requirements.¹⁵ The unfilled storage space in the storage area must be equal to at least 10 percent of the volume of electrical equipment stored outside. The equipment stored outside the storage area must be inspected at least weekly.

All free-flowing liquid must be removed from PCB-contaminated electrical equipment, except capacitors, before the equipment may be disposed. All free-flowing liquid must be disposed of as required under 40 CFR 761.60(a).

The equipment may be disposed of by one of the following methods:

- In accordance with 40 CFR 761.79

¹⁵ 40 CFR 761.65(c)(2)

- In a facility that is permitted, licensed, or registered to manage municipal solid waste or nonmunicipal nonhazardous waste (excluding thermal treatment units)
- In a scrap metal recovery oven or smelter operating in compliance with 40 CFR 761.72
- In an approved disposal facility

Compliance Checklist for Electrical Equipment

<input type="checkbox"/>	Is electrical equipment that is stored next to a storage area placed on pallets?
<input type="checkbox"/>	Does the unfilled storage space in the storage area equal 10 percent of the volume of the PCB items stored outside?
<input type="checkbox"/>	Is the equipment stored outside the storage area inspected at least weekly?
<input type="checkbox"/>	Has all of the free-flowing liquid been removed from the PCB-contaminated electrical equipment before it is disposed?
<input type="checkbox"/>	Are all free-flowing liquids disposed of as required?
<input type="checkbox"/>	Is the equipment disposed of by one of the methods listed in this section?

Rectifiers

PCBs at any concentration may be used in rectifiers for the fluid’s useful life. The rectifier must then be serviced with fluid that is less than 50 ppm PCBs (40 CFR 761.30(r)).

Compliance Checklist for Rectifiers

<input type="checkbox"/>	Have all rectifiers located at the facility been serviced with a fluid that is less than 50 ppm PCBs?
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Storage for Reuse

A facility may store PCB articles for reuse for no more than five years after the article was removed from use unless it has received written permission from the regional administrator allowing a longer retention period.¹⁶ Storage should incorporate the following requirements:

- The roof and walls of the building in which the PCBs are stored must be constructed so that rainfall will not contact PCBs and PCB items.
- The floor must have continuous curbing with a curb at least six inches high. The curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container or 25 percent of the total internal volume of all PCB articles or PCB containers stored there, whichever is greater.
- The curbed area must not have drains, valves, floor drains, expansion joints, sewer lines, or other openings that would allow liquids to flow from the curbed area.
- Floors and curbing must be constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface that prevents or minimizes penetration of the PCBs.

¹⁶ 40 CFR 761.35

- Location must not be below a 100-year floodwater elevation.
- The storage area must be marked with an ML label.

Records must be maintained concerning the time when the article was removed from service.

If PCB items are stored in a noncompliant area, the following requirements must be met:

- All applicable use and marking requirements must be met.
- Records, are kept starting at the time the PCB article is removed from service. These records include the following:
 - The date of removal
 - Projected location and future use of the article
 - The date the PCB article is scheduled for repair, if applicable

Compliance Checklist for Storage for Reuse

	Does the facility have PCB items that it stores for reuse?
	Does the facility have PCB items that have been stored for reuse longer than five years?
	Has the facility obtained written permission from the regional administrator for items to be stored for reuse longer than five years?
	Have records been maintained concerning when articles are removed from service and placed in storage for reuse?
	Has the facility stored its items in compliant storage areas or met all of the requirements for noncompliant storage areas?

Storage for Disposal

PCBs and PCB items at concentrations of 50 ppm or more that need to be stored before disposal must be stored in a facility meeting specific structural requirements.¹⁷ The PCB storage area must have the following provisions:

- The roof and walls of the building in which the PCBs are stored are to be constructed so that rainfall does not come into contact with PCBs and PCB items.
- An adequate floor is required that has continuous curbing with a curb at least six-inches high. The curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container or 25 percent of the total internal volume of all PCB articles or PCB containers stored there, whichever is greater.
- The floor must not have drains, valves, floor drains, expansion joints, sewer lines, or other openings that would allow liquids to flow from the curbed area.
- Floors and curbing should be constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface that prevents or minimizes penetration of the PCBs.
- Location must not be below a 100-year floodwater elevation.
- The storage area must be marked with the ML label.

PCBs and PCB items may also be stored in other areas that do not comply with the storage area requirements, if the unit meets one of the following conditions:

¹⁷ 40 CFR 761.65

- It is permitted to manage hazardous waste in containers, and spills of PCBs are properly cleaned up.
- It qualifies for interim status under Section 3005 of RCRA to manage hazardous waste in containers, meets the requirements for containment at 40 CFR. 264.175, and spills of PCBs are properly cleaned up.
- It is permitted by a state authorized under Section 3006 of RCRA to manage hazardous waste in containers, and spills of PCBs are properly cleaned up.
- It is approved or otherwise regulated pursuant to a state PCB waste management program no less stringent in protection of health or the environment than the applicable TSCA requirements.
- It is subject to a TSCA-coordinated approval that includes provisions for storage of PCBs.
- It has a TSCA PCB waste management approval that includes provisions for storage.

When storing items in a noncompliant storage area for temporary 30-day storage, only the following PCB items may be stored:

- Nonleaking PCB articles and PCB equipment
- Leaking PCB articles and PCB equipment placed in a nonleaking PCB container that contains sufficient sorbent material to absorb liquid contained in the PCB article or equipment
- PCB containers in which nonliquid PCBs have been placed
- PCB containers containing liquid PCBs at a concentration greater than or equal to 50 ppm, provided that a spill prevention control and countermeasures (SPCC) plan has been prepared for the temporary storage area, and the liquid PCB waste is in DOT-authorized packaging or stationary bulk storage tanks

A notation must be attached to the PCB item or container indicating the date the item was removed from service.

The following specific operational procedures are required at storage areas where PCBs or PCB items are stored:

- Movable equipment used for handling PCBs and PCB items that directly contact PCBs must not be removed from the storage unit unless they have been decontaminated.
- Inspections for leaks of all PCB items in storage must be completed at least once every 30 days.
- Any leaking PCB items and their contents must be immediately transferred to properly marked nonleaking containers, and the spilled or leaked materials must be immediately cleaned up and any spill-absorbent material properly disposed.
- PCB items must be marked with the date when they are removed from service for disposal.
- PCB items must be positioned so that they can be located by the marked date.
- Stationary storage containers for liquid PCBs must have a record that includes quantity and date of each batch added to or removed from the container.

Compliance Checklist for Storage for Disposal

	Does the facility have PCB items that must be stored for disposal for more than 30 days?
	If yes, does the facility have an adequate storage area that meets the structural requirements?
	If the area does not meet the structural requirements, does the facility have a storage area that meets one of the conditions listed in this section for noncompliant storage areas?
	Does the facility only store the allowed items in temporary 30-day storage if the facility does not have a compliant storage area?
	Does each item or container in storage have a notation indicating the date the item was removed from service?
	Does the facility follow the operational procedures that are required for areas where PCBs and PCB items are stored?
	Does the facility maintain records of the dates when items are removed from service, when inspections occur, and does it record quantities and dates when wastes are added to/removed from stationary storage containers as required?

Spills and Uncontrolled Discharges

Spills and other uncontrolled discharges of PCBs at concentrations greater than or equal to 50 ppm constitute improper disposal of PCBs.¹⁸

For all spills in excess of 50 ppm,

- Where a spill directly contaminates surface water, sewers, or drinking water supplies, the owner must notify the appropriate USEPA regional office and obtain guidance for appropriate cleanup measures in the shortest possible time after discovery, but no later than 24 hours after discovery.
- Where a spill directly contaminates grazing lands or vegetable gardens, the owner must notify the appropriate USEPA regional office and proceed with the immediate cleanup requirements in 40 CFR 761.125(b) and 761.125(c), depending on the source of the spill, in the shortest possible time after discovery, but no later than 24 hours after discovery.
- When a spill is less than 10 lb of PCBs by weight and does not directly contaminate surface water, sewers, drinking water supplies, grazing lands, or vegetable gardens, the owner must notify the appropriate USEPA regional office and proceed to decontaminate the area according to TSCA policy in the shortest possible time after discovery, but no later than 24 hours after discovery.

Note that the requirements listed here are in addition to the reporting required under the Clean Water Act (CWA) or Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

Waste Oil

Waste oil that contains any detectable concentration of PCBs may not be used as a sealant, coating, or dust control agent.¹⁹ Prohibited uses include, but are

¹⁸ 40 CFR 761.125

¹⁹ 40 CFR 761.20(d)

not limited to, road oiling, general dust control, use as a pesticide or herbicide carrier, and use as a rust preventative on pipes.

Waste oil containing any quantifiable level of PCBs (2 ppm) must be marketed only to

- Qualified incinerators as defined in 40 CFR 761.3
- Marketers that market off-specification used oil for energy recovery only to other marketers that have notified USEPA of their used oil management activities, and that have an USEPA identification number where an identification number is required by 40 CFR 279.73
- Burners identified in 40 CFR 279.61(a)(1) and (2)

Used oil to be burned for energy recovery is presumed to contain quantifiable levels (2 ppm) of PCBs unless the marketer obtains analyses or other information that the used oil does not contain quantifiable levels of PCBs. The person who first claims that the used oil does not contain quantifiable levels (2 ppm) of PCBs must obtain analyses or other information to support the claim. Other information documenting that the used oil fuel does not contain quantifiable levels (2 ppm) of PCBs may consist of either personal, special knowledge of the source and composition of the used oil or certification from the person generating the used oil claiming that the oil contains no detectable PCBs.

Waste oil containing any quantifiable levels of PCBs must be burned at an approved facility for energy recovery only when such facilities are operating at normal operating temperatures. This prohibits feeding these fuels during either startup or shutdown operations when the temperature may not be hot enough to destroy the PCBs.

Compliance Checklist for PCB Waste Oil

<input type="checkbox"/>	Does the facility use waste oil that has any detectable concentration of PCB as a sealant, coating, or dust control agent?
<input type="checkbox"/>	Is waste oil that contains more than 2 ppm of PCBs marketed only to qualified incinerators, registered marketers, or identified burners?
<input type="checkbox"/>	Has the facility determined if its waste oil contains greater than 2 ppm PCBs?
<input type="checkbox"/>	If the determination of PCB concentration is made through personal knowledge of the source and composition of the used oil, does the facility maintain a signed certification of the claim?
<input type="checkbox"/>	Is the waste oil generated at the facility only burned when the burner is operating at normal operating temperatures?

7.5 Asbestos

Asbestos is a mineral fiber that has been used in a multitude of construction materials for insulation and as a fire retardant. Because of its fiber strength and heat-resistant properties, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos-cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings.

When asbestos-containing materials are damaged or disturbed by repair, remodeling, or demolition activities, the fibers can become airborne and can be inhaled into the lungs, where they can cause significant health problems.

The types of asbestos-containing materials, as defined in 40 CFR 61.141, are listed in the following sections.

Friable Asbestos-Containing Material

Friable asbestos-containing material (ACM) is defined as any material containing more than 1 percent asbestos as determined using the polarized light microscopy (PLM) method. When dry, the ACM can be crumbled, pulverized, or reduced to a powder by hand pressure.

Nonfriable Asbestos-Containing Material

Nonfriable ACM is not easily crushed or pulverized by hand and has a low probability of releasing fibers into the air. There are two categories of nonfriable materials—Category I nonfriable ACM and Category II nonfriable ACM.

Category I Nonfriable ACM

Category I nonfriable ACM is any asbestos-containing packing, gasket, floor covering, or asphalt roofing product that contains more than 1 percent asbestos as determined using PLM.

Category I nonfriable ACM must be inspected and tested for friability if it is in poor condition before demolition to determine whether or not it is subject to the Asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP) under the Clean Air Act. If the ACM is friable, it must be handled in accordance with the requirements of the NESHAP. Asbestos-containing packings, gaskets, floor coverings, and asphalt roofing materials must be removed before demolition only if they are in poor condition and have become friable.

Category II Nonfriable ACM

Category II nonfriable ACM is any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using PLM. When the material is dry, it cannot be crumbled, pulverized, or reduced to a powder by hand pressure. This category includes all nonfriable ACMs not listed under Category I.

If Category II nonfriable ACMs (cement siding, transite board shingles, etc.) are subjected to intense weather conditions such as thunderstorms, high winds, or prolonged exposure to high heat and humidity, the materials may become weathered to a point where they become friable.

Compliance Checklist for Nonfriable Asbestos-Containing Material (ACM)

Have all of the asbestos-containing materials been identified at the facility?

Is nonfriable ACM periodically inspected to ensure that it has not become friable due to weathering or deterioration?

Spray Application of Asbestos-Containing Material

When ACMs are applied by spraying them on a surface such as a building, structure, pipe, or conduit, the materials must not contain more than 1 percent asbestos.²⁰ This requirement does not apply to the spray-on application of materials where the asbestos fibers in the materials are encapsulated by a binder during spraying and the materials are nonfriable after drying.

For spray-on applications on equipment and machinery, of ACM that contains more than 1 percent asbestos, the following requirements must be followed:

- The administrator must be notified at least 20 days before beginning the spraying operation.
- No visible emissions may be discharged to the outside air from spray-on application of the asbestos-containing material, or the methods specified by 40 CFR 61.152 must be used to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

Compliance Checklist for Spray Application of Asbestos-Containing Material (ACM)

	Does the facility apply ACM by spraying?
	Does the material contain more than 1 percent asbestos?
	If yes, does the facility follow the requirements for administrator notification and visible emissions as listed in this section?

Regulated Asbestos-Containing Material

Regulated asbestos-containing material (RACM) may be defined as any of the following:

- A friable asbestos material
- Category I nonfriable ACM that has become friable
- Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading
- Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder during the course of demolition or renovation operations

No RACM may be stripped, removed, or otherwise handled or disturbed unless at least one representative trained in asbestos removal is present.²¹ This representative must have received refresher training every two years since his or her initial training.

A trained representative is required during demolition of structures containing

- More than 80 linear meters (260 linear feet) of RACM on pipes or
- More than 15 m² (160 ft²) of RACM on other components or
- More than 1 m³ (35 ft³) of facility components

A trained representative is also required when facilities are renovating structures and stripping or removing

²⁰ 40 CFR 61.146

²¹ 40 CFR 61.145(c)(8)

- More than 80 linear meters (260 linear feet) of RACM on pipes or
- More than 15 m² (160 ft²) of friable asbestos on other facility components or
- More than 1 m³ (35 ft³) of facility components

Compliance Checklist for Regulated Asbestos-Containing Material

<input type="checkbox"/>	Has the facility stripped, removed, handled, or disturbed RACM?
<input type="checkbox"/>	Did the facility have a trained representative on-site to oversee the removal of the asbestos?
<input type="checkbox"/>	Did the facility maintain training records or certifications of the representative?

Disposal of ACM

ACM need not be removed before demolition²² under these conditions:

- It is a Category I nonfriable ACM that has not become friable.
- It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition.
- It was not accessible for testing and therefore was not discovered until after demolition began and, as a result of the demolition, could be safely removed. If not removed for safety reasons, the exposed ACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and kept adequately wet at all times until disposed of.
- It is a Category II nonfriable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition.

If a building or structure that is slated for demolition or renovation contains friable asbestos, the owner or operator who is responsible for the demolition or renovation must not discharge any visible emissions to the outside air during the collection, processing (including incineration), packaging, or transporting of any asbestos-containing waste material removed (40 CFR 61.145(c)).

If it is necessary to contain emissions to air, the owner or operator must use an approved emission control and waste treatment method.²³ One method is to adequately wet ACM. ACM may be adequately wetted as follows:

- Mix pollution-control device asbestos waste to form a slurry and adequately wet other asbestos-containing waste material.
- Discharge no visible emissions to the outside air from collection, mixing, wetting, and handling operations, or use the methods specified by 40 CFR 61.152 to clean emissions containing particulate asbestos materials before they escape to, or are vented to, the outside air.
- After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping.
- For asbestos-containing waste in leak-tight containers or leak-tight wrapping, label the containers or wrapped materials using the following warning labels that are printed in letters of sufficient size and contrast so as to be readily visible and legible:

²² 40 CFR 61.145 (a)

²³ 40 CFR 61.150 (a)-(b)

DANGER
Contains asbestos fibers.
Avoid creating dust.
Cancer and lung disease hazard.

- For asbestos-containing waste material that is to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated.

Another method is to process ACM into a nonfriable form. Properly processing ACM into nonfriable forms may be accomplished as follows:

- Form all asbestos-containing waste material into nonfriable pellets or other shapes.
- Discharge no visible emissions to the outside air from collection and processing operations, including incineration, or use the method specified by 40 CFR 61.152 to clean emissions containing particulate asbestos materials before they escape to, or are vented to, the outside air.
- For demolished facilities, including those from which RACM has not been removed prior to demolition, adequately wet asbestos-containing waste material at all times after demolition and keep wet during handling and loading for transport to a disposal site. Asbestos-containing waste materials covered by this paragraph do not have to be sealed in leak-tight containers or wrapping but may be transported and disposed of in bulk.
- Use an alternative emission control and waste treatment method that has received prior approval by the regional administrator.

All asbestos-containing waste material, except Category I nonfriable ACM that is not RACM, must be disposed of as soon as is practical by the waste generator at one of the following:

- A waste disposal site operated in accordance with the provisions of 40 CFR 61.154
- A USEPA-approved site that converts RACM and asbestos-containing waste material into asbestos-free material

Compliance Checklist for Disposal of ACM

	Has any friable ACM been detected or suspected at the facility?
	Has the owner/operator put in place an approved emission control and waste treatment method?
	Are containers or wrapped materials labeled as required?
	Has all ACM, except Category I nonfriable ACM that is not RACM, been disposed as soon as practical?

Transportation

Vehicles used to transport asbestos-containing waste material must be marked indicating an asbestos dust hazard (40 CFR 61.150(c)-(e)).

For all ACM transported off the facility property, waste shipment records should be maintained for at least two years. A copy of each waste shipment record should be provided to the waste disposal site. The facility must have a

procedure in place to notify the local, state, or USEPA regional office if a copy of the waste shipment record is not returned to the waste generator within 35 days after the waste was accepted by the initial transporter.

Compliance Checklist for Transportation

<input type="checkbox"/>	Has the transporter of ACM waste adequately marked the vehicle indicating an asbestos dust hazard?
<input type="checkbox"/>	Are waste shipment records maintained for at least two years?
<input type="checkbox"/>	Does the facility have a procedure in place to notify authorities if the shipment record is not returned within 35 days after the waste was accepted by the initial transporter?

7.6 Lead-Based Paint

Lead-based paint was used on steel bridges, towers, storage tanks, buildings, pipes, and machinery and equipment parts through the 1980s and 1990s. Lead-based paint is typically not hazardous unless it is scraped or sanded. Scraping or sanding lead-based paint creates small paint particles that are a hazardous waste and can be a health hazard if proper safety precautions are not taken. Lead can create a serious health hazard if it is inhaled or ingested.

The USEPA has proposed to regulate work on commercial buildings and steel towers under the Toxic Substances Control Act, 40 CFR 745. USEPA is collecting and reviewing comments and investigating issues that may possibly arise from this rule. Therefore, this regulation is not yet in effect but may be in the near future.

There are several basic BMPs that owners and operators should use to minimize the risk of harmful exposures to lead. These consist of identification, management, exposure control, abatement, and waste disposal.

Lead-Based Paint Identification

If it is suspected that lead is present in a facility, the facility may choose to map the location of the lead-containing materials. This can be done internally by qualified individuals or externally using qualified vendors. Most states require inspectors identifying lead in structures to be licensed. Once the location of lead-containing material has been identified, it should be shared with employees and contractors working in these areas. They should be instructed not to disturb the material. This information must also be shared with potential buyers and lease tenants, if or when this is applicable.

BMP Checklist for Lead-Based Paint Identification

<input type="checkbox"/>	Has the facility located all lead-containing materials on-site?
<input type="checkbox"/>	Has the facility shared the location of the materials and discussed the hazards of lead with its employees?
<input type="checkbox"/>	Has the facility instructed its employees that lead-based materials should not be disturbed?

Lead-Based Paint Management

If lead-based paint is in good condition, one management approach is to simply leave it alone unless activities are being performed that would make the lead airborne or expose occupants. If this approach is taken, the owner or operator of the property should inspect the condition of the lead-based paint at least annually. If the paint is found in poor, peeling, or chipping condition on inspection, it should be abated or encapsulated if it has a potential to expose building occupants to lead.

If the facility has considerable exposure potential, a lead exposure control plan (LECP) should be developed and a lead control manager (LCM) should be appointed to coordinate the plan and conduct routine inspections. Building owners must determine which occupants, if any, are potentially exposed. Consideration should be given to the types of activities performed, such as welding, paint removal, or grinding. If employees are not potentially exposed, or if the lead is inaccessible, occupants should be informed of its presence and instructed not to disturb the material.

An initial exposure assessment should be performed for potentially exposed personnel, particularly those in industrial settings. Representative individual air sampling should be performed for each job description having potential exposure. Employees must be protected during this exposure assessment. Upon receipt of monitoring results, employees should be notified of the findings. Further actions that must be taken will depend on the levels found during the assessments. This program must be in writing and must include a description of the work performed; the engineering, administrative, and personal protective equipment (PPE) controls; blood and air monitoring results; and the work schedule. The plan is subject to review and revision at least every six months. Employers should also incorporate relevant aspects of their respiratory protection and medical surveillance program.

BMP Checklist for Lead-Based Paint Management

<input type="checkbox"/>	Has the facility inspected the lead-based paint at least annually to ensure that it is in good condition?
<input type="checkbox"/>	If the paint is found in poor condition during inspection, has the lead-based paint been abated or encapsulated if it has a potential to expose building occupants to lead?
<input type="checkbox"/>	Has the facility determined that it should develop an LECP?
<input type="checkbox"/>	Has the facility appointed an LCM to coordinate the LECP and inspections?
<input type="checkbox"/>	Has air sampling been performed for each job description having potential exposure?
<input type="checkbox"/>	Has the facility prepared and implemented a program to protect workers having potential exposure?

Lead-Based Paint Exposure Control

If it is determined that lead exists at unhealthy levels, engineering, administrative, and PPE controls must be implemented. Engineering controls consist of process changes such as chemical stripping of paint instead of abrasive methods to reduce airborne lead concentrations. Other engineering controls include providing exhaust ventilation and enclosures to prevent migration of lead. Administrative controls include employee rotation and medical removal of excessively exposed employees. PPE controls consist of respiratory

protection, coveralls, and gloves. PPE must be selected based on the type of hazard and the nature of work to be performed.

BMP Checklist for Lead-Based Paint Exposure Controls

Has the facility determined that lead exists at unhealthy levels and have engineering, administrative, and personal protective equipment (PPE) controls been implemented?

Lead-Based Paint Abatement

If removal is determined to be the most appropriate course of action, or if employees are potentially exposed, the owner or operator may have qualified staff or a licensed firm conduct the removal of the lead-based paint. Abatement of lead typically includes creating a negative air enclosure around the work site to prevent the spread of lead to clean areas. The lead is then removed by workers in protective clothing who bag the removed material for disposal. The air inside the containment area is monitored prior to removal of the enclosure. Removal activities are subject to regulation under OSHA.

BMP Checklist for Lead-Based Paint Abatement

Has the facility determined that removal is the most appropriate course of action?
 Will the facility use qualified staff or a licensed firm to conduct the removal of the lead-based paint?

Lead-Based Paint Waste Disposal

Facility owners and operators must ensure the proper disposal of all lead-containing materials. This includes contaminated materials such as paint chips, PPE, wastewater, and rags used to decontaminate tools and equipment. These wastes must undergo waste determination and be taken to appropriate disposal facilities in accordance with USEPA and state-specific solid waste and hazardous waste regulations. Lead wastes must typically be managed as a hazardous waste with USEPA Waste Number D008; however, TSCA and USEPA policy have established less stringent disposal requirements for lead-based paint debris in nonhazardous landfills.

BMP Checklist for Lead-Based Paint Waste Disposal

Has the facility ensured that all lead-containing materials have been disposed of properly?

7.7 Overcoming Common Findings

Section 7.1 described some common regulatory findings in the water sector. The following are some tips on working to overcome the most common findings concerning toxic substances management programs.

1. **Failure to ensure that PCB waste is disposed of in one year.** PCB waste must be disposed of within one year from the date it was removed from service unless the regional administrator has granted an extension

for extenuating circumstances. This does not mean that the PCB waste should be shipped off-site for disposal within one year; it means that facility should receive the COD ensuring the destruction of the waste within one year.

2. **Failure by the facility to register with the USEPA as a generator of PCB waste.** Generators, commercial storage facilities, transporters, and disposers of PCB waste are required to have a USEPA identification number. The facility is also required to notify USEPA of its PCB waste handling activities using USEPA Form 7710-53.
3. **Failure by the facility to register transformers owned by the facility.** All PCB transformers, including those in storage for reuse, must be registered with the USEPA. Records for each registration (e.g., a copy of the registration and the return receipt signed by USEPA) must be retained by the facility.
4. **Fluorescent-light ballasts are not properly disposed.** In many instances, facilities collect numerous out-of-service fluorescent-light ballasts because they do not know how to dispose of them. If the manufacturing date is not known or if there is no label that states “No PCBs” attached to the fixture or ballast, the ballast must be disposed of as toxic waste. The facility may choose to test the ballast to determine the PCB concentration, or the worst-case scenario of more than 500 ppm PCBs may be assumed, and the waste must be disposed of accordingly.
5. **Waste oil is used as a dust suppressant.** The use of waste oil that contains any detectable concentration of PCB as a sealant, coating, or dust control agent is prohibited. Prohibited uses include, but are not limited to, road oiling, general dust control, use as a pesticide or herbicide carrier, and use as a rust preventative on pipes.
6. **Failure to ensure that a trained asbestos representative is on-site during asbestos demolition or renovation.** No RACM may be stripped, removed, or otherwise handled or disturbed unless at least one representative trained in asbestos removal is present. This representative must have received refresher training every two years since his or her initial training.
7. **Failure by the facility to control the discharge of visible emissions to the outside air during the collection, processing, packaging, or transporting of any asbestos-containing waste material.** It is the responsibility of the owner/operator to ensure emission control systems are in place before demolition or renovation occurs.
8. **Failure to properly dispose of painted items with lead-based paint.** It is the responsibility of the generator to ensure that all wastes are properly characterized and disposed of and to ensure that all wastes, including wastewater and rags that have become contaminated, are disposed of according to federal, state, and local regulations.

Compliance Checklist for Overcoming Common Findings

	Has the facility retained the COD for shipments of PCBs to ensure that disposal has occurred within one year?
	Has the facility registered with the USEPA concerning its PCB handling activities in order to receive an identification number?

	Has the facility registered all PCB-containing transformers located on-site?
	Has the facility determined the concentration of PCBs in the light ballasts that are to be disposed and offered them for disposal?
	Does the facility have procedures in place to ensure that waste oil with detectable concentration of PCBs is not used as a dust suppressant?
	Does the facility ensure that at least one trained asbestos representative is located on-site at all times for asbestos demolition or renovation?
	Does the facility have emission control systems in place to collect visible air emissions of asbestos during the collection, processing, packaging, or transporting of the material?
	Does the facility properly characterize and dispose of all painted items that have become contaminated with lead-based paint?

A complete toxic substances checklist appears on the CD that accompanies this guidebook.