



How to Find and Address PCBs in Building Materials



Prepared for:
Puget Sound National Estuary Program

Submitted by:
Washington State Department of Ecology
Olympia, Washington

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Related Information

- Ecology's Publication 21-04-030: [Focus on: PCBs in Building Materials](#)¹
- Ecology's Publication 21-04-034: [Polychlorinated Biphenyl Dangerous Waste Guide](#)²
- Ecology's Publication 22-04-036: [How to Estimate Abatement Project Costs for PCBs in Building Materials](#)³
- [EPA's PCBs in Building Materials Fact Sheet](#)⁴
- [EPA's PCBs in Building Materials webpage](#)⁵

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¹ <https://apps.ecology.wa.gov/publications/SummaryPages/2104030.html>

² <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

³ <https://apps.ecology.wa.gov/publications/SummaryPages/2204036.html>

⁴ <https://www.epa.gov/pcbs/pcbs-building-materials-determining-presence-manufactured-pcb-products-buildings-or-other>

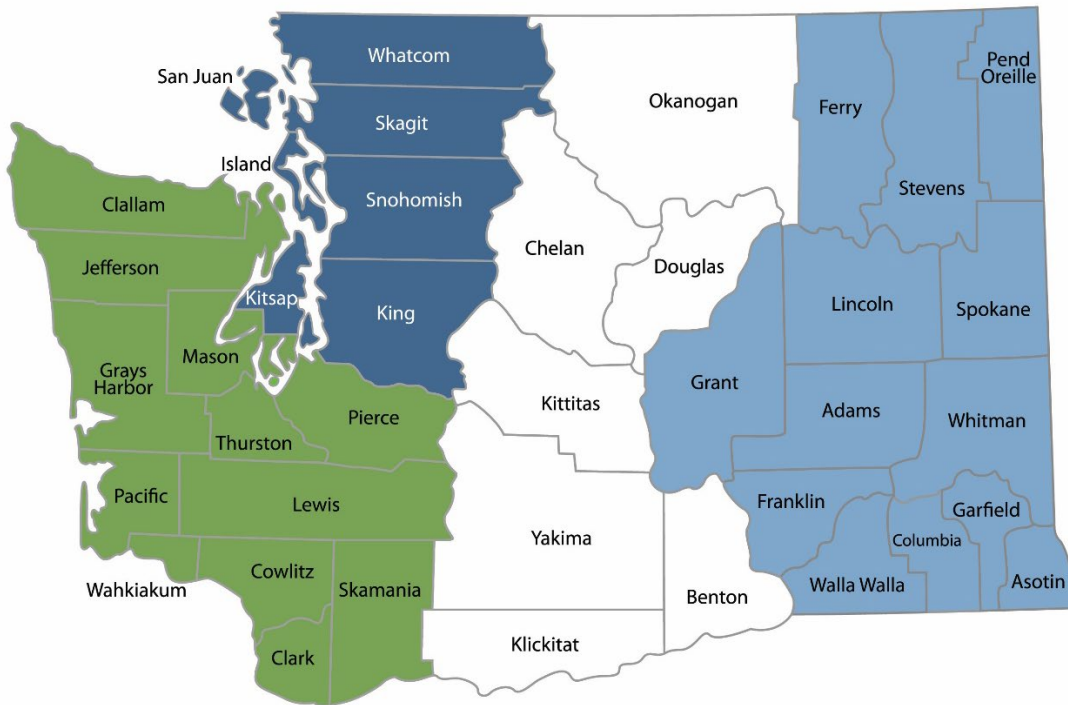
⁵ <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials>

⁶ www.ecology.wa.gov/contact

⁷ www.ecology.wa.gov/accessibility

Department of Ecology's Regional Offices

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Northwest Region
206-594-0000

Central Region
509-575-2490

Eastern Region
509-329-3400

Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	P.O. Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	P.O. Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 West Alder Street Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 North Monroe Spokane, WA 99205	509-329-3400
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Introduction

We created this guide to:

- Inform property owners, developers, contractors, and other interested parties about polychlorinated biphenyls (PCBs) in building materials and options for managing these materials.
- Promote best management practices (BMPs) to find and address PCB-containing **exterior building materials** before demolition or renovation because they're likely to contaminate the surrounding environment.
 - We also provide references to resources about finding and addressing interior building materials, which are also important to consider, particularly when demolishing or conducting large renovations.

PCB abatement refers to methods that remove PCB-containing building materials from existing structures. We also address **mitigation options** in this guide (such as taking steps to encapsulate or manage it in place as a temporary measure).

By using BMPs when working on PCB-containing building materials, you'll minimize exposure to you, your workers, and your community—as well as reduce PCB releases to the environment.

You can use this guide to understand:

- How to protect human health and the environment by minimizing releases of PCBs.
- How to identify, document, and test potential PCB-containing building material types.
- How to manage PCB-containing materials until abatement.
- How to complete the PCB-containing abatement process before renovation and demolition.
- What to include in a basic abatement work plan.
- How to manage the waste you generate.

While this guide focuses on TSCA requirements, we also specify areas regulated under Washington's Dangerous Waste Regulations.⁸

- **TSCA** regulates the manufacturing, processing, distribution, and use of PCBs.
- **The Dangerous Waste Regulations** regulate the management of waste materials in Washington State.

The following PCB wastes are regulated under the Dangerous Waste Regulations:

- PCB waste designated as a [listed dangerous waste](#)⁹ (other than WPCB¹⁰ listing).

⁸ Chapter 173-303 of the Washington Administrative Code (WAC):

<https://app.leg.wa.gov/WAC/default.aspx?cite=173-303>

⁹ <https://apps.leg.wa.gov/wac/default.aspx?cite=173-303-9904>

¹⁰ WPCB stands for Washington state-only PCB listed waste.

- PCB waste with one or more of the characteristic dangerous waste codes D001–D017.
- PCB waste with one or more state-only persistent dangerous waste codes WP01 and WP02.

You must meet PCB waste requirements for both TSCA and the Dangerous Waste Regulations; however, you may exclude PCB dangerous wastes from the Dangerous Waste Regulations if they comply with certain TSCA requirements.¹¹ For more information, please see Ecology’s [Polychlorinated Biphenyl Dangerous Waste Guide](#).¹²

Please note: The U.S. Environmental Protection Agency (EPA) has regulatory authority over reporting, recordkeeping, testing requirements, and other restrictions relating to PCBs under the Toxics Substances Control Act (TSCA). Our recommendations¹³ help prevent PCBs from entering stormwater, thereby reducing the impact of PCBs on human health and the environment. We defer to EPA on what actions you may need to take to meet TSCA requirements.

Please also note: PCB household wastes are narrowly defined as specific items generated by residents for household maintenance.¹⁴ Demolition and renovation waste don’t qualify as household wastes.

We developed this guide in collaboration with EPA, Seattle Public Utilities (SPU), Washington State Department of Health, the University of Washington, and other interested parties.

Background

What are PCBs?

Polychlorinated biphenyls (PCBs) are a class of synthetic chlorinated chemicals not found naturally in the environment. They’re persistent, bioaccumulative, and toxic (PBT) chemicals and probable human carcinogens.

Since their creation in 1929, PCBs were added to various exterior and interior building materials to improve flexibility, adherence, and abrasion resistance. Manufacturers used them in many industrial and commercial applications for decades because they’re non-flammable and stable.

PCB ban

In 1976, Congress passed the Toxic Substances Control Act (TSCA), which prohibited the U.S. manufacture, processing, and distribution of PCBs within three years. In 1979, EPA issued final regulations banning the manufacture and use of PCBs.

¹¹ WAC 173-303-071(3)(k)

¹² <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

¹³ Ecology makes recommendations as a Clean Water Act delegated authority and in accordance with RCW 90.48.

¹⁴ See 40 CFR 761.3: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-761>.

PCBs in building materials

Many industrial uses of PCBs ended after 1979. However, studies show the widespread presence of PCBs from construction and renovation between 1950–1979. The PCBs that remain in building materials are considered to be in use and are subject to PCB regulations. Buildings built or renovated during this time period are more likely to contain PCBs (typically mixed into products as a liquid).

EPA research found that caulking put in place between 1950–1979 typically contains 5–30% PCBs.¹⁵ Buildings built or renovated in the 1980s may also contain PCBs because stocks of PCBs purchased before the manufacturing ban were likely used (such as paint or sealants).

Remediating PCBs in building materials properly will help protect human health and the environment from the effects of this chemical class.

Current PCB regulations

Existing building products with PCBs equal to or greater than 50 parts per million (ppm) aren't authorized for use and must be properly and legally disposed of.

Manufactured PCB products are materials made with PCBs and in a non-liquid state.¹⁶ TSCA and federal regulations prohibit the use of manufactured products that contain PCBs at greater than or equal to 50 ppm.¹⁷ They're defined as [PCB bulk product waste](#) and you must dispose of them according to federal regulations.¹⁸

Waste regulated under TSCA is sometimes referred to as **TSCA waste** and can include any wastes regulated under TSCA (such as asbestos). In this guide, TSCA waste refers to [PCB bulk product waste and PCB remediation waste](#).

Please note: During demolition or renovation, you may encounter wastes with PCBs below federal regulatory levels that don't designate as TSCA waste, but may still be regulated as dangerous waste by Washington state. Learn more about state dangerous waste requirements in our [Polychlorinated Biphenyl Dangerous Waste Guide](#).¹⁹

You may be in violation of TSCA and face financial penalties and liabilities for:

- Using banned substances (**using** includes PCB-containing materials at or above 50 ppm that are still in place).
- Storing, transporting, or disposing of these products in a way that doesn't follow the federal PCB regulations.

¹⁵ See details in the PCB Chemical Action Plan:

<https://apps.ecology.wa.gov/publications/SummaryPages/1507002.html>.

¹⁶ As defined in 40 CFR 761.3.

¹⁷ See 40 CFR part 761.

¹⁸ See 40 CFR 761.62.

¹⁹ <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

Ensure you comply by either:

- Sampling and analyzing the materials for PCB concentration and following the PCB regulations based on concentration.
- Conservatively manage your building materials as if they contain PCBs at or greater than 50 ppm.

Learn more about PCB regulations in [Appendix A. Federal and State Regulations](#) or our [Focus on: PCBs in Building Materials publication](#).²⁰

Exposure

Despite the 1979 ban on PCB manufacturing and use, many PCB-containing building materials are still in use. PCBs are detected in nearly every environment on Earth. It's estimated that more than half a billion pounds of PCBs produced entered the environment from spills, leaks, and improper disposal and storage.

PCBs in building materials are known to:

- Migrate and adsorb to other surfaces.
- Impact indoor air quality.
- Contaminate soil and groundwater.
- Enter stormwater.
- Impact surface waters and sediment.
- Impact aquatic organisms and those that consume them.

People can be exposed to PCBs from building materials through various routes, including:

- Inhaling PCBs in the air.
- Touching PCB-laden dust, paints, caulking, or leaking ballasts.
- Ingesting contaminated particles or dust.
- Eating PCB-contaminated food, such as fish and shellfish.

Because PCBs are so widespread in varying materials and different concentrations, they can be hard to identify. [EPA's PCBs in Building Materials Fact Sheet](#)²¹ can help you identify possible PCBs in building materials based on the building's age and types of materials known to have been manufactured with PCBs.

Although there aren't visual standards to determine if products were manufactured with PCBs, you can determine their presence by:

- Getting input from EPA and Ecology's team of experts.
- Contacting the Region 10 EPA Regional PCB Coordinator.
- Contacting an experienced regulated building material consultant, engineer, or certified industrial hygienist (CIH).

²⁰ <https://apps.ecology.wa.gov/publications/SummaryPages/2104030.html>

²¹ https://www.epa.gov/sites/default/files/2021-05/documents/final_pcb_buildings_fact_sheet_05-10-2021_to_upload.pdf

Exterior building materials

PCBs in building materials can be released into the environment during demolition and renovation, routine maintenance (such as cleaning and power washing), and contaminated site remediation. Although PCBs are continually released into the environment from exterior PCB-containing building materials exposed to weather, it's expected that PCBs are released in higher quantities when materials are disturbed or degraded.

Stormwater is a primary way that PCBs from exterior building materials enter surface waters, where they contaminate fish and shellfish—important food sources for Washington state communities.²²

This guide provides BMPs that will reduce PCB releases from exterior building materials and prevent them from entering stormwater drainage systems, which often discharge stormwater to rivers without any treatment.

Interior building materials

Although indoor air contaminated by PCBs from interior building materials is an important route of exposure for people while indoors, this guide focuses on remediating **exterior** building materials. If you'd like to learn how to remediate interior PCB sources, please see EPA's resources:

- [Fact sheets and other resources](#).²³
- [Diagrams Showing Actions for Reducing Exposures PCBs in Indoor Building Environments](#).²⁴
- [Actions for Reducing Exposure to PCBs in Indoor School Building Environments](#).²⁵

Environmental contamination

PCBs in building materials that are released into the environment cause contamination and may require cleanup.

If surface soil near your building(s) has PCBs, contact the EPA Region 10 PCB coordinator to find out how much soil to remove and replace—you may need EPA approval to engage in remediation activities. You must [report under the Model Toxics Control Act \(MTCA\)](#)²⁶ once you're aware of a release that's a risk to human health and the environment, too.

²² There are numerous instances in Washington state where PCB-containing caulk, paint, or other sealants have contributed PCBs to stormwater at concentrations that impact aquatic life and human health, evidenced by stormwater and storm drain solids samples.

²³ https://19january2017snapshot.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials_.html

²⁴ <https://www.epa.gov/pcbs/diagrams-showing-actions-reducing-exposures-polychlorinated-biphenyls-pcbs-indoor-building>

²⁵ https://www.epa.gov/sites/default/files/2016-03/documents/diagram_pcb_chrt_2_0_0.pdf

²⁶ <https://apps.oria.wa.gov/permithandbook/permitdetail/60>

You may also enter the Voluntary Cleanup Program to access technical assistance from Ecology staff about cleanup requirements. We recommend contacting an environmental consultant to discuss your options.

Although soil, surface water, and other environmental media contaminated by PCBs is an important issue, this guide doesn't focus on environmental remediation or the management of remediation waste. For more details, please see EPA's resources on [Managing Remediation Waste from PCBs Cleanups](#).²⁷

EPA tools and resources

EPA provides various tools, guidelines, and information about PCBs in building materials tailored toward school administrators, building owners and managers, and contractors. They also have tools highlighting approved test methods and other research. You can find these resources on their [PCBs in Building Materials webpage](#).²⁸

EPA's guidance materials are designed to ensure PCB cleanups comply with TSCA. There's less guidance for situations where PCBs are suspected, but not confirmed through sampling—or in situations that aren't governed by TSCA. **We designed this guide to help fill that gap.**

If you're a responsible party undergoing a TSCA-regulated PCB cleanup, we encourage you to contact your regional EPA office to clarify which standards apply to manage waste generated during your cleanup process.²⁹

PCB FAST

In 2019, EPA developed the PCB Facility Approval Streamlining Toolbox (PCB FAST) to improve how efficiently they approve PCB cleanup plans and recommendations. The PCB FAST framework includes:

- A checklist for an initial discussion with responsible parties.
- A PCB site cleanup framework, which summarizes the cleanup goals and expectations.
- A TSCA self-implementing cleanup checklist.
- A TSCA risk-based cleanup checklist.

PCBs in building materials fact sheet

In May 2021, EPA published a [PCBs in Building Materials Fact Sheet](#)³⁰ that explains how to identify, abate, and dispose of materials in accordance with TSCA.

²⁷ <https://www.epa.gov/pcbs/managing-remediation-waste-polychlorinated-biphenyls-pcbs-cleanups>

²⁸ <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials>

²⁹ EPA's regional office can provide guidance to help TSCA-related cleanup to comply with 40 CFR (761.61(a) vs. 761.61(c)).

³⁰ <https://www.epa.gov/pcbs/pcbs-building-materials-determining-presence-manufactured-pcb-products-buildings-or-other>

We suggest you familiarize yourself with it when planning demolitions or renovations—especially for work on structures built or renovated between 1950–1980, when it was more common to add PCBs to products.

EPA’s fact sheet explains how to:

- Evaluate PCB exposure through indoor air and/or wipe sampling.
- Review building records.
- Develop a building materials inventory.
- Do analytical testing on building materials.

Web content

EPA produced web content to assist building owners and abatement contractors when planning their demolition and renovation projects. These resources can be found on [EPA’s PCBs in Building Materials webpage](#).³¹

³¹ <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials>

Section 1: Steps to Identify PCBs Before Demolition or Renovation

It's illegal to have building materials in use if they contain PCBs at 50 ppm or greater.³² Buildings with products (such as paint and caulking) with this level of PCBs can be subject to TSCA fines.³³ It is also essential to protect Washington state's surface water by controlling sources of PCBs from building materials—regardless of TSCA regulations and the concentration of PCBs in the building materials.

These next steps are intended to help you:

- Properly identify whether your facility has PCBs in building materials.
- Plan your project before demolition or renovation activities.
- Develop a safety plan to protect yourself, your workers, and the environment from harm.

For this guide:

- **Renovation** refers to removing or modifying portions of a building that may disturb building materials without affecting the structural integrity of the building.
 - This includes repair and maintenance. It may also include window and doorway repair, surface restoration, and surface preparation activities like pressure washing, abrasive blasting, sanding, and scraping.
 - During renovation, consider building materials that will be disturbed during construction activities and the surrounding substrates.
- **Demolition** refers to wrecking or taking out any load-supporting structural member of a facility along with any related handling operations, or intentionally burning a facility.
 - During demolition, consider all suspect PCB-containing building materials.

As you prepare for renovation or demolition, screen your building to:

- Determine if the building is likely to contain PCBs in building materials.
- Determine if suspect building materials contain PCBs at concentrations of 50 ppm or greater.

If you find PCBs at concentrations of 50 ppm or greater in building materials,³⁴ you must conduct [abatement](#), which means characterizing, removing, and disposing of them in accordance with regulations. If you find concentrations below 50 ppm, you must follow stormwater BMPs to protect stormwater and downstream surface water bodies (refer to [Stormwater Management Manuals for Eastern and Western Washington](#)).

³² Manufactured PCB products that contain PCBs equal to or greater than 50 ppm are unauthorized for use and must be removed for disposal as a PCB bulk product waste (see 40 CFR §§ 761.3, 761.20(a), and 761.62).

³³ We implement federal and state laws by regulating stormwater discharges from municipalities, industry, construction, and other activities so discharges don't violate water quality standards. Read more in [Appendix A. Federal and State Regulations](#).

³⁴ See the [Common examples of building materials that contain PCBs](#) section for more information.

Flowchart: Identify and Manage PCBs in Building Materials

Building age

Was the building built or renovated (in whole or in part) between 1950–1980?

No →

Yes or unsure **Continue** ↓

Approach 1

Follow all applicable requirements from your:

- Local building permit.
- Washington State Construction Stormwater General Permit (CSWGP).
- Federal Construction General Permit (CGP).

Building use and structure

Is it a commercial, industrial, or multi-story residential building?

No →

Yes **Continue** ↓

Gather information

Review previous PCB-related investigations conducted for the property.

Inspect exterior of the building. Document location and state of suspected PCB-containing materials (such as caulk, paint, joint materials) and substrate material. Estimate dimensions to determine potential PCB bulk product waste volume. Refer to the Inventory Table attachment on this guide's summary page as an additional resource.

You don't identify any suspect PCB-containing materials and substrate materials after review →

You suspect PCBs and don't plan to renovate or demolish; instead, you will monitor and manage your inventory of PCBs →

You suspect PCBs and plan to renovate or demolish **Continue** ↓

Note: If you **conservatively manage** building materials as if they contain 50 ppm or more of PCBs, you may skip sampling. Follow **Approach 4** and continue to the **Create a PCBs waste plan** step.

Approach 2

Follow all applicable requirements in Approach 1 and Implement BMPs in this guide.

If this is a K-12 school, contact Washington State Department of Health and review EPA guidance for schools.

Sample Building Materials

Review EPA guidance on PCBs in Building Materials to develop an appropriate sampling plan. You may want to hire a consultant for this. Notify your Regional PCB Coordinator to make sure your approach meets TSCA requirements.

Once you sample PCBs and can confirm levels of PCBs and where they're located:

Your PCBs are less than 50 ppm →

Your PCBs are 50 ppm or more **Continue** ↓ and →

Approach 3

Follow federal and state requirements to handle, store, and dispose of waste containing PCBs. Address solid waste disposal and recycling of building materials from renovation or demolition. Implement BMPs in this guide and all applicable requirements from Approach 1.

Create a PCBs waste plan

1. Establish how you'll proceed with the project and designate your waste.
2. Based on prior steps, determine if the TSCA PCB waste is also:
 - Dangerous waste.
 - Solid waste or construction debris.
3. Figure out how much waste you have.
4. Plan waste disposal. Determine if you'll manage all demolition waste as PCB bulk product waste or if separate out PCB bulk product waste from PCB remediation waste.
5. Get a quote for disposal costs and end disposal facilities.

Once you establish your PCBs waste plan **Continue** ↓

Approach 4

Follow TSCA handling, storage, and disposal requirements. Identify both PCB bulk product waste and PCB remediation waste. Implement BMPs in this guide and all applicable requirements from Approach 1.

Begin abatement planning

Prepare an abatement work plan. Detail how you'll manage PCB-containing building and substrate materials.

Always know and follow applicable local, state, and federal permitting requirements. This includes establishing BMPs to protect stormwater. We recommend you contact your local municipality in case they have source control requirements.

Figure 1: Flowchart showing how to identify and manage PCBs in building materials. See the plain text version in [Appendix B](#).

Flowchart notes:

- Review [EPA's PCBs in Building Materials Guidance](#)³⁵ or contact your [Regional PCB Coordinator](#)³⁶ to determine if you should investigate further.
- While many publications indicate PCBs are more likely in certain types of buildings, federal PCB regulations don't authorize the use of PCBs in building products, regardless of the building type or age. Some facilities may have had PCB-containing products in storage and used them after 1980.
- Some studies indicate that concrete and masonry buildings built between 1950 and 1980 likely have high PCB concentrations.³⁷

Step 1: Look for PCBs by age, use, and building structure

Multi-story residential, commercial, and industrial-use buildings are most likely to contain PCBs because builders were targeting structural longevity. It was common for builders to use PCB-containing caulk in stand-up (or **tilt-up**) concrete and masonry buildings.

Large commercial and industrial buildings constructed in the 1950s–1970s tend to have similar architecture, which may help identify PCB sources.

- They often have a boxy or rectangular shape with a flat roof and no cornice.
- Low-rise buildings were commonly made of masonry, wood, pre-cast stone, or concrete.
- Mid-rise buildings were typically made of reinforced concrete.

Stand-up/tilt-up concrete slab exteriors were common during this time period—they used PCB-containing caulk in the thick joints between the concrete slabs. Examples of common structures with PCBs include:

- Masonry construction structures that use concrete blocks or bricks as load-bearing walls.
- Steel frame construction that uses steel studs, columns, joists, or trusses to support flooring and roofs.
- Concrete frame structures with reinforced concrete columns, beams, and slabs.

You can review building records, permits, construction plans, tax assessor records, work change orders, and other property documents to identify the building's age or last renovation date.

³⁵ https://www.epa.gov/sites/default/files/2021-05/documents/final_pcb_buildings_fact_sheet_05-10-2021_to_upload.pdf

³⁶ <https://www.epa.gov/pcbs/epa-regional-polychlorinated-biphenyl-pcb-programs#regionalcontacts>

³⁷ S. Klosterhaus, et al., "Polychlorinated biphenyls in the exterior caulk of San Francisco Bay Area buildings, California, USA," *Environment International* 66 (2014) 38–43.

If you answer yes to both questions below, your building’s exterior is likely to have PCB-containing materials:

- Was your building built or renovated from 1950–1980?
 - **Please note:** Buildings built or renovated in the 1980s may also contain PCBs if contractors used stocks of PCBs purchased before the manufacturing ban (such as paint or sealants).
- Is your building commercial, industrial, or multi-story residential?

If you suspect PCBs based on age, use, and building structure—or if you are unsure—move on to Step 2.

If you don’t suspect PCBs in building materials after this step, follow both:

- Applicable local building permit requirements.
- Washington State Construction Stormwater General Permit (CSWGP) or Federal Construction General Permit (CGP) requirements, if applicable.

Step 2: Identify and inventory suspect building materials

If you identify suspected PCB-containing materials, document and photograph:

- The current condition (such as deterioration, delamination, and physical damage).
- An estimate of the material quantity, color, and location.

Some building materials may not be visible due to building construction or previous renovations, such as flooring covered by carpet or replaced windows covering old caulking. Look for evidence of these materials in the building and document them accurately.

Please see an example inventory table in Figure 2. You can find a blank inventory table in [Appendix C](#), or you can download an Excel version on this [guide’s summary page](#).³⁸

³⁸ <https://apps.ecology.wa.gov/publications/SummaryPages/2204024.html>

Homogeneous Material Description	Approximate Quantity	Condition	Color	PCB Potential	Homogeneous Area/Location	Location to Closest Storm Drain	Comments
Window caulking 1	500 LF	Good, no damage	White to beige	Confirmed	First and second floor, exterior of building	30 Feet, West	Unsafe to sample, will manage as if it contains PCBs
Door caulking 2	100 LF	Poor, severe cracking	White to gray	Suspected	First floor, north and east entry ways	30 Feet, West	
Old paint coating 1	2500 SF	Fair, slight peeling	Aqua green	Unknown	Interior and exterior, painted on brick and drywall	20 Feet, East	
Galbestos paneling	5000 SF	Fair, some locations have damage	Corrugated metal with beige fibers	Assumed	Exterior of building	20 Feet, North	East side of building has damaged panels
Additional notes:							
LF: Linear Feet							
SF: Square Feet							

Figure 2: Example inventory table.

In addition to building materials, other products used in and around buildings may contain PCBs (such as oils contained within fluorescent light ballasts, capacitors, or transformers). Although we don't address them in this guide, we encourage you to have them properly removed. Anyone handling or disposing of them must comply with federal and state regulations.

Common examples of building materials that contain PCBs

These common building materials may contain PCBs³⁹ and are also often exposed to weather conditions that could impact stormwater. We discuss them more in the [abatement section](#).

- Caulk, grout,³⁹ expansion joints, and other joint material (such as putty, silicon, or bitumen).
- Paints, sealants, coatings, varnishes, and lacquers (particularly oil-based paint).
- PCB/asbestos-coated metal sheets (trade names: Galbestos and Robertson Protected Metal) and asphaltic roofing and tar paper materials.

³⁹ Grout, concrete, bricks, and cinder blocks are likely not primary sources of PCBs, but may be contaminated with PCBs by other materials that are primary sources.



Figure 3: Examples of common building materials that contain PCBs.

These are additional common building materials that may contain PCBs:

- Ceiling and floor tiles.
- Window and door frames.
- Rubber and felt gaskets.
- Non-conducting materials in electrical cables (such as plastic and rubber).
- Coal-tar enamel coatings (such as pipe coating) and rust inhibitor coatings.
- Insulation materials (such as fiberglass, felt, foam, and cork).
- Pipe hangers.
- Plastic applications, including vinyl and PVC.
- Sealants, including those used for heating, ventilation, and air conditioning (HVAC) equipment.
- Mastics.
- Synthetic resins and floor varnish.
- Spray-on fireproofing.
- Concrete.⁴⁰
- Bricks and cinder blocks.⁴⁰

⁴⁰ Grout, concrete, bricks, and cinder blocks are likely not primary sources of PCBs, but may be contaminated with PCBs by other materials that are primary sources.

Joint material between sidewalk slabs or paving around a building may also contain PCBs (such as the walkway from parking areas to building doorways). Also, consider whether renovation or demolition will disturb those parts of the property.

Most buildings built or renovated before 1980 have a range of these types of materials, but they don't always contain PCBs. Studies in Seattle, Tacoma, and other urban areas show that the presence and amounts of PCBs can vary greatly between building materials.

Look for caulks, sealants, and other suspect PCB-containing materials in original building plans and specifications—especially in areas that are not readily visible.

If you suspect PCBs in building materials, move on to Step 3.

If you don't suspect PCBs in building materials after this step, follow both (as applicable):

- Local building permit requirements.
- Washington State Construction Stormwater General Permit (CSWGP) or Federal Construction General Permit (CGP) requirements, if applicable.

Step 3: Review knowledge of suspect building materials

It's important to fully identify the extent of PCB contamination before beginning any destructive work.

Apply additional knowledge before you consider sampling. Conduct a records review and visual inspection to help you identify, characterize, and estimate the quantities of suspected PCB-containing building materials.

Note: To confirm the absence or presence of PCBs, you will need an accredited lab⁴¹ to analyze your building samples—see Step 4.

Step 4: Use sampling to characterize suspect building materials

You'll need to do representative sampling to determine if PCBs are present in building materials and how extensive their presence may be. If the sampling reveals PCB concentrations at 50 ppm or above, any further action you take must also comply with [TSCA regulatory requirements](#).

To determine if sampling and analysis make sense for your project, consider:

- Safety.
- Material type and quantity.
- Building age and type.
- Likelihood that suspect materials have been released to other surrounding building materials.

⁴¹ <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation>

- Sampling and analysis costs.
- Waste management and disposal costs.

In 2022, we worked with a consulting company to develop a [costing tool](#)⁴² that considers the above elements so you can broadly estimate your project's costs.

It may be safer, simpler, and more economical to conservatively manage your building materials as if they contained PCBs at or above 50 ppm.

If you choose not to move forward with your project at this time and instead use best management practices (BMPs) to monitor and manage your building's possible PCBs, see the [BMPs for PCB-containing Buildings section](#) for more guidance).

Sampling Plans

If you choose to move forward, you'll need to create a **sampling plan** that fully complies with TSCA and EPA requirements. See more details about what to include in the [sample collection section](#).

We encourage you to discuss your sampling plan with the [EPA Region 10 PCB coordinator](#)⁴³ **before** you begin renovation or demolition. This will ensure you properly address regulatory requirements before disturbing building materials. Based on their input, you may wish to hire a consultant who is familiar with regulated building materials to develop a sampling plan.

EPA recommends you test suspected building materials for PCBs by including these tasks as part of your plan:

- Use proper sample collection techniques to test suspected building materials and determine PCB sources.
- Determine the extent of contamination by including potential secondary sources of PCBs (such as surrounding porous materials like concrete that may have absorbed PCBs from the primary source).
- Collect samples from all suspect primary and secondary sources using a statistically defensible sample collection plan or the grid-based approach.⁴⁴
- Outline areas requiring corrective action.
- Prioritize contaminated building materials for removal based on:
 - PCB concentration levels.
 - Potential accessibility.
 - Exposure to weathering elements.
 - Condition of building material.
 - Proposed renovation impacts.

⁴² <https://apps.ecology.wa.gov/publications/SummaryPages/2204036.html>

⁴³ <https://www.epa.gov/pcbs/region-10-pcb-program#contacts>

⁴⁴ Provided in 40 CFR 761 – Subpart N.

EPA also sets standards for sample documentation and provides guidance on sampling collection procedures for bulk solid samples, porous and non-porous surface samples, and indoor air samples.

In some cases, you may want to minimize sampling and conservatively manage your PCB wastes as if they were at or above 50 ppm. For example, if you confirm the presence of PCBs in a small number of window caulk samples to be above 50 ppm, you could manage window caulks as TSCA waste to avoid additional sampling and analytical costs.

To prepare for disposal, contact your waste hauler or disposal facility to determine if they need analytical sample data before accepting waste for disposal.

Before sampling building materials, coordinate with an [accredited analytical laboratory](#).⁴⁵

Testing

Analytical testing is the only conclusive way to confirm there aren't PCBs in your building materials. When testing suspect materials:

- Ensure you thoroughly inventoried your suspect building materials. Use the list of known items PCBs were commonly added to in [Step 2](#).
- Ensure the person conducting sampling is qualified to collect samples and is familiar with proper sampling protocols and analyses of PCBs in building materials.
- Test for PCBs **at the beginning of your project**, during the planning stage.
 - Discovering PCBs during a project can dramatically increase costs and delays.
 - If you don't test before beginning active site work, and renovation or demolition with PCBs causes harm to others or the environment, you could be liable for excessive cleanup costs or claims of harm to workers or the public.
- Confirm sampling requirements with your waste hauler and disposal facility—they may require analytical data.
- Collect samples from various areas of the building with suspected PCB-containing materials. For example, some windows may contain PCBs in the caulking while others may not, so you may need a sample from each set of windows.
- Document the exact location of where you collected each sample—use photographs, schematic drawings, or a building map.
- Work with EPA to determine characterization requirements. This will help you know how to dispose of PCB-containing materials to both protect the environment and meet TSCA requirements. Sampling must represent each material type.

At a minimum, we recommend you consider sample frequency per material type when preparing your work plan or follow the latest EPA guidance (see Tables 1 and 2).

⁴⁵ <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation>

Table 1: Minimum number of samples based on square footage of building material.

Square Footage of Building Material	Minimum number of samples
1–1,000	3
1,000–5,000	5
More than 5,000	7

Table 2: Minimum number of samples based on linear feet of building material.

Linear Feet of Building Material	Minimum number of samples
1–50	1
50–250	3
250–1,000	5
1,000–2,500	7
More than 2,500	9

Table notes:

- Values are based on the Bay Area Stormwater Management Agencies Association.⁴⁶ For uniform materials, such as thermal insulation, you may only need to collect one sample. It’s best to use the same length as using one side of a grid (for example, for every 100 square feet of sampling, every 50 feet would need a linear sample).
- Consider using these numbers as guidelines to estimate the level of effort and cost associated with characterizing your materials. EPA has further guidance related to porous materials.⁴⁷
- If PCBs are released into the environment from your building, it may be more expensive for you to address later.

Sample method and collection

Method

EPA SW 846 Method 8082A (Method 8082A) is the approved sampling method for building materials. It reveals the PCB concentration as **Aroclors**, a commercial mixture of PCB chemical compounds. Each Aroclor has a specific number that indicates the chlorine concentration in the compound.⁴⁸

Laboratory data reports often include the sample’s Aroclor concentrations and provide a “total PCB (as Aroclors)” concentration in the results. If a “total PCB (as Aroclors)” concentration is not provided in the lab results, you should **add up the concentrations** of each detected Aroclor to determine the total PCB concentration.

Collection

Make sure only trained staff collect your samples and only a laboratory accredited to perform Method 8082A analyzes them.

Follow these steps:

⁴⁶ Bay Area Stormwater Management Agencies Association, “PCBs in Priority Building Materials: Model Screening Assessment Applicant Package,” 2019.

⁴⁷ Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs): <https://www.epa.gov/sites/default/files/2015-08/documents/484692.pdf>

⁴⁸ See common Aroclors at <https://www.epa.gov/pcbs/table-aroclors#:~:text=The%20numbering%20standard%20for%20the,by%20mass%20in%20the%20mixture.>

1. Ask the analytical laboratory (lab) about the Method 8082A reporting limit.
 - Compare the reporting limit to applicable county, state, and/or federal cleanup levels.⁴⁹ The reporting limit must be lower than the cleanup level.
 - If the reporting limit is above the cleanup level, ask the lab if they can analyze to a lower reporting limit. If not, contact other labs and repeat this step.
2. Ask the lab to provide the sum of Aroclors (total PCB concentration) in the results and ask them for chain of custody forms. Also confirm:
 - Availability.
 - Sample drop-off hours.
 - Required sample volume.
 - Sample holding time.
 - Estimated data turnaround time.
 - Sample container type (the lab will be able to provide these).
 - Any potential tools or conditions that could contaminate a sample.
3. Develop a sampling plan to document requirements and characterize areas of potential contamination. Consider:
 - Proposed project schedule.
 - Sampling objectives.
 - Intended data use.
 - Data quality objectives.
 - Action, screening, and cleanup levels.
 - Monitoring approach.
 - Sampling methodology.
 - Sampling equipment and tools for disassembling building components. You can use stainless steel bowls to hold the materials before placing them in the sample container (with a stainless steel spoon) provided by the lab.
 - Health and safety requirements, including personal protection equipment.
4. Before collecting samples:
 - Minimize dust through practices such as:
 - Wetting the material with deionized water.
 - Sampling under a shroud.
 - Using appropriate tools.
 - Use clean tools to collect a section of building material.
 - Place the sample in a lab-approved container. Label each sample with the identification number/code, date, and time.

⁴⁹ Link to guidance on MTCA cleanups: <https://ecology.wa.gov/CLARC>. Please consult a trained professional who specializes in using cleanup levels. Method 8082 may not be sufficient for all sites.

- Decontaminate reusable tools with a detergent that effectively removes PCBs (ask the lab what will work best). Rinse with deionized water in between sample collections. Change gloves between each sample collected.
5. Document all pertinent information about sampling activities and observations, including:
- Exact time and date of sampling events and/or visual observations, including weather.
 - Types of samples collected and sample identification number.
 - Number of samples collected.
 - Specific description of sample locations.
 - Description of sampling methods.
 - Field observations.
 - Personnel on site (such as field crew, facility representatives, and visitors).
 - Complete a chain of custody form⁵⁰ and submit it to the lab with your samples.
 - Photographs. Include wide shots and close-up shots of site activities, areas of sample collection, and sampled containers.
 - Consider collecting additional information on materials you sample from, including:
 - Color.
 - Condition.
 - Approximate quantity.
 - Location and extent, including all places the material is present.
 - Materials that cannot be sampled due to access restrictions, building work limitations, or safety concerns.

Please note: We included some of these categories in the example inventory table, available as an attachment and in [Appendix C](#).

⁵⁰ Obtain this form from the laboratory prior to conducting sampling.

Section 2: The PCB Management and Abatement Process

This section explains how to safely remove and dispose of exterior building materials determined to be TSCA wastes that contain PCBs. It's based on EPA guidance and Ecology's technical expertise and focuses on protecting the environment during and after demolition and renovation—specifically on preventing PCBs from entering stormwater.

The TSCA requirements and EPA coordination we describe in this section assume:

- You have PCBs greater than or equal to 50 ppm in your building materials.
- You will characterize them as PCB bulk product waste and/or PCB remediation waste.
- You will characterize the contaminated material as PCB remediation waste if surrounding substrates are contaminated with PCBs at any concentration from the building material.

Please see [our Polychlorinated Biphenyl Dangerous Waste Guide](#)⁵¹ to ensure you meet Dangerous Waste Requirements and to determine if you have other types of PCB wastes you must manage.

Although safely removing and legally disposing of PCB-containing material is labor intensive and can be costly, improper abatement and disposal may cost more due to:

- Re-doing renovations.
- Financial penalties for unauthorized activities.
- Legal liability (such as workers harmed or property transfers).
- Potential cleanups of contaminated soils, stormwater drainage pipes, and/or surface water bodies.

In 2022, we worked with a local consulting company to develop a [costing tool](#)⁵² that considers the PCB management and abatement process so you can broadly estimate your project's costs. We included cost ranges for the various abatement steps in the tool to help you evaluate your project's feasibility.

Please note: PCB household wastes are narrowly defined as specific items generated by residents for household maintenance.⁵³ Demolition and renovation waste don't qualify as household wastes.

If you identify PCBs greater than or equal to 50 ppm in your building materials, we recommend you work directly with the EPA Region 10 PCB Coordinator to ensure your demolition or renovation project meets TSCA requirements. Based on their input, you may wish to hire a

⁵¹ <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

⁵² <https://apps.ecology.wa.gov/publications/SummaryPages/2204036.html>

⁵³ See 40 CFR 761.3: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-761>.

consultant or other experienced professional who is familiar with managing and disposing of regulated building materials.

Here are direct links to the topics addressed in this section:

[Waste handling, storage, and disposal](#)

[Preparing a work plan](#)

[Abatement](#)

- [Stormwater requirements](#)
- [Best management practices \(BMPs\)](#)
- [Addressing exterior building materials](#)
 - [Caulk and expansion joint abatement](#)
 - [Paints and coatings abatement](#)
 - [Galbestos panel abatement](#)
 - [Miscellaneous materials abatement](#)

Waste handling, storage, and disposal

The following non-liquid PCB bulk waste materials may be disposed of at municipal or non-municipal non-hazardous waste landfills permitted, licensed, or registered by Washington state:

- Plastics, including:
 - Plastic insulation from wire or cable.
 - Radio, television, and computer casings.
 - Furniture laminates.
- Preformed or molded rubber parts and components.
- Applied dried paints.
- Varnishes.
- Waxes or other similar coatings or sealants.
- Caulking.
- Galbestos.
- Non-liquid building demolition debris.

If you're disposing at a facility without a commercial PCB storage or disposal approval, you must:

- Provide written notice to the landfill at least 15 days before the first shipment.⁵⁴
- Maintain a written record for 3 years from the date of the waste's generation of:
 - All sampling and analysis of PCBs.
 - Notifications made.⁵⁵

Please note: During demolition or renovation, you may encounter wastes with PCBs below federal regulatory levels that don't designate as TSCA waste, but may still be regulated as dangerous waste by Washington state. Learn more about state dangerous waste requirements in our [Polychlorinated Biphenyl Dangerous Waste Guide](#).⁵⁶

You must properly dispose of your waste. To do that, you must:

- Properly profile your waste with the disposal facility so you have an approved waste stream ready. Reach out to disposal facilities early in your project to ask:
 - What they're permitted for.
 - What wastes they'll accept without profiling.
 - What requires profiling or specific permissions.
- You must determine the type of waste and arrange for disposal at an appropriately permitted waste facility.
 - You must dispose of building materials with confirmed concentrations of 50 ppm or greater as PCB bulk product waste.
 - Alternatively, you can conservatively manage building materials as if PCB concentrations are equal to or greater than 50 ppm.
 - You may also have PCB remediation waste (see the [PCB Bulk Product Waste vs. Remediation Waste section](#) for additional details).
- Limit waste accumulation on site by pre-arranging large-volume waste transportation.
- Properly package your waste according to U.S. Department of Transportation (USDOT) regulations.
 - Ensure shipping documents are correct for the type of waste being disposed of.
- Use bins or roll-off containers pre-lined with plastic to dispose of PCB waste.
 - Once full, roll and "burrito wrap" the waste inside the bin.
 - You may also need to follow asbestos management requirements for Galbestos panels.

⁵⁴ You must include information as described in 40 CFR 761.62(b)(4)(i) and (ii).

⁵⁵ See 40 CFR 761.62(b)(5).

⁵⁶ <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

Preparing a work plan

Each project needs its own site-specific work plan. Include these steps in your plan to make sure you prevent PCB exposure and follow applicable rules.

- Determine EPA’s notification requirements if you have PCBs at or above 50 ppm.
- Get relevant permits.⁵⁷
 - Develop a Stormwater Pollution Prevention Plan (SWPPP).
 - Include BMPs for the site, regardless of PCB concentration.
 - Consult the [Stormwater Management Manual for Western Washington \(SWMMWW\)](#) or [Eastern Washington \(SWMMEW\)](#),⁵⁸ for details about BMPs and SWPPPs.
- Develop a project-specific health and safety plan.
 - Require appropriate training, qualification, certificates, and personal protective equipment (PPE) for worker health and safety.
 - Conduct air monitoring and/or sampling by an experienced professional that meets local, state, or federal regulations.
- Review the PCB sampling report.
- Prepare your site for renovation or demolition activities.
 - Identify areas with:
 - Drainage system features, such as storm drain inlets (catch basins), pipes, ponds, and underground infiltration facilities.
 - Potential water pathways, such as slopes and paved areas that direct stormwater.
 - Restricted access and obstacles.
 - People nearby (such as neighboring homes or parks).
 - Set up the site so it follows your Stormwater Pollution Prevention Plan.
 - Be aware of, identify, and properly manage additional hazardous materials (such as asbestos or lead) as required by federal, state, and local requirements.
- Describe BMPs you’ll follow to:
 - Keep workers safe.
 - Prevent PCBs from being released as they’re removed and before they’re disposed of.
 - Prevent PCBs from entering the stormwater drainage system and nearby waterways.

See a comprehensive list in the [BMPs section](#) below.

⁵⁷ Such as a Washington State Construction Stormwater General Permit, Federal Construction General Permit, and city demolition permit.

⁵⁸ <https://ecology.wa.gov/stormwatermanuals>

- Prepare a waste management plan.
 - Describe how you'll remove and manage the PCB bulk product waste.
 - Determine how you'll [characterize, handle, store, label, and dispose of the waste](#).
- If the building will be occupied during and/or after completing the work, plan how you'll address indoor air quality and dust concerns. This may involve:
 - Isolating and cleaning ventilation systems.
 - Removing carpet.
 - Vacuuming with a HEPA filter.
 - Wet wiping dusty areas.
- Consider and discuss PCB-related on-site risks and potential ways to help minimize those risks. This could include:
 - Regular site walks.
 - Discussing site activities and potential risks with team members.
 - Completing operations in phases.
 - Safe renovation and abatement techniques.
- Describe how you'll document the characterization and abatement work.
 - Keep accurate and current documentation so information is readily available upon EPA request.

You should write and develop the work plan to meet existing industry standards for your demolition or renovation job. This may include developing design specifications. If you're not familiar with TSCA regulations, work with an expert or consult with EPA's PCB Program. These rules and regulations can be confusing and complex, but if you don't follow them properly, you may be liable for costly cleanup.

Abatement

EPA has some PCB-specific guidance available on their website:

- [Handling PCBs in caulk during renovation](#).⁵⁹
- [Steps to safe renovation and repair activities for PCB-containing buildings](#).⁶⁰
- [Steps for safe PCB abatement](#).⁶¹

This guide focuses on exterior building materials to supplement EPA's guidance and to be more protective of stormwater. The following sections include considerations for a safe, successful abatement.

⁵⁹ <https://www.epa.gov/sites/default/files/2016-01/documents/contrctrs.pdf>

⁶⁰ <https://www.epa.gov/pcbs/steps-safe-renovation-and-repair-activities#a2>

⁶¹ <https://www.epa.gov/pcbs/steps-safe-pcb-abatement-activities>

Stormwater requirements

No matter how large or small your construction activity is, if you're discharging stormwater that significantly contributes pollutants⁶² to state waters you must do all of the following:

- Request coverage under the [Washington State Construction Stormwater General Permit \(CSWGP\)](#).
 - Contact Ecology's Water Quality staff to determine if CSWGP coverage is appropriate. While CSWGP coverage is usually required when disturbing 1 acre or more of land, it's also required for sites of any size discharging stormwater to state waters that either:
 - Ecology determines to be a significant contributor of pollutants.
 - Is reasonably expected to cause a violation of any water quality standard.
 - Coverage may be required under the Federal Construction General Permit instead. See the [Federal and State Regulations section](#) for details.
- Comply with any applicable provisions of the [CSWGP](#).⁶³
- Comply with any applicable [municipal stormwater permit \(MS4\) requirements](#) required by your city or county.
- [Report releases of a hazardous substance to the environment under MTCA](#).⁶⁴

Best management practices (BMPs)

The following BMPs reflect guidance from EPA, Ecology, and Seattle Public Utilities.⁶⁵ Use them when demolishing or renovating buildings with PCB-containing materials.

Continuously notify

Make sure building occupants, workers, building owners, contractors, subcontractors, maintenance staff (such as groundskeepers) and community members know about your project. Share:

- Goals, methods, and duration of demolition or renovations.
- Health and safety aspects of the project.
- Site access requirements and limitations.

⁶² We determine significant contributions of pollutants based on: <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Contaminated-water-on-construction-sites>

⁶³ <https://ecology.wa.gov/Construction-stormwater-permit>

⁶⁴ <https://apps.oria.wa.gov/permithandbook/permitdetail/60>

⁶⁵ Publications include:

- https://www.epa.gov/sites/default/files/2019-05/documents/final_2017_cgpfact_sheet.pdf
- San Francisco Estuary Institute, "A BMP tool box for reducing Polychlorinated biphenyls (PCBs) and Mercury (Hg) in municipal stormwater," Oakland, CA, 2010.
- GeoSyntec Consultants and Larry Walker Associates, "BMPs for Reducing PCBs in Runoff Associated with Demolition and Remodeling Projects - prepared for Spokane River Regional Toxics Task Force, Spokane Regional Health District," 2018.

Train workers appropriately

- Discuss the potential presence of PCBs in materials. Explain how they affect human health and the environment.
- Identify safety and health personnel for the site.
- Locate safety and health hazards on site.
- Require personal protective equipment (PPE).
- Specify work practices to reduce hazards.
- Ensure workers use engineered controls and equipment safely.
- Make sure workers recognize signs, symptoms, and hazards of exposure.
- Ensure compliance with OSHA Health and Safety requirements and Washington Industrial Safety and Health Act (WISHA) requirements.
- Review the site health and safety plan.

Use appropriate personal protective equipment

Accumulate and dispose of contaminated personal protective equipment (PPE) appropriately. PPE for this type of project includes:

- Chemical-resistant gloves.
- Disposable Tyvek coveralls and shoe covers.
- Safety glasses or protective goggles.
- Respiratory protection.

Contain the work area

- Close windows and doors within 20 feet of the work area and provide seals (such as secured poly sheeting) over windows and doors.
- Shut down the HVAC system for the inside space opposite the external work area.
 - Leave it off until you complete the PCB abatement work.
 - Seal all openings to protect the system from contamination.
- Construct a containment area to keep all generated dust or debris inside the protected area.
 - Support the enclosure with mobile scaffolding.
 - Attach heavy plastic sheeting—use two-by-fours to create a passage.
 - Tape heavy plastic sheeting to the floor.
 - Consider placing the containment area under negative air pressure using high-efficiency particulate air (HEPA) filtration units.
 - Build a decontamination area just outside the enclosure.
 - Put heavy plastic on the ground for workers to remove PPE and clean equipment.

- Establish a hygiene station for employees to wash hands before breaks that involve eating or drinking, and before leaving at the end of their shifts.
 - Cover any drain inlets around or near the building and containment area.
 - Create a plan to address difficult areas to contain.
 - Cover the ground and plants with heavy plastic or alternative. Secure one end to the exterior wall and extend the plastic at least 10 feet from the building.
 - Seal⁶⁶ any vents or air exchange systems located in the work area.
 - Move any play areas within 20 feet of the building. If they can't be moved, cover them with heavy plastic.
 - If you're working above the first story, extend the plastic covering around the building to catch falling debris.
 - Cover scaffolding sides with plastic sheeting when near a sidewalk, street, or property boundary, or when the building has more than three floors.
 - Avoid working in high winds. Take extra precautions when working in wind strong enough to move dust and debris.
 - For example, you can construct a windscreen of plastic at the edge of the groundcover to keep dust and debris from spreading.
 - You can look up wind speed and direction—and other adverse weather conditions—online.
 - Avoid working in heavy rain and make sure containment will hold up during heavy rainfall and runoff.
 - Control dust outside of the work area.
 - Stage all tools and supplies on the protective sheeting next to the containment area before you begin work. This will help you avoid unnecessary trips outside of the enclosure.
 - Remove or vacuum off disposable protective suits before exiting the work area.
 - Before stepping off the plastic sheet, remove disposable shoe covers and wipe/vacuum shoes—especially the soles.
 - Consider using a large disposable tack pad or sticky pad on the floor to clean shoe soles.
 - Consider setting up containment, controls, and/or monitoring on the inside of the building opposite the external work area. This could include:
 - Plywood sheeting to block a window.
 - Plastic sheeting draped along an interior wall.

⁶⁶ A seal is defined as a physical barrier (one or more layers of plastic) sufficient to prevent airborne contaminants in a work area from migrating into an adjacent area, protecting the environment from air pollution release due to abatement activities.

- Pre- and post-abatement wipe sample collection from the wall and/or floor to ensure controls were effective.
- Take field notes and photographs throughout abatement to document removal activity and building conditions.

Use tools and equipment appropriately

- Select tools and work methods that generate the least dust and heat.⁶⁷
- Consider using manual tools—especially for smaller or difficult to reach areas—because they generate less fine dust and heat.
- Be aware of your tools' temperature. If they get hot enough to boil water (212°F), they may release gases containing PCBs into the air.
- Make sure you have protective containment measures in place for your electromechanical tools.⁶⁸
 - They complete larger areas and materials more quickly but generate more heat and dust.
 - Define work area containment and use HEPA vacuum or wet control attachments when possible.

Take proper precautions during renovation or demolition

- Don't proceed with renovation or demolition until you've removed hazardous materials from the building (such as PCBs).
- Spray potable water during demolition to limit dust generation, but use techniques that limit excessive water use to avoid generating runoff.
- If there is runoff, contain it and collect it.
- Make sure any PCBs in wastewater meet disposal requirements.
- Follow site erosion and sediment controls⁶⁹ to protect demolition materials from wind and water exposure, and prevent them from moving off site. For example, consider how you will:
 - Prevent erosion of soil, debris, and fine particles.
 - Prevent track out from vehicles and workers.
 - Manage stockpiles (for example, how you'll cover or stabilize them, or where you'll store them).
 - Manage TSCA waste, contaminated soil, and concrete debris.
 - Manage dewatering activities to avoid transferring solids.

⁶⁷ See EPA's summary of suggested tools and methods: <https://www.epa.gov/pcbs/summary-tools-and-methods-caulk-removal>.

⁶⁸ Examples of these types of tools: oscillating knives, jigsaws, saber saws, rotary cutting tools, angle grinders, masonry groove cutters, circular saws, and slot mills.

⁶⁹ Available on Washington's Stormwater Center: <https://www.wastormwatercenter.org/permit-assistance/municipal/municipal-tools-resources/>

- Protect sensitive areas, such as trees and creeks.
- Minimize land disturbance when operating paving and grinding equipment.
- Observe any additional demolition BMPs the municipality may require.

Set up and begin structural stormwater BMPs

- Clean out catch basins on or near the site before beginning abatement or demolition. Protect these catch basins throughout the project.
- Protect nearby exposed soils. Don't expose them to building debris or unnecessary construction activities.
- Install berms around the work area to prevent stormwater runoff into and out of the work area.
- Cover nearby storm drain inlets when feasible or install and maintain a filter insert at the applicable storm drain inlet(s).
- Have a plan in place to monitor BMP effectiveness (such as checking the position of storm drain inlet covers, condition of filters, and berms daily).

Conduct regular housekeeping

- Check the work area for dust and debris.
 - Keep it as clean as possible.
 - Make sure it's free of dust and debris once the job is complete.
- Daily:
 - Pick up as you go. Put trash in heavy-duty plastic bags.
 - Vacuum the work area with a HEPA vacuum cleaner multiple times throughout the day and again at the end of the day.
 - Cover and line trash containers. Remove material from the site daily.
 - Clean tools at the end of the day.
 - Dispose of or clean PPE.
 - Manage produced wastewater as TSCA waste.
 - You may discharge to sanitary sewer only if the receiving wastewater agency authorized it and it meets all standards.
 - Keep the work area separate from the rest of the building. Remind occupants to stay out.
 - Change out of work clothing before returning home. Wash non-disposable PPE that may be contaminated with dust.
 - Use site security measures to prevent unauthorized parties from entering the work area until after the final cleanup. Examples of security measures include:
 - Lock fence gates or doors to the work areas during off hours.
 - Place signs, barrier tape, and/or cones to keep all non-workers out of the work area. Make sure signs:
 - Are in the occupants' primary languages.

- Read “Do Not Enter—Authorized Personnel Only” and “No Eating, Drinking, or Smoking.”
 - Include the PCB Mark as described in 40 CFR 761.45.
- Identify authorized parties and any limitations to their approved activities.
- Provide a way to approve visitors to the work area.
 - Make sure trained site personnel accompany visitors at all times.
 - Verify that visitors have site-required PPE.
- At the end of the project:
 - Properly dispose of all trash and debris—including building components and structural stormwater BMPs.
 - Vacuum any exposed surfaces—including walls and ceilings—with a HEPA vacuum cleaner and wet-wipe. Decontaminate all equipment as necessary.
 - Mist dusty sections of the plastic sheeting with water before taking them down. This will keep the dust from becoming airborne again.
 - Remove plastic sheeting carefully. Fold it with the dirty side in, tape it shut, and properly dispose of it.
 - Visually inspect the site to ensure no dust or debris is present. Re-clean the area thoroughly if you find dust or debris.

Addressing exterior building materials that contain PCBs

Follow important procedures and recommendations—in addition to the [BMPs](#) above—when renovating or demolishing a building with exterior PCB-containing materials.

Your site may also have specific conditions that require additional procedures. Consider specific exterior building materials that are more common and likely to affect stormwater during renovation or demolition. We discuss them more in these sections:

- [Caulk and expansion joints.](#)
- [Paints and coatings.](#)
- [Galbestos panels.](#)
- [Miscellaneous materials management.](#)

EPA and the Occupational Safety and Health Administration ([OSHA](#))⁷⁰ also have more guidance available:

- [Steps to safe PCB abatement activities.](#)⁷¹
- [Summary of tools and methods for caulk removal.](#)⁷²

⁷⁰ <https://www.osha.gov/>

⁷¹ <https://www.epa.gov/pcbs/steps-safe-pcb-abatement-activities>

⁷² <https://www.epa.gov/pcbs/summary-tools-and-methods-caulk-removal>

Planning the project

It's essential to prevent PCBs from moving off site. Plan and implement your project so that PCB-containing materials don't impact the surrounding air, stormwater, surface waters, soil, or hard surfaces (such as sidewalks, roads, driveways, or streets).

Select your tools

Select the appropriate tools to remove PCB-containing materials. Some materials could require different abatement methods. Detail each method in your plans.

- Evaluate where the material is located and how hard it is to reach.
- Consider the material's properties. For example, is it brittle, elastic, smooth, and/or rough?
- Consider dust and heat concerns.
 - If your tools or work methods generate high heat (temperatures exceeding 212°F), PCBs may release into the air and workers or occupants may breathe them in.
 - You need to use more protective measures for methods that generate moderate to heavy amounts of dust or heat.
- Consider the size of the project.
 - Manual tools are generally used for smaller projects or when access is difficult.
 - Electromechanical tools have ergonomic advantages over most manual methods and may be better suited for a larger project.

Prepare the work area

Follow the site-specific abatement work plan and health and safety plan you developed.

Additional steps may include:

- Posting warning signs at each entrance and surrounding the PCB-removal work area.
- Using "danger" tape to clearly show the work area.
- Reviewing necessary documents (such as the health and safety plan) with on-site workers.
- Establishing exclusion or contamination reduction zones.
- Making sure the supervisor or designated competent person⁷³ is monitoring the PCB-removal work area to prevent unauthorized entry.
- Conducting air monitoring as laid out in the site-specific approved health and safety plan.
- Setting up a waste accumulation area.

⁷³ The designated competent person must meet worker protection standards and be someone who has the experience to recognize occupational PCB hazards and authority to prompt corrective measures.

Caulk and expansion joints

Remove and handle PCB-containing caulk and expansion joints in a way that disturbs them as little as possible.

Evaluate the caulk:

- Where is it?
- What quantity is present?
- How brittle is it?
- What kind of building material is it attached to?

Determine which tools will work best. Then build your health and safety plan and stormwater management plan.

The substrate may be contaminated. You may want to cut into the substrate around the PCB-contaminated area and remove the section of both the PCB-contaminated caulk and the surrounding substrate.⁷⁴ If the substrate stays attached to the PCB-containing material, the entire piece is considered PCB bulk product waste.

Paints and coatings

You may remove bonded or adhered paints or coatings with a few methods:

- Manual (hand scrapers, razor scrapers, and/or other handheld tools).
- Mechanical (sand or abrasive blasting, and dry ice blasting).
- Chemical (paint strippers).

Properly contain and dispose of wastewater you generate during the removal process. Ensure liquid solvents (like paint strippers) are both:

- Stored properly on site (under cover, with secondary containment).
- Not released into the surrounding soil, hard surfaces, or storm drain inlets.

You may need to follow specific safety considerations depending on the removal method you use. You must detail them in the work plan and health and safety plan, and ensure they're followed.

Be aware the substrate may be contaminated. You might want to cut into the substrate around the PCB-contaminated area and remove the section of both the PCB-contaminated caulk and the surrounding substrate. If the substrate stays attached to the PCB-containing material, the entire piece is considered PCB bulk product waste.

⁷⁴ Refer to Step 2 of EPA's Steps to Safe PCB Abatement activities for more details:
<https://www.epa.gov/pcbs/steps-safe-pcb-abatement-activities>

Galbestos panels

You may remove Galbestos panels with machinery or manual hand tools.

- Use manual hand tools for either:
 - The overall site.
 - Hard-to-reach areas.
- For machinery:
 - Use specific equipment (such as shears) to remove panels by gripping the panel and pulling the sheet. This allows the bolted connections to pull through the sheet or break.
 - Use dust suppression shears or ancillary equipment to provide adjustable water flow. This can suppress any release of asbestos dust, chips, or fibers.

Miscellaneous materials management

Please note: See potential building materials that may contain PCBs from production or cross-contamination—they're listed in the Steps to Identify PCBs section.

There are three options when decontaminating miscellaneous materials:⁷⁵

- **A measurement-based procedure** that analyzes a material sample after decontamination to confirm you met the standards.
- **A self-implementing procedure** that follows the exact methods in 40 CFR 761.79(c) to decontaminate materials. You don't need to sample the decontaminated materials after the procedure.
- **A risk-based procedure that requires prior written approval from EPA.**

When contaminated nonporous materials (such as metal or glass) are in contact with non-liquid PCBs, consider the following:

- When possible, either decontaminate all nonporous materials in place or disassemble and transport them to a secure decontamination area. Stage all decontamination areas on undamaged polyethylene sheeting.
- If you decontaminate nonporous materials by chemical washing with a chemical extraction solvent, follow the manufacturers' recommended procedures.⁷⁶
- You must collect wastewater generated from the decontamination process in USDOT-approved containers for proper disposal.
- Collect and dispose of decontamination waste and residues in accordance with federal regulations.⁷⁷

⁷⁵ The Federal PCB decontamination regulations are located at <https://www.osha.gov/>.

⁷⁶ Find solvents allowed under CFR 761.79(c), the self-implementing procedures, in CFR 761.79(d).

⁷⁷ See CFR 761.79(g).

Section 3: How to Protect Stormwater from PCBs in Buildings Materials Before Removal

Once you're aware or suspect that PCB-containing materials exist in your building, removal and disposal may take time. You'll need to:

- Gather enough information to make decisions about how and when to remove the PCB-containing materials.
- Coordinate with the EPA Region 10 PCB Coordinator if PCBs are 50 ppm or greater, or if you're conservatively managing building materials as if they contain 50 ppm or greater PCBs.
- Be prepared for delays due to permitting processes (construction or development permits).

In the meantime, it's important to prevent the release of PCBs into the environment. We recommend the following best management practices (BMPs) to protect stormwater—this is a direct pathway that links PCB sources to surface water bodies.

While you have the flexibility to choose which practices to implement, you must minimize the building materials' exposure to rain and other stormwater flows. PCB-contaminated stormwater discharge may be defined as illicit, and local regulatory agencies may require stringent controls to protect public drainage systems and local waters.

Best management practices to protect stormwater

Provide training and awareness

Make sure anyone involved in building and property maintenance are aware that:

- The building exterior contains PCBs.
- The PCBs should remain intact until you can begin proper removal.

Make sure landscaping and cleaning crews know where PCBs are identified in your building's materials and are trained on these BMPs.

Coordinate with your municipality

Contact your local municipality's stormwater program to let them know PCB-containing materials are present. They may be able to prioritize street sweeping and/or storm drain pipe cleaning in the area.

Plan for wet weather

Before wet weather begins, establish good source control practices (refer to the Source Control BMPs in the SWMMWW or SWMMEW,⁷⁸ as applicable). By removing or protecting potential

⁷⁸ <https://ecology.wa.gov/stormwatermanuals>

contamination sources before it rains, fewer PCBs will enter the stormwater system and our waterways.

Inspect regularly

Regularly look at the areas where you know or believe PCB-containing building materials are present to make sure they remain intact. If weathering (such as flaking or peeling) becomes worse, consider moving up your removal and disposal timeline. EPA's Region 10 PCB Coordinator may be able to provide advice.

Collect eroded material

Use a shop vacuum with a HEPA filter to collect paint chips or other building material that might blow off your building in the wind or physically degrade and fall to the ground.

Make sure any equipment you use to collect materials potentially containing PCBs is exclusively used for this activity—this will prevent potential cross-contamination with clean areas. Mark equipment as “PCB contaminated” and store it properly.

Prevent PCB-contaminated particles from migrating

Don't transfer any soil at PCB-containing building sites into neighboring properties, the street, vegetation, ditches, or other nearby areas. You must protect the soil from rain, wash water, and stormwater flows. Don't do any building washdowns.

- Use a HEPA vacuum below painted walls, caulking seams, windows, doors, downspouts, and any specific exterior features known or suspected of containing PCBs.
- Use dry methods to carefully collect the removed dirt, take a representative sample in-place and analyze the sample to determine if PCBs are present and at what levels in this waste. Contain the collected soil for waste designation and proper disposal.
- **Don't** use leaf blowers or brooms to move surface dirt away from hard surfaces. Blowers and brooms might spread contamination across a wider area.
- **Don't** use liquids (such as water or detergent) to spray dirt off hard surfaces, such as with a gardening hose or pressure washer. This will transfer contaminants into the street and the storm drainage system.

Cover materials

You may not continue to use PCB-containing paint, caulking, or other materials. Contact the EPA Region 10 PCB Coordinator to discuss using an encapsulant⁷⁹ as a short-term, protective option.

- Cover exterior peeling paint with an encapsulant to minimize paint degradation.
- Cover exterior caulking and joint sealant seams with an encapsulating layer to help reduce or prevent stormwater contact.

⁷⁹ EPA published research on effective encapsulants: <https://www.epa.gov/sites/default/files/2015-08/documents/p100fa5l.pdf>

- Cover Galbestos roofing and siding with an impermeable barrier, like plastic sheeting.
- You may use encapsulants as a long-term control on substrates contaminated with PCBs from building materials. This option requires approval from the EPA.
 - For example, if you remove PCB-contaminated window caulking and the remaining brick it was attached to is contaminated, you may apply encapsulant to the brick.

Protect the storm drain system

Prevent contaminants and solids from entering catch basins following effective BMPs.⁸⁰ For example:

- Place filters (such as filter fabric⁸¹) in stormwater inlets and catch basins near the building to capture solids. Install a filter sock around the inlet for additional protection, as long as it doesn't disrupt stormwater flow.
- Inspect and maintain the filters on a regular basis. Replace them when they become damaged or full.
- Accumulate all replaced spent filters for waste designation and proper disposal. Place them in secure containers and mark them properly.
- If your plans involve preventing stormwater from entering certain inlets:
 - Use containment berms to direct stormwater flow.
 - Install drain covers on top of applicable inlets.
- Clean drainage system structures before they become ineffective.
 - At a minimum, clean out catch basins when solids accumulate to 60% or are within 6 inches of an outlet pipe. Consider cleaning them long before they reach the 60% level.
 - Consider cleaning during the dry summer months to generate less waste that requires proper disposal.
 - If you hire a drain cleaning contractor, ensure they're familiar with managing potentially regulated TSCA wastes.

Avoid washing

Never pressure-wash buildings that may have PCB-containing materials unless stormwater BMPs are in place and all wash water is collected.

Reconsider landscaping

Minimize irrigation water use in areas near buildings that may contain PCBs. Overwatering may cause contaminated soil to enter the drainage system.

⁸⁰ Refer to BMP C220 in the SWMMWW: <https://ecology.wa.gov/stormwatermanuals>

⁸¹ Filter fabric is a geotextile placed underneath a catch basin inlet cover to filter stormwater.

Appendix A. Federal and State Regulations

Toxic Substances Control Act

The primary federal law regulating PCBs in building materials is the Toxic Substances Control Act (TSCA) (40 CFR Part 761). Implemented by EPA in 1979, the law banned the manufacture, process, distribution, and use of PCBs in commerce, with certain exemptions.

Under TSCA, property owners must comply with use, transportation, storage, and disposal regulations for building materials that contain PCBs. Any building material that contains levels of PCBs 50 ppm or greater is considered “prohibited use” and must be abated.

Under TSCA, EPA can regulate materials discovered to contain PCBs. Their regulations include requirements for reporting, recordkeeping, testing, and restrictions. These activities may violate TSCA:

- Using prohibited substances.
- Storing, transporting, or disposing of materials that contain PCBs in a way prohibited by federal regulations.

EPA strictly regulates the presence of PCBs greater than or equal to 50 ppm.

Make sure you comply by either:

- Sampling and testing the materials for PCBs and following the PCB regulations based on the concentration.
- Following the most conservative PCB regulations.

Under TSCA, you must also consider and manage PCB-contaminated materials appropriately. The TSCA regulations apply to the PCB source and the contaminated areas. For example, if stormwater, wind, or washdown water carry PCBs into the soil under PCB-containing paint or caulk greater than or equal to 50 ppm, the soil may be a waste managed under TSCA regulations.

Washington State Dangerous Waste Regulations

The Washington State Department of Ecology also regulates PCB wastes under the Dangerous Waste Regulations.⁸² While they regulate the management of waste materials, TSCA is much broader and also regulates PCB manufacturing, processing, distribution, and use.

You must meet the requirements of both rules for PCB waste. However, building materials regulated under TSCA are typically excluded by Washington’s Dangerous Waste Regulations, including most PCB bulk product waste. Read more about how to handle PCB dangerous waste in [our Polychlorinated Biphenyl Dangerous Waste Guide](#).⁸³

⁸² Chapter 173-303 WAC.

⁸³ <https://apps.ecology.wa.gov/publications/SummaryPages/2104034.html>

PCB bulk product waste vs. remediation waste

We provided a brief overview of this topic in the [current PCB regulations section](#) above.

PCB bulk product waste is when original building materials contain PCBs at 50 ppm or greater (such as caulk around a window).

PCB remediation waste typically includes building materials that didn't originally contain PCBs but now contain PCBs because PCBs have been released into them (such as window frames that are contaminated by adjacent PCBs in caulk). Remediation waste also includes environmental media (such as soil under the window) that are contaminated with PCBs from the PCB bulk product waste.

While PCB bulk product waste and remediation waste are similar, they're regulated differently for disposal:

- You must manage PCB bulk product waste in accordance with TSCA.
- You must manage PCB remediation wastes separately under TSCA, MTCA, or both.

According to an EPA reinterpretation in 2012,⁸⁴ if the building material was coated at the time of disposal, you may dispose of the following as PCB bulk product waste instead of as PCB remediation waste—even if they later become unattached:

- PCB source materials.
- Adjacent building material coated or serviced with PCB bulk product waste, even if PCBs migrated into the adjacent material from the overlying bulk product waste.

This [reinterpretation](#)⁸⁵ (illustrated in Figure 4) makes PCB disposal more efficient, safe, and streamlined. Managing wastes as PCB bulk product waste reduces your costs by making removal more efficient—through spending less on segregating the waste.

Please note: This reinterpretation applies when building materials are disposed of together and you document your intent to dispose of the bulk product waste and attached substrate together. You cannot later group remediation waste together with bulk product waste and must manage it as a separate waste stream if either:

- You don't dispose of building materials⁸⁶ at the same time you dispose of bulk product waste.
- The materials become unattached and you have no documentation that prior to detachment you designated them as bulk-product waste to be disposed of together.

⁸⁴ Download the memo: https://www.epa.gov/sites/default/files/2016-01/documents/wste-memo_102412.pdf.

⁸⁵ <https://www.epa.gov/pcbs/frequent-questions-about-polychlorinated-biphenyl-pcb-guidance-reinterpretation>

⁸⁶ Such as PCB-contaminated masonry and concrete.

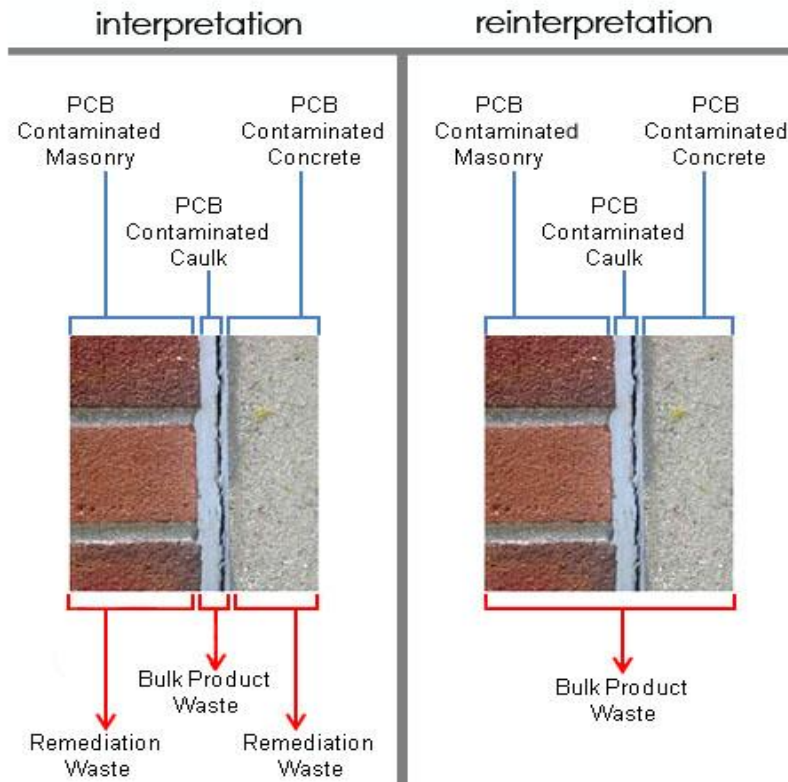


Figure 4: PCB guidance reinterpretation for contaminated building materials (EPA 2014).

Read more about environmental remediation on [EPA’s Managing Remediation Waste From Polychlorinated Biphenyls \(PCBs\) Cleanups webpage](#).⁸⁷

Waste regulated under TSCA is sometimes referred to as **TSCA waste** and can include any wastes regulated under TSCA (such as lead and asbestos). In this guide, TSCA waste refers to PCB bulk product waste and PCB remediation waste.

Washington State Model Toxics Control Act

Implemented by Ecology, the Model Toxics Control Act (MTCA) (Chapter 70A.305 RCW) is Washington state’s environmental cleanup law that directs investigation and cleanup of contaminated sites.

While MTCA focuses on protecting the environment and doesn’t regulate building materials specifically, contamination from building materials may require PCB site cleanup on a case-by-case basis. Our initial site evaluations consider PCB levels and the potential for them to spread into the environment. Possible outcomes include:

- You may conduct cleanup independently, with a requirement to file a report with Ecology once the cleanup is completed.

⁸⁷ <https://www.epa.gov/pcbs/managing-remediation-waste-polychlorinated-biphenyls-pcbs-cleanups>

- You may conduct independent cleanup with advice from Ecology’s Voluntary Cleanup Program.
- Ecology may ask you to enter into an agreed order, which will detail work to be conducted and a timeline with Ecology oversight.
- Ecology may file an enforcement order requiring you to conduct cleanup work as directed by Ecology.
- In some circumstances, Ecology may conduct the cleanup work itself and seek cost recovery from a liable person.

We may oversee demolition of buildings containing PCBs so contractors avoid spreading PCBs into the environment. We don’t have the authority to directly address sources of PCBs when cleanup is carried out voluntarily or initiated independently.

Under MTCA, you’re not required to report toxic releases from building materials containing PCBs that are still in use, and Washington state has no existing database with this information. However, we will follow up with any report of materials that contain 50 ppm PCBs or more, because TSCA defines this as “unauthorized use.” Also, if PCBs are released into the environment, you must [report under MTCA](#).⁸⁸

Typically, unauthorized use notification is reported to the [Environmental Report Tracking System](#) (ERTS).⁸⁹ We determine next steps through various factors, such as:

- Location (exterior or interior of the building).
- Physical conditions of the material containing PCBs.
- PCB concentration.
- Evidence of degradation or particles traveling into surrounding soils.

We may investigate if factors indicate a high potential for greater contamination. We may collect soil samples or list the building site on the [Hazardous Sites List](#).⁹⁰ We refer building owners to EPA when concentrations of 50 ppm or more are found.

Please see our [options for contaminated site cleanup webpage](#)⁹¹ for more information.

Federal and state stormwater legislation

Polluted stormwater is considered the leading threat to Washington’s urban waters, affecting both marine life and people. Because stormwater usually flows into surface waters without treatment, it’s important to prevent contaminants like PCBs from entering stormwater.

⁸⁸ <https://apps.oria.wa.gov/permithandbook/permitdetail/60>

⁸⁹ <https://ecology.wa.gov/ERTS>

⁹⁰ <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Site-Register-lists-and-data>

⁹¹ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-process/Cleanup-options>

Ongoing research shows PCBs in stormwater, sediments, and fish in Washington’s rivers, lakes, and estuaries. We’ve established fish consumption advisories in various waterways based on the health risks of eating PCB-contaminated fish.

Despite the ban on PCB manufacturing, evidence shows existing sources continue to release PCBs into the environment and stormwater is a major pathway. A 2011 Ecology study determined that the largest pathway for PCBs to enter the Spokane River was the city’s stormwater.⁹²

We regulate Washington’s stormwater management as the EPA-delegated authority to implement the Federal Clean Water Act⁹³ and through the state’s Water Pollution Control Act.⁹⁴

We use National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge permits to control pollution sources from entering stormwater. We use them to regulate discharges from:

- Municipal separate storm sewer systems (MS4s).
- Construction activities.
- Industrial activities.
- [Many other activities](#),⁹⁵ like boatyards and sand and gravel operations.

Stormwater Management Manuals for Eastern and Western Washington

The [2019 Stormwater Management Manual Manuals](#)⁹⁶ for Eastern and Western Washington help those discharging to state waters comply with water quality standards. These manuals provide:

- Operational best management practices (BMPs).
- Structural source control BMPs.
- Treatment BMPs.

Each of the key Washington stormwater permits relies on the BMPs included in these two manuals. Although neither manual specifically includes BMPs for PCB-containing building materials in construction projects (Manual Volume II),⁹⁷ both manuals explicitly call out BMPs for PCB-containing building materials or demolition, renovation, and/or maintenance as Source Control (Manual Volume IV).⁹⁸ We listed these in Table 3.

⁹² <https://apps.ecology.wa.gov/publications/SummaryPages/1103013.html>

⁹³ 33 U.S.C. 1251 et seq.

⁹⁴ RCW 90.48

⁹⁵ <https://ecology.wa.gov/Stormwater>

⁹⁶ <https://ecology.wa.gov/stormwatermanuals>

⁹⁷ Volume II is the Construction Stormwater Pollution Prevention Volume.

⁹⁸ Volume IV is the Source Control BMP Library.

Table 3: PCB-related BMPs contained within current Washington State Stormwater Management Manuals.

Stormwater Management Manual (Ecology, 2019)	BMPs Number(s)	BMPs Name	BMPs Details Related to PCBs
Western Washington	S424	Roof or Building Drains at Manufacturing and Commercial Buildings	Operational source control BMPs related to sampling/analyzing, sweeping areas. Note: the Eastern Washington manual uses similar language in BMPs number S424E, however it doesn't include PCBs in the list of pollutants.
Western Washington and Eastern Washington	S438 and S438E	Construction Demolition	Operational BMPs: <ul style="list-style-type: none"> Identify, remove, and properly dispose of hazardous substances from the building before beginning construction demolition activities that could expose them to stormwater. Educate employees about the need to control site activities. Protect the drainage system from dirty runoff and loose particles (cover inlets, use berms). Sweep paved surfaces daily. Schedule demolition for the dry season. Construct a screen to prevent stray materials and dust from escaping the area. Lightly spray water to control windblown fine materials (such as paint chips or dust), but not enough to cause runoff from the site.
Western Washington and Eastern Washington	S451 and S451E	Building, Repair, Remodeling, Painting, and Construction	See BMPs S438/S438E details. Use ground cloths underneath scraping and sandblasting work.
Western Washington and Eastern Washington	S431 and S431E	Washing and Steam Cleaning Vehicles, Equipment, or Building Structures	Collect the washwater from building structures and convey it to appropriate treatment. Sweep surfaces prior to cleaning/washing. Construct a containment pad.

Municipal stormwater permits

Washington state has surface water quality criteria to protect aquatic and human health.⁹⁹

According to the state's [Phase I and II MS4 permits](#),¹⁰⁰ municipalities must implement a stormwater management program so the discharge to state waters meets water quality standards. The standards are consistent with the water body's designated uses, for example:

- Salmon spawning.
- Shellfish harvesting.
- Recreation.

Phase I MS4 permittees

Large cities and counties fall under the Phase I permit. They must require their development and construction sites to follow BMPs for stormwater management.¹⁰¹ The current Phase I MS4 permit (2019–2023) doesn't have any PCB-specific requirements, except for Appendix 13.¹⁰²

Phase II MS4 permittees

Small and medium municipalities fall under the Phase II permit. These permits don't explicitly reference PCBs or PCB-containing building materials. Phase II MS4 permittees must implement a program to control runoff from new development, redevelopment, and construction sites.¹⁰³

Phase II permits reference stormwater BMPs in either the Eastern or Western Washington Stormwater Management Manual. Table 3 lists PCB-related BMPs included in those manuals.

Construction stormwater permits

Washington State Construction Stormwater General Permit

Washington's Construction Stormwater General Permit (CSWGP) applies when either:

- One acre or more of land is disturbed.
- **Any** size construction activity Ecology determines a significant contributor of pollutants discharges stormwater to state waters.

The current CSWGP version doesn't include explicit requirements relating to PCB-containing building materials. It directs permittees to use stormwater BMPs in the applicable Stormwater Management Manual (see Table 3).

Federal Construction Stormwater General Permit

EPA issues and oversees compliance with NPDES permits for federally owned facilities and permits on tribal lands, including the federal Construction Stormwater General Permit (CGP).

⁹⁹ See WAC 173-201A-240: <https://app.leg.wa.gov/WAC/default.aspx?cite=173-201A-240>.

¹⁰⁰ <https://ecology.wa.gov/MS4>

¹⁰¹ A common resources is the Stormwater Management Manual for Western Washington.

¹⁰² Appendix 13 requires the City of Seattle to implement a source tracing and sampling program to eliminate priority contaminant sources to the Seattle MS4. PCBs are a priority contaminant, but there aren't specific requirements related to PCBs in building materials.

¹⁰³ This requirement in Phase II MS4 permits must be adopted by June 30, 2022, in Western Washington and by December 31, 2022, in Eastern Washington. It applies to construction activities that disturb one acre or more.

This permit contains PCB-specific requirements and BMPs. The current version¹⁰⁴ explicitly prohibits non-stormwater discharges of external building washdown waters that contain hazardous substances, such as paint or caulk containing PCBs.

This applies to demolition when stormwater discharges to a PCB-impaired water body and structures are both:

- At least 10,000 square feet of floor space.
- Built or renovated before January 1, 1980.

The CGP also requires the permittee to both:

- Implement controls to minimize exposure of PCB-containing building materials to rain and stormwater—including paint, caulk, and pre-1980 fluorescent lighting fixtures.
- Ensure PCB-containing materials disposal complies with applicable state, federal, and local laws.

See Part 3.2 of the CGP in the [2022 Construction General Permit \(CGP\)—Fact Sheet](#) (pages 86–88)¹⁰⁵ for details about types of stormwater BMPs to apply when demolishing PCB-containing structures. We also incorporated the CGP BMPs in the [BMP section](#) of this guidance document.

Industrial stormwater permit

Washington’s Industrial Stormwater General Permit (ISGP)¹⁰⁶ prevents industrial facilities from discharging stormwater that could violate surface water quality standards. There aren’t any references to PCB-containing building materials in the ISGP.

Permittees with coverage under the ISGP must implement BMPs contained in stormwater manuals approved by Ecology¹⁰⁷ or practices they can demonstrate as equivalent to those manuals.

¹⁰⁴ The current CGP became effective on February 17, 2022.

¹⁰⁵ <https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-fact-sheet.pdf>

¹⁰⁶ The current version is 2021–2025.

¹⁰⁷ Eastern or Western Washington Stormwater Management Manual Manuals

Appendix B. Flowchart Plain Text: How to Identify and Manage PCBs in Building Materials

Building age

Was the building built or renovated (in whole or in part) between 1950–1980?

How to proceed

- Yes or unsure—proceed to next step.
- No—Approach 1.

Building use and structure

Is it a commercial, industrial, or multi-story residential building?

How to proceed

- Yes—proceed to next step.
- No—Approach 1.

Gather information

Review previous PCB-related investigations conducted for the property.

Inspect exterior of the building. Document location and state of suspected PCB-containing materials (such as caulk, paint, joint materials) and substrate material. Estimate dimensions to determine potential PCB bulk product waste volume. Refer to the Inventory Table attachment on this guide's summary page as an additional resource.

How to proceed

- You don't identify any suspect PCB-containing materials and substrate materials after review—Approach 1.
- You suspect PCBs and **don't** plan to renovate or demolish; instead, you will monitor and manage your inventory of PCBs—Approach 2.
- You suspect PCBs and plan to renovate or demolish—Continue to **Sample Building Materials**.
 - If you **conservatively manage** building materials as if they contain 50 ppm or more of PCBs, you may skip sampling. Follow **Approach 4** and **continue to the Create a PCBs waste plan step**.

Sample building materials

Review EPA guidance on [PCBs in Building Materials](#)¹⁰⁸ to develop an appropriate sampling plan. Notify your [Regional PCB Coordinator](#)¹⁰⁹ to make sure your approach meets TSCA requirements.

How to proceed

Once you sample PCBs and can confirm levels of PCBs and where they're located:

- Your PCBs are less than 50 ppm—**Approach 3**.
- Your PCBs are 50 ppm or more—**Approach 4** and **proceed to next step**.

Create a PCBs waste plan

1. Establish how you'll proceed with the project and designate your waste.
2. Based on prior steps, determine if the TSCA PCB waste is also:
 - Dangerous waste.
 - Solid waste or construction debris.
3. Figure out how much waste you have.
4. Plan waste disposal. Determine if you'll manage all demolition waste as PCB bulk product waste or if separate out PCB bulk product waste from PCB remediation waste.
5. Get a quote for disposal costs and end disposal facilities.

How to proceed

Once you establish your PCBs waste plan—**proceed to next step**.

Begin abatement planning

Prepare an abatement work plan. Detail how you'll manage PCB-containing building and substrate materials.

Always know and follow applicable local, state, and federal permitting requirements. This includes establishing BMPs to protect stormwater. We recommend you contact your local municipality in case they have source control requirements.

Approach 1

Follow all applicable requirements from your:

- Local building permit.
- Washington State Construction Stormwater General Permit (CSWGP).
- Federal Construction General Permit (CGP).

¹⁰⁸ https://www.epa.gov/sites/default/files/2021-05/documents/final_pcb_buildings_fact_sheet_05-10-2021_to_upload.pdf

¹⁰⁹ <https://www.epa.gov/pcbs/epa-regional-polychlorinated-biphenyl-pcb-programs#regionalcontacts>

Approach 2

Follow all applicable requirements in Approach 1 and Implement BMPs in this guide. If this is a K-12 school, contact [Washington State Department of Health](#)¹¹⁰ and review [EPA guidance for schools](#).¹¹¹

Approach 3

Follow federal and state requirements to handle, store, and dispose of waste containing PCBs. Address solid waste disposal and recycling of building materials from renovation/demolition. Implement BMPs in this guide and all applicable requirements from Approach 1.

Approach 4

Follow TSCA handling, storage, and disposal requirements. Identify both PCB bulk product waste and PCB remediation waste. Implement BMPs in this guide and all applicable requirements from Approach 1.

Notes

Review [EPA's PCBs in Building Materials Guidance](#)¹¹² or contact your [Regional PCB Coordinator](#)¹¹³ to determine if you should investigate further.

While many publications indicate PCBs are more likely in certain types of buildings, federal PCB regulations don't authorize the use of PCBs in building products, regardless of the building type or age. Some facilities may have had PCB-containing products in storage and used them after 1980.

Some studies indicate that concrete and masonry buildings built between 1950 and 1980 likely have high PCB concentrations.¹¹⁴

¹¹⁰ <https://doh.wa.gov/community-and-environment/contaminants/pcbs>

¹¹¹ <https://www.epa.gov/pcbs/fact-sheet-practical-actions-reducing-exposure-polychlorinated-biphenyls-pcbs-schools-and>

¹¹² https://www.epa.gov/sites/default/files/2021-05/documents/final_pcb_buildings_fact_sheet_05-10-2021_to_upload.pdf

¹¹³ <https://www.epa.gov/pcbs/epa-regional-polychlorinated-biphenyl-pcb-programs#regionalcontacts>

¹¹⁴ S. Klosterhaus, et al., "Polychlorinated biphenyls in the exterior caulk of San Francisco Bay Area buildings, California, USA," *Environment International* 66 (2014) 38-43.

Appendix C. Example Inventory Table

You can print this page to use as an inventory table template for surveying exterior building materials. You can also download an Excel version on [this guide's summary page](#).¹¹⁵

Inventory table template

Date of site visit:

Contact name:

Contact email:

Contact phone:

Building name:

Building address:

Current uses:

Historical uses:

Year built:

Architecture/style:

Site description:

Table 4: PCB-containing building materials inventory table template.

Homogeneous Material Description	Approximate Quantity	Condition	Color	PCB Potential	Homogeneous Area/Location	Location to Closest Storm Drain	Comments

Additional notes:

¹¹⁵ <https://apps.ecology.wa.gov/publications/SummaryPages/2204024.html>

Appendix D. Acronyms and Abbreviations

Term	Meaning
BMPs	Best management practices
BPW	Bulk product waste
CFR	Code of federal regulations
CGP	Federal Construction General Permit
CSWGP	Washington State Construction Stormwater General Permit
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
°F	Degrees Fahrenheit
HEPA	High-efficiency particulate air
HVAC	Heating, ventilation, and air conditioning
ISGP	Industrial Stormwater General Permit
Lab	Analytical laboratory
Method 8082A	EPA SW-846 Method 8082A
MS4	Municipal separate storm sewer system
MTCA	Model Toxics Control Act
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PBT	Persistent, bioaccumulative, and toxic
PCB FAST	PCB Facility Approval Streamlining Toolbox
PCBs	Polychlorinated biphenyls
PPE	Personal protective equipment
ppm	Parts per million
SPU	Seattle Public Utilities
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TSCA	Toxic Substances Control Act
USDOT	U.S. Department of Transportation
WISHA	Washington Industrial Safety and Health Act

Appendix E. Glossary

Abatement

Procedures that remove PCB-containing building materials from existing structures.

Accredited laboratory

A laboratory that's shown Ecology it can properly perform specific analytical methods.

Aroclors

A commercial mixture of PCB chemical compounds and congeners.

Aroclor is the tradename the Monsanto Company used for their PCB mixtures in the United States.

Bulk product waste

Non-liquid bulk wastes or debris derived from manufactured products containing PCBs, generated from the demolition or renovation of buildings and other man-made structures manufactured, coated, or serviced with PCBs.

Once removed, these wastes or debris are defined as PCB **bulk product waste** and must be disposed of in accordance with federal regulations. See 40 CFR 761.62.

Characterization

A specific description of features or characteristics based on environmental data, observations, and other related information.

Demolition

Refers to wrecking or removing any load-supporting structural parts of a facility. It includes related handling operations or intentionally burning a facility.

During demolition, you must consider all suspect PCB-containing building materials.

Encapsulation

Painting or coating building surfaces with substances that prevent PCBs in building materials from entering the environment.

Environmental media

Soil, water, air, biota, or any other parts of the environment that can contain contaminants.

EPA SW 846 Method 8082A

An EPA-approved sampling method for PCBs (Aroclors) that analyzes building materials for PCB concentration. It's more sensitive than Method 608 and less sensitive than Method 1668C.

Galbestos

A material made from multiple layers of asphalt and asbestos, known to be coated in PCBs (as Aroclors). In Washington state, Galbestos was used as building siding and roofing.

Manufactured PCB products

Non-liquid materials (as defined in 40 CFR 761.3) made with PCBs. Note that PCB household wastes referenced in the Code of Federal Regulations (CFR) are specific items generated by residents for household maintenance. Demolition and renovation waste aren't household wastes, so the PCB household waste exemption isn't available for most situations involving renovation or demolition.

Mitigation

Action that reduces the degree of contamination.

Polychlorinated biphenyls (PCBs)

A class of synthetic chlorinated chemicals not found naturally in the environment. They're persistent, bioaccumulative, and toxic (PBT) chemicals and probable human carcinogens.

In 1976, Congress passed the Toxic Substances Control Act (TSCA), which prohibited the manufacture, processing, and distribution of PCBs within three years.

Porous materials

Any solid material that has pores (holes, cavities, or channels). Examples include concrete and wood.

Remediating

An environmental cleanup term that refers to removing contaminants.

Remediation waste

Waste containing PCBs as a result of a release from a PCB bulk product waste. Examples of PCB remediation waste include:

- Adjacent building substrates, such as window frames.
- Soil contaminated with PCBs.

According to federal regulations,¹¹⁶ remediation waste also extends to waste containing PCBs from a spill, other types of releases, and other unauthorized disposal of PCBs. This depends on all of the following:

- The concentration of the source of PCBs.

¹¹⁶ 40 CFR 761.3

- The date of release.
- The current PCB concentration in the materials.
- Whether the original source was authorized for use.

See [Appendix A. Federal and State Regulations](#) to learn more about PCB bulk product waste and PCB remediation waste, and for details on how their disposal is regulated differently.¹¹⁷

Renovation

Refers to removing, modifying, or repairing areas of a building that may disturb materials without affecting the building's structural integrity. This may include activities like:

- Window and doorway repair.
- Surface restoration.
- Surface preparation (like sanding and scraping).

During renovation, consider building materials and the surrounding substrates you may disturb during construction activities.

Sampling plan

A detailed plan that outlines what measurements will be taken from which building materials, where, time of sampling, how to sample materials, and who will take the samples.

Stand-up (or tilt-up)

A construction method involving large concrete slabs. Before EPA's PCB ban in 1979, it was very common for builders to use PCB-containing caulk in the thick joints between the slabs.

Substrate

Building materials such as concrete or masonry that may be contaminated by leaching from PCB-containing products.

TSCA waste

TSCA waste can refer to any wastes regulated under TSCA (such as lead and asbestos). In this guide, TSCA waste refers to PCB bulk product waste and PCB remediation waste.

¹¹⁷ 40 CFR 761.61