

BEST MANAGEMENT PRACTICES FOR

Reducing PCBs

in Runoff Associated with

Demolition and Remodeling

Projects



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Manual adapted from San Francisco's Estuary Partnership and its PCBs in Caulk project, prepared by Geosyntec Consultants, Inc. and Larry Walker Associates, Inc.

BEST MANAGEMENT PRACTICES

Specific to removing materials that could contain Polychlorinated Biphenyls (PCBs)¹ during demolition and remodeling, U.S. Environmental Protection Agency (EPA) recommends that property owners and contractors implement a series of best management practices (BMPs) that mobilize PCBs-containing dust.

PCBs are a man-made chemical produced for industrial use, including in caulk, from the late 1930s until they were largely banned as an environmental and human health hazard in 1979. Because they resist breaking down in the environment, PCBs persist in soils, surface water, and groundwater and accumulate in animals who live in water. In turn, humans are exposed to PCBs when they eat fish or other aquatic organisms with these chemical accumulations, resulting in magnified health risks. According to the U.S. Department of Health and Human Services, individuals who are continually exposed to PCBs are at increased risk of developing cancer and experiencing toxic effects on bodily systems.

Best management practices that protect human health by reducing dust exposures also help meet the objectives of Spokane Regional Health District's Local Source Control program, which are to reduce ground deposition of PCBs to ultimately protect water quality. When fewer surface PCBs are left behind during dry weather, it reduces concentrations in rainfall and runoff. Additionally, several unrelated BMPs, routinely implemented on construction projects, also reduce the mobilization of PCBs including BMPs for erosion control, sediment control, and waste management practices.

Figure 1 shows the typical sequence of BMPs that owners/contractors should consider when demolishing or remodeling buildings with PCBs-containing materials, like caulk.² These fundamental BMP categories are commonly involved in most projects. Although, actual selection of specific BMPs within each category will vary depending on the nature of the project, site conditions and local permitting requirements.

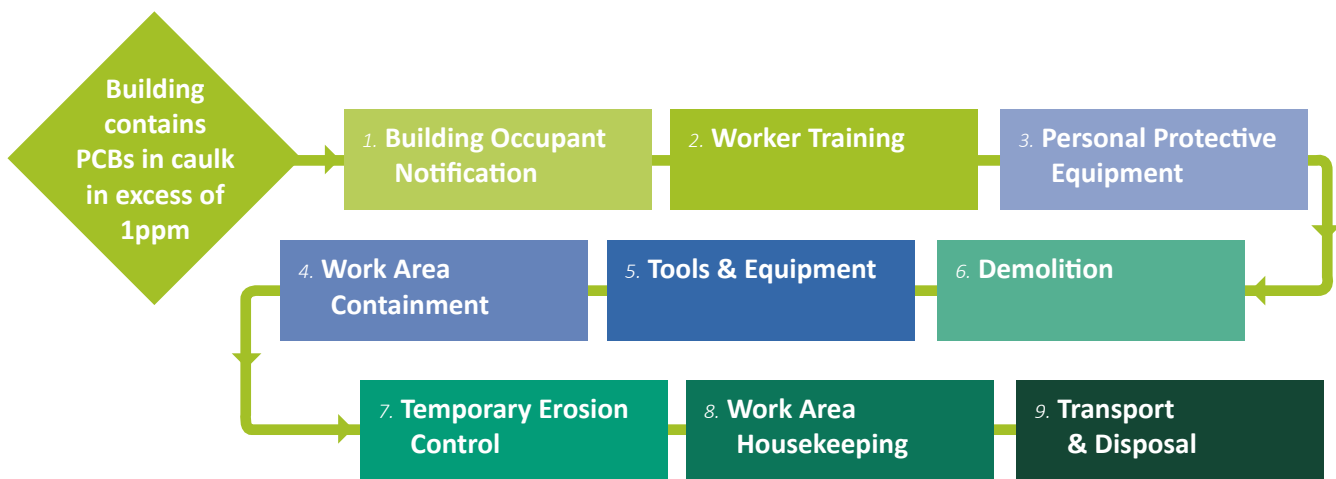


Figure 1: Typical Sequencing of Categories of Best Management Practices, Courtesy of San Francisco Estuary Partnership

The BMP categories are organized as follows:

1. Building Occupant Notification
2. Worker Training
3. Personal Protective Equipment
4. Work Area Containment
5. Tools and Equipment
6. Demolition
7. Site Erosion and Sediment Controls
8. Work Area Housekeeping and End of Project
9. Transport and Disposal



1.1 BMP Category 1

Building Occupant Notification

This BMP is primarily designed for the protection of human health during demolition and remodeling projects. Yet, the practice can help limit unauthorized access to work zones, and therefore limit unintentional tracking of contaminated dust from the site to where it may enter receiving waters. This requires effective communication with people who may be in proximity to building demolition or remodeling. For example, EPA recommends that the owner/contractor continually inform affected groups (e.g., building occupants, workers, building owners, and community members) of:

- Goals, types, and duration of the demolition/remodeling activities.
- Health and safety aspects of the project.
- Site access requirements and limitations.



1.2 BMP Category 2

Worker Training

Worker training should promote proper handling and disposal of PCBs-contaminated materials, limiting the potential for these materials to pollute surface waters.

Site-specific training should include:

- Discussing potential presence of PCBs in materials like caulk, as well as consequences to human health and ecology.
- Identifying safety and health personnel for the site, and their alternates.
- Locating safety, health and other hazards present on the site.
- Using personal protective equipment (PPE) appropriately.
- Specifying work practices that minimize hazards' risks.
- Using engineering controls and equipment safely.
- Understanding medical surveillance requirements, including recognition of signs and symptoms of overexposure to hazards.
- Reviewing the site's safety and health plan.



1.3 BMP Category 3

Personal Protective Equipment

PPE is intended to protect human health during renovation and demolition projects. Applied correctly, PPE limits the transport and spread of PCB contamination from clothing and other materials that would otherwise be carried offsite by workers.

Appropriate PPE ranges from chemically resistant gloves, used during initial inspections, to Tyvek® suits and respirators used during dust-generating activities. EPA recommends the following PPE for sites contaminated with PCBs3:

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

1.4 BMP Category 4



Work Area Containment

Containment of the work area is intended to prevent the spread of contaminated dust outside of the controlled work zone. Contaminated dust may spread by wind or water erosion. This BMP, when used correctly, limits the areas contaminated by dust containing PCBs.

When working on a demolition or remodeling of a structure determined to have PCBs-containing materials, appropriate controls are needed to minimize spreading dust during activity. At a minimum, separate work areas to keep potential PCBs-containing materials isolated. Also, it is important to phase the work, especially for demolition projects, such that removal work involving PCBs is completed and the area is cleared of contaminated wastes prior to continuing other demolition or remodeling work. This minimizes the potential for PCBs to contaminate other materials and protects workers from prolonged exposure.

Whenever work activities may generate dust containing hazardous materials, control the work area by constructing a containment area. Plastic sheeting should be applied to the floor, walls, or other applicable surfaces to prevent contamination of the building interior, exterior, and surrounding areas. The containment area should be constructed so that all dust or debris generated by the work remains within

the area enclosed by the plastic sheeting. Additional containment measures include applying a vacuum to the enclosed area during work to create negative air pressure and collect dust that is generated. The size of the containment area and dust controls used will vary depending on the size of the demolition/remodeling project, the methods used, and the amount of dust and debris that will be generated.

EPA specifically recommends the following techniques for setting up containment areas¹:

- Use mobile scaffolding to provide a convenient frame for supporting the enclosure.
- Attach heavy plastic sheeting to scaffolding to create an enclosure around the work area. Use two-by-fours attached to sheeting to create an entrance/exit to the enclosure.
- Use heavy plastic sheeting to cover the ground within the enclosure. Secure with tape.
- Construct a decontamination area just outside of the enclosure by placing heavy plastic sheeting on the ground. This area is used to remove personal protective equipment and to clean equipment used in the enclosure.

For locations where constructing a containment area is infeasible, the following techniques should be used to capture dust and debris.

- Cover the ground and plants with heavy plastic sheeting to catch debris. The covering should extend at least 10 feet out from the building. Secure the covering to the exterior wall with a wood strip, staples or tape.
- Close windows and doors within 20 feet of the work area to keep dust and debris from getting into other parts of the building undergoing demolition or remodeling. Occupants and workers in adjacent buildings should be notified and windows in adjacent buildings should be closed.
- Seal off any vents or air exchange systems into the building that are located within the work area.
- Move or cover any play areas within 20 feet of the work area.
- When working on, or above, the second story, extend the sheeting farther out from the base of the building and to each side of the area where materials are being disturbed, to prevent debris from falling beyond the existing 10-foot covering.
- To prevent the spread of debris when work is close to a sidewalk, street or property boundary, or when the building is more than 3 stories high, cover scaffolding sides with plastic sheeting.
- Avoid working in high winds, if possible.

Otherwise, take special precautions to keep the work area contained when the wind is strong enough to move dust and debris. For example, a wind screen can be constructed of plastic at the edge of the ground-cover plastic to keep dust and debris from migrating.

- Avoid working during heavy rainfall events, if possible, or otherwise ensure that containment will not be compromised during heavy rainfall and runoff.

After constructing an effective containment area, make sure to control the spread of dust outside the work area.

- Put all necessary tools and supplies on the protective sheeting in the work area before beginning work to avoid stepping off the protective sheeting before the work is complete.
- Remove or vacuum off Tyvek® suits when exiting the work area so the dust stays inside the work area.
- Before stepping off the plastic sheeting, remove disposable shoe covers, and wipe or vacuum shoes, especially the soles. A large disposable tack pad placed on the floor can help to clean the soles of shoes.
- Change out of work clothing before going home, and launder non-disposable protective clothing that may be contaminated with PCBs dust.



1.5 BMP Category 5

Tools and Equipment

To minimize generating dust, select appropriate tools for removal surrounding materials that contain PCBs.

EPA recommends the following tool-use practices¹:

- Select tools and work methods that generate the lowest possible dust volume. Remember that scraping, drilling, cutting and grinding create dust.
- If tools or work methods produce high heat (temperatures exceeding 212 F), gases containing PCBs may be released into the air. This increases the risk that workers or building occupants may breathe in PCB gases and necessitates more comprehensive protective measures.
- Manual tools, such as utility knives, chisels, and scrapers, generate lower volumes of fine dust and less heat but are primarily used for smaller joint lengths or when the joints are difficult to access.
 - Electromechanical tools, such as oscillating knives, jigsaws, and rotary cutting tools, have ergonomic advantages over most manual methods, as they are better suited for projects with many joints and for semi-soft to hard and brittle caulk. Moreover, such tools may be appropriate for removing concrete or other materials that may be contaminated by virtue of being in contact with caulk that contains PCBs. However, these types of tools generate higher volumes of dust and more heat, which requires more protective containment measures than with use of manual tools. Jigsaws and saber saws also lead to dust emissions, especially in the case of brittle caulk; furthermore, elastic compounds may gum up the saw blade.
 - Work area containment (BMP Category 4) must be used when grinding electromechanical tools are in use. Examples of these tools include angle grinders, masonry groove cutters, circular saws and slot mills. High-efficiency particulate air (HEPA) vacuum attachments should also be used to contain dust. This is especially important when PCBs-containing materials could be present.
- For larger projects, use wet sanders and misters to control the dust created during sanding, drilling and cutting.



1.6 BMP Category 6

Demolition BMPs

Demolition BMPs address activities such as razing (leveling a building skeleton to rubble). Demolition activities should only occur after hazardous materials such as asbestos, lead and PCBs are removed from the building¹.

To limit generating dust and its transport by wind, spray potable water in the area where excavators are razing, in addition to designing wetting activities to avoid runoff. Runoff must be contained and properly managed.



1.7 BMP Category 7

Site Erosion and Sediment Controls

Demolition material that is temporarily stored on-site, prior to removal, must be managed to limit exposure to wind and water. In many respects, such management calls for traditional erosion and sediment control BMPs. Washington Stormwater Center offers guidance specific to⁴:

- Wind Erosion Control
- Stabilized Construction Entrance/Exit
- Stockpile Management
- Hazardous Waste Management
- Contaminated Soil Management
- Concrete Waste Management
- Demolition Adjacent to Water
- Paving and Grinding Operations



1.8 BMP Category 8

Work Area Housekeeping and End-of-Project Activities

Work area housekeeping is important to maintain control of potentially contaminated areas and to limit further contamination. In addition to daily housekeeping controls, thorough cleaning should occur once the project is complete. Activities related to these BMPs are described below.

EPA specifically recommends the following cleaning activities¹:

- The work area should be left clean at the end of every day and especially at the end of the job. The area should be as free of dust and debris as possible. The following cleaning supplies, tools, and equipment are available in hardware or garden supply stores:
 - Heavy-duty plastic bags
 - HEPA vacuum with attachments
 - Masking tape, duct tape, or painters tape
 - Misting bottle or pump sprayer
 - Disposable wet-cleaning wipes or hand towels
 - Detergent or general-purpose cleaner
 - Mop and disposable mop heads
 - Two buckets or one two-sided bucket with a wringer
 - Shovel and rake

On a daily basis, contractors should:

- Pick up as they go. Put trash in heavy-duty plastic bags.
- Use covered and lined trash containers and remove material from site on regular basis.
- Vacuum the work area with a HEPA vacuum cleaner frequently during the day and at the end of day.
- Clean tools at end of the day.
- Dispose of or clean off personal protective equipment.
- Note that wastewater produced during the job from mopping, wet cleaning, cleaning of equipment, or misting is considered a process

wastewater and must be managed as a hazardous waste, or discharged to a sanitary sewer system, provided that the receiving wastewater agency has authorized the discharge and the applicable standards are met.

- Continue to separate the work area from the rest of the building and remind occupants to stay out of the area.

When the job is complete, contractors should:

- Make sure all trash and debris, including building components, are disposed of consistent with disposal requirements.
- Vacuum any exposed surfaces, including walls and ceilings, with a HEPA vacuum cleaner.
- Consider misting dusty sections of the plastic sheeting with water before taking them down. This will keep dust from becoming airborne again.
- Remove plastic sheeting carefully, fold it with the dirty side in, tape it shut, and properly dispose of it.
- Vacuum all surfaces again with a HEPA vacuum cleaner.
- Scrub the work area with a general-purpose cleaner on a wet rag or mop until dust and debris are removed.
- Visually inspect your work to ensure that no dust or debris is present.
- Re-clean the area thoroughly if you find dust or debris.



1.9 BMP Category 9

Disposal

The disposal of PCBs-containing waste generated from demolition or remodeling projects is regulated. The generator of the waste is responsible for disposing of any PCB wastes. The generator must determine the type of waste and arrange for disposal at an appropriately permitted waste disposal facility. The general disposal requirement depends on the type of waste material and concentration of PCBs in the waste material.

References

- 1 U.S. Environmental Protection Agency. PCBs in building materials. <https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials>
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- 3 Washington State Department of Labor and Industries. Personal protective equipment. <https://www.lni.wa.gov/Safety/Topics/AToZ/ppe/default.asp>
- 4 Washington State Department of Ecology. Stormwater manuals. <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals>



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