



Ministry of
Environment and
Climate Change Strategy

Environmental
Protection Division

Guideline to Managing Lead-containing Construction and Demolition Waste in B.C.

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Disclaimer

This document does not supersede or replace the Environmental Management Act or its regulations; in the case of omissions or discrepancies, the Act and the Hazardous Waste Regulation apply. It is intended for guidance only.

Background

This document provides guidance to generators of **demolition and construction waste** to help determine whether a waste is a hazardous waste due to the presence of **lead**. Lead can be found in a coating applied to the surface of a construction material (e.g., paint) or in the material itself (e.g., plumbing fittings, solder, etc.).

Wastes with lead could include wood, metal, plastic, concrete, asphalt and any other material, and if they exhibit “leachable toxic” characteristics, they would meet the definition of a hazardous waste. A “leachable toxic waste”, as defined in the B.C. [Hazardous Waste Regulation](#) (HWR), is a hazardous waste that produces an extract with a lead concentration greater than 5 mg/L, when subject to the extraction procedure US EPA Method 1311, also known as the Toxicity Characteristic Leaching Procedure (TCLP).

Paints made before 1950 contained large amounts of lead, as well as other metals, primarily as pigments. In fact, some paint made in the 1940s contained up to 50% lead by dry weight. If a building was constructed before 1960, it was likely painted with lead-based paint. Since the 1950's, the use of lead has been more common in exterior paint than interior paint. Lead has also been used in water lines and plumbing including pipes, pipe or plumbing fittings, fixtures, solder and flux. Lead is also a common additive in plumbing materials such as lead solder, brass, bronze, and other alloys.

According to a June 2013 document “Hazardous Materials in Construction¹” (Levelton, 2013), lead paint was phased out of architectural paints from mid 1970s. However, lead-containing paints are still in use for rust inhibition on metal structures and for sheet applications and ceramics.

Waste Assessment

A flowchart outlining the steps to follow when the presence of lead-based paint on building/structure surfaces and components is suspected is presented at the end of this document. Before beginning a demolition project, a work plan should be developed. The plan should include hazard assessment to identify all potential hazardous wastes that could be generated as a result of the demolition and/or cleaning of a facility, depending on the building/structure type and usage. Hazardous wastes are those which fall under the definition of “hazardous waste” in the HWR. All hazardous wastes generated must be managed in a manner that complies with the requirements of the HWR.

The work plan should include an assessment of the presence of lead-based paint on building/structure surfaces and components. The presence of lead should be confirmed on the basis of analytical test results from representative samples or other reliable field-testing methods (e.g. direct sampling of paint). Sampling should be carried out by a qualified person to ensure the representativeness of the samples in terms of the number and size of the samples, as well as sampling locations. All representative samples must be collected and handled in a way that preserves the original physical form and chemical composition of the sample, and prevents contamination in the field, in transit and in the laboratory.

Generally, a representative sample means a sample which can be expected to accurately exhibit the average properties of the whole waste. In a demolition project, it is expected that different components of the whole waste could contain varying amounts of lead-based paints. The number of representative samples must be taken in proportion to the volume of the components that form the whole waste. Dilution is prohibited; therefore, what constitutes “whole waste” must not include other types of wastes into the suspect hazardous wastes (e.g., mixing siding that is known or suspected to contain lead-based paint with unpainted vinyl window frames).

¹ <http://bcbec.com/wp-content/uploads/2018/03/Hazardous-Materials-in-Construction.pdf> or <http://bcbec.com/event/vancouver-luncheon-hazardous-materials-construction/>

Recommended sampling locations include:

- Fences and porches
- Sidings, walls, doors, ceilings and windowsills
- Stairs and banisters
- Painted built-ins (e.g. bookcases, shelves etc.),
- Paint and solvent wastes abandoned in the building prior to and during occupancy

Regulatory Requirements Under the Hazardous Waste Regulation

Some of the HWR requirements for generators includes the following:

- waste must not be diluted or otherwise mixed to evade the regulation (HWR Section 36)
- registration of the hazardous waste generated at the generating site, when the hazardous waste quantity exceed the registration threshold for that waste (HWR schedule 6),
- proper storage of any hazardous waste generated,
- the use of a transporter licensed for the appropriate hazardous waste(s) for any off-site shipment of the waste(s),
- the use of a manifest where quantities shipped exceed the manifesting threshold (HWR s.46), and
- shipment to an authorized hazardous waste management facility.

In addition to the requirements of the HWR, Section 6(2) of the *Environmental Management Act* states that waste must not be introduced into the environment in such a manner as to cause pollution. Other provincial requirements may apply including, but not limited to, WorkSafe BC requirements² for the work site and all personnel involved in the construction/demolition activity.

Specific Management Guidance by Substrate and Waste Type Generated

Demolition waste may contain two types of painted components, or substrate: metallic and non-metallic. The following is a guideline as to how each waste type stream is properly managed:

A. NON-METALLIC PAINTED COMPONENTS/SUBSTRATE:

If not tested on site, demolition waste can be screened for the presence of lead by collecting samples of paint chips and submitting them to an approved laboratory for lead analysis. If test results indicate that lead is present in the coating, two waste management options are available:

Option 1: A further evaluation is carried out to determine if the demolition waste is a regulated hazardous waste. The evaluation is completed by subjecting **representative core samples** of the whole waste (paint unremoved) in proportion to the volume of the components to the TCLP test to determine if it exhibits the characteristic of “leachable toxic” hazardous waste. For example, if evaluating the quality of a pile of painted siding that is three times larger in volume compared to a pile of painted doors, the volume of sample(s) collected from the pile of painted siding should be three times greater than the volume of samples(s) collected from the pile of painted doors. If the TCLP test results show that the concentration of lead is greater than 5 mg/L, then the total generated waste quantity must be characterized and managed as hazardous waste. Otherwise, the demolition waste is characterized and managed as non-hazardous construction and demolition (C&D) waste.

² <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-06>

- Option 2:** The paint is professionally removed from the painted components (e.g. by sand blasting, chemical paint strippers, etc.) and the resulting wastes from the removal process are segregated into two streams: the **paint waste** stream and the **cleaned component waste** (the substrate) stream. Management of the generated waste streams shall be carried out as follows:
- The **paint waste** (including paint chips, spent shot blast and residues) must be contained and not released to the environment. The paint waste must be collected and contained in secure covered containers or heavy plastic bags, as appropriate and managed as follows:
 - **Option 2.1** (recommended): Based on investigation into other jurisdictions and available analytical information, it is expected that the paint waste would fail the TCLP test for lead and would be characterized as “leachable toxic” hazardous waste in B.C. Accordingly, it is recommended that the paint waste stream is managed as hazardous waste without having the specific waste undergo TCLP testing. The waste is manifested as “leachable toxic waste” and shipped by an appropriately licensed carrier directly to an authorized hazardous waste facility or,
 - **Option 2.2:** Representative samples of the waste stream are appropriately collected and subjected to the TCLP test at an accredited laboratory. The waste stream is characterized and managed based on the TCLP test results.
 - The **cleaned waste** (the substrate) must be appropriately sampled (**representative core samples** of the whole waste) and subjected to TCLP testing to determine if the waste qualifies as hazardous waste. Based on the test results, the cleaned substrate is either managed as hazardous waste (i.e., failed the TCLP test) or as a solid waste. Cleaned substrates passing the TCLP test can be disposed of by recycling or by disposal as non-hazardous C&D waste.
 - The advantage of the Option 2 approach is a reduction in the hazardous waste volume generated and thus both an economic and an environmental benefit.

B. METALLIC PAINTED COMPONENTS:

At a demolition site, the work plan should include an assessment for lead-based paint on metallic building/structure components. Waste generated from the maintenance or demolition of metallic structures (e.g., such as bridges, water towers, or tanks) may include chemical residues and/or sandblast grit from paint removal activities. These wastes may contain lead-based paint, which consequently would necessitate carrying out a hazardous waste assessment.

All painted metallic demolition components are not characterized as hazardous waste so long as the paint is not removed from the painted surfaces. However, generators of such waste streams are encouraged to dispose of the waste at metal recyclers rather than by landfilling.

If lead-based paint is removed from metal surfaces (e.g. by sand blasting, mechanical stripping or chemical paint strippers, etc.), then the paint waste stream generated from the removal process, which could include spent shot blasting waste, collected paint chips or chemical residues, must be collected and contained in secure, covered containers or heavy plastic bags, as appropriate, and managed as described in Options 2.1 (recommended) or 2.2 above. The professionally cleaned and paint-removed metal waste is not characterized as hazardous waste and can be managed at authorized scrap metal recyclers under the condition that all visible lead-based paint has been

removed.

C. OTHER LEAD-CONTAINING METALLIC WASTES:

Other potentially lead-containing metallic waste streams resulting from demolition activities include plumbing components such as lead pipe and soldered joints, lead-containing compounds used in welding or soldering of the water lines and other plumbing applications, masonry plugs for fasteners and brass fixtures are also potential sources of lead. However, these waste components are not characterized as hazardous waste and can be managed as solid, non-hazardous waste at authorized scrap metal recyclers (metallic components).

Waste radiation shielding should be professionally surveyed to document it is free from residual radioactive contamination prior to disposal or recycling. Radioactive materials are regulated by the federal *Nuclear Safety and Control Act*.

HWR Registration Requirements

A person must register as a generator of hazardous waste if they produce within a 30-day period or store at any time at the generating site more than 500 kg of leachable toxic waste. Generator registration is done online³.

A person must register as a registered site (hazardous waste management facility) and obtain approval of plans if they treat, recycle or dispose more than 500 kg of leachable toxic waste in any one-day period or if they store in more than 500 kg of leachable toxic waste generated at another site.

Transporting Hazardous Waste

A license to transport (LT) and manifest are required when transporting more than 5 kg of solid hazardous waste, except for the following exemptions:

- Homeowners are exempt from the manifest and LT requirements if they are transporting the wastes to an authorized government or municipal waste management facility
- Generators are exempt from the LT requirements (but not the manifest requirements) if they transport less than 500 kg of leachable toxic waste to any authorized facility.

Additional Information

Demolition debris should not be shredded, milled, chipped, mulched or similarly processed in such a way that would increase the leachability of the material prior to disposal (i.e., processed in a manner that increases the surface area and/or assists in the breakdown of the material so as to promote absorption of the material into a liquid).

The responsibility of complying with all applicable regulatory requirements in terms of health, safety and the environment lies with the owner of the waste. For further information on the management of hazardous waste, please see the Ministry of Environment's hazardous waste website⁴

The WorkSafeBC Regulations also have requirements that apply. The publication: "Safe Work Practices for Handling Lead"⁵ has useful information about working with lead safely. Also, these sites may have other hazardous materials and the WorkSafeBC Regulation⁶ requires that a Qualified Person properly assess the site for all hazardous materials. These requirements apply to all contractors that work on the site and the owner.

³ <https://www2.gov.bc.ca/gov/content/environment/waste-management/hazardous-waste/registration-of-hazardous-waste-generators-and-facilities>

⁴ <http://www2.gov.bc.ca/gov/topic.page?id=4C31A8F4F63B414D807AE4CF35EF9E36>

⁵ <https://www.worksafebc.com/en/resources/health-safety/books-guides/safe-work-practices-handling-lead?lang=en>

⁶ <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation>

