

**Michigan Department of Community Health
Bureau of Laboratories
Division of Chemistry and Toxicology, Trace Metals Section**

Soil Sampling Procedure for Lead

This sampling procedure covers the collection of bare soil in residential properties. It does not address sampling design content that is used by risk assessors and environmental investigators.

Contents

1. Soil Sampling Tools and Materials
2. Bare Soil Sampling Procedure and Techniques
3. Labeling the Container
4. Trash Disposal
5. Assessor Decontamination
6. Form Completion and Fees
7. Quality Assurance/Quality Control
8. Lead Hazard Identification
9. References

1. Soil Sampling Tools and Materials:

- a. 50 mL polypropylene flat-bottom tubes with caps stored in a tray or plastic bag. 1-quart or 1-gallon plastic resealable bags may also be used. Plastic bags must be double-bagged unless they are 4 millimeter industrial strength.
- b. Non-sterilized non-powdered disposable gloves
- c. Property sketch
- d. Environmental Lead Sampling Request Form DCH-0558
- e. Pre-printed labels with address and collection date (advised)
- f. Permanent ink pen
- g. Disposable wipes
- h. Trash bags

2. Bare Soil Sampling Procedures and Techniques.

- a. Soil sampling is not recommended when the ground is frozen. If there is snow cover preventing soil sampling, soil samples must be collected when the snow has melted and the ground is not frozen.
- b. The soil samples and areas of bare soil should be identified on a site plan sketch.
- c. Sampling containers should be pre-labeled with site-specific identifiers (i.e., site address and collection date).
- d. Put on a new pair of clean, disposable gloves for each sampling event.

e. Sampling Techniques:

Techniques include single sample collection and multiple subsample collection, referred to as composite sampling. The type of sampling depends upon the pattern and extent of bare soil in an area to be sampled.

Although paint chips should not be oversampled, they should also not be excluded from the soil sample, since they are part of the soil matrix. The assessor should make an effort to avoid including grass, twigs, stones, and other large debris (other than paint chips) in the sample. Samples should be taken from bare soil areas only; grass or sod does not need to be removed.

When all subsamples of the composite sample have been placed in the sampling container, the container should be sealed. If using a plastic bag and the bag is not 4 millimeter industrial weight, the sample should be double-bagged.

Single Sample Collection: Single sample collection is used when the bare soil area is small. Determine the depth to which the container should be inserted in the soil in order to collect the top ½ inch of soil. Push the container into the soil and scrape the container at least 4 inches horizontally along the soil surface. Two additional samples should be taken within 1 ft. of the first for a total of three samples. If soil is dense or hard, coring sampling methods should be used.

Composite Sample Collection: Composite collection is used when the bare soil area is larger and/or has an elongated shape. Up to 10 subsamples of surface soil can be collected. Subsamples should be more than 1 ft. and less than 3 ft. apart. Larger area subsamples can be spaced up to 6 ft. apart.

f. Sampling Locations:

Building Foundation Perimeter: Depending upon bare soil present, most often the sampling technique used at the foundation perimeter is composite sampling. Refer to collection procedures in prior section. Subsamples should be taken linearly and evenly spaced along the length of the area to be sampled. Soil should be sampled within 3 ft. of the structure foundation.

Bare Soil Areas: Bare soil areas are defined as 9 sq. ft. or larger. A play area is defined as a bare soil area of frequent contact by the child under six years old as indicated by play equipment, toys, observations of play patterns, or information provided by parents, caretakers or property owners. Refer to collection procedures in prior section.

Vegetable Garden Soil: For vegetable gardens, 6-10 subsamples should be collected, depending on the size of the garden. Samples should be collected to a depth of 3 or 4 inches to account for previous soil mixing. Samples should be evenly spaced and

collected using an 'X' or zigzag pattern using a trowel or coring tool. Samples should be mixed in a clean plastic container and approximately one cup of soil should be removed for lead analysis.

3. Labeling the Container:

Label the tubes or bags with four individual and unique identifiers, using either a pre-printed label or permanent marker. The identifiers include a sample number, site identifier (i.e., street address), location where the sample was taken (i.e., dripline, yard or play area), and date of collection. Identifiers on the sample should match the sample number and descriptions on the Environmental Lead Sampling Requisition form.

4. Trash Disposal:

All used gloves and sampling debris should be put into a trash bag. The trash bag should be disposed of off-site.

5. Assessor Decontamination:

When conducting sampling, the assessor, should avoid hand-to-mouth contact (i.e., smoking, eating, drinking, and applying cosmetics) and should wash their hands with running water immediately after sampling. The assessor should ask to use the resident's bathroom for this purpose. Wet wipes may be used if running water or the bathroom is not available.

6. Form Completion and Fees:

- a. Complete the Environmental Lead Sampling Requisition. Record any field notes on the requisition or a separate piece of paper. Chain of custody requirements should be followed if applicable.
- b. Fees: County certified lead assessors are to submit a check payable to the State of Michigan and a list of clients with each specimen. Attach the check to the Environmental Lead Sampling Requisition. Interested parties may establish a billing procedure for testing services by contacting the laboratory at 517.335.9490. Public health-related samples, which are environmental lead specimens for lead-poisoned clients, are exempt from a fee. Individuals wishing to submit samples should contact their local health department to arrange billing, submittal, and payment. For more information regarding fees, contact the MDCH lab at 517.335.9490.

7. Quality Assurance/Quality Control:

Any questions or problems concerning environmental sampling results should be directed to:

MDCH - Trace Metals Laboratory
3350 N. Martin Luther King Blvd.
Lansing, MI 48909
Phone: (517) 335-8244
Fax: (517) 335-9776
Email: knottnerusm@michigan.gov or fisherk@michigan.gov

Questions on sampling procedures can be directed to the MDCH Healthy Homes Section at 517.335.9390.

8. Lead Hazard Identification:

In accordance with Michigan administrative rule R325.99402 and the U.S. Environmental Protection Agency 40 CFR Part 745.227, the following are the levels at which a soil sample is deemed a lead paint hazard during a lead risk assessment or environmental investigation. If soil testing for a lead abatement project clearance is performed, soil results under these levels are considered passing clearance.

Hazard Determination and Failing Clearance Levels - at or above:

400 µg/g	bare soil in child play areas
1200 µg/g	bare soil at the foundation/dripline and any other sections of the yard with bare soil

9. References:

- a. ASTM E 1727-05. Standard practice for Field Collection of Soil Samples for Subsequent Lead Determination. Copies are available on the ASTM website (for a fee) at: <http://www.astm.org/Standards/E1727.htm>.
- b. *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*, U.S. Department of Housing and Urban Development, July, 2012. Copies of the Guidelines are available on the HUD website at: http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/hudguidelines.