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An American National Standard

Standard Guide for Conducting Lead Hazard Assessments of Dwellings and of Other Child-Occupied Facilities[1]

This standard is issued under the fixed designation E 2115; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers how to conduct, document and report findings of a lead hazard assessment of dwellings and of other child-occupied facilities.

1.2 Procedures for assessment of personal items, such as toys, dishes, and hobby materials that may contribute to elevated lead levels in blood are not included in this guide.

1.3 Procedures for random sampling of units within dwellings having multiple units are not included.

1.4 The values stated in SI units are to be regarded as the standard.

1.5 This guide contains notes, which are explanatory, and are not part of the mandatory requirements of this guide.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 4840 Guide for Sampling Chain-of-Custody Procedures

E 631 Terminology of Building Construction

E 1605 Terminology Relating to Abatement of Hazards from Lead-Based Paint in Buildings and Related Structures

E 1613 Test Method for Analysis of Digested Samples for Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP/AES), Flame Atomic Absorption (FAAS), or Graphite Furnace Atomic Absorption (GFAAS) Techniques

E 1644 Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead by Atomic Spectrometry

E 1645 Practice for Preparation of Dried Paint Samples for Subsequent Lead Analysis by Atomic Spectrometry

E 1726 Practice for The Sample Digestion of Soils for the Determination of Lead by Atomic Spectrometry

E 1727 Practice for Field Collection of Soil Samples for Lead Determination by Atomic Spectrometry Techniques

E 1728 Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques

E 1729 Practice for Field Collection of Dried Paint Samples for Lead Determination by Atomic Spectrometry Techniques

E 1753 Practice for Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Dry Paint Films

E 1864 Practice for Evaluating Quality Systems of Organizations Engaged in Conducting Facility and Hazard Assessments to Determine the Presence and Extent of Lead in Paint, Dust, Airborne Particulate, and Soil in Buildings and Related Structures

E 1979 Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

E 2051 Practice for Determination of Lead in Paint, Settled Dust, Soil, and Air Particulate by Field-Portable Electroanalysis

E 2119 Practice for Quality Systems for Conducting In Situ Measurements of Lead Content in Paint or Other Coatings Using Field-Portable X-Ray Fluorescence (XRF) Devices

E 2239 Practice for Record Keeping and Record Preservation for Lead Hazard Activities

E 2252 Practice for Selection of Lead Hazard Reduction Methods for Identified Risks in Residential Housing or Child Occupied Facilities

2.2 *Other Documents:*

40 CFR 745.227, Environmental Protection Agency (EPA), Lead-Based Paint Poisoning Prevention in Certain Residential Structures (especially subparts D, L and Q)[3]

Guidelines for the Evaluation and Control of Lead-Based

[1] This guide is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.23 on Abatement of Hazards from Lead in Buildings and Related Structures.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

Paint Hazards in Housing, HUD-1539-LBP, June 1995, revised September 1997 ("HUD Guidelines")[4]

3. Terminology

3.1 *Definitions:*

3.1.1 For definition of terms not appearing here, refer to Terminologies E 631 and E 1605.

3.1.2 *lead hazard assessment*, *n*—an investigation of buildings and associated areas in the immediate vicinity of the buildings conducted to determine the location, type, and severity of lead hazards.

4. Summary of Guide

4.1 This guide discusses the conduct of a lead hazard assessment, in a stepwise progression, using a systematic application of the three general tasks listed below. Simultaneous conduct of several activities within these tasks generally is performed.

4.1.1 *Task 1*—Pre-site visit activities: Preparing for the on-site visit.

4.1.2 *Task 2*—On-site activities: Conducting field work.

4.1.3 *Task 3*—Post-site visit activities: Analyzing information and reporting.

NOTE 1—The procedures described in this guide are based on the hazard identification portion of a risk assessment of dwellings and other facilities frequented by children as described in 40CFR745.227 and HUD Technical Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.

5. Significance and Use

5.1 This guide is intended to help prevent lead poisoning of children by providing standardized procedures for conducting a lead hazard assessment and providing information needed to develop and recommend lead hazard control options as described in E 2252.

5.2 This guide is applicable for use in either occupied or unoccupied dwellings and in other child-occupied facilities.

5.3 The procedures in this guide, when supplemented by recommendations for controlling lead hazards, provide for the conduct of a lead risk assessment of a dwelling or of other child-occupied facilities.

5.4 This guide may be used to supplement assessment procedures used to determine the causes of elevated blood lead (EBL) levels in young children.

NOTE 2—In cases of EBL levels, investigation of the total living environment of the child and a pediatric medical evaluation may also be needed. Reference should be made to documents such as *Managing Elevated Blood Lead Levels Among Young Children*,[5] *Preventing Lead Poisoning in Young Children (1991)*,[6] *HUD Technical Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*,[4] and *Screening Young Children for Lead Poisoning.(1997)*[6]

5.5 Although this guide was developed for dwellings and for other child-occupied facilities, this guide may be suitable for lead hazard assessments in non-residential buildings and other properties following agreement between assessor and client on appropriate lead action levels.

5.6 This guide is not intended for use in identifying building materials that when abraded or otherwise degraded, such as that which may occur in remodeling or renovation activities, may result in lead hazards.

5.7 Lead hazard assessment reports describe lead hazards identified at the time the assessment was performed. The locations, types or severities of lead hazards can change over time as a result of property improvement or deterioration, significant changes in property use, or other factors.

NOTE 3—The term "lead-free" should never be used to describe the absence of lead hazards because testing methodologies are not designed to measure the total absence of lead. Small amounts of lead present in building materials and components or soil may result in a hazard with changes in building conditions or as a result of activities that create dust that contains lead.

5.8 This guide is applicable for assisting professionals, homeowners, owners or occupants of rental property, lenders, insurers and others with a property interest in determining the presence of lead hazards.

5.9 This guide also is applicable for assisting designers of lead hazard mitigation projects to target resources toward lead hazard controls that are deemed most likely to result in the prevention of lead poisoning in young children.

6. Requirements for a Risk Assessor

6.1 The reliability of a lead hazard assessment depends on the training, experience and knowledge of the lead risk assessor. Lead hazard assessments shall be carried out by risk assessors qualified as required through certification or licensing by applicable regulations promulgated by authorities having jurisdiction.

7. Conducting a Lead Hazard Assessment

7.1 Lead hazard assessments are conducted using a systematic approach consisting of a series of activities within three general tasks. Although several of the activities within a task may be conducted simultaneously, in this standard they are discussed in a stepwise progression.

Task 1—Pre-site visit activities: Preparing for the on-site visit
- Prepare a specifications document
- Gather property information
- Prepare property profile
- Acquire releases
- Assemble assessment supplies
- Determine and document qualifications of personnel and laboratories
- Prepare summary of collected information.

Task 2—On-site visit activities: Conducting field work
- Conduct visual inspection.
- Review collected information.
- Conduct personal interviews.
- Summarize information.
- Make decision either to conduct environmental testing or to assume presence of lead above action levels
- Conduct environmental testing.

Task 3—Post-site visit activities: Analyzing information and reporting
- Process collected environmental samples
- Identify lead hazards
- Catalog lead hazards

[4] Available from U.S. Department of Housing and Urban Development (HUD), 451 7th Street S. W., Washington DC 20210.

[5] Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention, Centers for Disease Control and Prevention (CDC), March 2002. Available from Centers for Disease Control & Prevention (CDC), 1600 Clifton Rd., Atlanta, GA 30333.

[6] Available from Centers for Disease Control & Prevention (CDC), 1600 Clifton Rd., Atlanta, GA 30333.

Prepare a lead hazard assessment summary
Prepare a lead hazard assessment report.

7.2 When applicable, ensure that all requirements of regulations promulgated by authorities having jurisdiction for conduct of a lead hazard assessment are met. Consideration should favor the application of the more stringent regulation, if more than one applies.

8. Task 1—Pre-site Visit Activities: Preparing for the On-site Visit

8.1 *Prepare a Specification Document*—For most lead hazard assessments performed for compensation, a specification document serves to define the scope of work and is used in the contract between the risk assessor and the client (see Note 4). Otherwise, it serves to define the scope of work for use in a project plan, for example, for staff work assignments. This document, at a minimum, should include:

NOTE 4—In most cases, this document will be generated from boilerplate materials that are modified as needed to fit the conditions and requirements of the specific site being assessed, as agreed upon by the client and assessor. It may or may not include approvals by the client or contingencies regarding the successful receipt of signed releases for information gathering from the client and occupants.

8.1.1 *Scope*—A description of the work to be performed including a description of the area to be assessed and the minimum number and types of environmental tests (for example, paint, dust, and soil) to be performed during the assessment.

NOTE 5—Some geographical areas are susceptible to lead contamination in water. Visual inspection of plumbing for the presence of potentially leaded components is generally believed to be unproductive beyond a general assessment regarding whether older or modern materials appear to have been used. It is recommended practice for a lead risk assessor to inform the client that collection of water may be of value should older plumbing materials be observed during the visual inspection, particularly if the site is located in a susceptible geographic area. Agreement between the assessor and client should be reached regarding water sampling. A first-draw sample that collects water that has remained in the plumbing system undisturbed overnight may be needed. To collect this sample, either the risk assessor must obtain access to the site before the occupants use water for that day or provide the occupants with instructions and materials to collect a first-draw sample themselves.

8.1.2 *Cost*—The cost for conducting the work, if the lead hazard assessment is performed for compensation.

8.1.3 *Regulatory Requirements*—A summary of the applicable regulatory requirements for the lead hazard assessments and subsequent hazard mitigation procedures for the area and structures being assessed including identification of the regulatory agencies having jurisdiction.

8.1.3.1 Include regulatory lead action levels promulgated by authorities having jurisdiction, as appropriate.

8.1.3.2 Action levels more stringent than those promulgated by the authorities having jurisdiction may be used following agreement between assessor and client.

8.1.3.3 In the absence of action levels in regulations by authorities having jurisdiction, agreement between assessor and client shall be addressed prior to field work.

8.1.4 *Personnel Qualifications*—A summary of the qualifications required for conduct of a lead hazard assessment as prescribed in regulations promulgated by authorities having jurisdiction.

8.1.5 *Laboratory Qualifications*—Relevant regulatory requirements promulgated by authorities having jurisdiction for laboratory (both fixed site and field operational, as appropriate) analysis of environmental samples.

8.2 *Gather Property Information*—Acquire background information on the building to be assessed, as feasible, from the client or occupants, such as:

8.2.1 Building construction or structural records including construction date,

8.2.2 Existing floor plans,

8.2.3 Past property usage records,

8.2.4 Home inspection records,

8.2.5 Any appropriate existing environmental testing records such as a lead hazard or risk assessment, lead-based paint inspection, or other lead or lead hazard testing,

8.2.6 A statement as to the current general use of the structure,

8.2.7 The number of occupants, and the approximate ages of children, if any,

8.2.8 Any exposure related records from the occupants of the structure.

8.3 *Prepare a Property Profile*—Include in the profile, if feasible:

8.3.1 Name and address of client, and relationship to property (owner, buyer, tenant, lender, insurer, and so forth.),

8.3.2 Address of property assessed,

8.3.3 Description of the property assessed (home, apartment, commercial structure, and so forth),

8.3.4 Age of property,

8.3.5 Past, current, or planned renovations or repainting,

8.3.6 Existing lead testing, or inspection reports or previous lead hazard assessment reports, or a combination thereof,

8.3.7 Incidents of lead poisoning in the property,

8.3.8 Repair or maintenance work orders of activity recently carried out, and

8.3.9 Other information on sources of lead in the property.

8.4 *Acquire Releases*—Acquire signed permission releases needed to enter the property to conduct the lead hazard assessment, as necessary. Examples of such releases include:

8.4.1 Permission to enter the property,

8.4.2 Permission to acquire and review available property construction records, inspection records, previous lead hazard assessment or risk assessment records, and any other records appropriate to the conduct of the lead hazard assessment,

8.4.3 Permission to conduct dust sampling, soil sampling, in situ paint testing, water sampling, and any intrusive paint chip sampling deemed necessary or appropriate, and

8.4.4 Permission to conduct interviews of the client, the client's personnel and of occupants, as appropriate.

8.5 *Assemble Assessment Supplies*—Assemble, inventory, and pack for shipment to the assessment site testing and sampling materials and protocols that may be needed during the lead hazard assessment.

8.6 *Determine and Document Qualifications of Personnel and Laboratories*:

8.6.1 Document that all personnel to be involved in the assessment meet the requirements in 8.1.4. Include in the documentation copies of appropriate licenses and certifications.

8.6.2 Document that all laboratories (both fixed site and field operational, as appropriate) to be used for analysis of environmental samples meet the requirements in 8.1.5. Include in the documentation copies of appropriate licenses and certifications.

8.7 *Prepare Summary of Collected Information*—Review all the information obtained and prepare a summary to use in making decisions during the on-site visit. Attach signed permission releases to the summary for quick reference. At a minimum, the summary should list physical locations targeted for environmental testing.

9. Task 2—On-site Visit Activities: Conducting Field Work

9.1 *General Conduct of Field Work*:

9.1.1 Use Practice E 1864 as a field-work quality guide.

9.2 *Conduct Visual Inspection*—Conduct a visual inspection of the area to be assessed in accordance with E 2255 to identify suspected lead hazards.

9.2.1 Ensure that each potential friction surface (for example, sash and sill of a double hung operable window, jamb or frame of a door, and painted floor or stair tread) is assessed for evidence of abrasion.

9.2.2 Ensure that each potential impact surface (for example, door and door jamb) is assessed for damaged paint.

9.2.3 Ensure that each potential chewable surface (for example, interior window sill) is assessed for damaged paint.

9.3 *Review Collected Information*—Review and summarize the visual assessment data and previously collected information to provide an improved frame of reference for conducting personal interviews.

9.4 *Conduct Personal Interviews*—Personal interviews with the occupants of the dwelling or with occupants of other child-occupied facilities are recommended to better understand the use and use patterns of the dwelling or facility being assessed. If personal interviews with the occupants cannot be conducted, then, if possible, conduct interviews with persons familiar with the dwelling or facility to be assessed, such as the owner, previous occupants, neighbors, or maintenance personnel. If interviews are not possible, use professional judgment to make assumptions regarding children's use or use patterns with respect to both interior and exterior areas. The use pattern information is used in assigning a potential lead-risk hazard category to each item identified as a lead hazard.

9.4.1 *Interview Questions*—Attempt to get answers to as many of the questions shown in Table 1 as possible. Table 1 is not an exhaustive list and should be supplemented with additional questions deemed necessary to provide useful information regarding the use and use patterns of the building. Use of pre-configured interview questionnaire forms with columns provided to record answers and other observations can provide a convenient method of recording interview data minimizing the need for extensive writing during the next review and summarization step.

9.5 *Summarize Information*—Summarize all interview and other previously collected information to assist in determining living areas and locations within the living areas for environmental testing.

9.5.1 Note on the floor or site plan the potential hazards that residents may frequently contact based on use patterns for suitable locations for environmental testing.

9.6 *Make Decision either to Conduct Environmental Testing or to Assume Presence of Lead above Action Levels*:

9.6.1 For suspected lead hazards listed in the paint/dust/debris or ground data forms, an assumption that lead is present above the applicable regulatory action level may be made with the permission of the client. However, environmental testing is needed to determine the absence of lead hazards.

9.6.2 If lead hazards are assumed to be present, go to 10.4.

9.7 *Conduct Environmental Testing*—Determine whether the testing guidelines given in this section meet the requirements of regulations promulgated by authorities having jurisdiction. If not, make appropriate changes to the guidelines given. Also consider testing areas that potentially represent the greatest lead risks as identified in 9.5.1. This approach to sampling provides for the potential identification of worst-case situations as opposed to a sampling design having an objective of identifying average situations.

9.7.1 *Select Living Areas for Paint and Dust Testing*—In the dwelling or facility to be assessed, select:

9.7.1.1 All, or a minimum of four living areas that children under 6 are most likely to frequent.

9.7.1.2 Each additional living area with deteriorated paint that was identified in the visual assessment, and

9.7.1.3 In addition for dust, at each entryway from the exterior of the dwelling or facility.

9.7.2 *Identify Locations for Paint Sampling and Testing*—Identify a location(s) in each living area for each surface appearing to have a unique painting history in each of the following categories that apply:

9.7.2.1 Painted surfaces subject to friction, for example, windows, doors and painted floors or stairs,

9.7.2.2 Painted surfaces subject to impact, for example, door frames,

9.7.2.3 Painted surface on which there is evidence of teeth marks, and

9.7.2.4 Painted surfaces having deteriorated paint that were not included above.

9.7.3 *Identify Sampling Locations for Surface Dust*—Identify a location(s) in each living area in each of the following categories that apply:

9.7.3.1 A minimum of one interior window sill in each living area,

9.7.3.2 Floor in every living area and entryway,

9.7.3.3 Horizontal surfaces directly beneath painted surfaces deteriorated by friction or impact. In cases where more than one painted surface is deteriorated by friction or impact in the living area, select representative horizontal surfaces using professional judgment, and