Designation: E3366 – 23

Standard Guide for Using Publicly Available Data to Identify Schools and Vulnerable Communities at High Risk for Elevated Lead in Drinking Water[1,2]

This standard is issued under the fixed designation E3366; 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.

INTRODUCTION

Sections 50105 and 50110 of the *Infrastructure Investment and Jobs Act* (1)[3] direct the US EPA to identify schools and housing in vulnerable communities at high risk to lead exposure from water supply infrastructure. The Agency has responded with its *Guidance for Developing and Maintaining a Service Line Inventory* EPA 816-B-22-001 (August 2022) and the January 2021 Lead and Copper Rule Revision. The Lead and Copper Rule Revision establishes new limits for lead and copper in drinking water. This guide describes a series of steps to effectively identify schools and vulnerable communities at risk of high lead levels in drinking water using only publicly-available information and robust geographic information systems software and is consistent with the Predictive Modeling approach described in Section 5.5 of *Guidance for Developing and Maintaining a Service Line Inventory*. This guide complements the records review activities described in EPA's lead service line replacement guidance. Stakeholders can use the procedures described in this guide to rapidly assess the likelihood of lead in water exceeding the limits in federal regulations (*40 CFR 141 et seq.*) without the costs associated with inspecting water service lines and water service line connections at schools and in *vulnerable communities*.

According to EPA:

Service line inventories are the foundation from which water systems take action to address a significant source of lead in drinking water - lead service lines (LSLs). Establishing an inventory of service line materials and identifying the location of LSLs is a key step in getting them replaced and protecting public health. Lead service line replacement (LSLR) is not dependent on knowing the location of all LSLs; in fact, simultaneously developing an inventory while conducting LSLR can have many benefits. For example, systems can save costs by replacing LSLs when crews find them onsite during service line investigations. Systems can also leverage the opportunity for LSLR by seeking customer consent and private property access during service line investigation. Replacing LSLs in a safe and prompt manner while crews are in the field for inventory development provides an opportunity for public health benefits for consumers by more quickly eliminating this potential source of lead exposure from drinking water. (EPA August 2022)

1. Scope

1.1 As the General Accountability Office (GAO) reported in 2018 (**2**), the discovery of toxic levels of lead in drinking water in Flint, Michigan in 2015 renewed awareness about the risks that lead poses to public health. Exposure to lead can result in elevated blood lead levels and negative health effects. Children are at particular risk, because their growing bodies absorb more lead than adults, so protecting them from lead is important to lifelong good health. According to the Centers for Disease Control and Prevention (CDC), elevated blood lead levels have been linked to anemia, kidney and brain damage, learning disabilities, and decreased growth. As a result of widespread human use, lead is prevalent in the environment; for example, it can be found in paint (lead in paint was banned in the United States in 1978)[4] and soil, and can leach into drinking water from lead-containing plumbing materials, such as faucets and drinking fountains.

1.2 Lead in school drinking water is a concern because it is a daily source of water for over 50 million children enrolled in public schools. The pattern of school schedules—including time off over weekends, holidays, and extended breaks—can contribute to standing water in the school's plumbing system. If there is lead in the plumbing system, the potential for it to leach into water can increase the longer the water remains in contact with the plumbing. Estimating the risk of lead contamination of schools' drinking water at the State level is a complex and important challenge. Variable water quality among water systems and changes in water chemistry during distribution affect lead dissolution rates from pipes and fittings. In addition, the locations of lead-bearing plumbing materials are uncertain. EPA, 2002 (**3**), Triantafyllidou and Edwards, 2012 (**4**).

1.3 The US EPA is responsible for enforcement of the *Safe Drinking Water Act* (SDWA) on Tribal land; there is no delegation of this authority to the States.

1.4 Sections 50105 and 50110 of the *Infrastructure Investment and Jobs Act* (Public Law 117–58) (**1**) provides funding and directs the US EPA and the Department of Interior to address lead in drinking water systems that provide potable water to schools and on Tribal land. EPA has announced that in accordance with this statute, the Agency discourages partial lead service line replacements and encourages full replacement of deficient service lines. The legislation provided the US EPA with approximately $15 billion over a 5-year period to achieve this goal.

1.5 This guide describes steps to rapidly identify community and public water systems, as defined in the SDWA, at risk of lead concentrations exceeding the maximum contaminant level (MCL), using publicly available data. These steps augment and complement the records review activities that the US EPA encourages as part of the LSLR program.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[5]

E3032 Guide for Climate Resiliency Planning and Strategy

2.2 *EPA References:*[6]

EPA 810-R-19-003 EPA. Strategies to Achieve Full Lead Service Line Replacement. October 2019

EPA 816-B-22-001 EPA Guidance for Developing and Maintaining a Service Line Inventory. August 2022

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *community water system, CWS, n*—as defined in the Safe Drinking Water Act, a water system that supplies water to the same population year-round.

3.1.1.1 *Discussion*—A community water system serves at least 25 people at their primary residences or at least 15 residences that are primary residences (for example, municipalities, mobile home park, subdivisions).

3.1.2 *maximum contaminant level (MCL), n*—The highest level of a contaminant that is allowed in drinking water.

3.1.2.1 *Discussion*—MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

3.1.3 *maximum contaminant level goal (MCLG), n*—The level of a contaminant in drinking water below which there is no known or expected risk to health.

3.1.3.1 *Discussion*—MCLGs allow for a margin of safety and are non-enforceable public health goals.

3.1.4 *national primary drinking water regulations (NPDWRs), n*—the National Primary Drinking Water Regulations (NPDWR) are legally enforceable primary standards and treatment techniques that apply to public water systems.

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[1] This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.05 on Environmental Risk Management.

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[2] Adapted from "Identifying Schools at High Risk for Elevated Lead in Drinking Water Using Only Publicly Available Data. Science of the Total Environment

[3] The boldface numbers in parentheses refer to a list of references at the end of this standard.

[4] Lead in Paint. Centers for Disease Control and Prevention. https://www.cdc.gov/nceh/lead/prevention/sources/paint.htm

[5] 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.

[6] Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, http://www.epa.gov.