Identifying High Priority Areas for Addressing Lead-in-Water Potential in Fort Worth

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Introduction
In 2016, the Fort Worth Independent School District (FWISD) conducted voluntary, no-cost testing of drinking water at 127 schools and administrative locations across the district to assess whether students were being exposed to high lead levels in drinking water at school (2). Because children are still in the developmental phase of growth, they are particularly vulnerable to the negative health effects associated with exposure to lead contamination (4). Results from the FWISD study showed that 80 of 127 locations had lead levels that exceeded the United States Environmental Protection Agency’s lead action level of 15 parts per billion (ppb) at one or more sample points (2). This infrastructure was older and was suspected to be the primary cause of the lead contamination due to the leaching of lead from lead-containing components (1). However, the issue of lead contamination and its potential link to old infrastructure transcends the school system and necessitates a comprehensive assessment on a citywide basis.

To address this issue, the Fort Worth Independent School District (FWISD) conducted voluntary lead testing of drinking water at 127 locations to assess whether students were being exposed to high lead levels in drinking water at school (2). The results from the FWISD study showed that 60 of 127 lead-containing components is directly correlated to the age of the system (3,5). Given that schools are developed around communities of similar age, the FWISD lead data may be useful as a proxy for assessing wider citywide potential lead-in-water and infrastructure replacement issues. In this project, lead data from the FWISD study was combined with infrastructure-related data, spatial analysis, and spatial statistics techniques to identify potential high priority areas for the city’s lead pipe replacement project and to re-evaluate drinking water infrastructure.

Objectives
• To identify areas in Fort Worth that have the greatest potential for lead-in-water issues.
• To identify which areas should receive highest priority for addressing potential lead-in-water issues.
• To identify population characteristics of the vulnerable to lead contamination.

Spatial Data

Discussion
Figure 1: Building Age vs. Maximum Lead Rating

Figure 2: Minimum Lead Levels

Figure 3: Median Lead Levels

Figure 4: Maximum Lead Levels

Figure 5: Population Vulnerability

Conclusions
• The areas of greatest priority for addressing lead-in-water potential are north Fort Worth in the west of I-35W and southeast Fort Worth. These areas have the greatest potential to experience high lead levels in drinking water due to aging infrastructure and experience high population vulnerability.
• These results may be useful in informing decisions on where to allocate funds to address areas of greatest concern for lead in drinking water.

Sources
1. Carman, John (Director of Fort Worth Water Department) in discussion with Annaliese Miller, Omar Harvey, and Tamie Morgan, Personal interview. Fort Worth, 3 March 2017.