Milwaukee's Lead Service Line Replacement Program Semi-Annual Report

February 2019

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Milwaukee Water Works

Safe, Abundant Drinking Water.

Outline

I. Brief lead introduction

II. Lead reduction efforts

III. Lead service line replacement program

   i. LSL inventory and financial updates

   ii. Lead and copper compliance

   iii. Lead water testing updates

IV. Summary

V. Questions/Discussion

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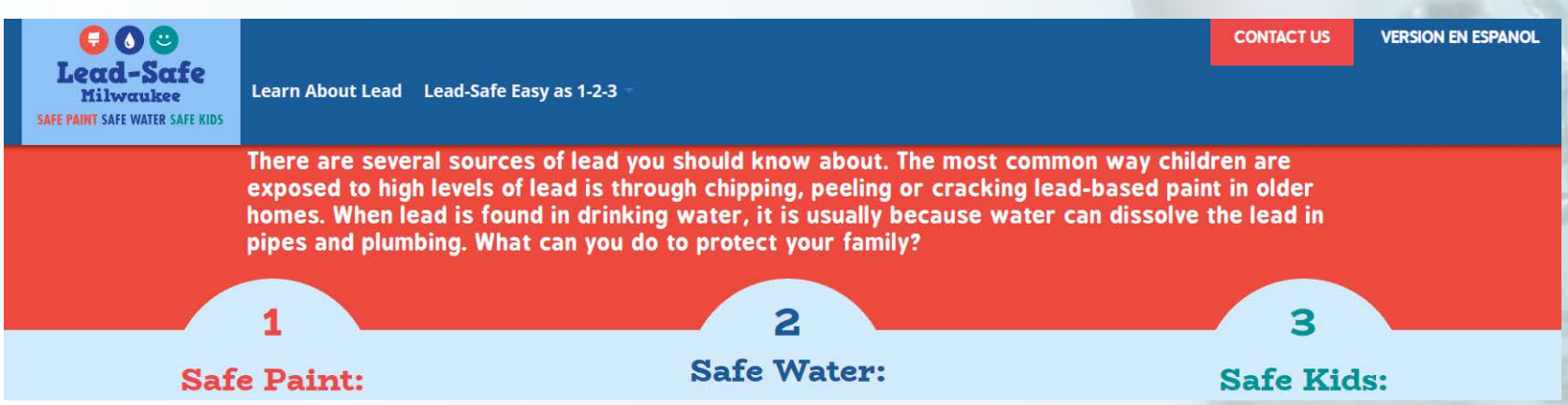
Lead Basics

- Lead is a toxic substance
- Lead exposure is cumulative
- There is no safe exposure to lead
- Young children are particularly vulnerable
- Goal is to remove all sources from the community



https://city.milwaukee.gov/LeadSafeMKE

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Lead reduction efforts

1970	Clean Air Act
1971	42 USC Ch 63
1978	Consumer Protection Safety Commission
1986	Safe Drinking Water Act (and amendments)
1988	MWW conducts proactive lead reduction study
1991	Lead and Copper Rule (and revisions)
1996	MWW initiates corrosion control treatment (CCT)
2002	MWW CCT optimized by WDNR standard
2016	MWW CCT optimized by revised EPA standard
2017	MWW enacts lead service line replacement program

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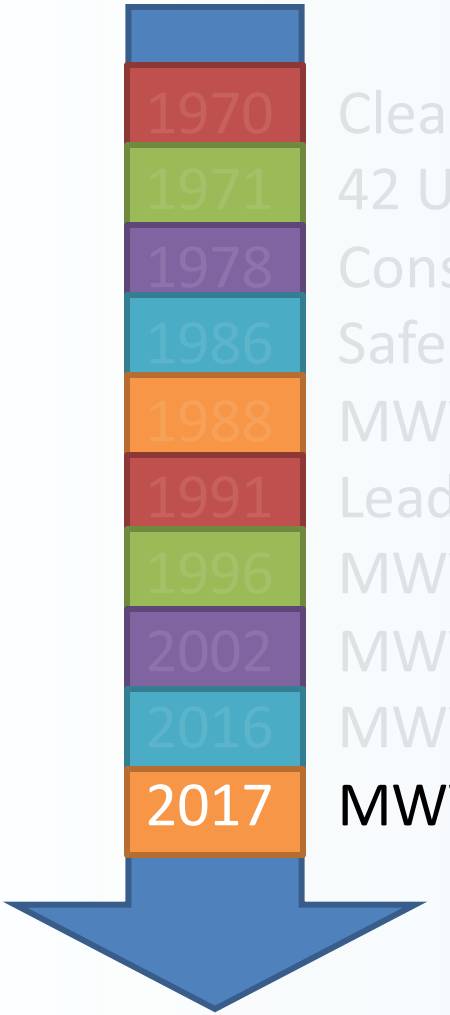
Lead reduction efforts in water



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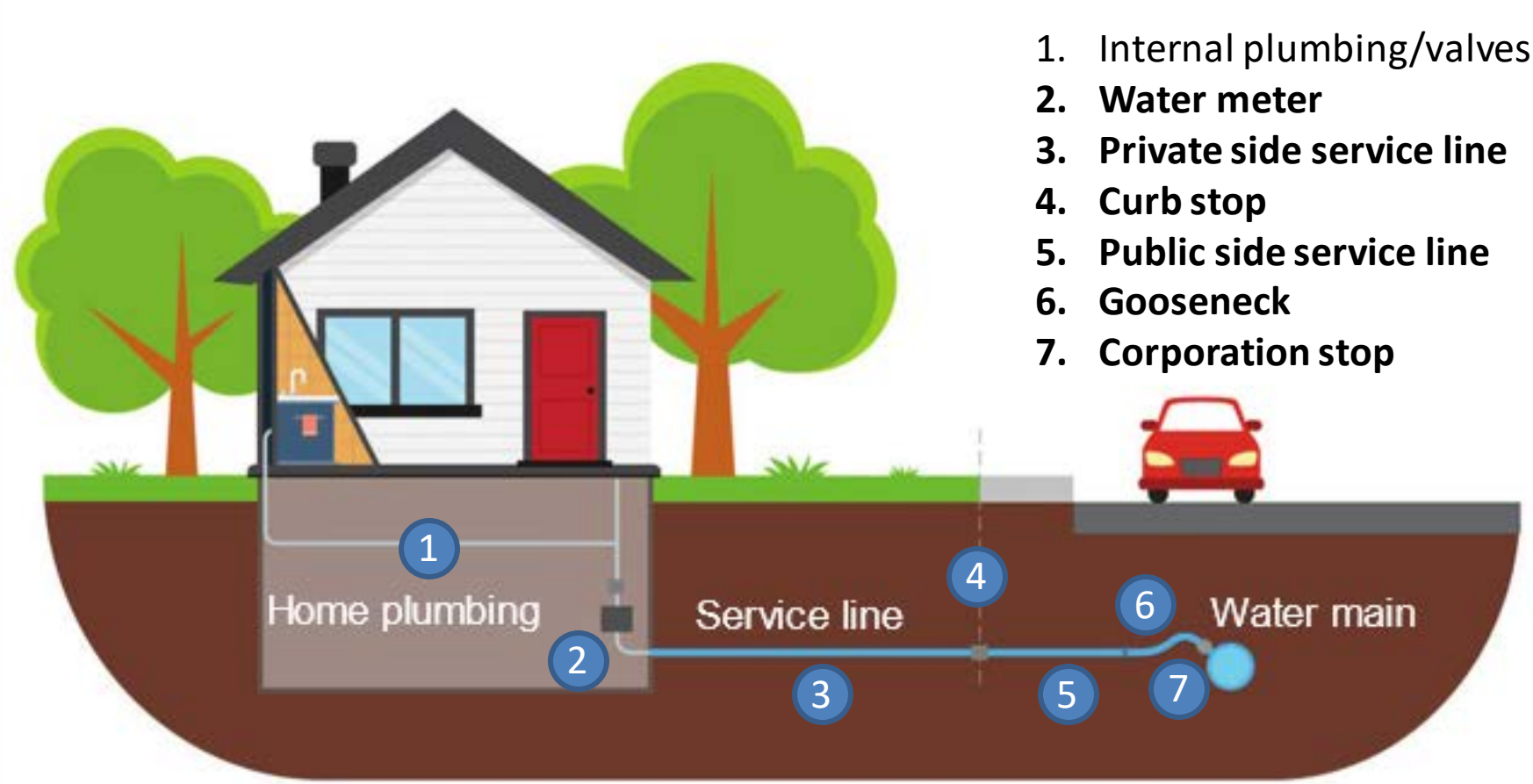
What is a service line?



1. Internal plumbing/valves
2. **Water meter**
3. **Private side service line**
4. **Curb stop**
5. **Public side service line**
6. **Gooseneck**
7. **Corporation stop**

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Review of MKE lead service lines

- 1951 MWW installed last public-side LSL
- 1962 City ordinance requiring private side copper
- 2014 Public Service Commission ordered increased water main relay program
- 2015 MWW pilot study to assess lead in water
  - Study resulted in a moratorium on water main projects connected to LSLs
- 2016 MWW began replacing, rather than repairing, LSLs
  - Filters and lead safety materials provided
  - Led to mandate to perform **full** LSLRs only
- 2017 Lead Service Line Replacement Program established (CCFN 160742)

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Lead service line replacement mandate

As of January 1, 2017, MWW replaces lead service lines with copper when:

- A lead service line is found to be leaking or disturbed
- A lead service line is disturbed during planned water main construction
- A lead service line serves water to a child care facility or a private school
- An owner calls to initiate a replacement (no subsidy)
- Mandate extended to licensed and certified child cares as of 5/25/18

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Water main inventory

Numbers as of December 31st, 2017*	Miles	%
Total miles	1,962	100
Cast iron	1,235	62.9
Ductile iron	661	33.7
Concrete	63	3.2
Copper	2	0.1
Plastic	1	0.1
Lead	0	0.0

*Survey completed by AECOM in 2017 with complete report available online at:
https://city.milwaukee.gov/ImageLibrary/Groups/WaterWorks/files/MWW_TM_Water_Main_Replacement_Evaluation_2017Dec.pdf

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Lead service line inventory

Numbers as of December 31st, 2018	*n* =	%*
Total service connections*	168,973	100
Total lead service lines*	76,626	45.3
Total lead service lines, City of Milwaukee	75,729	44.8
Residential	70,691	41.8
Residential – ON	67,861	
Residential – OFF	2,830	
Commercial, Industrial, Public Authority	5,038	3.0

*Includes the City of Milwaukee and retail customers: Greenfield, Hales Corners, St. Francis, a portion of Franklin, and West Milwaukee (maintains its own distribution)

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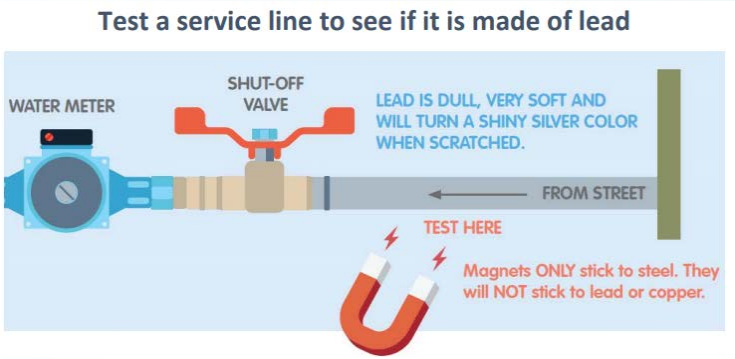
Lead service line inventory



- 31,706 properties built between 1952-1962 (CCFN 170526)
- Letters sent out to help identify basement material; online also
- 5,917 (18.7%) replied to-date

Public Side	Private Side	*n* =	%
Copper	Copper	4,922	83
Copper	Galvanized steel	429	7.3
Copper	Lead	181	3.1
Lead	Copper	273	4.6
Lead	Lead	33	0.6
Lead	Galvanized steel	28	0.5
Iron	Iron or copper	34	0.6

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Lead service lines replaced to-date

Reason for LSL Replacement	2017	2018	%
Leak or disruption	438	542	64
Licensed child care** and schools	149	204	23
Water main relay project	18	124	9
Owner initiated	10	40	3
Other utility work	6	0	<1
Total LSL Replacements	621	910	100

*Licensed Child Cares (2019)

- 35 with lead service lines, 21 out to bid
- Monitored monthly and updated when posted on YoungStar
- Bottled water provided during project and at least 30 days
- Initial filter distribution and water testing done by MHD

**Certified Child Cares added per CCFN 171665

- Currently, 80 with lead service lines, 30 out to bid
- Testing to be offered, replacements to be funded in 2019

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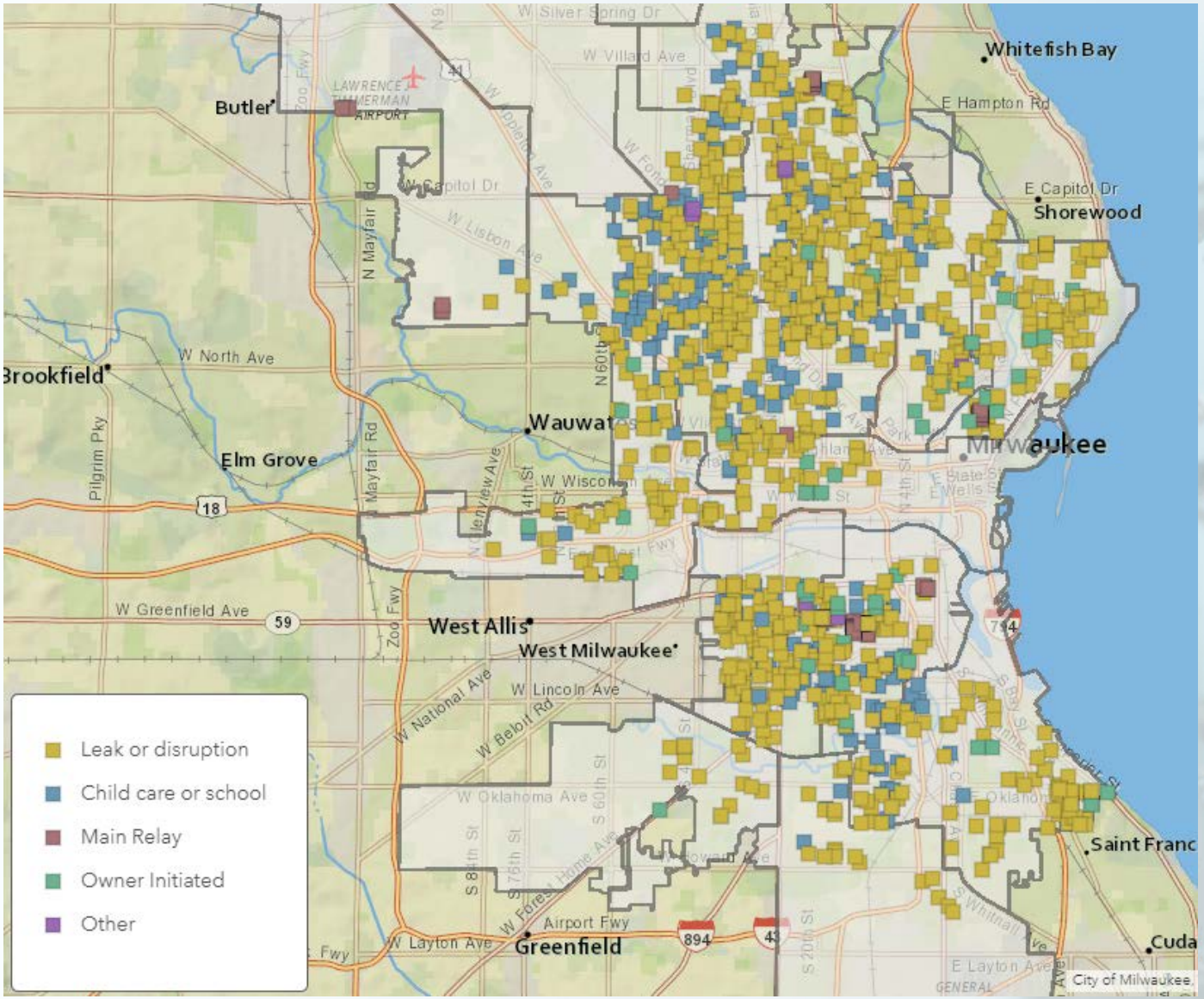
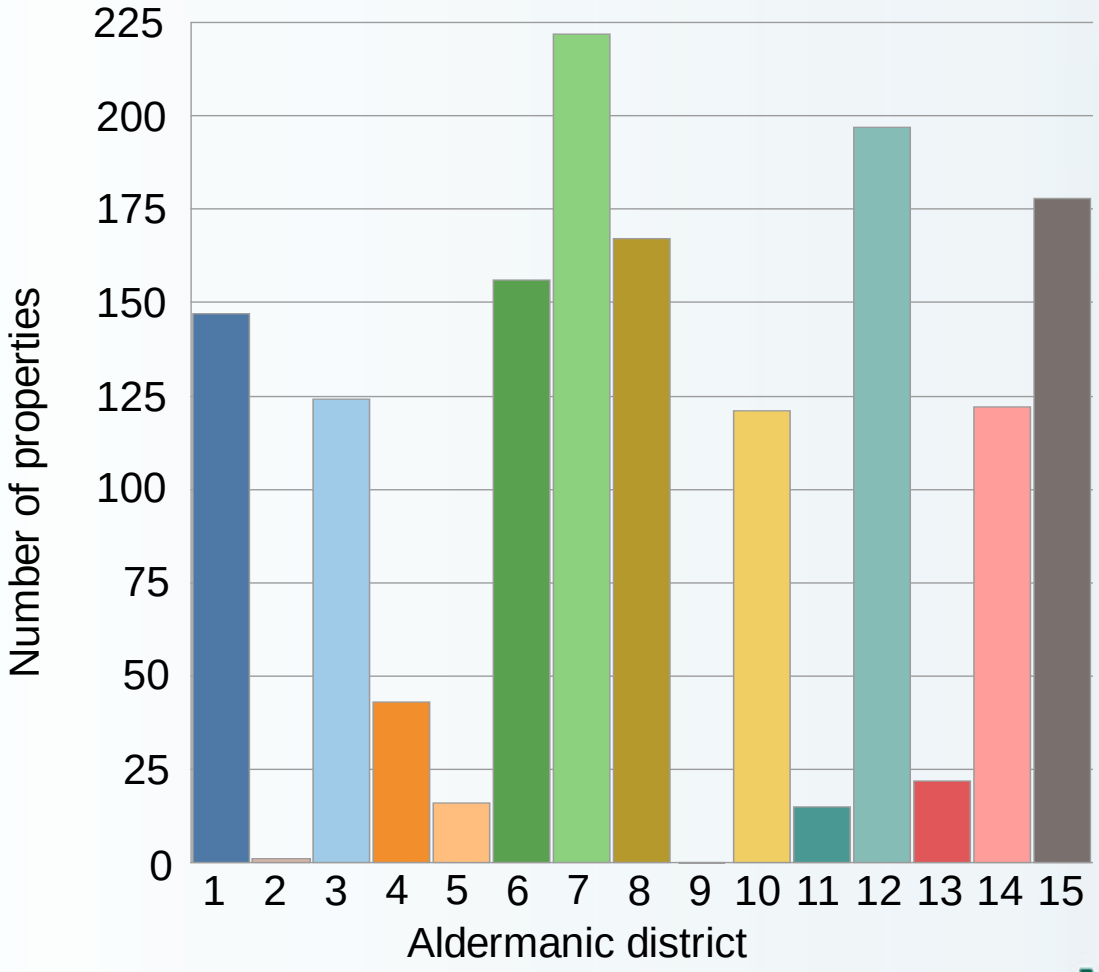
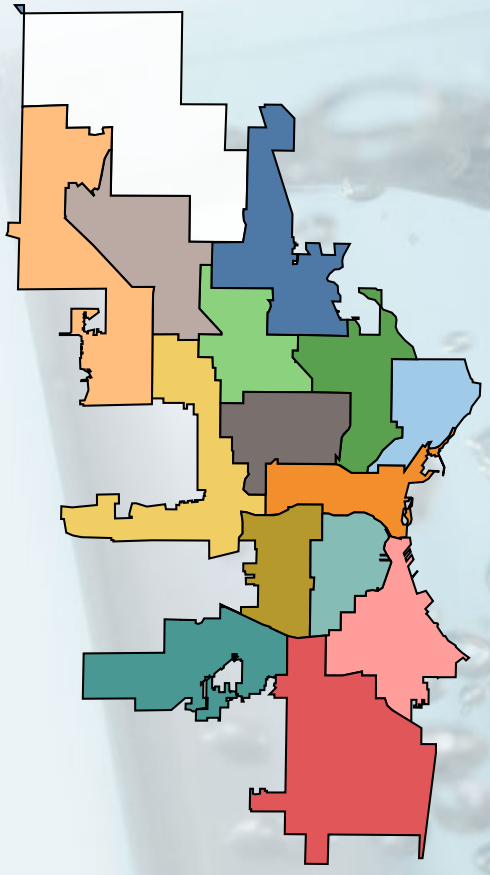
Lead service lines replaced to-date



Lead service lines replaced to-date





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Lead service line financial impact

- $8.8M budgeted for 2018 (800 LSLs at $11,000)
- Using private contractors in a bidding process
- Average full replacement cost to date: $11,224
  - Private Side: $6,026 (previously $6,536)
  - Public Side: $5,465 (previously $6,139)
- Cost has come down by $1,184/per project since July report
- $9.4M estimated cost for 2018
  - Does not include costs from 182 public side LSLs replaced by MWW crews
  - Does not include administration and overhead costs
- Cumulative $13.1M since January 1, 2017

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MWW filter distribution

- NSF 53 certified water pitchers provided by MWW when:
  - There is a leak in the LSL
  - A LSL is damaged during a construction project
  - MWW replaces the public LSL as planned or an emergency basis, necessitating replacement of private LSL
  - A LSL has frozen and must be thawed by removing the meter to restore water service
- Voucher for NSF 53 water pitcher provided by MWW when:
  - Planned or emergency water shut-off affects property with LSL
  - A DPW sewer replacement or street construction project is proximate to a property with a LSL
- Filter Distribution Plan per CCFN 180001, Budget Amendment 78 of 2019 F&P Committee Meeting, to report by March 31, 2019

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Lead reduction efforts in water

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US EPA Lead and Copper Rule (LCR)

- "First draw" sample
- DNR approved sites
- 15 ppb action level at 90th percentile
- Actions:
  - Corrosion control
  - Public notice
  - Outreach and education
  - Additional monitoring

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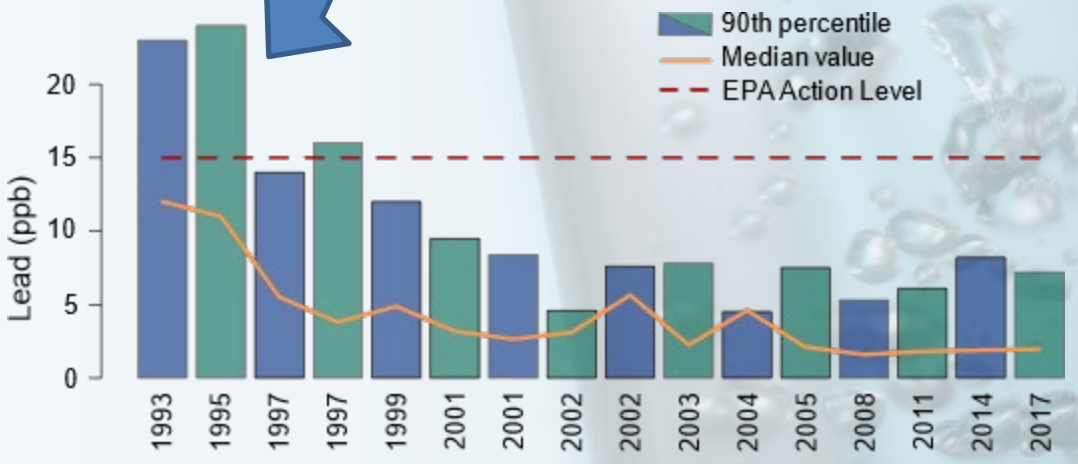
Optimized Corrosion Control Treatment (OCCT)

- CCT initiated in 1996
- Reduced lead by > 60%
- OCCT highly regulated
  - For example, monitor treated water phosphate and pH continuously at both plants
- Routinely measure ancillary parameters for OCCT
- Report daily, monthly, and annually to WDNR

Currently feed 1.9 ppm orthophosphate to finished water ($350K/year)



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Lead and water testing beyond LCR

- Public education and assurance
- Quantify impact of lead service line removal
- Capture and investigate episodic events
- Capacity for further research
- Laboratory certification process underway

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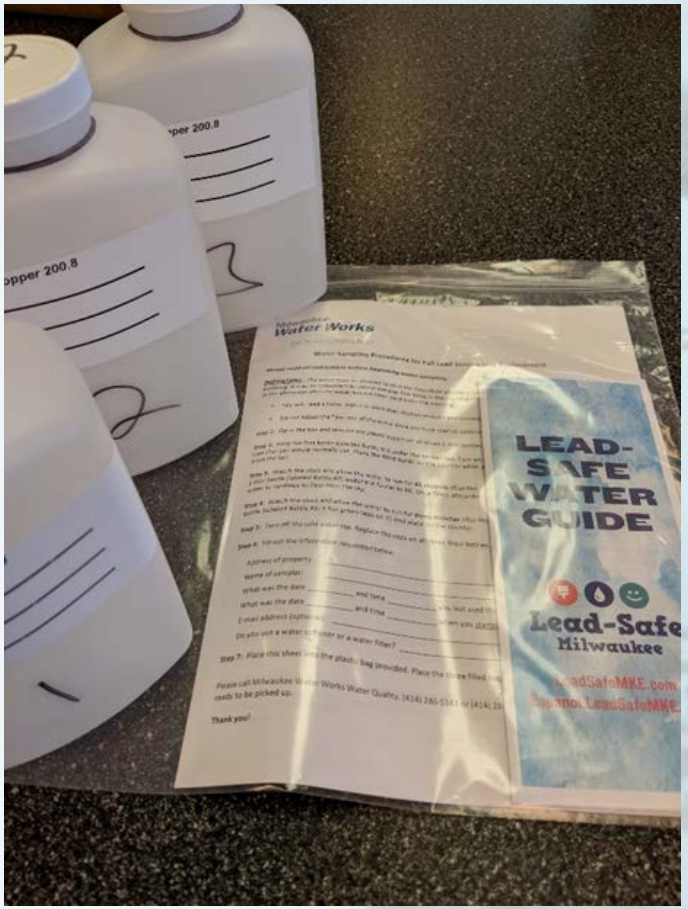
Lead and water testing

- LSLR project entered
- Project leader contacts resident
- Deliver lead and copper kit, provide instructions
- Resident calls, pick up kit, preserve samples, chain of custody form, sent to certified laboratory
- Contact resident, mail results, follow-up



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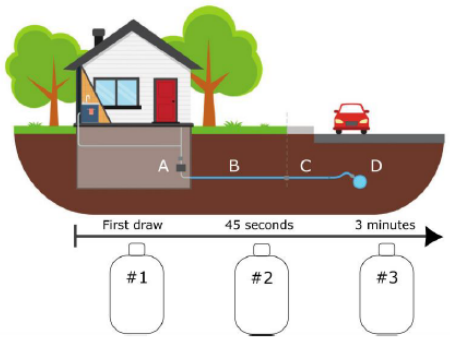
WATER SAMPLE TEST RESULTS FOR LEAD

Address:
Date of Report:
Type of work: Full Lead Service Line Replacement
Date work performed:

	Samples collected before work was performed Date sample collected:	Samples collected __ days after work was performed Date sample collected:	Samples collected ___ days after work was performed Date sample collected:
Sample 1: First draw collected after water was not used for six hours	µg/L	µg/L	µg/L
Sample 2: Collected after a 45-second flush following sample 1	µg/L	µg/L	µg/L
Sample 3: Collected after a 3-minute flush following sample 2	µg/L	µg/L	µg/L

How to interpret these results



A) Everything inside the house past the utility meter is home plumbing. This is represented in bottle 1.

B-C) From the meter to the curb stop is the private side of the service line and from the curb stop to the water main is the public side service line. We try to target this in bottle 2.

D) After the service line is the water main. This is main distribution water and we try to target this in bottle 3 after flushing.

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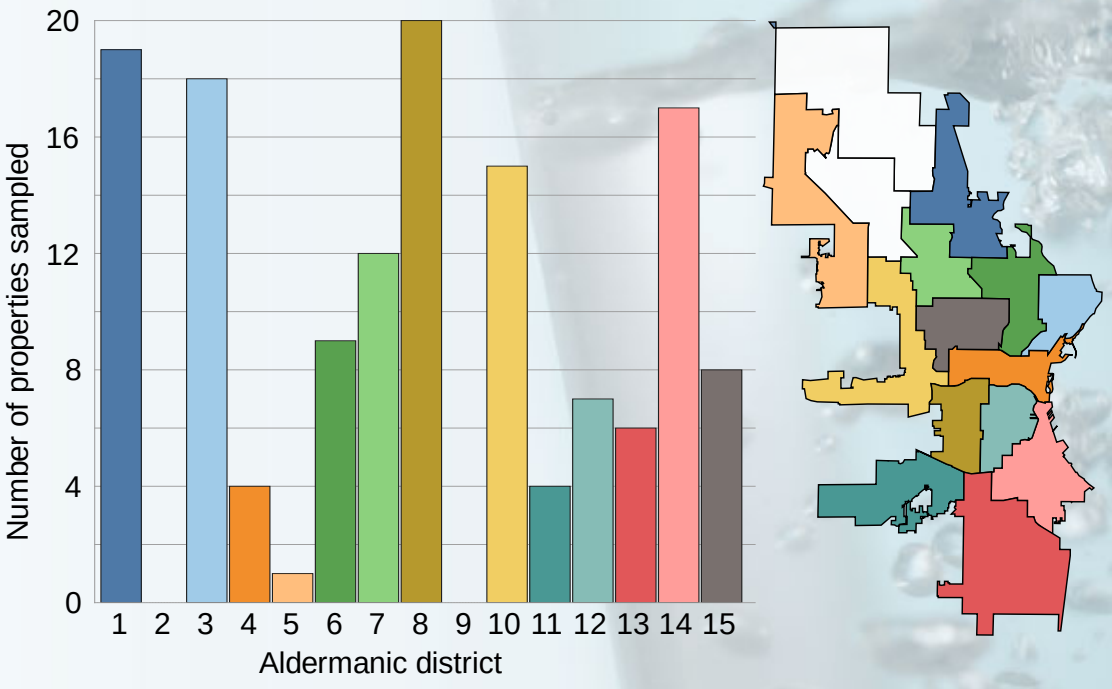
Participation in LSLR testing

- 1531 LSLRs to-date
- 140 pre-LSLR kits
- 70 post-LSLR kits
- 630 total samples run
- 18 kits outstanding
  - District 3 (6)
  - District 12 (12)



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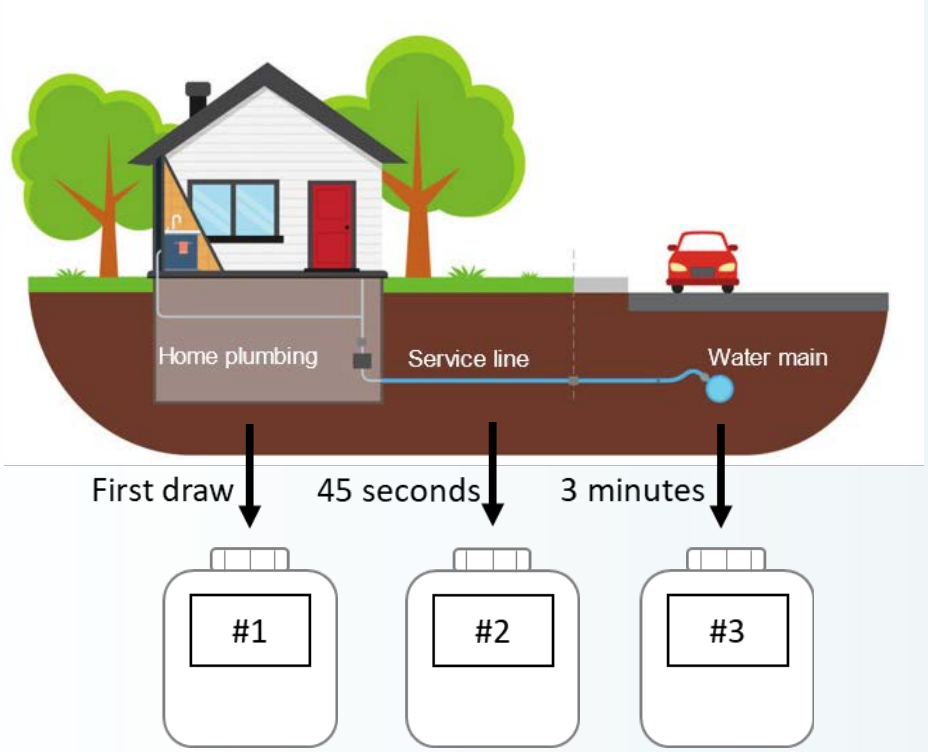
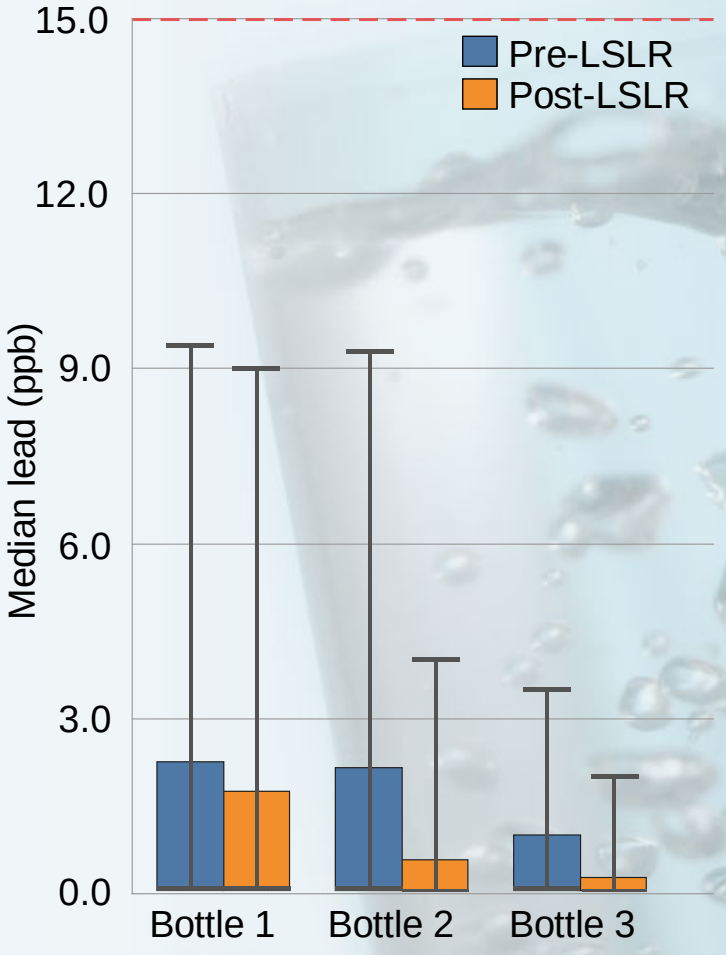
Lead service line replacement results





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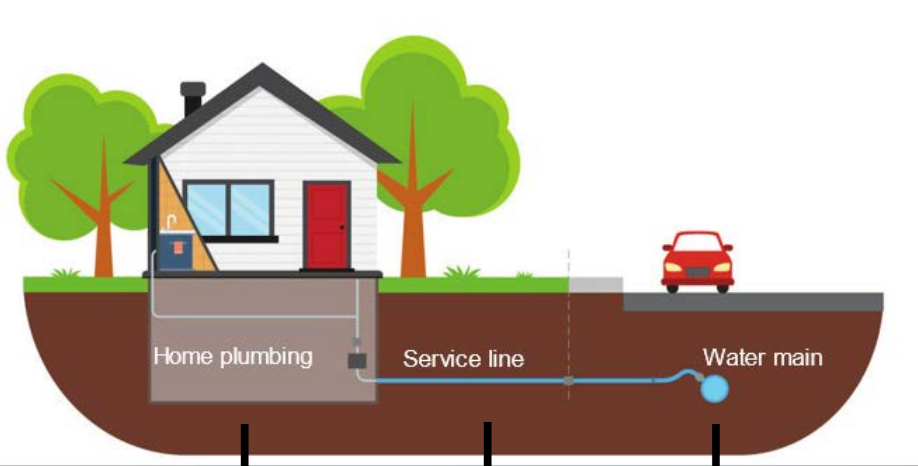
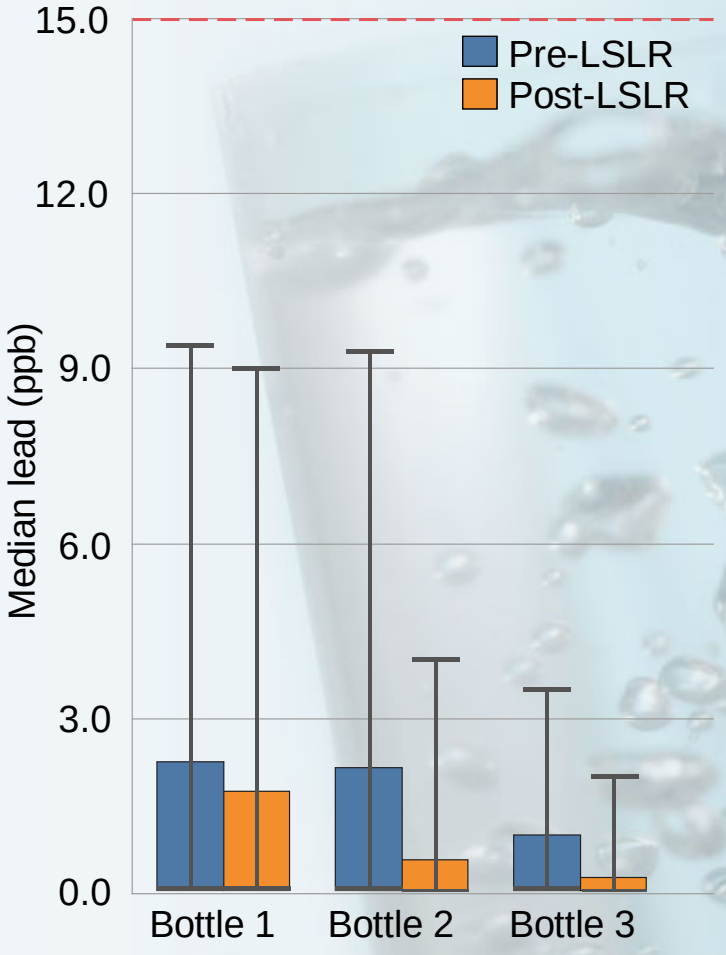


Lead	2.20	2.10	0.96
Copper	1.70	0.53	0.23
Diff	**0.50**	**1.57***	**0.74**



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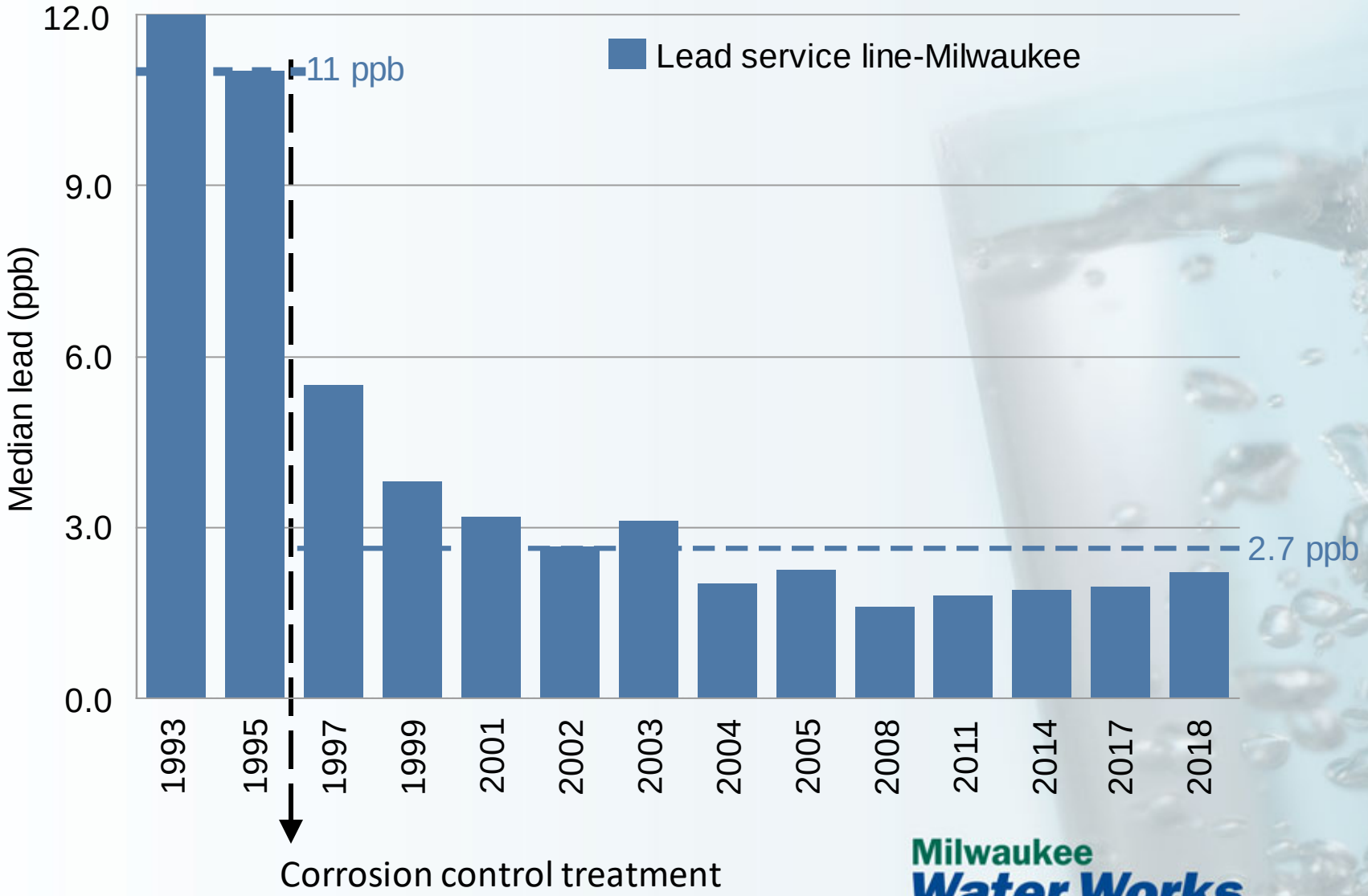
Overall reductions of lead in water



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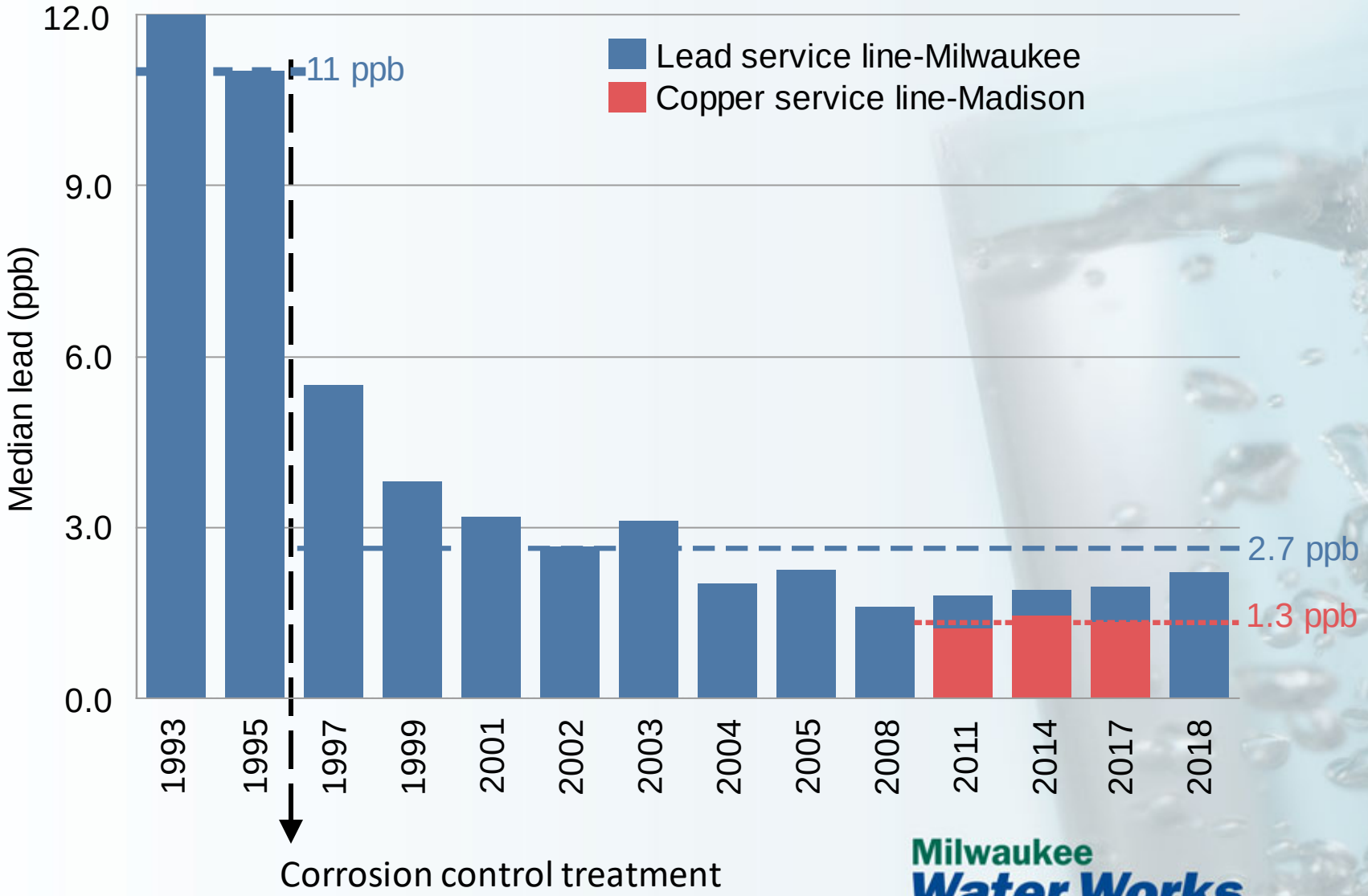

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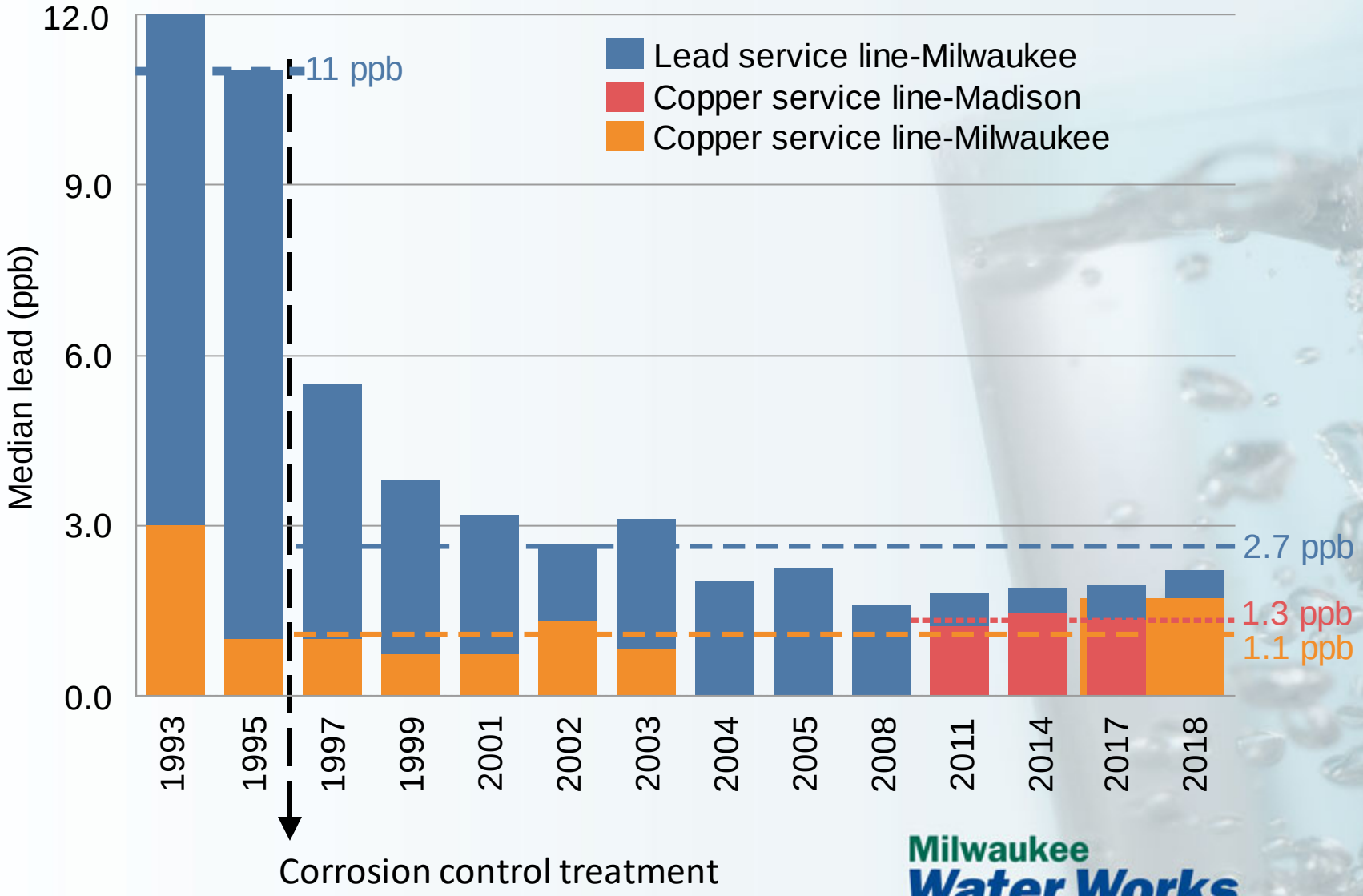

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Summary of lead testing

- No significant reduction in first draw lead levels following LSLR
  - i.e. home plumbing potential sources of lead
- Significant reduction in lead levels seen after 45 second flush following LSLR
  - Reduction of 1.6 ppb
- Corrosion control has been effective at reducing lead and copper in water, but does not eliminate it

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Thank you for your attention.
Questions?

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