



# Water Quality Task Force

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Prepared by the Legislative Reference Bureau

**Activities, Findings, and Recommendations  
Final Report**

**April 2017**

Report by the Legislative Reference Bureau conveying the activities, findings, and recommendations of the City of Milwaukee Water Quality Task Force.

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**WATER QUALITY TASK FORCE**  
ACTIVITIES, FINDINGS, AND RECOMMENDATIONS

City of Milwaukee, Wisconsin  
April 2017

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## TEAM MEMBERS

### Representing the City of Milwaukee

**Ald. James Bohl, Jr., Chair**  
*Common Council, Fifth District*

**Ald. Cavalier Johnson**  
*Common Council, Second District*

**Ald. Jose Perez**  
*Common Council, Twelfth District*

**Bevan Baker**  
*Commissioner of Health*

**Ghassan Korban**  
*Commissioner of Public Works*

**Carrie Lewis**  
*Superintendent of Milwaukee Water Works*

### Representing the Private Sector

**Ben Gramling**  
*Sixteenth Street Community Health Center*

**Dr. Patricia McManus**  
*Black Health Coalition of Wisconsin*

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## I. EXECUTIVE SUMMARY

The Water Quality Task Force is an ad hoc City of Milwaukee committee created for the purpose of evaluating and making recommendations to the Common Council regarding the problem of the presence of lead in the City's drinking water. The Task Force was established by Common Council File Number 160438, adopted July 26, 2016. The Task Force was comprised of members of the Common Council, Department of Public Works, Health Department, the community, and the medical profession. All City departments were directed to cooperate with the work of the Task Force. The specific issues the Task Force was tasked with investigating the following:

1. Possible sources of lead in drinking water, including the City's drinking-water infrastructure and within buildings and private residences.
2. The effect of chemicals on leaching of lead into water.
3. Additional issues related to the long-term health and safety of Milwaukee's drinking water.

The overarching goal of all of the Task Force's activities was to find ways of making the City of Milwaukee's drinking water safe for all residents.

## II. INTRODUCTION

### A. Establishment and Purpose

The Water Quality Task Force (WQTF) was established by Common Council File Number 160438 on July 26, 2016, to address the importance of safe drinking water in the City of Milwaukee. Other communities, such as Flint, Michigan, and Washington, D.C., have been in the national spotlight for their residents being exposed to high levels of contaminants and unsafe drinking water, putting their citizenry at risk of public health crises.

The Milwaukee Water Works (MWW) is a national leader in providing high-quality, healthful drinking water and comprehensive water-quality monitoring. As a greater community, Milwaukee has also made a commitment to be known as a global water hub, at the forefront of freshwater research and technology. The linking of Milwaukee with Lake Michigan, and with safe, clean, and affordable water is as much a measure of this community as beer and bratwurst, or Laverne and Shirley.

Brought into the national spotlight following a major cryptosporidium outbreak in 1993, the City has made major investments in water-quality monitoring and water-treatment infrastructure since that time. On the lead-related front, the MWW has not detected lead in its treated water or source water since it began annual testing for lead in 1996, and testing has consistently shown Milwaukee water is in compliance with U.S. Environmental Protection Agency lead regulations.

Having a significant amount of older housing stock, City figures for children with elevated blood-lead levels as measured by federal standards were among the highest in the nation at the turn of the millennium. For the past two decades the City has been at the forefront of communities in addressing the remediation of lead paint in its homes, the result of which has been a significant drop in City childhood blood lead levels over that time. Despite the progress, the percentage of children with elevated blood lead levels in Milwaukee still exceeds that of Flint.<sup>1</sup> This shows that there is still much work to be done in Milwaukee.

Milwaukee's drinking water is drawn from a lead-free source in Lake Michigan and has been shown to remain lead-free from the treatment plant through its delivery in thousands of miles of

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<sup>1</sup> According to Reuters, in 2016, 5 percent of children screened in Flint, Michigan had elevated blood lead levels. Meanwhile, 8.6 percent of children screened in Milwaukee in 2016 had elevated blood lead levels, according to a report from Wisconsin Public Radio. Compare this figure, however, to the 38 percent of children screened in Milwaukee in 2003 who had elevated blood lead levels, according to a report from Milwaukee Neighborhood News Service.

City-laid water mains. The infrastructure involved in delivering drinking water also includes public- and privately-owned water-service lines connecting homes to water mains, as well as interior plumbing in homes and buildings. It is from these latter sources where lead may potentially enter into drinking water consumed at the tap. Recognizing there is no safe level of lead in the human body, it is the charge of the WQTF to make recommendations to mitigate the potential sources of exposure to lead in water.

Consumption of lead poses a significant threat to public health and safety, with infants, young children, and pregnant women being at the greatest risk of complications from exposure to lead. The City recognizes a need for taking a proactive approach to the assurance of public health and has instituted measures to mitigate the leaching of lead into drinking water, such as the use of an orthophosphate additive to coat the pipes.

In light of ongoing scientific concern over the potential hazards of lead consumed in water, along with the desire to continue Milwaukee's proactive approach to reducing lead exposure among our citizens, the Common Council passed File Number 160742 on December 13, 2016, mandating the replacement of lead water-service lines under certain circumstances and establishing a special assessment policy for the replacement of water-service lines on private property. The 2017 Budget provides approximately \$3.9 million in MWW funding for a lead water-service line replacement program, which includes \$3.6 million for replacement of the utility-owned portion of approximately 600 lead service lines. The remaining \$300,000 will fund one new position to coordinate programming for service line replacement, one chemist position for additional sampling, and the cost of filters certified to remove lead by NSF/ANSI Standard 53 and bottled water for properties experiencing service disruption as a result of work related to lead water-service line replacement. In addition to the \$3.9 million in City funding, Safe Drinking Water Program funding from the State of Wisconsin in the amount of \$1.6 million is set aside for replacing lead service lines at 300 schools and daycares in 2017. An additional \$1 million of Safe Drinking Water Program funding will partially fund the cost of replacing approximately 300 lead services lines that experience leaks in 2017.

The new ordinance mandates complete replacement of both the utility-owned and the privately-owned portions of a lead service line when a leak is discovered or when an emergency or planned infrastructure project affects a lead water-service line. Additionally, the ordinance creates a cost-sharing program for eligible property owners to limit costs incurred by the property owner to the lesser of \$1,600 or the average current cost to replace the privately-



owned portion of a lead service line, and permits eligible owners to use special assessment financing to pay their portion of the cost over a maximum of 10 years.

The Common Council seeks additional ways to ensure long-term health and safety in the delivery of drinking water to Milwaukee residents. Accordingly, the Task Force was established to do the following:

- Explore the problem of lead in the City's drinking-water infrastructure;
- Investigate and make recommendations regarding additional ways to ensure long-term health and safety to Milwaukee's drinking water; and
- Provide its final findings and recommendations to the Common Council.

In consideration of this directive, the WQTF of the City of Milwaukee herewith offers the following report and recommendations to the Common Council.

Date,

James A. Bohl, Jr.

Chair, Water Quality Task Force

## **B. Meetings**

The Water Quality Task Force held regular meetings, which occurred on the following dates:

September 16, 2016

October 14, 2016

November 11, 2016

December 9, 2016

January 13, 2017

February 10, 2017

March 10, 2017

April 1, 2017

April 8, 2017

April 28, 2017

### III. DISCUSSION ITEMS

The Water Quality Task Force discussed a wide variety of matters relating to its mission of exploring ways to make the City of Milwaukee's drinking water safer for all residents. These discussions are described briefly below. Minutes from each Task Force meeting can be found in the attachments.

#### Water Filtration Systems

The Task Force discussed what types of water filters offer adequate protection from lead. The National Sanitation Foundation (NSF) and American National Standards Institute (ANSI) have developed several standards for water filters. The filters that are specifically rated for lead reduction are certified NSF/ANSI Standard 53 filters. Milwaukee Water Works (MWW) has detailed information on its website regarding home water filtration systems.

Sarah DeRoo and Paul Biedrzycki of the Health Department gave an update on the status of distribution to the public of water filters certified to remove lead by NSF/ANSI Standard 53.

#### Lead Water Testing Conducted by Milwaukee Water Works and Other Communities

Milwaukee conducts its lead-in-water testing pursuant to the Lead and Copper Rule, the federal rule regulating monitoring requirements for lead and copper in tap water, 40 CFR 141.86, which is overseen by the Environmental Protection Agency (EPA). There are two types of monitoring: standard and reduced. To qualify for reduced monitoring, the water must not exceed 15 parts per billion (ppb) of lead. Milwaukee is in compliance with the requirements of the rule and qualifies for reduced monitoring. Accordingly, Milwaukee Water Works (MWW) conducts a test of 50 homes once every three years. Cities that are not in compliance with the rule must test 100 homes every six months. Water is tested after it has been stagnant for at least 6 hours. MWW tests the same 50 homes each time as a way to establish a standard baseline. Those 50 homes were selected based on the likelihood of having a higher concentration of potential lead exposure, with the added importance of having a reliable source of test subjects who will follow mandated protocols for drawing water. Testing that is conducted is done with the particular aim of ascertaining if the corrosion-control additives being used are effectively mitigating the leaching of lead.

The Task Force discussed public perception that the City is not testing its water frequently enough. Carrie Lewis, Superintendent of Milwaukee Water Works, stated that the weakness of the Lead and Copper Rule is that it only requires testing of the first liter of water, which would

not include water from the water-service line. Accordingly, MWW goes beyond the base requirement and tests 12 liters of water. Superintendent Lewis also discussed the outreach and education MWW conducts with residents. Additionally, MWW and the Health Department have information available to residents who wish to get their water tested by a commercial testing facility.

The concern was raised that lead flakes can be dislodged or disrupted and may not be caught during testing, because results will depend on the time between the dislodging and the testing.

Health Commissioner Bevan Baker stated that the Health Department has been conducting lead testing for children since the 1990s. The Health Department is working with the State to address lead in childcare centers. Milwaukee Public Schools will begin voluntary testing of the water at its facilities. Additionally, the Health Department is working with the University of Wisconsin–Milwaukee’s Zilber School of Public Health and School of Freshwater Sciences to test lead in soil. Lastly, during the deliberations of the WQTF, the Common Council passed File Number 160964, mandating annual testing of all water used for City-controlled charter schools, and scheduled File Number 161645, calling on the State of Wisconsin to mandate regular testing protocols for all schools and state-licensed daycare centers.

#### Additives Used in Milwaukee Water

The following additives are used in the City’s drinking water: ozone gas, chlorine, aluminum sulfate, orthophosphate phosphoric acid, hydrofluorosilicic acid (fluoride), and chlorine and ammonia (chloramine). Superintendent Lewis stated that the chemicals used to treat water are for the purpose of removing contaminants from Lake Michigan. Additionally, fluoride is added to prevent dental cavities, and an orthophosphate is used to coat pipes. During this discussion, Superintendent Lewis also offered that the city’s Cryptosporidium outbreak of 1993 and the lead crisis in Flint have changed the way people think about and treat water.

#### Disinfectant Processes

In studying water treatment in European communities, the Task Force was advised by the LRB that the most common disinfecting processes used (if any) are ozone, chlorine, and chloramine. Superintendent Lewis stated that surface water treatment plants in the United States are required to disinfect water.

### Sources of Lead that Enters Humans

Lead enters the body through ingestion more often than through inhalation. Some sources claim approximately 10-20% of lead contamination comes from drinking water, although that percentage is higher for formula-fed infants, at 40-60%,<sup>2</sup> or even as high as 85%.<sup>3</sup> It is difficult, however, to track exactly where lead comes from once it enters the body. Commissioner Baker stated that 17,000 homes have been abated for lead paint, but tens of thousands more remain unaddressed. Continuing to abate lead paint will take time and a comprehensive approach. Ald. Johnson expressed concern regarding consistent exposure to lead and the effect on a child's learning ability. Dr. Baker stated there are many cognitive issues that arise with exposure to lead.

### Private Property Water Infrastructure

Ald. Bohl stated that lead pipes for interior plumbing, solder and fluxes, galvanized pipes, and old faucets can contribute to lead in drinking water. He added that just replacing lead water-service lines will not solve the entire problem.

### City Budget

Aaron Szopinski, Research and Policy Coordinator from the Mayor's Office, discussed the budget and plan for addressing lead water-service lines. The City's 2017 Budget provides \$6.5 million to replace lead service lines as follows:

1. \$3.4 million to replace lead service lines for approximately 385 daycare facilities and a number of schools:
  - a. \$1.8 million in Milwaukee Water Works operating spending to replace the City-owned portion of lead service lines replaced.
  - b. \$1.6 million in State funding for the non-City-owned portion of lead service lines replaced.
2. \$2.8 million for 300 "emergency" lead service line replacements anticipated in 2017 relating to service line failures:

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<sup>2</sup> This statistic comes from a report by Monty C. Dozier and Mark L. McFarland of Texas A&M University.

<sup>3</sup> Articles in Urban Milwaukee, Wisconsin Center for Investigative Journalism, and Urban Wall Street Journal cite the EPA as the source of this statistic.

- a. \$1.8 million in Milwaukee Water Works operating spending to replace the City-owned portion of lead service lines replaced.
  - b. \$1.0 million in State funding for the non-City-owned portion of lead service lines replaced.
3. \$120,000 – Construction supervisor.
4. \$100,000 – Water quality chemist.
5. \$100,000 – Program to warn customers of the possible risks of increased lead concentration in the water after service line repair. Supplies (including temporary pitcher-type filters certified to remove lead by NSF/ANSI Standard 53) will also be provided to properties where lead service lines are replaced.

Dennis Yaccarino, Bill Christianson, and Mark Nicolini of the Budget and Management Office and Assistant City Attorney Tom Miller discussed revenue sources for the replacement of the privately-owned side of water-service lines. Ken Kraemer of Building Advantage and Steve Mahan of the Department of Administration discussed the workforce development component of replacing lead water-service lines.

#### Madison and Other Communities That Have Replaced Lead Water-service lines

Madison started replacing lead water-service lines in 2001. Of note, Madison did not have the city do replacement work on the private portion of the water-service line. Instead, the city completed replacement of the utility portion of service lines and allowed homeowners to hire preapproved contractors to tackle private-side work (to be eligible for cost rebate). The city replaced approximately 8,000 lines and offered to cover half of each homeowner's cost, up to \$1,000. Through roughly a decade of work, the utility paid an average of \$675.85 in reimbursements for costs that averaged approximately \$1,350 per replacement for their private side of the service line work.

In Lansing, Michigan, the utility paid for the entire replacement of lead water-service lines, as there was not a distinction between private and utility side in the city's ordinance. When work first started in 2004, each line cost approximately \$9,000 to replace. By the time the last line was removed, the cost was down to \$3,600 per line, a price that was reached through non-trenching techniques being employed and the benefits of economy of scale.

### Testing Protocols for Daycares and Schools

The State daycare licensing body (Department of Children and Families) does not require daycares to test their water for lead contamination unless the water is supplied from a private well. The City is in discussions with the State about whether to incorporate lead-in-water testing into the daycare licensing process. The Health Department plans to start testing the water at each of the City's licensed daycare facilities that are known to have lead water-service lines. The test results will determine the priority schedule for replacing lead service lines at daycares.

On September 9, 2016, Milwaukee Public Schools announced that a district-wide effort to conduct precautionary testing of drinking water in schools had begun over the 2016 summer recess. According to correspondence from MPS, the drinking water in all MPS schools was tested for lead contamination. The water samples were collected by MPS staff and sent to a contracted laboratory for testing. The analysis was performed according to methodologies outlined by the City of Milwaukee Health Department and the U.S. Environmental Protection Agency.

At the hearing, it was reported that the Charter School Review Committee (CSRC) does not require new or existing City of Milwaukee charter schools to test their water for lead contamination. The charter school application form merely requires applicants to certify that their facilities are building code compliant, and that any notices of health or safety code violations are remedied. The CSRC stated that it had no plans in place to require new or existing charter schools to test their water for lead. However, subsequent to the Task Force meeting at which this issue was discussed, a policy change was brought about when the aforementioned Common Council File Number 160964 was passed on January 18, 2017.

### Stagnating Water in Pipes

MWW recommends flushing water lines by means of running water until it is noticeably cold, approximately one to two minutes in duration, after the water has been stagnant for at least six hours. This period of time is based on recommendations by the EPA and the Centers for Disease Control (CDC). Alderman Bohl raised contention with the six-hour waiting period, saying flushing should be encouraged after any prolonged period of stagnation, as contamination could occur within a much shorter timeframe than six hours.

According to the EPA, the amount of lead that leaches into water over a given period of time is

dependent on several factors, including:

- The chemistry of the water (acidity, alkalinity, corrosiveness) and the types and amounts of minerals in the water;
- The amount of lead it comes into contact with;
- The temperature of the water;
- The age and amount of wear in the pipes;
- How long the water stays in pipes;
- Composition of the pipes;
- Volume of water in the pipes; and
- The presence of protective scales or coatings inside the plumbing materials.

According to a 2000 study published by D.A. Lytle and M.R. Schock in the *Journal of Water Supply*, “Impact of stagnation time on metal dissolution from plumbing materials in drinking water,” the EPA based its six-hour timeframe on a “worst case” lead or copper exposure period. In 1940, researchers found that copper levels increased to a maximum value under some experimental conditions in as little as two to three hours. In Schock’s review of investigations related to lead pipe, researchers most often found that lead levels in treated drinking water rapidly increased and reached equilibrium at approximately “overnight” periods of stagnation. The rapidity of the increase was somewhat variable over the first few hours of stagnation and dependent on a variety of factors, as listed above. Thus, a minimum stagnation time of six hours was required to represent the maximum level of lead in water for testing purposes. However, any period of prolonged stagnation could result in an accumulation of lead.

#### Neurological Effects of Contaminants Found in Water

The primary concern for lead exposure is with children, whose developing brains are more vulnerable to toxic effects of lead exposure than those of adults. The detrimental effects of lead occur at lower levels in children than they do for adults exposed to lead. According to the CDC, the effects in children include: ataxia (lack of voluntary coordination of muscle movements), attention deficit hyperactivity disorder (ADHD), balance, coma, convulsions, death, encephalopathy (overall brain dysfunction), hearing impairment, hyperirritability, muscle coordination and weakness, muscle and bone development and growth, peripheral nerve



function, sense of touch, stupor, synapse formation, and transmission of signals from one location to the next. The Task Force also discussed the neurotoxic effects of chlorine, copper, and fluoride.

#### Effects of Water Additives on Lead-Leaching

The committee discussed the corrosive effects of chlorine, chloramine, phosphates, and fluorosilicic acid added to the water supply. Superintendent Lewis explained the importance of balanced chemistry to mitigate any corrosive effects.

#### Galvanic Effect

Galvanic corrosion is an electrochemical process in which the presence of one metal increases the corrosion of another metal when both metals are in electrical contact in the presence of an electrolyte. Water chemistry is a driving factor in increasing galvanic corrosion and water lead contamination. Studies have shown abnormally erratic lead concentrations when lead pipe is connected to copper pipe. Because of the electrochemical connection, the corrosion rate of lead pipe can be markedly accelerated when connected to copper relative to that of a pure lead pipe. When a copper pipe is placed upstream of a lead pipe, dissolved copper ions can collect onto the lead pipe surface and create multiple micro-galvanic cells between lead and plated copper. Each site of copper deposition can act as an individual galvanic cell, increasing the concentration of lead in the water. When lead pipe is placed upstream of copper pipe in the plumbing sequence, the risk of galvanic corrosion is decreased.

#### Laboratory Capacity for Testing Locally

MWW provides on its website a list of local commercial laboratories certified by the Wisconsin Department of Natural Resources for testing water for lead. Those labs are: Eurofins/ Eaton Labs, Northern Lake Service, and Wisconsin State Lab of Hygiene. Additionally, residents can buy lead testing kits from most home improvement stores.

#### Public Information / Media Campaign on Lead

Sarah DeRoo from the Health Department and Sandra Rusch Walton from the Department of Public Works described the City's public information and media campaign on lead awareness. A rollout of that campaign, termed "Lead Safe Milwaukee," occurred on February 3, 2017.

#### Ordinance Related to Shutting Off Water for Noncompliance

The lead-service line ordinance under Common Council File Number 160742 provides that the

City may discontinue water service for failure to comply with replacing the privately-owned side of a water-service line if it is deemed necessary to replace the water-service line and if the City determines continued use of the lead service line is an imminent threat to the health, safety, or welfare of the public. Aaron Szopinski of the Mayor's Office, Assistant City Attorney Tom Miller, Alderman Stamper, and Mark Nicolini of the Budget and Management Office all discussed this policy related to shutting off water for non-compliance.

#### The Date Milwaukee Started Using Copper for Water-service lines

Currently, 1951 is used as a reference date for properties being served by lead water-service lines versus copper water-service lines. The 1951 date does not come from the Milwaukee Code of Ordinances, but rather, from a search that MWW conducted of the actual materials historically used in water-service lines that were installed throughout the City. MWW keeps records of the materials used for the City-owned portion of the water-service lines. The records are kept because a permit is required every time a water main is tapped. Tapping permits are numbered in sequential order, beginning with Number 1, which was issued in 1874. Permits provide the address and the material used for the water-service line. A search of the records revealed that all permits issued up to permit no. 139,000, which was issued in 1947, were made of lead. All water-service lines after permit no. 150,000, which was issued in 1951, were made of copper. The water-service lines installed from 1947 to 1951 (permit nos. 139,001 – 149,999) were made of either lead or copper. Because some permits for lead lines were issued in 1951 prior to permit no. 150,000, using 1951 as the reference year is an estimate of the last year lead service lines were used. MWW does not have records of the material used for the privately-owned portion of the water-service line or even whether the material on the private side has been changed. This results in a measure of uncertainty, as the content of private service laterals for homes built after 1951 but before 1962, when the City code officially mandated the use of copper on private-side lateral construction, remains in limbo.

#### Discussion Related to the Cumulative Effects of Lead in Humans

Dr. Robert Thiboldeaux, Senior Toxicologist from the Wisconsin Bureau of Environmental and Occupational Health, Wisconsin Department of Health Services gave a presentation related to toxicology of exposure to lead in humans. He discussed the distribution of lead in the environment and health effects of lead.

## IV. RECOMMENDATIONS

As a result of its outreach, research, and discussions, the Water Quality Task Force developed a number of recommendations for making the City of Milwaukee's drinking water safer for all residents. These recommendations are summarized below.

- 1. The City should do all in its authority to accelerate the removal and / or rehabilitation of lead service lines within its jurisdiction.**
- 2. Provide adequate City resources, supplemented by resources from foundations, corporations, and additional governmental or private sources to ensure vulnerable populations have access to lead-removing water filters certified to remove lead by NSF/ANSI Standard 53.**

With at least 70,000 properties that have lead water-service lines and countless others that may have interior sources of lead plumbing, the City should secure necessary resources to provide ongoing access to lead-removing water filters certified to remove lead by NSF/ANSI Standard 53 and to ensure populations in financial need are provided no- or low-cost access to these filters and filter cartridges on an ongoing basis. In particular, measures should be taken to ensure that women of childbearing age,<sup>4</sup> expectant mothers, families of formula-fed babies, and young children have lead-removing water filters in their homes and that they are provided with education regarding why and how to use filters.

- 3. Promote and support lead-removing water filtration systems as the most thorough means of lead-water safety.**

The use of lead-removing water filtration systems should be emphasized to the public in City informational efforts and be afforded adequate resource prioritization by the City.

- 4. Educate residents regarding internal plumbing as a source of lead.**

Almost exclusive emphasis has been placed on lead water-service lines as a source of lead in water, which can be problematic in that it may lead to false assurances that if a property's water-service line is not lead, then the occupants are "out of the woods" in terms of potential risk from lead in water. Interior sources of lead are often overlooked, but are not insignificant sources of potential lead toxicity. The City must ensure adequate

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<sup>4</sup> At the time of this writing, the national average is 15 to 45 years.

attention is given to educating property owners of the potential sources of lead leaching into water from interior plumbing, including testing those properties, information on ways to fix potential sources of lead, the need for ongoing flushing of pipes, the use of cold water for consumption, and information and access to filters certified to remove lead by NSF/ANSI Standard 53 as an assured source of lead free water. Milwaukee Health Department recommends that information for homeowners on internal lead plumbing include recommendations related to possible concerns from the disturbance of lead plumbing through activities such as home remodeling projects or water main replacement.

**5. Incorporate lead-in-water and lead public education materials with all City water bills.**

A separate insert should be established and included in the mailing of all City water bills, which would include information about the Health Department's Lead Safe Milwaukee campaign or any future modified campaigns as well as information about water filtration systems and a reminder to change filter cartridges on water filter systems.

**6. Use area universities as resources to address the lead-water issue.**

In addition to looking to other resources, such as community health organizations, the City should use the talent of Milwaukee's higher education institutions and find ways to collaborate with University of Wisconsin–Milwaukee's School of Freshwater Sciences and other educational institutions to study the impacts of lead in water on the local population, study the impacts of interior plumbing fixtures on lead in homes, and assist the City in innovative programming to maximize citizen safety.

**7. Support State legislative action requiring testing of water in schools and daycares.**

The City should provide ongoing lobbying efforts to the State of Wisconsin to pass legislation requiring annual testing of all faucets and drinking fountains serving all schools (public, private, and charter) and licensed daycare centers. Schools and daycare facilities should include pre-kindergarten, Head Start, and other early childhood education programs. Milwaukee Health Department recommends that the City advocate for uniform protocols across all municipalities and use of a certified laboratory for analysis, notification of test results to local public health agencies, and notification of

results to clients (the population served) along with appropriate risk messaging.

**8. Mandatory City testing of water in schools and daycares.**

In the absence of State legislative action, the City should explore the feasibility of adopting local legislation requiring all daycare facilities, and urging Milwaukee Public Schools, private schools, and non-City charter schools, to conduct annual inspections of all drinking and water fixtures to ensure they meet minimum EPA standards for safety. Schools and daycare facilities should include pre-kindergarten, Head Start, and other early childhood education programs. Milwaukee Health Department recommends that the City advocate for uniform protocols across all municipalities and use of a certified laboratory for analysis, notification of test results to local public health agencies, and notification of results to clients (the population served) along with appropriate risk messaging. Additionally, Milwaukee Health Department notes that reference to the EPA standards may be best served by including language such as “latest federal or State health-based standard.” For example, the American Academy of Pediatrics recommends lead-in-water testing and mitigation to <1 ppb (whereas the current EPA standard of 15 ppb is not a health-based standard).

**9. Establish an annual review process before the Common Council regarding blood lead testing being conducted of children in the city and regarding the policies and actions taken by the Health Department for children found with elevated blood lead levels.**

This effort would encompass lead consumption from all known sources of lead and not just lead in water.

**10. Explore and expand on ways in which proper nutrition may mitigate lead absorption in our City’s children and residents.**

The Milwaukee Health Department should collaborate with the Milwaukee Hunger Task Force, community health organizations and groups, and organizations of higher learning to explore and share information how proper nutrition may mitigate lead absorption in the human body. A Milwaukee Nutrition and Lead Task Force has already formed to explore and coordinate efforts in this vein and a “Well Fed Means Less Lead” campaign to better educate constituencies about this issue has started. The City should study this issue and

look for ways to partner with organizations working in this area.

**11. Urge the State of Wisconsin and U. S. Federal Government to provide greater funding to the City to eliminate sources of lead.**

The City should support legislative efforts to have the State of Wisconsin and U. S. Federal Government provide greater funding to the City through the Safe Drinking Water Loan Fund or other sources. The City should continue to promote proportionate funding from the State and U. S. Federal Government to the City.

**12. Allow greater water-utility flexibility to pay for lead water-service line replacement.**

The City should advocate for changes in State policy through the legislature and public service commission to provide municipalities and water utilities flexibility to either pay for or pay toward the replacement of privately-owned portions of lead water-service lines and municipality-provided water filters certified to remove lead by NSF/ANSI Standard 53.

**13. Explore additional financial assistance options for low-income homeowners' replacement of the privately-owned side of water-service lines, while maintaining a balanced payment program for most to ensure timely removal of service lines.**

The City should find a balance where low-income and at-need property owners would be provided greater City financial assistance toward replacement of lead water-service lines. Currently, if the City pays the full cost, it will put the City on a much longer trajectory for removing all lead water-service lines. Each property owner would pay less, but more residents will be dealing with dangerous pipes for a considerably longer period of time, putting a larger number of people at greater risk.

**14. Seek new partners and avenues to expand public service information/announcements on managing the potential risks relating to lead-contaminated water, with a special emphasis on vulnerable populations, and ensure the City's ongoing public information campaign presents a balanced approach to all lead risks.**

Ensure public education measures are stepped up to adequately reach the public. These efforts should be long-range in scope. City Departments should work to schedule and attend community information sessions and Water Works and Health Department

staff should be properly trained to disseminate timely and accurate information to the public. The City should continue to expand public service announcements and public education campaigns regarding the impacts of bottle feeding and using lead-contaminated water on vulnerable populations, as well as the possibility of interior plumbing being a source of lead in addition to lead water-service lines. Public awareness should include all lead hazards, as homes having lead water-service lines also tend to have lead paint, as well as promotion of lead testing for children. All recommendations to the public should be evidence-based.

**15. Provide outreach to local healthcare providers on the need for lead testing of infants and toddlers.**

The City should work to influence the local medical establishment (particularly area pediatricians and obstetricians), and to provide outreach through its visiting nurse program, to ensure infants and toddlers are tested for blood lead levels annually to at least the age of three.

**16. Seek to balance workforce development opportunities with timeliness and cost-containment efforts on the lead service line removal program.**

The City should develop a workforce development component for its work related to replacing lead water-service lines. This effort should strive for a balance between cost and workforce development so as to not drive up the cost of lead water-service line replacement work, while still providing expanded opportunities for training in the plumbing trades. Lastly, expediting a timeline for replacement of lead service lines across the city lowers exposure risks for vulnerable populations and should be prioritized.

**17. Contract for an outside review of Milwaukee Water Works' operations in order to build community confidence in its ability to deliver healthy and safe drinking water to its users.**

The City should contract with a third-party to conduct an outside review of the water additives and corrosion-control products and levels used by MWW to ascertain and provide public assurance that the water's chemistry is at an optimized level for mitigating the leaching of lead.

**18. Pass City legislation to provide private-side lead service line identification, removal and special assessment cost-share criteria for homes constructed between 1952 and 1962.**

The City must ensure that properties which fall into the “notch” gap of 1952 to 1962 for original construction are tested to determine if they have lead water-service lines on the private side. If necessary, the City should initiate a means to gain access to homes, or provide information regarding how residents may test, report, or request a City confirmation of lead pipes. In addition, homes that potentially have copper on the City side and lead on the private side of their water-service lines may experience galvanic corrosion that significantly raises lead levels. This legislation should also allow such properties to qualify for City financial assistance relating to private-side costs similar to the subsidy available to property owners under the current replacement ordinance. The modification to the ordinance should also provide for the City to either fund or partially fund the replacement of the private portion of the service line if there is an emergency structural break.

**19. The Common Council should pass legislation requiring semi-annual reporting to the Council by the Milwaukee Water Works and Department of Public Works to the status of service line removal or lining efforts, testing results of lead in water, emerging technologies for remediating lead in water, and ongoing plans for addressing the lead-in-water issue.**

The Freshwater for Life Action Coalition (FLAC) called upon the City to create a strategic short- and long-term plan for the removal of lead service lines (March 30, 2017 FLAC letter). Through passage of Common Council File No. 160742, the City has already established a short-term plan to tackle service line removal. Similarly, the Health Department established a public education campaign and joined the Milwaukee Water Works in placing information on various City sites regarding lead in water. Lastly, the City began its initial efforts to purchase and disseminate water filtration systems. Because additional federal, state, and state-allowed funding sources have not yet been procured and because emerging, alternative technologies for the removal of service lines are first coming to the City’s awareness, it would be premature to establish a long-range plan for what may soon become an obsolete, overly-expensive, and slower paced process than the current plan for lead service line removal and replacement. By



establishing semi-annual reporting to the Common Council, the Milwaukee Water Works and Department of Public Works can provide ongoing status updates regarding service line removal, lining efforts, funding sources, testing being conducted, and promising emerging technologies that might be employed in the future.

- 20. Milwaukee Water Works and the Department of Public Works should continuously evaluate lead service line lining and coating technologies or other emerging technologies that may present themselves as cost-effective and safe alternatives to lead service line removal.**

## V. ATTACHMENTS

### **Appendix A:**

Minutes of the meetings of the Water Quality Task Force

### **Appendix B:**

LRB-issued research relating to the Water Quality Task Force

### **Appendix C:**

Correspondence directed to the Water Quality Task Force

### **Appendix D:**

Other documents relating to the Water Quality Task Force

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