

Health Impacts of the City of Toronto's Lead in Drinking Water Mitigation Strategy

Date:	July 31, 2014
To:	Board of Health
From:	Medical Officer of Health
Wards:	All
Reference Number:	

SUMMARY

Lead exposure is associated with neurodevelopmental, neurodegenerative, cardiovascular, renal, and reproductive effects. Lead adversely affects those that are most vulnerable in our society: infants, children and pregnant women. While exposures to lead continue to decrease in the general population, studies show that remaining exposures to lead should be minimized or eliminated whenever possible. Reducing lead in drinking water is considered to be one of the most feasible and least expensive options available to reduce exposures to lead.

This report provides a summary of recent research on the health impacts of lead in drinking water. An overview of lead levels and protocols with respect to school drinking water is also provided. Lead components exist in both the public and private side of the drinking water system and there are important actions that both the City and the public should take to reduce exposures. This report provides an update on the City's efforts to engage and encourage the public to take actions to mitigate exposure to lead in drinking water.

Research shows that homeowners are more likely to take action to reduce their exposures to lead in drinking water when their drinking water is found to be in excess of the drinking water quality standard. Ontario's drinking water quality standard should be reviewed to ensure it reflects current understanding of the health impacts of lead exposure and that it is protective of the most vulnerable in our society.

This report provides an assessment of the health impacts of the City of Toronto's Lead in Drinking Water Mitigation Strategy and provides options and recommendations for

additional actions the City can take to further reduce risks from exposure to lead in drinking water.

RECOMMENDATIONS

The Medical Officer of Health recommends that:

1. City Council direct the General Manager of Toronto Water, in consultation with the Medical Officer of Health, to explore the following options to improve the Lead in Drinking Water Mitigation Strategy, and report to the Public Works and Infrastructure Committee in early 2015:
 - a. Expand the distribution of free filters to vulnerable populations living in pre-1950s homes; and,
 - b. Develop and promote a publicly accessible database and/or map of the status of lead service lines.
2. City Council direct the General Manager of Toronto Water, in collaboration with the Medical Officer of Health, to evaluate current public education and outreach efforts and implement enhancements as necessary to reduce exposures to lead in drinking water, particularly for those populations that are most at risk;
3. The Board of Health endorse the recommendation presented at the Public Works and Infrastructure Committee on August 13, 2014 for City Council to authorize the General Manager of Toronto Water and the Deputy City Manager and Chief Financial Officer to report back on the proposed details of a program to financially support homeowners to replace their portion of the lead water service line through a loan program from the City of Toronto secured as a local improvement charge on their property;
4. The Minister of the Environment and Climate Change direct the Ontario Drinking Water Advisory Council to review and provide a recommendation on updating the Drinking Water Quality Standard for lead to ensure it is adequately protective of health; and,
5. This report be forwarded to the Minister of Environment and Climate Change, the Chief Medical Officer of Health, Public Health Ontario, Toronto Catholic District School Board, Toronto District School Board, Conseil scolaire Viamonde, Conseil scolaire de district catholique Centre-Sud, Toronto Real Estate Board and Health Canada.

Financial Impact

There are no financial implications of this report for Toronto Public Health.

DECISION HISTORY

On September 12, 2012 Public Works and Infrastructure Committee requested the General Manager of Toronto Water, in cooperation with the Medical Officer of Health, to

report back on a review of the recent research on the health impacts of partial lead service line replacements

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.PW17.15>). The review is available at:

(<http://www.toronto.ca/legdocs/mmis/2013/ex/bgrd/backgroundfile-57362.pdf>)

On June 10th, 2014 City Council directed the Medical Officer of Health, in consultation with the General Manager of Toronto Water, to report to the Board of Health on the health impacts of the City of Toronto's Lead in Drinking Water Mitigation Strategy (<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.MM52.4>).

ISSUE BACKGROUND

Toronto has 475,000 residential water service connections. In 2007, approximately 65,000 services were assumed to be made from lead, and in 2014 there are approximately 35,000 remaining¹.

Lead components exist in both the public and private side of the drinking water system. The City is responsible for the repair or replacement of the City-owned portion of a lead water service, while the individual property owner is responsible for the privately-owned portion of the water service. Many important risk mitigation strategies rely on the public taking action to reduce exposures to lead in drinking water.

Equity Impact

Access to safe drinking water is a priority for all residents in Toronto and particularly those that are most vulnerable to exposure to lead: pregnant women, children, and infants. Research shows that those that are already experiencing other vulnerabilities (*i.e.*, individuals experiencing low income, poor nutrition, newcomers, racialized individuals) are the most at risk from exposure to lead. Developing strategies that reach all residents, and in particular those who are most at risk, is a core consideration in the development of risk mitigation and outreach strategies.

Ontario Ministry of Environment Regulations – 2007

In 2007, the Ontario Ministry of the Environment (MOE) ordered 36 drinking water system owners in Ontario to conduct lead testing of the water supply system and submit the results for assessment. This led to the Regulated Lead Testing Program which requires drinking water system owners to collect samples in areas where the plumbing is suspected of being connected to lead water services, analyse these samples and submit results. Samples were collected by Toronto Water (TW) from 100 residential water service connections, 20 connections from within the distribution system (e.g. hydrants) and 10 non-residential water service connections in two separate testing periods, June to October and December to April from 2007 to 2010.

¹ Estimate for City-owned portion of the lead service line.

The MOE program stipulates that if any two of the three most recent test rounds do not meet the regulations (e.g. more than 10 per cent of test results exceed 10 parts per billion) the municipality must develop a corrosion control plan.

The City had two out of the three most recent test rounds where more than 10 per cent of the residential samples were above 10 ppb. As a result, in 2010 the City submitted a corrosion control plan to the MOE for approval.

Council Approved Lead Water Service Replacement Program – 2007

In July 2007, Toronto City Council approved an accelerated residential water service replacement program to allow TW to aggressively change out the lead services throughout the City's water distribution system. The program consolidated water service replacements with capital projects to accomplish removal of City-owned lead services within a nine-year period (starting in 2008) with the goal of replacing approximately 7,000 lead pipes annually. Additionally, as part of this program, residents with a lead test result above 10 parts per billion (ppb) had their pipe replaced on a priority basis. This program was superseded by the Lead in Drinking Water Mitigation Strategy in 2011.

Council Approved Lead in Drinking Water Mitigation Strategy – 2011

In 2011, Toronto City Council approved the Lead in Drinking Water Mitigation Strategy that combined various elements of the lead in drinking water issue into one consolidated program. The strategy included:

1. Annual water service replacements: 3,000 capital program work (lead/substandard); 1,500 replacement through a priority program (lead); and 500 allocated to emergency work (lead/substandard). It also advocated the importance of communicating with residents the benefit of full replacement, rather than partial replacement, to further reduce the risk of lead in drinking water.
2. Corrosion control was another key element of the strategy (now approved by the MOE) with the addition of orthophosphate using phosphoric acid as the preferred alternative for corrosion control. Corrosion control has been implemented at two water treatment plants with the remaining two to come on-line this fall. Orthophosphate works by forming a protective coating inside water pipes. This coating helps reduce corrosion and the leaching of lead from surfaces in contact with drinking water.
3. Finally, the strategy included a faucet filter component for low income households; free filters immediately following all lead service line replacements; and, new in 2014, a free filter for homes when TW has to cut a lead service line to install an automated water meter.

On August 13th, 2014 Toronto Water, in consultation with the Medical Officer of Health, will report to Public Works and Infrastructure Committee an update on the implementation of the Lead in Drinking Water Mitigation Strategy.

COMMENTS

Recent Research Findings on Health Impacts of Lead in Drinking Water

While Canadian blood lead levels have declined significantly over the last three decades, exposure to lead continues to be a concern. The adverse health effects from exposure to lead are well-documented in children and adults. Health effects have been associated with blood lead levels that are currently found in Canadians. Exposures to lead have been associated with neurodevelopmental, neurodegenerative, cardiovascular, renal, and reproductive effects. Lead adversely affects those that are most vulnerable in our society: infants, children and pregnant women. Research also shows that those who are already experiencing other vulnerabilities (*i.e.*, individuals experiencing low income, poor nutrition, newcomers, racialized individuals) are the most at risk from exposure to lead.

Although the average lead concentration in Toronto's drinking water is considered to be low, drinking water is considered to be an important source of exposure to lead when lead service lines or other lead-bearing materials are present in the plumbing system. Recent literature reports an association between exposure to lead in drinking water and blood lead levels. In particular, infants living in older homes may be at risk if they are fed formula reconstituted with drinking water. If lead levels in drinking water become elevated and as lead levels from other sources continue to decrease due to environmental regulations, water becomes an increasingly important source of exposure relative to other sources of lead.

Partial lead service line replacements are conducted throughout North America. Over the last few years, concerns have been raised by researchers about the potential health impacts of partial lead service line replacements. Toronto Public Health recently conducted a review of the recent research on potential health impacts of partial lead service line replacements. This review concludes that this practice is frequently associated with a short-term spike in lead levels and there may be a potential for health impacts if actions are not taken by the homeowner to mitigate exposures. There are also concerns that partial lead service replacements may increase lead exposure over the long term. This report is available at:

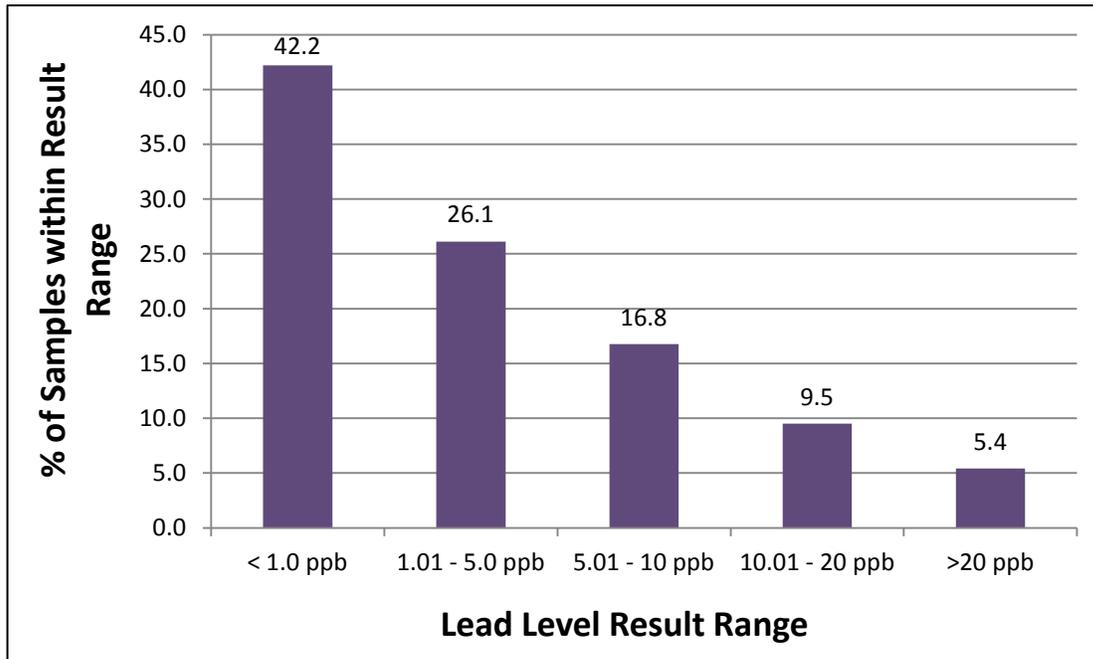
<http://www.toronto.ca/legdocs/mmis/2013/ex/bgrd/backgroundfile-57362.pdf>.

Additional details about the health impacts of lead in drinking water are available in a technical report called Health Impacts of Lead in Drinking Water at www.toronto.ca/health/reports.

Lead Levels in Toronto's Drinking Water

Toronto Water provides water quality testing for lead in drinking water, at no charge, to property owners with lead water services or where there is reason to believe that lead levels may be elevated. Homeowners are directed to collect samples from the kitchen faucet after flushing for five minutes, consistent with the water sampling procedures required by the MOE. Figure 1 provides a summary of the results of the residential drinking water sampling program provided by TW for the years 2011-2013.

Figure 1: Residential drinking water sample results, Toronto, 2011-2013



Data source and prepared by: Toronto Water Laboratory

Note: Residents collected the drinking water sample and it is unknown if sampling instructions were followed. As such, results may not be consistent and/or representative of actual levels in the field.

Regulated lead sampling and testing, which will resume in June 2015 are the most representative and follow the MOE's prescribed sampling procedure.

The residential drinking water samples indicate that the majority of the drinking water lead level results are low. However, the data also suggest that there are many households in the City of Toronto that would benefit from reductions in their exposures to lead in drinking water. There are many actions residents living in older housing can take to mitigate their exposures to lead in drinking water (e.g., use of a filter, flushing, only using cold water for drinking and cooking). Corrosion control, currently being implemented by TW, will significantly reduce lead leaching into drinking water, reducing the public's exposures.

Support for Toronto Residents with Elevated Lead in Drinking Water

Households that receive a lead in drinking water result in excess of the drinking quality water standard are assigned to the district TPH Public Health Inspector (PHI) for follow-up. The PHI discusses the health impacts of elevated lead levels in drinking water, identifies any vulnerable individuals and discusses ways to reduce exposures. The City also sends an information package to residents, including a letter from the Medical Officer of Health encouraging them to opt for a full lead service line removal. This is done to assist the residents in an effort to either eliminate or reduce exposure to lead in drinking water. Residents are also directed to City of Toronto programs such as the Priority Lead Water Service Replacement program and the Faucet Filter Rebate Program.

Lead Levels in Toronto's School and Day Nursery Drinking Water

Lead may enter the drinking water of schools from interior plumbing, lead containing fixtures, and lead solder². Other features of schools may also contribute to elevated concentrations of lead: drinking fountains are associated with more solder joints, intermittent use of drinking water and longer stagnation periods; and longer pipes increase contact time between water and plumbing components.

Ontario Regulation 243/07 under the Ontario Safe Drinking Water Act (SDWA: 2002, S.O. 2002, c. 32) requires all schools, private schools and day nurseries to undertake sampling for lead in drinking water between May 1st and October 31st annually³. Lead levels greater than 10 ppb in drinking water are considered adverse (O.Reg 169/03 Ontario Drinking Water Quality Standards). Such adverse results are reported to the Medical Officer of Health and the Ministry of Environment and Climate Change (MOECC, formerly MOE). Ontario is the only province in Canada that requires lead testing in drinking water in schools.

Based on the most recent data available, less than 2 per cent of schools and day nurseries in Toronto report drinking water levels in excess of the drinking water standard after flushing⁴. These results indicate that some schools and day nurseries in Toronto still require additional risk mitigation⁵ even after flushing. It is anticipated that corrosion control will significantly reduce leaching of lead into drinking water in these facilities as well as reduce the number of facilities that require daily flushing and additional risk management to ensure the safety of the drinking water for the children.

Support for Toronto Schools and Day Nurseries with Elevated Lead in Drinking Water

In 2007, TPH recommended to the Toronto District School Board and the Toronto Catholic District School Board actions that should be taken to mitigate the elevated levels of lead in drinking water, in addition to those required by O.Reg 243/07. Upon confirmation of elevated lead levels in drinking water, TPH recommended that these facilities immediately provide a safe alternate source of water and as appropriate: disable specific taps; install filters; notify parents; and, investigate the source of lead. These measures remain in effect until the facility's water supply is free of lead or lower than the 10 ppb limit for lead in drinking water. Similar recommendations are provided to private schools and day nurseries on a case-by-case basis. The regulation is enforced by the MOECC's Drinking Water Branch staff who follow-up on the facilities' compliance with

² It is generally assumed that schools do not have lead service lines. The water service lines for larger facilities are typically too large to be lead.

³ Exceptions are provided to facilities that provided low lead in drinking water sampling results for three consecutive years.

⁴ Data provided by MOECC for the years 2010 to 2012. Typically, flushed samples have lower lead levels when compared to standing samples due to contact time between water and the lead constituents of the plumbing system. This report summarizes flushed samples because these samples are more representative of exposures and they are indicative of the need for additional risk management after flushing (i.e., provision of an alternative drinking water supply).

⁵ Additional measures may include: provision of an alternative drinking water supply, disabling specific taps, installing filters, notifying parents, further investigations into source of lead.

the risk management recommendations provided by TPH. The MOECC and TPH meet biannually to discuss all drinking water related issues including lead in drinking water.

Ontario's Drinking Water Quality Standard for Lead

In Canada, the Guidelines for Canadian Drinking Water Quality limit the lead content of drinking water to a maximum acceptable concentration of 10 ppb ($\mu\text{g/L}$) in drinking water, free flowing sample of water measured at the tap. The guideline was developed by Health Canada to be protective of children, assuming a lifetime of exposure to drinking water at or near 10 ppb. The Province of Ontario adopted this limit as the Ontario Drinking Water Quality Standard for lead (O.Reg 169/03 Ontario Drinking Water Quality Standards).

This standard is partially based on the World Health Organization's (WHO) provisional tolerable weekly intake (PTWI) for lead. The PTWI was withdrawn in 2010 after research on the health effects of low level of exposures demonstrated that this level was no longer protective.

Research shows that homeowners are more likely to take action to reduce their exposures to lead in drinking water when their test results are in excess of the drinking water standard. A re-assessment of the drinking water quality standard would help ensure the public receives accurate guidance on when to take action to reduce exposure.

Toronto's Public Education and Outreach Programs on Lead in Drinking Water

Toronto Public Health and TW have worked collaboratively on a comprehensive public education and outreach program to inform residents about the risks associated with lead in drinking water and encourage them to take action to reduce their exposures.

Since 2007, an expanded program has been in place and includes a range of topics:

- The likelihood of lead in drinking water (based on age and type of residence);
- Identifying the health effects of lead and those subpopulations most vulnerable;
- Flushing practices before drinking tap water (*i.e.*, removing standing water from residential plumbing, etc.);
- Using an NSF-certified filter to remove lead in drinking water;
- Using cold water for drinking, cooking or preparing baby formula;
- Accessing lead water testing via Toronto Water;
- Preparing for full service line replacement; and,
- Publishing the capital works schedules that include water service replacement work to be undertaken by the City.

Since 2007, information on these topics has been provided to residents through a wide range of communication methods including: detailed information on the City of Toronto website, *WaterSource* updates to the Mayor and all Councillors for use in Ward newsletters, media releases, information in utility bills, information in various City of Toronto newsletters, information for 311 customer service agents, fact sheets with

construction notices where capital work is underway, information in lead testing kits, direct mail (200,000 cards) to older homes where lead pipes are suspected, information and/or staff presentations at public meetings and city events, and information included in the faucet filter distribution package.

Toronto Public Health has many programs to improve the health and well-being of vulnerable populations, as well as the general population. Messaging on lead in drinking water has been integrated into these program materials where appropriate, and TPH staff, who regularly interact directly with vulnerable populations, have been provided with training on the risks and actions that the public can take to reduce their exposures to lead in drinking water.

Research on Barriers and Drivers to the Public Taking Action to Reduce Exposures

In the spring and summer of 2011, TPH and TW conducted a study to explore the barriers and drivers to residents' taking actions to minimize their exposure to lead in drinking water and to evaluate the City of Toronto's outreach plan and materials. The key findings of the research are as follows:

- i. awareness of the lead in drinking water issue and personal concern about exposure are fairly low;
- ii. recall of receiving information from the City about lead service lines was very low;
- iii. most residents report taking some actions to minimize lead exposure (*i.e.*, using cold water for cooking and drinking, flushing pipes, using a filter);
- iv. however, most residents are not taking all the actions required following a lead service line replacement (partial or full) (flushing the system with cold water for 15 minutes from the lowest tap before anyone in the house uses the water, use of a filter for at least 3 months, only using filtered water to mix infant formula, flushing, regular cleaning of aerators, using only cold water for cooking and drinking);
- v. the most common reasons for not taking any actions include:
 - a. lack of concern about lead;
 - b. lack of knowledge of the risks; and
 - c. lack of knowledge of whether their home has lead pipes.
- vi. the strongest driver for full lead service line replacement is concern about the health risks;
- vii. the greatest barrier to full lead service line replacement is cost; and,
- viii. most residents were more likely to take action if they understood the health risks and if the information was provided by a health authority.

The Lead in Drinking Water Research Study reports submitted by Ipsos Reid are available at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.PW17.15>.

As a result of this research, TPH and TW have made improvements to the public education and outreach strategy and materials, notably but not limited to:

- Health information has been moved to the front and top of all educational materials on lead in drinking water and design features were used to further highlight health information (*i.e.*, font size and colour);
- Letters from the Medical Officer of Health are now included in information package provided to residents 3 months and 2 weeks in advance of the City changing the public- side of the lead service line. The letter highlights the health message, mitigation measures and strongly encourages residents to opt for full lead service line replacement;
- Elevated lead in drinking water results are accompanied with a factsheet and letter from the Medical Officer of Health noting the importance of risk mitigation measures based on the age of the housing (pre-mid 1950s home), and strongly encourages residents to opt for full lead service line replacement;
- A kit is delivered to each household that has undergone a lead service replacement (partial or full), with the provision of a free water filter and a postcard highlighting the importance of taking risk mitigation measures, lead in drinking water factsheet and letter from the Medical Officer of Health;
- A note translated into 31 languages is included in all packages. The note highlights the importance of the enclosed health information and directs the reader to ask a family member or friend to provide translation; and,
- Factsheets, website and 311 are updated regularly to improve the public's understanding and knowledge.

Impact of Enhanced Public Education and Outreach

Since 2011, TW records suggest that there has been an increase in the number of residents who are choosing to remove their portion of the lead service line. However, very little is known whether this increase is as a result of the City's enhanced public education and outreach or is instead due to improvements to the City's record keeping on lead service line replacements (see following section). In 2011, TPH and TW collected a baseline of public awareness and actions taken to reduce exposure to lead in drinking water. Thus, TPH and TW are uniquely positioned to conduct this research and evaluate the impact of the City's enhanced public education and awareness campaign. This research will provide a greater understanding of the strengths and weaknesses of the public education and outreach efforts, as well as provide information to improve the City's efforts to reach out to residents.

City of Toronto's Corrosion Control Plan

Corrosion control is not only required by the MOE but is also endorsed as a lead reduction measure by Health Canada and the United States Environmental Protection Agency. Corrosion control is the most cost-effective strategy available to water utilities to address lead in drinking water. One of the key advantages of corrosion control is that the health benefits are experienced by all Toronto residents regardless of their socioeconomic status and ability to take action to reduce their exposures to lead in drinking water. Based on the results from TW's corrosion control tests and from other municipalities that have implemented phosphoric acid systems for corrosion control, Toronto Water anticipates a significant reduction in the leaching of lead into drinking water, full compliance with MOE's Regulation 170/03, and a reduction of the public's exposure to lead in drinking

water. Toronto Public Health has participated in the development of the Corrosion Control Plan and supports it as a key component to reduce lead exposure to the residents of the City.

Information on the Status of Residential Lead Service Lines

Since it was established in 2008, TW has improved the process to collect and compile data on the status of lead service line replacements (none, partial, full; materials used). In 2009, TW and Technical Services published Field Service Manuals instructing the City's contract inspector to collect this data and provide it to TW. In 2010, TW issued operational guidelines instructing all program delivery groups responsible for overseeing water service replacement to complete the new water service cards and forward them to TW. According to TW, the private-side portion of the water service card may or may not be filled out. If it is filled out, the City will have the material type of the private side. If it is not filled out, the City must assume that the service was not replaced.

Under the Priority Lead Water Service Replacement Program, private side replacement of lead services is a condition of the program and accurate information currently exists for the approximately 1,500 lead water services replaced each year under this program.

TW through its Watermain Asset Planning unit has begun to analyze the information collected through the water service cards to report on the material type of the water services replaced. From service card data collected for 2013, it appears approximately 30%⁶ of planned replacements of the City portion of lead services also resulted in replacement of the private portion.

As a follow-up to the 2010 operational guidelines, TW has reiterated the importance of completion of the water service cards to program delivery groups that manage planned water service replacement. In 2014, the water service card has been modified to track the distribution of NSF-053 certified faucet mounted lead removal filters provided to property owners immediately following lead service replacement.

Improvements to the quality and consistency of the collection and reporting of this information to TW would help to support the City to provide accurate information to Toronto's residents about the status of their lead service line. A publically-available and user-friendly database and/or map providing information to residents about their home and neighbourhood would further support Toronto residents to make effective decisions about mitigating their exposures to lead in drinking water.

Lead Service Replacement Loan Programs

As noted in the research on barriers and drivers to support the public taking action to reduce their exposures, cost is the greatest barrier to full lead service line replacement. Ottawa, Hamilton, London, Brantford, Welland and the City of Guelph offer financial assistance to their residents to remove their portion of the pipe.

⁶ In 2011, it was estimated that between 10 and 30% of homeowners were opting for full lead service line replacement (based on estimate provided by TW).

Providing financial assistance is a strategy that is recommended by many health agencies to support residents to remove their portion of the lead service line. The MOH supports the creation of a program that reduces financial barriers to the public taking action to reduce their exposure to lead in drinking water, such as a loan repayment program. Strong promotion and evaluation of a loan program after one year of implementation will be important to assess its impact and explore changes needed to ensure the program is successful in supporting the public, particularly those individuals experiencing low income, to opt to replace their portion of the service line.

Assessment of the City of Toronto's Lead in Drinking Water Mitigation Strategy from a Public Health Perspective and Options for Improvements

Toronto Public Health assessed the City of Toronto's Lead in Drinking Water Mitigation Strategy in order to explore ways to improve the health benefits of the Strategy. Options to enhance each element of the Strategy are provided in Table 1 in this report. Corrosion control is not included in Table 1 because it is already underway and once optimized will significantly reduce lead leaching from all sources in the drinking water system. Corrosion control will affect all residents regardless of their ability to pay and institute exposure reduction measures. This is particularly relevant for vulnerable subpopulations and tenants, who may experience barriers to taking action and accessing information.

Table 1: Options to Improve the City of Toronto's Lead in Drinking Water Mitigation Strategy

Risk Mitigation Strategy	Current status	Options to Improve
Free Filter Program Free water filter provided for all households that are impacted by Lead Service Line Replacement Programs	~5,000 households receive free filter per year	Expand the distribution of free filters to vulnerable populations living in older housing
Filter Rebate Program One time \$100 rebate for the purchase of a water filter for low income residents	Currently, program has minimal health impact. Since 2011, nine applications have been received of which four were approved	Increase awareness of the program, identify and address barriers to public uptake
Priority Full Lead Service Line Replacement Program City removes their portion of the lead service line on a priority basis if the household removes their portion	Currently, the City is not reaching its target of 1500 households per year (1019, 1390 and 630 households participated in 2012, 2013 and 2014, as of June 30 th , respectively)	Increase awareness of the program, identify and address barriers to public uptake, including introduce, promote and evaluate a loan program
Removal of the City's Portion of the Lead Service Line City replaces the lead in their portion of the system during planned capital upgrades and emergency repairs to the system	~ 3,500 households per year However, approximately 30% of households replace their portion of the lead service line	Increase awareness of the Priority Full Lead Service Line Replacement Program

Risk Mitigation Strategy	Current status	Options to Improve
<p>Improved Access to Lead Service Line Information</p> <p>Provision of easily accessible data about the existence of lead service line (partial/full/ or suspected based on age of home)</p>	<p>Currently there is no publically accessible information about the status of a home's lead service line</p>	<p>Develop a publically-accessible database and/or map of the status of lead service lines</p> <p>Promote database and/or website to new home buyers, Toronto Real Estate Board and tenant advocate groups</p>
<p>Lead In Drinking Water Testing Program</p> <p>Residents collect a drinking water sample and have it tested free of charge by TW</p>	<p>Number of participants varies year by year (for example: 5256 and 914 households took drinking water samples in 2009 and 2013, respectively)</p>	<p>Provide an information package to residents with detectable levels of lead encouraging them to take action to reduce their risk</p>
<p>Ontario Drinking Water Quality Standard for Lead</p>	<p>The drinking water quality standard, established in 1992, no longer reflects current understanding on the health effects of lead exposure</p>	<p>Recommend the MOECC to request the ODWAC to review the current drinking water quality standard for lead to ensure it is adequately protective of health</p>
<p>Public Education and Outreach</p> <p>In order for the City's strategies to be effective in mitigating the public's exposure to lead in drinking water, the public must be a full partner</p>	<p>2011 research indicated that residents had a low awareness of lead in drinking water and were not receiving the City's messages</p>	<p>Conduct research to provide an understanding of the strengths and weaknesses of the City's public education and outreach efforts, as well as options for improvement, particularly reaching out to those most vulnerable</p>

Toronto Public Health supports the City of Toronto's Lead in Drinking Water Mitigation Strategy. The Strategy has and will continue to have a positive health impact on the residents of Toronto by reducing their exposures to lead in drinking water. As the public are important partners in these efforts, additional efforts are recommended to engage and encourage the public to take actions to mitigate their exposures to lead in drinking water.

This report has been prepared in consultation with the General Manager of Toronto Water.

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