

What Municipalities Need to Know about Reducing Lead in Drinking Water through Corrosion Control

Safe Drinking Water Act, 2002, O. Reg. 170/03

Why is there increased attention being paid to lead in drinking water in Ontario?

In parts of the province some older homes with lead service lines were found to have elevated levels of lead in their water when samples were taken at the tap. To address this concern, the province announced a Lead Action Plan. The plan includes mandatory requirements for municipalities to test for elevated levels of lead in their drinking water and to take corrective action.

How does lead in water affect health?

Children six and under are more sensitive to the effects of lead because they are still developing and able to absorb ingested lead more easily than adults. Long-term exposure to elevated levels of lead may increase the risk of subtle impairment of learning capacity and intellectual development. Pregnant women can pass lead in their blood to their fetus during pregnancy.

Does Ontario have a drinking water quality standard for lead?

Yes. The Ontario drinking water quality standard for lead is 10 micrograms per litre or 10 parts per billion, which is based on a national standard. This limit is based on a

conservative estimate of how much lead in drinking water can contribute to a developing child's total exposure to lead from all sources.

What does the legislation require municipalities to do to reduce lead in drinking water?

Ontario requires municipalities to:

- sample for lead twice a year at a specified number of taps from households, non-residential facilities and from the municipal distribution system
- recruit volunteers to permit sampling of their tap water
- where there are elevated lead levels, take corrective action as directed by the local medical officer of health
- notify home and non-residential facility owners of the results from their taps and, if there are elevated lead levels, provide advice from the local medical officer of health to reduce health risks.

The requirements are detailed in O. Reg. 170/03 made under the *Safe Drinking Water Act, 2002* which can be found on [Drinking Water Ontario www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater) under Drinking Water Legislation.

How does lead get into drinking water?

Lead in drinking water likely originates from older internal pipes and service lines or from the solder used to connect the pipes or fixtures, both of which could contain high levels of lead.

Older homes built prior to the mid-1950s are more likely to have lead pipes and service lines. Homes built between the mid-1950s and 1989 most likely won't have lead pipes or service lines, but there might be lead in some fixtures or solder. Homes built after 1989 are unlikely to have any lead in pipes, service lines, solder or joints. Low concentrations of lead may still be found in brass and bronze fittings and fixtures.

Depending on the physical or chemical properties of the water, the water flowing through a pipe can wear away the inner surface of the pipe and dissolve some of the metal making up the pipe. This dissolving of the pipe's inner surface is called corrosion.

If the pipe's inner surface contains lead, this corrosion can result in lead entering the drinking water, especially if the water has been left standing in the plumbing for an extended period of time.

When a tap is turned on, water that flows from the tap that has been standing in the pipes may have accumulated lead levels higher than Ontario's standard.

Many municipalities have ongoing programs to replace lead service lines. However, the municipality is only responsible for the portion of the lead service line up to the property line. It is the homeowners' responsibility to replace the lead service lines from the property line to the house.

How can municipalities make their water less corrosive?

Municipalities can make their water less corrosive through a process called corrosion control. By altering the physical and chemical properties of the water at the treatment plant, water can be made less corrosive and therefore reduce the amount of lead dissolving from the pipes into the water.

Are municipalities required to control corrosion if excess amounts of lead are found in their drinking water?

O. Reg. 170/03 requires large municipal residential systems (systems serving more than 100 private residences) to implement corrosion control depending on the test results from the samples they have taken at the tap and distribution system. The regulation sets out the percentage of test results above the standard over two consecutive or two out of three most recent sampling periods that would trigger mandatory corrosion control.

If a municipality's test results indicate that corrosion control is necessary, they must submit a corrosion control plan to the Ministry of the Environment.

It is likely that the majority of Ontario's drinking water systems will not have the kind of elevated lead levels that would require a corrosion control plan.

What must the corrosion control plan contain?

The corrosion control plan must:

- analyse how corrosion may be causing the lead exceedances
- analyse measures to reduce the potential for lead leaching
- identify preferred measures for corrosion control
- set out an implementation schedule
- include a program for monitoring the effectiveness of the preferred measures.

The plan must be approved by the Ministry of the Environment before it is implemented.

What is the deadline for submission of a corrosion control plan?

If a plan is required, it must be submitted to the ministry within one year of the end of the sampling period that triggered the need for a corrosion control plan.

What are the benefits of corrosion control? How can it reduce the potential for exposure to lead in drinking water?

The Ontario Drinking Water Advisory Council in their [Summary of ODWAC Drinking Water Corrosion Control Measures and Lead](http://www.odwac.gov.on.ca/activities.htm) (www.odwac.gov.on.ca/activities.htm), states that from a cost-benefit perspective, system-wide corrosion control is beneficial, not only to protect and prolong the life of expensive infrastructure and household plumbing, but also to reduce human exposure to lead and possibly some other contaminants.

The Summary also says that “Changes to the water chemistry to make distribution system water less corrosive is the most effective method to reduce lead as it is protective of

all three sources [service lines, solder and fixtures] of lead exposure in drinking water in homes.”

How complicated is corrosion control?

Long-term corrosion control programs take time to assess, develop, and implement. Several years of trials and tests may be necessary to arrive at a program that is effective in eliminating a lead problem as well as addressing aesthetic and operational issues.

One type of plan does not fit all situations. It is important to closely examine the municipality’s specific source water characteristics, analyse the potential for lead dissolving into the water through corrosion, and evaluate measures that suit the particular situation.

If a municipality chooses to hire a consultant to assist with the preparation of a corrosion control plan, it is important to ensure that the consultant is experienced in the area of corrosion control.

Will there be noticeable impacts on the taste or odour of the drinking water?

Many of the chemicals used to implement corrosion control are already in common use at water treatment plants or occur in nature. All water treatment chemicals must have NSF60/61 certification to safeguard human health. The amounts of these chemicals added to drinking water for corrosion control purposes should not noticeably change the taste and odour of water supplied to customers.

Will there be extra costs associated with corrosion control?

There are costs associated with the implementation of corrosion control. There are one-time costs associated with the equipment used to store and dose chemicals, and ongoing costs for chemicals, testing, labour and monitoring. The municipality is responsible for the costs of corrosion control.

What supports will the Ministry of the Environment provide to help municipalities required to undertake corrosion control?

The ministry will provide a guide for preparation of a corrosion control plan toward the end of 2008. Training on the guide will be available in 2009. As well, the ministry will work with the Walkerton Clean Water Centre to provide training on the engineering principles and practices of corrosion control.

My municipality already practices corrosion control. Do we still have to submit a corrosion control plan?

Corrosion control that is already in place at a particular system may have been implemented for the purposes of infrastructure preservation only and may not be effective in controlling lead in water at the consumer's tap. The requirement to submit a corrosion control plan depends on the results of the lead testing.

If we put in place a corrosion control plan, do I need to replace lead service lines?

O.Reg.170/03 does not require the replacement of lead service pipes. However, O. Reg. 453/07 (Financial Plans), also made under the *Safe Drinking Water Act, 2002* does require

financial details about the municipality's lead service pipe replacement program to be included in its overall financial plan.

Replacing lead service lines may be part of a corrosion control strategy.

Other related sources of information:

- **Ministry of the Environment's *Drinking Water Ontario***
www.ontario.ca/drinkingwater
- **Health Canada - Lead and Human Health**
www.hc-sc.gc.ca/index-eng.php
- **Canada Mortgage and Housing Corporation: Lead in Older Homes**
www.cmhc-schl.gc.ca/en/co/ .

Your own municipal water experts will be able to provide you with more details about the drinking water in your area.

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