Lead in Drinking Water

Lead is a metal found naturally in the environment. It can be present in:

- air
- soil
- food
- water
- certain consumer products (for example: car brakes and batteries)

Over the past few decades, the levels of lead in the environment have decreased significantly.

In Canada, lead is not usually found in natural water sources or in water from drinking water treatment plants. However, lead can enter drinking water if it is released from parts of distribution or plumbing systems. Lead is more likely to be present in the drinking water of older homes and neighbourhoods because the National Plumbing Code of Canada considered lead an acceptable material for use in pipes that bring water to homes until 1975.

Lead from plumbing parts

The most significant source of lead in drinking water is likely to be from lead service lines. These are the water pipes that link the house to the main water supply. Some plumbing parts or fittings, such as solder or faucets or valves, may also contain lead that can leach (seep) into drinking water.

Many things can affect the amount of lead that seeps into drinking water, including:

- chemistry of the water
- age of the plumbing system
- length of time the water sits in the pipes

To find out if there are lead service lines in your area, you can check with your:

- plumber
- water utility provider
- municipality

You can also look at the water service line entering your home (you may be able to see a portion of the service line in the basement, by the water meter). It might be made of lead, or contain lead, if it is:

- greyish-black
- soft or easily dented when scraped with a knife

If you suspect that your service line contains lead, testing conducted by your municipality or by an accredited laboratory can determine if lead is present in the water. These testing results as well as an understanding of the water treatment and the flow of water in the pipes can determine if the water is safe for consumption. Monitoring results from your municipality or by an accredited laboratory can be utilized to determine if lead levels are below Health Canada’s

maximum acceptable concentration. The municipality must continue to monitor the lead levels to ensure that this remains unchanged.

Health Effects of Lead in Drinking Water

Drinking water that contains lead, even for a short time, can be a health risk. Most at risk, because of their developing brains, are:

- fetuses
- infants
- children

Exposure to lead in drinking water can cause:

- effects on neurological development and behaviour, such as a lower intelligence quotient (IQ) in children
- increased blood pressure or kidney problems in adults

Guideline Value for Lead in Drinking Water in Canada

While every effort should be made to keep lead levels in drinking water as low as possible, Health Canada worked with provinces, territorial and other federal departments to lower its new guideline value for lead in drinking water to 0.005 milligrams per litre (mg/L). The guideline value is protective of the health of Canadians, including the most vulnerable members of society, such as infants and children.

Health Canada revised the previous guideline value (0.01 mg/L) for lead because new scientific studies have shown that health effects can occur from exposure to lead at much lower levels than previously thought.

The Guidelines for Canadian Drinking Water Quality for Lead set out the basic parameters that every water authority should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible.

How to Reduce your Exposure to Lead in Drinking Water

After confirming that you have lead in your drinking water, there are effective ways to remove it permanently, as described in the next section. In the meantime, you can reduce your exposure to lead using a few simple, temporary measures:

- use only cold tap water, hot water increases the release of lead and other metals from your plumbing, (let it run for about 1 minute) for:
    - drinking
    - cooking
    - preparing baby formula
- flush out your plumbing after water has been sitting in the pipes for a few hours, such as first thing in the morning or when you get home from work. Clear the pipes by:
    - flushing the toilet
    - taking a shower

- starting a load of laundry

Lead will not enter the body through the skin or by breathing in vapours while showering or bathing. Bathing and showering in water that contains levels of lead above the guideline value is considered safe.

If you are pregnant or breastfeeding

Lead can be passed from a:

- pregnant mother to her fetus
- mother's breast milk to a baby

If you are pregnant or breastfeeding and suspect that your drinking water may contain lead, you should have it tested. If lead levels are above the guideline value, you should:

- find an alternate source of drinking water
- install a treatment device to remove lead

Removing Lead from Drinking Water

There are several options for removing lead from drinking water, including water treatment devices, replacing lead service lines or upgrading your plumbing materials.

Using water treatment devices

There are effective household water treatment devices that are certified to remove lead from drinking water at the tap. These include:

- carbon-based filters
- reverse osmosis or distillation treatment devices

For best results, a device should be installed at the tap that is most commonly used for drinking water. In most cases, this is the kitchen tap.

Make sure that any device you buy is:

- certified as meeting the NSF International standard for lead removal (look at the box or label)
- installed and maintained according to the instructions given by the manufacturer

Treatment devices are currently certified to remove lead down to 0.01 mg/L, but the technology is able to remove lead to well below that level. Many can achieve the new guideline of 0.005 mg/L. If you have questions about the device, you can contact the manufacturer.

It is important to make sure treatment devices are maintained (or replaced) according to the instructions provided by the manufacturer. Since water treatment devices require ongoing maintenance, such as the regular replacement of filters, they are not considered permanent solutions.

Replacing lead service lines

Replacing the lead service lines to your home and any lead interior pipes or fittings is the most effective, and permanent, way to reduce lead from your drinking water.

In most communities, the municipality or water utility provider is only responsible for the service line up to the curb. If the part of the service line from the curb to the home is lead-based, the homeowner would be responsible for its replacement.

Some municipalities have established programs where residents can replace their portion of the service line at the same time that the main service lines are replaced, for a reduced cost. Contact your municipality to find out if a similar program exists in your community.

If only a portion of the lead service line is replaced (for example, only the municipal portion), you may continue to have lead issues. Some lead particles may detach from the remaining lead pipe for 2-3 months due to disruption from the change in the municipal pipes. During that time, it is important to continue taking steps to reduce exposure, such as flushing your plumbing after water has been sitting in the pipes for a few hours or using a treatment device.

Upgrading the plumbing material

Upgrading your plumbing material is a permanent solution to ensure your plumbing parts are lead-free. You, or your plumber, can remove any pipes, fittings or faucets in your home that contain lead. Replace them with appropriate materials certified for use in drinking water systems. Make sure that any solder used in your plumbing is lead-free.

Values in Other Countries

At 0.005 mg/L, Canada's guideline value for lead in drinking water is one of the lowest in the world.

Other countries and organizations have established limits for lead in drinking water that are different from ours for various reasons (for example, a different value is used to determine how much water a person drinks based on the country average). Some examples of values in other jurisdictions include:

- European Union: value limit of 0.01 mg/L
- Australia: guideline value of 0.01 mg/L
- United States: treatment-based action level of 0.015 mg/L
- World Health Organization: drinking water guideline value of 0.01 mg/L