TORONTO

STAFF REPORT
INFORMATION ONLY

Corrosion Control Plan for Mitigating Lead in Drinking Water

Date:	August 11, 2011
To:	Public Works and Infrastructure Committee
From:	Lou Di Gironimo, General Manager, Toronto Water
Wards:	All
Reference Number:	P:\2011\Cluster B\TW\pw11010

SUMMARY

This report provides information on the status of the proposed Corrosion Control Plan and Public Education and Communication Program for the new "Lead in Drinking Water Mitigation Strategy".

The multi-faceted “Lead in Drinking Water Mitigation Strategy” incorporates the implementation of a Corrosion Control Plan, as prescribed by Ontario Ministry of the Environment Regulation**.** In addition, a Public Education and Communication Program has been developed and implemented by Toronto Water, in collaboration with Toronto Public Health, to better educate the public of the benefit of replacing both the City-owned and privately-owned sections of lead water services to gain the maximum potential reduction of lead in drinking water.

FINANCIAL IMPACT

There is no financial impact arising from this report.

DECISION HISTORY

City Council, at its meeting of February 23, 24, 2011, requested the General Manager of Toronto Water, in consultation with the Medical Officer of Health to report on the status of the proposed Corrosion Control Plan and Public Education and Communication Program for the

new "Lead in Drinking Water Mitigation Strategy". A copy of the Council Decision Document (see Motion 4b) related to this request is available at http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.EX3.2

A copy of the Lead in Drinking Water Mitigation Strategy, which also includes details on the Corrosion Control Program, is available at: (http://www.toronto.ca/legdocs/mmis/2011/bu/bgrd/backgroundfile-34876.pdf)

BACKGROUND

Corrosion Control Plan

Toronto Water was required by Ontario Ministry of the Environment (MOE) Regulation 170/03, made under the *Safe Drinking Water Act, 2002*, to prepare a Corrosion Control Plan for its drinking water system. The purpose of the Corrosion Control Plan is to reduce the potential for lead leaching from lead water services, internal plumbing and brass fixtures, thereby reducing lead levels in household tap water and reducing the potential health risk from exposure to this source of lead.

The Corrosion Control Plan was submitted to the MOE in October 2010 to comply with the deadlines as prescribed in the Regulation. The MOE acknowledged receipt and accepted the Corrosion Control Plan in April 2011. Corrosion control is widely recognized as one of the best methods to reduce exposure to lead from drinking water. It is not only required by the MOE but is also endorsed as a lead reduction measure by authorities such as Health Canada and the United States Environmental Protection Agency. One of the key benefits of corrosion control is that the health benefits are experienced by all Toronto residents (population level health benefits) regardless of their socioeconomic status and ability to pay.

Moreover, researchers note that corrosion control is the most cost-effective strategy available to governments to address lead concerns 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. The Corrosion Control Plan proposes the addition of orthophosphate using phosphoric acid, based on the successful use of orthophosphates by other cities and water utilities within the Great Lakes Basin such as Detroit and Chicago; and Washington DC and Winnipeg.

Prior to system-wide implementation, the Corrosion Control Plan recommends additional testing that includes a pipe loop study and/or a full-scale demonstration to confirm the performance of the preferred corrosion control measure, ascertain the need for any additional chemical for pH adjustment, assess potential secondary impacts and establish design dosages and parameters.

Public Education and Communication Program

An expanded public education and outreach program regarding concerns about lead in drinking water has been in place since late 2007. However, the multi-faceted aspect of this complex issue (i.e. full vs. partial service replacement; homeowner responsibility for the private portion of the service; at-risk audiences; the likelihood of having lead pipes depending

on age of home, etc.) has made educating the public challenging. Toronto Water and Toronto Public Health have been working collaboratively to improve the communication program.

For example, previously, Toronto Public Health, Toronto Water and 311 maintained their own web pages with information on City programs related to lead issues. The need for a consolidated, singular online resource for information on lead in drinking water was detailed in the Lead Mitigation Strategy staff report approved by City Council in February 2011. A single web page is now available on the City's public website.

Toronto Water and Toronto Public Health continue to carry out public education regarding lead in drinking water. This includes providing information on topics as follows:

- The likelihood of lead in drinking water (based on age and type of residence as well as history of previous service replacement work);
- Flushing practices before drinking tap water (i.e. removing standing water from residential plumbing etc.);
- Using cold water for drinking, cooking or preparing baby formula;
- Accessing lead water testing via Toronto Water, if deemed appropriate;
- Using an NSF-certified filter to remove lead in drinking 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.

This information is provided to residents through a variety of communications resources and methods.

COMMENTS

Corrosion Control Plan Implementation
Following acceptance of the Corrosion Control Plan by the MOE, Toronto Water proceeded with engaging the services of a consulting engineering firm in May 2011. The engineering consultant will provide support to complete a pipe loop study, preliminary and detailed design of the corrosion control systems at all four water treatment plants and contract administration services during construction.

In the water treatment plants, orthophosphate is typically added in small doses in the form of food-grade phosphoric acid, which is a clear, odourless liquid. This would represent only a small fraction of the phosphate in the Canadian diet, where phosphate is found in many foods, including dairy and meat products and soft drinks.

Pipe Loop Study
A special pipe rack has been installed at the R.C. Harris Water Treatment Plant to confirm the performance of the recommended corrosion control measure. The pipe rack is designed as a flow through system that contains several individual lead pipe loops that were constructed of existing lead service pipes harvested from the City's distribution system during recent

construction activity. These test pipe loops will simulate household plumbing and be used to evaluate lead levels under various operating conditions.

The pipe loops are currently being conditioned so that the lead concentrations will be similar to the samples taken at residential taps. Following conditioning, several of the loops will receive different dosages of phosphoric acid with and without pH adjustment. A pipe loop study has no impact on consumers and is strictly used to assess potential secondary impacts and establish initial and long term design dosages and operating parameters. As recommended in the Corrosion Control Plan, pipe loops will be maintained for treatment optimization after implementation of the corrosion control systems in the drinking water treatment plants.

Implementation Details
It is anticipated that the Corrosion Control Plan will be fully implemented by 2013. The estimated capital cost to install the new infrastructure at all four water treatment plants is $6 to $8 million with an annual estimated operating cost of about $1.25 million per year.

Orthophosphate works by forming a protective coating inside water pipes. This coating reduces corrosion and the leaching of lead from surfaces in contact with drinking water. Corrosion control will be an effective long term solution to mitigating the potential health risk of lead in drinking water while the removal of lead services (both public and private) throughout the distribution system continues over the next few decades. Despite the implementation of the Corrosion Control Plan, there is the potential for small amounts of lead to continue to leach from lead water services (if they have not been replaced), internal plumbing containing lead solder joints and even brass plumbing fixtures.

Public Education and Communication Program
An enhanced Public Education and Communication Program has been developed to improve residents' awareness of the issues associated with lead in drinking water. While building on outreach work that had previously taken place, this Program will strive to present issues related to lead in drinking water and ways that individual homeowners and residents can reduce their exposure to protect their health. The Program features a clear focus on educating homeowners on the benefits of replacing the private side of their water service.

A major component of the Public Education and Communication Program was the development of a user-friendly section on the City of Toronto public website. This new section (www.toronto.ca/leadpipes) provides up-to-date information about the City's comprehensive lead mitigation strategy featuring content provided by and approved by Toronto Water and Toronto Public Health.

The locations and projected timelines for the "planned" lead-service program projects for 2011/2012 in the City are posted at http://www.toronto.ca/water/lead/lprp/pdf/2011-2012_wsr_list.pdf

Additional components of the Lead in Drinking Water Mitigation Strategy include:

a) An annual communication strategy that summarizes all initiatives related to the lead in drinking water issue;
b) Consistent messaging regarding all aspects of the issue used throughout all publications;
c) Continuation of the collaborative working relationship between Toronto Water and Toronto Public Health in the management of this issue;
d) Information and application process for the Priority Lead Water Service Replacement Program that is easily accessible;
e) Detailed training information/opportunities for all staff that engage with the public on this issue (i.e. 311, etc.);
f) Continued improvements/updates to the public notification protocol for all water service replacement construction projects (which includes the use of advance notification in order to allow residents sufficient time to plan and prepare for lead water service replacement on the private side and post-replacement public education material to advise of the necessary post-replacement actions required to further reduce their exposure to lead from drinking water).

The Public Education and Communication Program will include notification to the general public, industrial and institutional customers, and York Region, all of whom will be affected by changes proposed by the Corrosion Control Plan.

This report has been prepared in consultation with the Medical Officer of Health.

CONTACTS

Jim Harnum, CET, MBA
Director, Water Treatment and Supply
Toronto Water
Tel: 416-392-8220
E-mail: jharnum@toronto.ca

Howard Shapiro MD MSc FRCPC
Associate Medical Officer of Health
Healthy Environments, Toronto Public Health
Tel: 416-338-8562
E-mail: hshapir@toronto.ca

SIGNATURE

_____

Lou Di Gironimo
General Manager
Toronto Water