

## **GREENEST CITY SCHOLARS PROGRAM - 2014 PROJECT**

### **Project title**

Studying the relationship of chemical and physical parameters on the corrosion rate of cast iron water mains

### **Greenest City goal(s) supported**

Clean Water

Long Term Goal: to ensure City of Vancouver's water distribution system allows for the delivery of high quality drinking water that meets or exceeds provincial, federal and international standards and guidelines

### **Project context, scope, and value to City**

The City of Vancouver actively monitors drinking water quality as per requirements of provincial legislation. Water quality parameters such as temperature, pH, conductance, turbidity, total and free chlorine are recorded from samples collected at dedicated monitoring stations located throughout the City. Water samples are also collected and submitted to the BC Centre for Disease Control for bacteria analysis. The City takes great pride in delivery high quality drinking water and consistently meets and exceeds standards and guidelines, a Greenest City goal.

Water quality is dependent on many factors including source water treatment and filtration. The GVWD is a key stakeholder in providing Vancouver with high quality drinking water. And while the GVWD is responsible for treatment and filtration at the source, the City's contribution to water quality is in the form of a healthy and well-functioning distribution system so that the end-user is getting the best quality at the tap.

A component of the distribution system has recently come under close investigation. Cast iron pipes of various ages make-up approximately 50% of the City's water distribution system. Recently, several cases have come forward from residents within Vancouver, which have revealed iron levels in drinking water above the federal aesthetic objectives. This finding may suggest changing chemistry in the water quality which could be contributing to premature corrosion of cast iron pipes. Using data from the City's 53 sampling stations plus recent water quality investigations, the scholar will research the chemical and physical parameters that may cause accelerated corrosion of pipes, specifically cast iron.

Understanding the cast iron corrosion process is valuable to the City. This knowledge will help Water Design engineers proactively remediate distribution mains to prevent impairment of water quality. On a larger scale, this research would be presented to the GVWD to share knowledge, system observations, and if applicable, look at source water treatment that could be contributing to Vancouver's changing water chemistry.

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### **Deliverables**

- Summary of existing external research on cast iron corrosion
- Analysis of internal sampling data and water quality cases
- Provide research and data-based explanations contributing to cast-iron corrosion rates and recommendations for proactive management
- Summary report of interviews with stakeholder
- Presentation of material to internal/external stakeholder

### **Mentor department**

Waterworks Design

### **Candidate skill set/background**

- Strong analytical skills.
- Science background required: chemistry or environmental science. Specific courses related to water and water quality also an asset.
- Excellent research and writing skills.
- Excellent database skills, especially with MS Access.
- Solid communication skills.

*Note: The Scholar's 250 hour requirement must be fulfilled by July 23. The ideal schedule for the Scholar would be 3 days per week, Mondays to Wednesdays.*