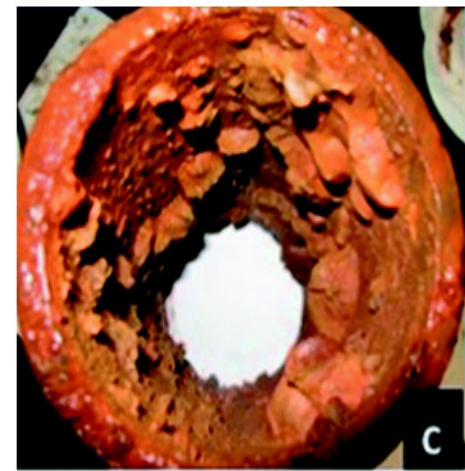
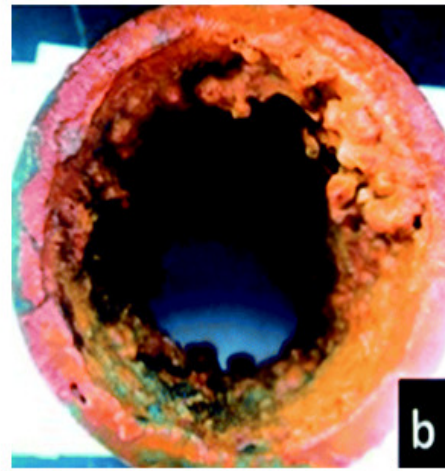
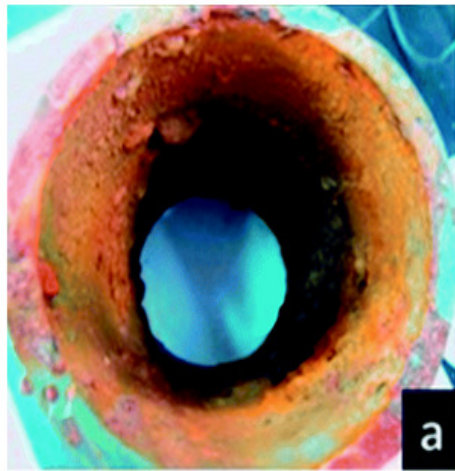


MEHDI BAGHERI  
ENGINEERING - WATERWORKS

Predicting the internal corrosion  
in cast iron drinking water mains.



Time

# DRINKING WATER GOAL

- Source waters from all three watersheds serving the lower mainland are naturally corrosive.
- Focus of research study was to look at the chemical & physical parameters affecting the corrosion rate of water mains in the City, specifically cast iron.

Non-Corrosive water



Corrosive water



1. Developing predictive models to assess the water potential for corrosion and iron concentration level
2. Providing a visual user-friendly computational tool to consistently monitor the water corrosivity with minimum input requirement

**The City can integrate these deliverables to prioritize proactive actions in drinking water mains**

# MODELING SOFTWARE – WATER CORROSION ANALYZER



Water Corrosion Analyzer (WCA)

File Setting Options View Help

Enter water characteristics below :

Temperature (T) =

pH =

Alkalinity (ALK) =

Electrical conductivity =

Dissolved solids (TDS) =

Calcium as Ca =

Solpate as SO4 =

Chloride as Cl =

**cations** Anions

Magnesium as Mg =

Aluminium as AL =

Iron as Fe =

Manganese as Mn =

Zinc as Zn =

Sodium as Na =

Potassium as K =

Fluoride as F =

Nitrate as NO3 =

Nitrite as NO2 =

Carbonate as CO3 =

Bicarbonate as HCO3 =

Calculate

Show results

Clear

Water analysis accuracy test

Sample properties :

Accuracy Test Results :

Sum of Cations =

Sum of Anions =

Percent difference(%) =

Ready for entering Data

8/14/2014 5:32 PM

Results

Water stability indices

Langelier = -3.1745 **Langelier**

Ryznar = 13.3489 **Ryznar**

puckorius = 21.9945 **Puckorius**

Larson-Scold = 8.1875E-1 **Larson -Scold**

Aggressiveness = 8.8742E0 **Aggressiveness**

Driving Force = 2.8892E-4 **Driving Force**

CCPP = 1.0814E-4 **CCPP**

Momentary Excess= -8.5415E-5 **Momentary Excess**

More results



# SAMPLE ANALYSIS RESULTS

## Corrosivity study of the water

(Capilano + Seymour + Coquitlam)

### City of Vancouver

Exp. Iron Level (ppb)

- 1
- 10
- 50
- 100

Ryznar Corrosivity index (round 2)  
Prediction Map

- 12.7 – 13.1
- 13.1 – 13.6
- 13.6 – 14.1
- 14.1 – 14.6
- 14.6 – 15

Water pressure zones

