Ingersoll Water System: Water Quality

Public Works Department

November 26, 2012

The Ingersoll System

- 7 groundwater wells distributed throughout the system (5 currently online)
- Wells are bedrock with depths ranging from 109 to 140 metres deep (358 to 459 feet)
- Storage: one elevated and one ground-level, local storage at each treatment facility
- Treatment: oxidation/filtration to remove H2S and disinfection
- Pumping: level in water tower controls well pumping

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General Water Quality

- Bacteriological: excellent, rarely any findings
- Chemical (health):
  - Fluoride: 1.0 – 2.1 mg/L. MAC 1.5 mg/L, Treatment Level 2.4 mg/L
  - Sodium: 40 – 88 mg/L. MAC 20 mg/L, Aesthetic Objective 200 mg/L
- Chemical (aesthetic):
  - Hardness: 338 mg/L (average)
  - Hydrogen Sulphide (H2S): removed by treatment, may reform in distribution system due to presence of build up on old cast iron pipes

Water Quality: Metals

Metal	Low (ug/L)	High (ug/L)	MAC (ug/L)
Antimony	ND	ND	6
Arsenic	ND	0.7	25
Barium	19	62	1000
Boron	114	170	5000
Cadmium	ND	0.07	5
Chromium	ND	1.8	50
Mercury	ND	ND	1
Selenium	ND	ND	10
Uranium	ND	0.07	20

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Water Quality: Organics

- Required to test for over 50 different organic compounds including solvents, & pesticides, etc. every 3 years
- All parameters were non-detect (any presence would be below the laboratory's ability to measure)
- Trihalomethanes (THMs): a group of chemicals formed as a result of disinfection
  - Tested 4 times per year
  - Ave 23.7 ug/L, MAC 100 ug/L

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Discoloured Water

- Has been a historical issue in Ingersoll
- Due to:
  - Insufficient flow in watermains (stagnant) – reacts with pipe wall
  - High flowrate (fires, watermain breaks) – strips sediments/tuberculation from pipe wall
  - Water quality changes (pH, alkalinity, H2S)
- More prevalent in areas with old cast iron watermains

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Cast Iron Watermain

- Common pipe material used into the 1960s
- Replaced by ductile iron and more recently PVC pipe
- Unlined: water reacted with pipe wall to form corrosion tubercules
- Recent change in treated water quality (lower levels of H2S, higher levels of chlorine residual, lower pH)
  - Started re-dissolving/loosening tuberculation
  - Dissipated chlorine residual
  - Worse in locations with poor circulation

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Older Watermains

Distribution System Improvements

Solution:

- Reline or replace existing cast iron or unlined ductile iron pipe
- Estimate: 14 km of watermain
- $5.5 – $7.0M over 4 to 5 yrs