

December 6, 2013

## What you need to know about watermain breaks

### What causes watermain breaks?

Weather: Watermain breaks are more frequent in winter months (November to March) when colder temperatures can cause soil to freeze and expand, creating force on the watermain. Prolonged periods of cold weather will result in an increase in the number of watermain breaks.

Pipe thickness: Watermains constructed during the late 19th century have thicker walls than watermains constructed during the 1950s and '60s and are therefore less prone to breaks. Small watermains with thinner walls are more vulnerable to corrode and therefore more likely to break.

Corrosion: External corrosion causes 'pits' to develop into small holes in cast iron or ductile iron pipes. The highest corrosion rates occur on watermains with copper service connections located in soils such as clay. Added moisture caused by a watermain leak can result in increased rates of external corrosion.

Leaks and ground erosion: Leaks can erode the ground surrounding a watermain ultimately causing the pipe to collapse.

Other reasons: Type of joint, installation process and workmanship, manufacturer process, pipe depth, water pressure (such as high water pressures inside a pipe), ground water, seismic activity (waves of movement through the earth), disturbances and stray current interference (caused by rail transit systems) are all additional factors that contribute to watermain breaks.

### What is Toronto Water doing to address watermain breaks?

Replacement/rehabilitation: Toronto Water is spending about \$110 million in 2013 for replacement and rehabilitation of watermains. Watermain replacements are determined by considering age, break frequency, material, operational requests, hydraulic performance, future growth and minimizing cost and disruption to the local community in co-ordination with other construction programs (e.g., road, sewer, gas, hydro, etc).

### Preventive maintenance:

- Cathodic protection: Preventive maintenance to draw erosion away from the existing watermain is used on cast iron and ductile iron pipes and extends the service life of a watermain.
- Cleaning/cement mortar lining (trenchless technology): This trenchless technology is designed to address rusty water concerns and improve hydraulic capacity by removing rust build-up from the inside of older watermains and lining the internal surface with a thin layer of cement.
- Structural lining: This process uses resin-impregnated fibreglass to form a new pipe wall conforming to the old pipe, ideally in situations where larger diameter watermains need to be renewed and the cost of open-cut (trenching) is a significant consideration.

### **How does the City respond to watermain breaks?**

A watermain break is considered emergency work as it provides drinking water to local residents and businesses. When a watermain break is reported to 311, Toronto Water staff are immediately dispatched to determine the location and severity of the watermain break. They excavate to expose the broken watermain and clean and dewater the area surrounding the break. Depending on the severity of the break, the watermain may be repaired by using a repair clamp or by replacing the deteriorated section of pipe. Property owners and businesses affected by a watermain break are notified if water service in the area needs to be turned off (to complete the repair), the repair schedule and when the water will be turned back on. If not serious, most repairs can be completed in less than 24 hours. **To report a watermain break please call 311.**

For more information on watermain breaks see the Toronto Water video at <http://www.toronto.ca/watermains>

Road restrictions due to a watermain break or other significant traffic impacts are reported to the Transportation Services Road Restrictions website, 311, etc.

### **Some basic statistics:**

- Toronto has 548 kilometres of trunk watermains that are used for the bulk transmission of water and are generally larger in diameter; in Toronto, they typically range from 600mm to 2500mm in diameter.
- The trunk watermains connect to over 5,466 kilometres of distribution watermains which are smaller in diameter (typically less than 400mm) and carry water from the trunk system into all areas of the city.
- The majority of the city's watermains are approximately 55 years old.
- Approximately 17% of the watermains are 80-100 years old .
- Approximately 6.5% are more than 100 years old.
- Most watermains are buried about 1.8 metres deep, just below frost line

- The City's water distribution system is comprised of 69% cast iron watermains, 17% ductile iron watermains and 8% PVC water mains. The remaining 6% of the system is comprised of steel, concrete, polyethylene, and transite watermains.
- Average number of breaks/year: 1,100
- Total breaks: 1,283 in 2010; 1,610 in 2011; 1,095 in 2012; 1,137 in 2013 (to October 31)
- 40 to 60 kms of watermains replaced each year through capital program
- 30 to 50 kms of watermains undergo structural lining rehabilitation each year
- 100+ kms of watermains undergo cathodic protection each year
- Approximate cost to repair an average watermain break is \$8,000

For more information visit: [www.toronto.ca/water](http://www.toronto.ca/water)