



**NRC-CNRC**

*Institute for  
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## *Long-Term Performance of Ductile Iron Pipe*

### *Objectives*

To estimate long-term deterioration rates of ductile iron pipes and to develop cost-effective techniques for estimating and forecasting their failure rates.

### *Background*

The oldest ductile iron (DI) pipes in water distribution systems have been in use since the late 1960s and are almost 40 years old. Water utilities have experienced both high-breakage rates in relatively young DI water mains and low breakage rates in relatively old DI mains. This has led to a consensus that age is not always the key indicator of DI pipe condition.

It is also impractical and prohibitively expensive to determine soil properties and corrosion rates at every point along pipes in distribution or transmission systems. Therefore, the industry needs robust statistical techniques that can determine the condition of long pipe segments from limited numbers of samples. In this way, failure rates can be estimated without incurring high condition-assessment costs.

### *Statement of Work*

- Collect pipe samples from across North America and Australia, and conduct a thorough examination of their condition. A soil sample will accompany each pipe sample.
- Develop techniques that correlate the current condition of pipes and corrosion rates with soil properties, and allow the user to draw inferences about the condition of long spans of pipe.
- Develop methods that combine physical and statistical failure models as well as past performance data to predict the residual life of pipes.

### *Expected Outcomes*

A computer application that helps to predict the residual life of ductile iron pipes.

### *Partners*

American Water Works Association Research Foundation (AwwaRF), Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia, and Kingston Software, with in-kind contributions from Canadian, U.S. and Australian water utilities.

### *Start/Expected Completion Dates*

This project began in 2005 and will be completed in 2008.

### *Project Manager*

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For more information, see [http://irc.nrc-cnrc.gc.ca/ui/bu/ductile\\_e.html](http://irc.nrc-cnrc.gc.ca/ui/bu/ductile_e.html)

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*Corroded ductile iron mains*



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