

AT BURSTING POINT

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ABSTRACT

Burst water mains and pin hole leaks in pressure pipes, have always been repaired by the traditional methods of ‘excavate and replace’. Little thought has ever been given to trenchless NoDig technologies that apply to so many other aspects of our lives.

With the ability to insert a stent into an artery or vein, how is it we still rip up a road to fix a water pipe? With the roll out of the new century, is it not time to bring new technology to our assistance?

1.0 INTRODUCTION

As with the rest of the world, Australia is suffering from ageing infrastructure of both a commercial and domestic nature. This, combined with the ever increasing urban population is placing significant pressure on our water network. Many of these services are operating with pipe assets that may fail at any time.

Typically, ‘excavate and replace’ has been the preferred method of repair and this is understandable, as historically few other alternatives were available.

Now Redline technology is here in Australia and pipes can be coated with minimal disturbances to stop corrosion in its tracks. We have the option to completely re-coat a pipe with absolutely no digging.

To Redline a water main for example, we would use the existing landing valves and hydrants as our entry and exit points. In internal situations, there would be no requirement to break into walls, we would use the existing tap outlets as the entry and exit points of the pipes. Redline uses a highly specialised epoxy resin to coat small bore water pipes from the inside, which provides an increase in protection from corrosion and deterioration, resulting in increased longevity to the original asset.

This paper will highlight some of the reasons why prevention is better than cure, due to minimisation of reactionary management. We will specifically touch why in fact we should be using NoDig cutting-edge pipe rehabilitation technologies like Redline, rather than ‘excavate and replace’. We will cover the huge **increases in safety, pipe longevity, and water quality** that can be obtained, versus the decreases in **emergency spending, the poor media coverage** from road closures, and the backlash from the public for wasting millions of litres of our most

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precious resource every year, due to what is usually deemed (correctly or not) as poor maintenance.

2.0 DISCUSSION

Prevention Vs Cure

With an expected 50 per cent increase in urban population by 2050, providing safe, reliable and sustainable water services for Australia’s cities is a major challenge for the 21st century.

As cities expand, the demand for water will continue to increase, as will the generation of waste and stormwater runoff. These pressures will be exacerbated by an ageing infrastructure. Now more than ever, improvements in water infrastructure management are a critical necessity.

New approaches to the management of pipe repairs are required to address the increasing inconvenience, damage and danger caused by collapsed and burst water pipes.

Coating pipes needs to be seen as an investment, it saves time and saves money in the long run. It also reduces pressure being put on company and council resources, PR disasters and placing other assets at risk.

One outstanding feature of Redlines is that existing pipes with a nominal bore reduced to as little as 20 per cent, can be cleaned back out to nearly its full potential, then coated to reinstate its integrity, extending the life of your asset exponentially.

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Another great thing about this product is that unlike conventional repair and replace options that can often cause a whole site to be shut down whilst work is done, this process can be managed to ensure minimum disruption to operations.

Redline has been used successfully in a variety of applications including hospitals, high rise apartments, factories, fire suppression systems and domestic homes.

Let’s take this apartment complex, located in the exclusive Forest Hill area of Toronto. Built in 1989, this luxurious 60-unit building has an average unit value of \$700,000. Mandatory chemical additives to treat drinking water had slowly corroded the pipes, resulting in multiple active pinhole leaks.

With one new pinhole leak each week occurring, the owner was spending up to \$60,000 per year in repairs, and needed to find a more affordable, permanent solution to the problem.

A repipe would take up to six months to complete and accessing the deteriorated pipe would require tearing into walls and internal facades throughout the property. The noise, mess, and down time would require the displacement of residents and cost hundreds of thousands of dollars

In 2008, the owners contacted NuFlow Canada to find out about in-place pipe relining, using the Redline process, an epoxy coating, was “shot” through the pipes, creating a barrier coating between the piping system and corrosive water, which permanently prevented further pinhole leaks. Redline leaves walls intact, eliminating displacement of residents, and takes considerably less time than repiping, and at less than half the cost. All potable water plumbing on the property including hot and cold recirculation lines, the mains into and throughout the property, and all pool lines, were Redlined successfully and on schedule.

Let’s recap, the owner of the property is saving \$60,000.00 per year on repairs, residents are not having to re-locate and the in past 14 months since job completion they haven’t had one pinhole leak. This is a great example of a preventative measure that provides peace of mind in terms of the assets function.

As a plumber, who has been in the business for over 30 years, I strongly believe that prevention is better than cure. It never ceases to amaze me why companies continue to take risks when there is a product in the market that can assist them.

Increased safety

The great thing about trenchless versions of pipe rehabilitation, is that unlike conventional repair and replace options that can often cause a whole street or building to be shut down, this process can be managed to ensure minimum disruption to operations.

The use of Redline technologies also assists with public safety. There is less traffic congestions, disruption to pedestrians, no large open holes and the reduced chance of land collapses.

Assists with water quality – prevents leaching

In Australia, little is heard about drinking water as a source of lead poisoning. This is probably because – unlike Europe and the USA – lead pipe plumbing is not as widespread in Australian homes. Lead poisoning is however, more common in Australia than many people think.

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The main cause for concern, arises out of the common use of lead based solder on brass fittings and copper pipes as recently as 1989. As a result of corrosion, there is a potential for the lead to leach into the water after prolonged contact. It is therefore the consumption of first flush water – the first cup of tea in the morning – which presents a hazard.

Studies conducted in Perth (WA) in 1993 on cold water from kitchen taps have indicated that 5% of samples were above the acceptable lead level as defined by the National Health and Medical Research Council (NHMRC), 2% were above the limit for cadmium and 12% above the limit for copper.

However, there is virtually no monitoring of the water quality at the kitchen tap. Water quality monitoring takes place before the water reaches your home, with the exception of the occasional monitoring at the garden tap. This is not going to tell you whether the water in your kitchen is safe after travelling through your plumbing system.

So, what can you do about it?

You can collect a sample of water from your kitchen tap and send it to a laboratory for analysis, flush your plumbing in the morning (it takes on average 10 litres of running water to flush each tap every morning to the length of pipes), avoid using hot water for drinking or cooking purposes.

Or you can Redline your pipes!!!

Redline is designed to restore integrity to entire pipe networks rather than repair a single event, this internal epoxy pipe coating has some amazing properties.

The system can be used on pipes measuring 12mm to 300mm. After cleaning, the unique epoxy lining is blown along the pipeline by specially conditioned air. It successfully negotiates all junctions, joins and changes in pipe diameter to leave a perfectly reconditioned pipeline with a barrier between the host pipe and the fluid travelling through it. This means an instant halt to corrosion.

If you've got a large fixed asset supported by a network of pipes or a long pipeline that may start to corrode or is already doing so, the product offers the ability to save hundreds of thousands of dollars on reconstruction. Prevent the need to future repairs, by lining it in situ, without major disruption.

Increase pipe longevity

As most pipes have a recognised lifespan of 25–50 years, the application of the Redline technology can result in up to an additional 40 years in pipe performance.

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For most water pipes, the epoxy coating will last considerably longer. It is generally known that epoxies have a lifespan of up to 100 years. One example, pipes that were recoated 50 years ago in Japan still show no sign of deterioration.

Bad press

You just need to look at your local news publication to see the negative publicity burst water pipes generates. Take this article for example...

A crater swallowed my car

A BURST water main created a 25m crater that swallowed at least one parked car and caused a landslide in exclusive Sydney suburb Bellevue Hill.

The water main ruptured about 8pm (AEST) yesterday, leaving the crater near the intersection of Victoria and Bellevue Roads. The torrent of water brought down a power pole and swept two motor vehicles into nearby Cooper Park, police said.

Traffic diversions caused by the massive crater could be in place for several days, Sydney Water said. Motorists have been warned to expect major disruptions in the area this morning, with emergency crews still repairing ruptured water and gas mains on Victoria Rd. Victoria Rd will be closed indefinitely between Bellevue and Birriga Roads, while Bellevue Rd will be closed between Buller St and Victoria Rd, police said this morning.

“This kind of disruption and damage often results in public relations disasters for local authorities.”

Sydney Water spokeswoman Karen Smith said the diversions could be in place for some time, while utility companies and authorities assessed the damage. When the water main burst last night, police had to warn residents to stay indoors because of the associated gas leak.

This kind of disruption and damage often results in public relations disasters for local authorities and results in reactionary management and spending.

Reactionary Management

When a pipe fails, those responsible go into reactionary management. This puts huge pressure on resources, and often results in significant disruption and costs far more than the preventative measures available.

For example, as reported on news.com.au, a burst water pipe closed one of two southbound lanes on Pennant Hills Road, at Carlingford in Sydney's northwest. Possibly with some preventative maintenance, this may never have occurred. Instead New South Wales Water Minister Phil Costa was forced to apologise for two burst water mains which caused traffic

chaos in Sydney. The rupture blasted a massive hole in the street, with tens of thousands of litres flooding the area, causing an estimated millions of dollars in damage.

In 2008-09, there were 431 unplanned shutdown events in SYDNEY WATERS designated area. These events affected 25,656 properties within Sydney. Unplanned water interruptions can be caused by water main breaks and leaks, damage caused by third parties carrying out construction work near Sydney Water infrastructure, and power failure.

In 2007-08, two broken water mains took longer than five hours to repair, affecting a large number of customers in Gerringong and Gerroa. Poorly performing water mains such as these are identified and repaired through the Water Mains Renewal Program.

3.0 CONCLUSION

I see preventative trenchless technologies like Redline as an absolute necessity for all water asset owners in the future. It is a preventative technique that provides peace of mind in terms of the assets function.

With an expanding urban population, the demand for reliable infrastructure will continue to increase. Due to ageing infrastructure, we are replacing much more pipe now than ever before, when we should be doing the complete opposite, and relining them instead.

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We must act now to provide safe, reliable and sustainable water services for Australia’s cities. This includes choosing a preventative measure over reactionary remedies. There are significant benefits to relining, including increases in safety, pipe longevity, and water quality. This results in a decrease in emergency spending, the poor media coverage from road closures, and the backlash from the public.

The aim of relining is very simple, to provide the ability to secure an asset and its operation and prevent future problems from occurring.

4.0 ACKNOWLEDGEMENTS

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