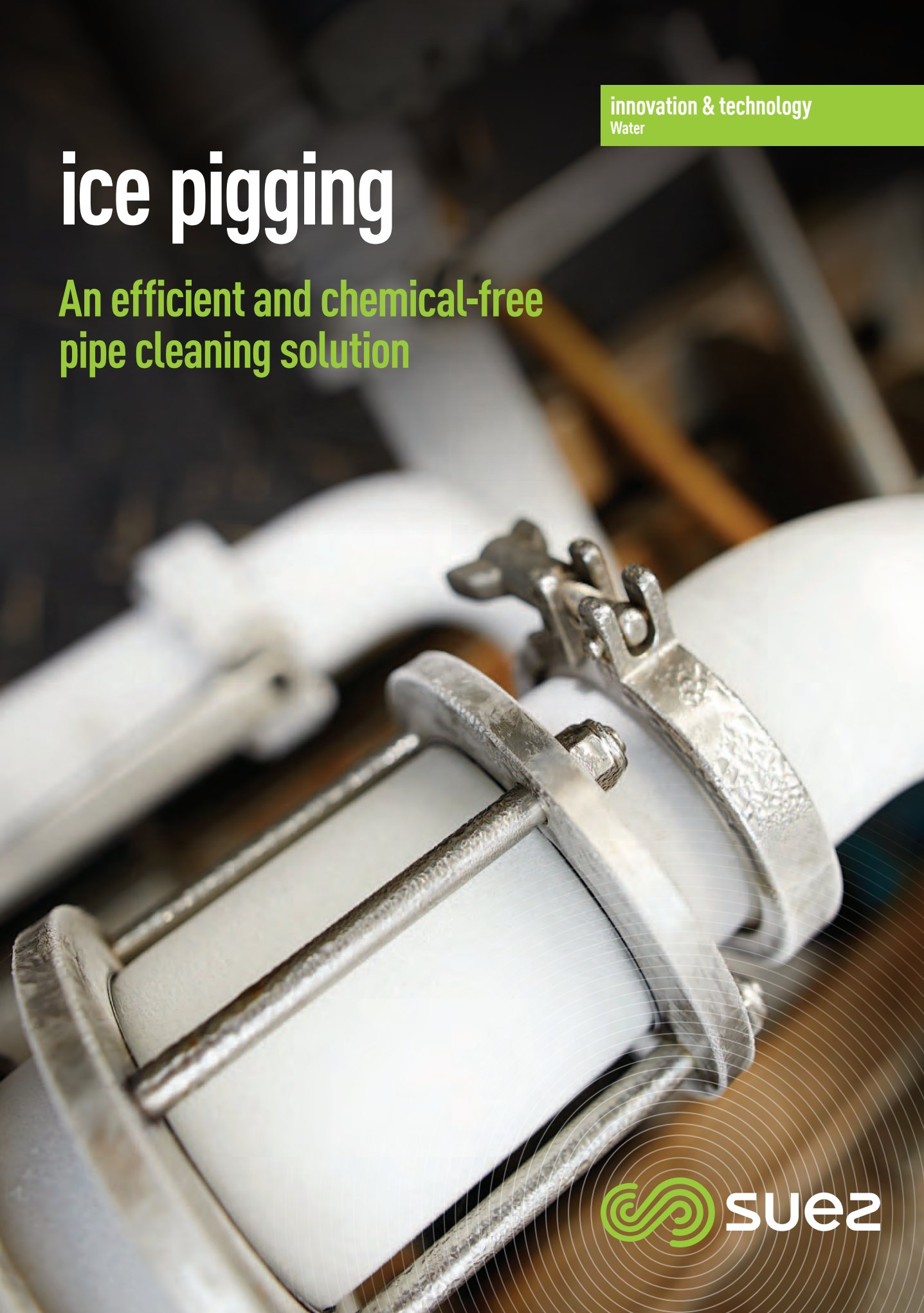
innovation & technology
Water

ice pigging

An efficient and chemical-free pipe cleaning solution



SUEZ

With time, drinking and wastewater infrastructure can develop issues that impact **water quality** and **network reliability**.

In drinking water networks, the presence of iron, manganese and biofilms can cause water discolouration and consumer complaints. They may also pose health risks.

Iron and manganese can accumulate due to poor filtration at the water treatment stage, or with deterioration of water network infrastructure.

Biofilms are biological growths on the internal surface of pipes which typically grow in environments with high manganese or aluminium content, or where the chlorination of water is not possible.

In networks carrying chlorinated or chloraminated water, reactions with biofilms can lead to the creation of TriHaloMethanes (THMs) which may also pose health risks. Cleaning pipes and other infrastructure helps remove sediment, improving water quality and optimising network operations.

In wastewater networks, sewage can decrease flow rates causing increased odours, blockages, and, in severe cases, flooding to nearby properties. Cleaning sewer pipes can extend asset life and reduce occurrences of wastewater main failure.

To assist water operators in delivering quality water and wastewater services, SUEZ has developed ice pigging, a chemical-free and cost-effective pipe cleaning method.

what is ice pigging?

Ice pigging is a **pipeline cleaning process** in which an ice slurry is pumped into a pipe and forced through under pressure. This process removes sediment and deposits to **leave the pipe clean**.

A semi-solid ice slurry can be applied uniquely because it is pumpable like a liquid, yet also behaves as a solid when a 'pig' of ice slurry is formed within a pipe.

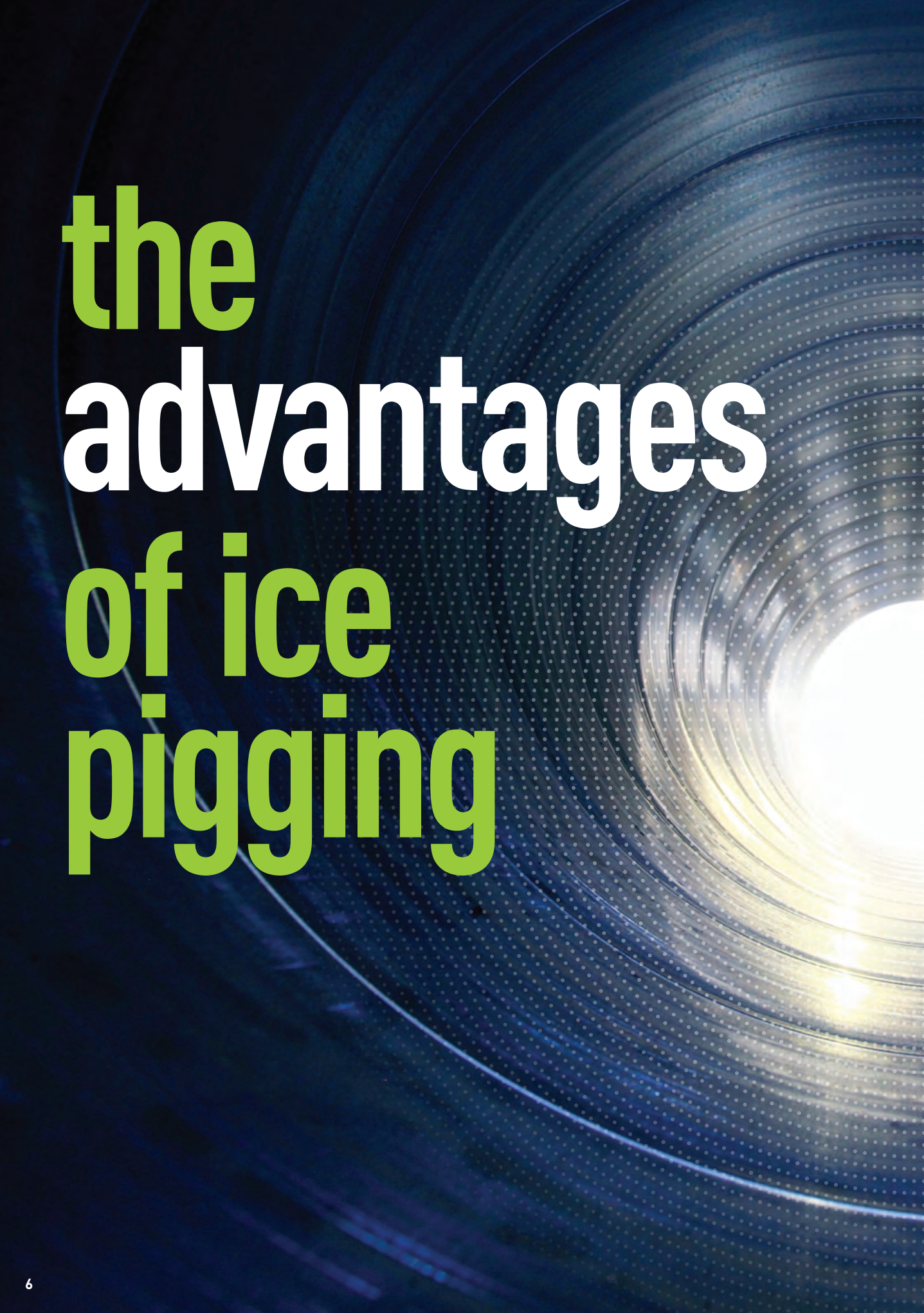
Ice pigging can be used to clean pipelines ranging from 60-700mm in diameter without excavation of the pipeline.

Ice pigging is fast, effective and exceptionally low risk. It also uses significantly less water than most comparable techniques.

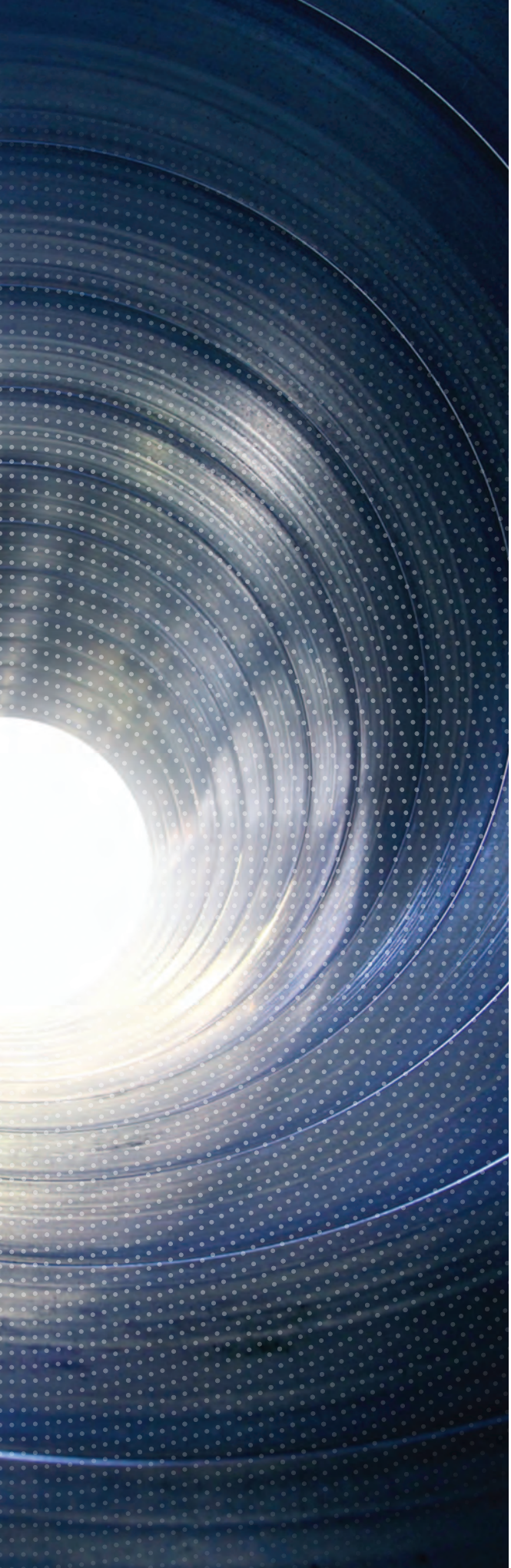
Ice pigging has been widely adopted across municipalities and industries throughout the world and is widely considered the most cost-effective pipe cleaning method.

Applications

- Drinking water
- Urban wastewater
- Oil & gas pipe cleaning
- Industries (food & beverage, home & personal cares, cosmetics)



the advantages of ice pigging



Operational efficiency

- Up to 1000 times more effective at removing sediment and biofilm than traditional flushing
- Ice slurry can flow through pipes of different diameters, bends, and pipe fittings
- Ice pigging takes half the time normally required by other techniques
- Pipes are typically only isolated for 30 to 180 minutes, depending on the length of pipes to be cleaned
- Exceptionally low-risk. Ice blockages can be resolved by simply allowing ice to melt.
- Ice pigging allows cleaning of pipes without harmful chemicals.
- Ice pigging process produces quantifiable results

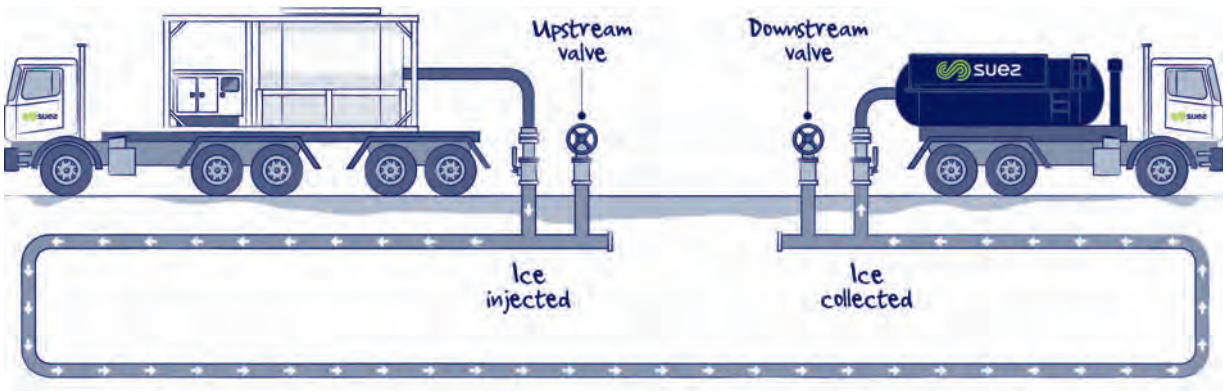
Cost effectiveness

- Ice pigging uses up to 50% less water than traditional techniques such as flushing or swabbing
- Cost-effective, particularly when considering the amount of sediment removed
- Ice pigging generally requires no excavation

Service improvement

- Reduce service disruption

understanding the ice pigging process for drinking water pipes



STEP 1

Isolate the main

The main is isolated by closing valves upstream and downstream of the section to be cleaned.

STEP 2

Insert the ice

The ice slurry is pumped into the pipe via a fire hydrant or similar fitting. The downstream pressure in the pipe is monitored and managed at the outlet point via a fire hydrant. A 'pig' of ice is formed.

STEP 3

Open upstream valve

The ice is pushed along the pipe using the natural pressure in the network. To do this, the upstream valve is opened and flow at the outlet hydrant is used to control the speed of the ice. As the ice flows through the pipe it passes over every surface and collects sediment and biofilm.

STEP 4

Collect ice pig

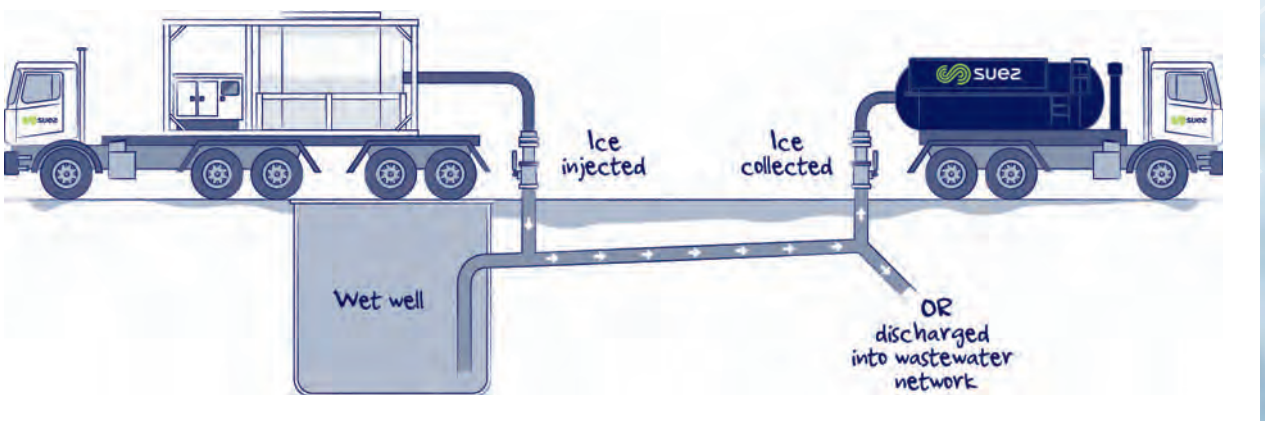
Water in front of the pig is discharged normally. Temperature at the outlet point warns of the arrival of the ice, which allows the sediment-laden ice to be collected separately using a tanker if required.

STEP 5

Flush and return to service

The pipe is flushed to the appropriate standard and promptly returned to service. The process is efficient, rapid and exceptionally low risk.

understanding the ice pigging process for urban wastewater pipes



STEP 1

Isolate the main

An ice delivery unit will pump through the non-return valve located at the pumping station or via any fitting on the pipe.

STEP 2

Insert the ice

Once the ice has been inserted, the wet well pump can be used to push the ice pig through the full length of the pipe to be cleaned.

STEP 3

Ice collection

At the collection outlet, the ice and waste material can either be discharged through the wastewater network or retrieved with a suction waste tanker.

STEP 4

Return to service

After ice pigging, waste lines simply return to service as normal.

ice pigging for industries

Ice pigging is also suitable for a wide variety of industries including **Oil & Gas**, **Food & Beverage**, **Home & Personal Care** and **Cosmetics**.

Even though the process is tailored to different industries, sites and client needs, the main operational principles of ice pigging remain the same.

Benefits

- Improved product recovery
- Faster change-over between products
- Reduced CIP (clean in place) times
- Decreased effluent production

Contact our local team for more details

key references

34 water authorities served

6,500 tonnes of ice produced

1,700 kilometres of pipe cleaned

(figures from June 2013 to December 2016)

Northern Territory

- Power & Water Corporation

Queensland

- Central Highlands Regional Council
- Queensland Urban Utilities
- Unity Water

New South Wales

- Armidale Regional Council
- Bathurst Regional Council
- Bega Valley Shire Council
- Cowra Council
- Vales Delta
- Glenn Innes Severn
- Gosford City Council
- Harden Shire Council
- Hunter Water Corporation
- Kempsey Shire Council
- Mid-Western Regional Council
- Nambucca Shire Council
- Orange City Council
- Port Maquarie-Hastings Council
- Rous Water
- Sydney Olympic Park
- Tweed Shire Council
- Wingecarribee Shire Council

Victoria

- Barwon Water
- Central Highlands Water
- Coliban Water
- Goulburn Valley Water
- Melbourne Airport
- North East Water
- Wannon Water
- Western Water
- Yarra Valley Water

South Australia

- Central Irrigation Trust
- SA Water

Tasmania

- TasWater

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