Introduction

The introduction of the Sustainable Development Goals (SDG) in 2016 benchmarked new standards of community wellbeing and satisfaction, as well as new expectations for water service providers to meet productivity and sustainability targets.

Of fundamental relevance to the water sector, **SDG 6: ensuring availability and sustainable management of water and sanitation for all,** outlines the expectation for potable water services to ensure liveability for communities via the production and delivery of clean and safe drinking water to their customers. Furthermore, water service providers are tasked with ensuring cost-effective and sustainable processes are adopted for network maintenance moving forward.

First adopted in Australia in 2011, **ice pigging offers water providers a non-invasive, trenchless process for cleaning pressurised potable water mains.** Within the relatively short period of its implementation, ice pigging has proven to be one of the mosteffective, time-efficient and energy effective methods for removing biofilms and sediments from water mains, while also significantly reducing process risks.

Adaptive and proficient, ice pigging has also proven to deliver higher levels of energy efficiency in wastewater pumping stations due to its effective and safe removal of build-up in sewer rising mains.

With the demands of community wellbeing and sustainability increasing into the future, ice pigging offers relatively high-yield benefits in comparison to alternative water and sewer main maintenance methods.

SUEZ offers an Ice Pigging service from mobile delivery units as well as Ice Pigging machines that can be permanently installed in factory or industrial plant facilities. **This low-risk, clean-in-place process can be applied to a wide range of pipe systems in diverse industrial and municipal applications.**

what's involved?

Ice pig, or pigging, technology utilises the properties and benefits of semi-solid water, referred to as ice slush, or slurry. Due to the abrasive yet compromising physical properties of ice slurry, which is coarse but dissolvable, the medium is highly effective in scouring surfaces without damage or risk of blockage.

Ice slurry is pumpable and conforms to varying pipe topology, much like liquid water. However, its semi-solid structure also offers the benefits of a solid, creating pressure stress on pipe surfaces.

While pressure stress is highly effective in scouring sediments and biofilm, the risk of blockage and the need for expensive enabling and removal costs (including trench digging) is completely removed due to the transmutable nature of the ice slurry medium.

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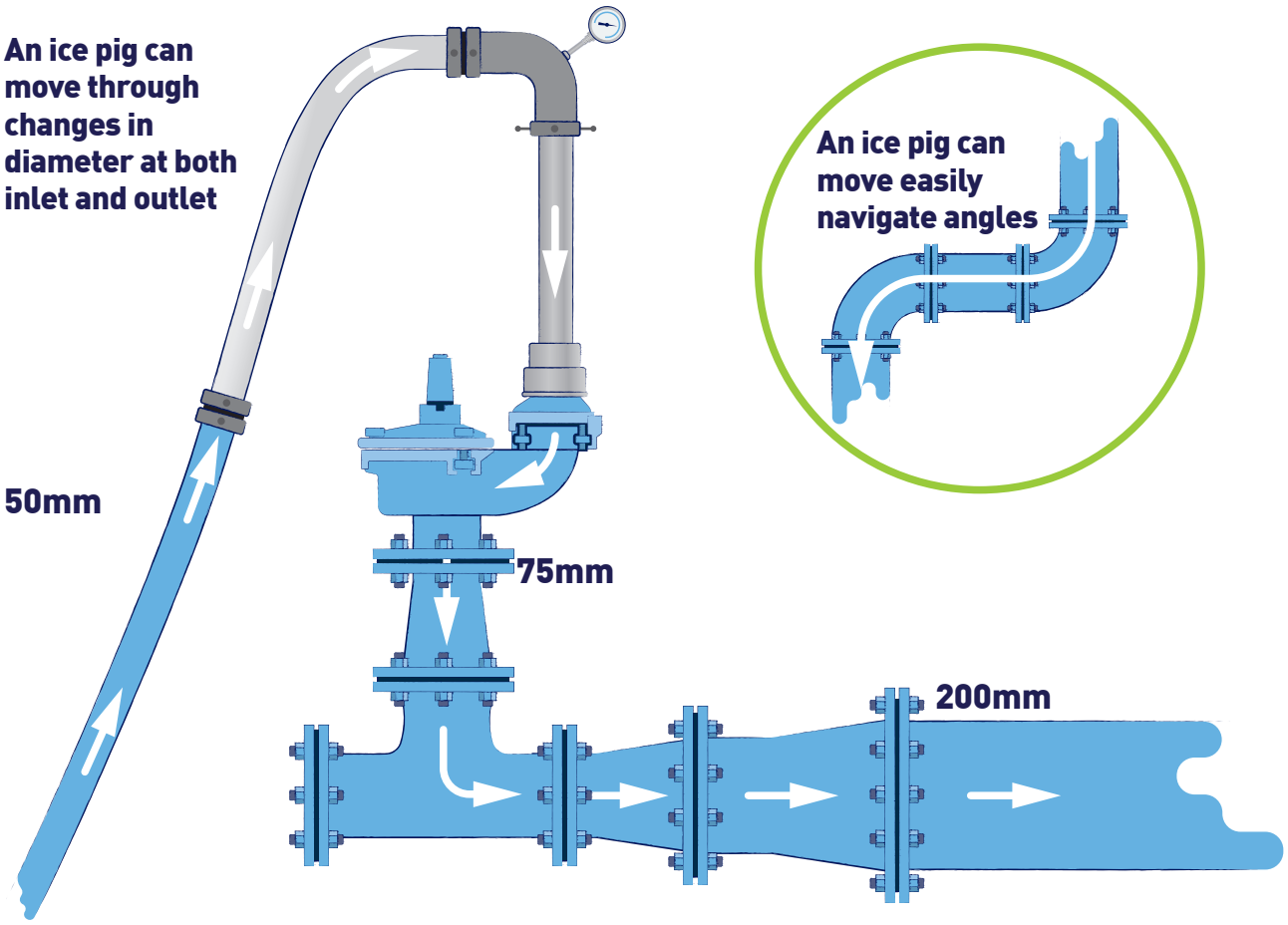
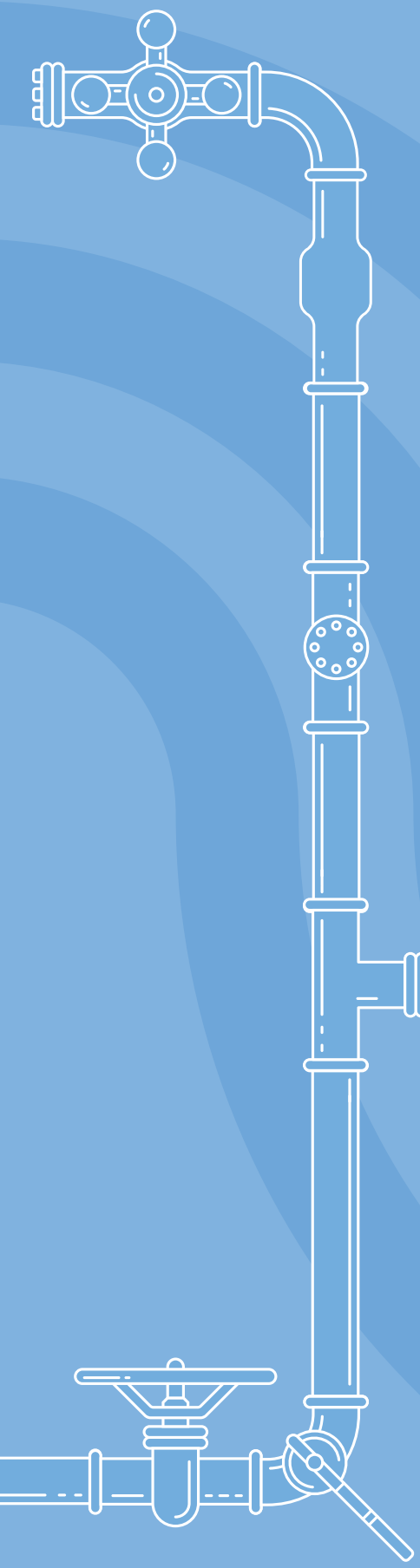


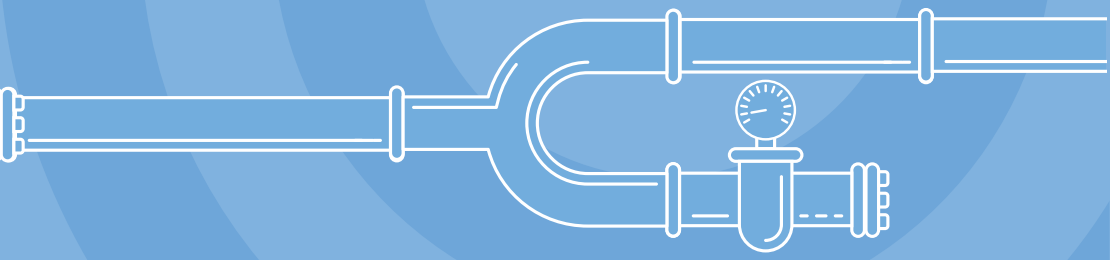


How it works:

1. **Semi-solid ice slurry** is produced by combining slush ice with salt. The amount of ice slurry required for the process depends on the length of the pipe to be cleaned and its diameter.

2. **Standpipes** are installed on hydrants as close as possible to the upstream and downstream valves.

3. **All valves** are closed to isolate the pipe from network pressure and the pipe is depressurised.



4. **The ice slurry is pumped** into the upstream hydrant and the displaced water is allowed out of the downstream hydrant while maintaining a small amount of pressure to allow the ice pig to form.

5. **Once the required amount** of ice slurry has been pumped in, both hydrants are closed and the upstream valve is opened to pressurise the ice.

How it works:

6 ⇛ **The downstream hydrant** is gradually opened to induce flow. The ice slurry begins to move through the pipe as a result of the pressurised pipe network.

7 ⇛ **As the ice slurry** moves through the pipe, it collects and carries sediments and biofilms, while navigating bends and changes in pipe diameter.

8 ⇛ **An analyser unit** is utilised at the downstream hydrant to measure key parameters, including the progress of the ice slurry along the length of the pipe.

9 ⇛ **The water** before the ice is dechlorinated and flushed to waste or collected for reuse. As the ice slurry nears the extract point the downstream valve is closed and the ice slurry is diverted to a waste tanker for safe disposal.

10 ⇛ Afterwards there is short period of flushing until the turbidity quickly drops to acceptable levels.