

# Ice Pigging for drinking water pipes

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Ice Pigging is a patented process for cleaning the inside of pipes using an ice slurry. It is fast, effective and exceptionally low risk, using significantly less water than most other techniques.

A semi-solid ice slurry can be applied uniquely because it is both pumpable like a liquid, but also takes on properties of a solid when a 'pig' of ice slurry is formed within a pipe. It is a highly effective method of removing sediment and biofilm from drinking water pipelines.



## Benefits...

- ▶ Uses 50% less water than flushing or swabbing / standard pigging.
- ▶ Is up to 1000 times more effective at removing sediment and biofilm than traditional flushing.
- ▶ Flows through all diameters, fittings and bends of pipes.
- ▶ Significantly reduces customer disruption.
- ▶ Takes half the time that is normally required by other techniques.
- ▶ Generally requires no excavation: a genuine 'no-dig' technique.
- ▶ Lowest cost option when considering volume of sediment removed.
- ▶ Exceptionally low risk – if ever the ice gets stuck, it will simply melt.
- ▶ It produces quantifiable results – proof of the volume of sediment removed.
- ▶ Ice is harmless to public health.

# How does it work?

## 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 or wipes biofilm as it passes.

## 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 in a tanker if desired.

## Step 5: Flush and return to service

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



# Why clean pipes?

**Ice Pigging is proven to effectively remove both sediment and biofilm without causing damage to the pipe wall.**

Over time, drinking water pipes can suffer from problems that can have an impact on water quality and cause consumer complaints.



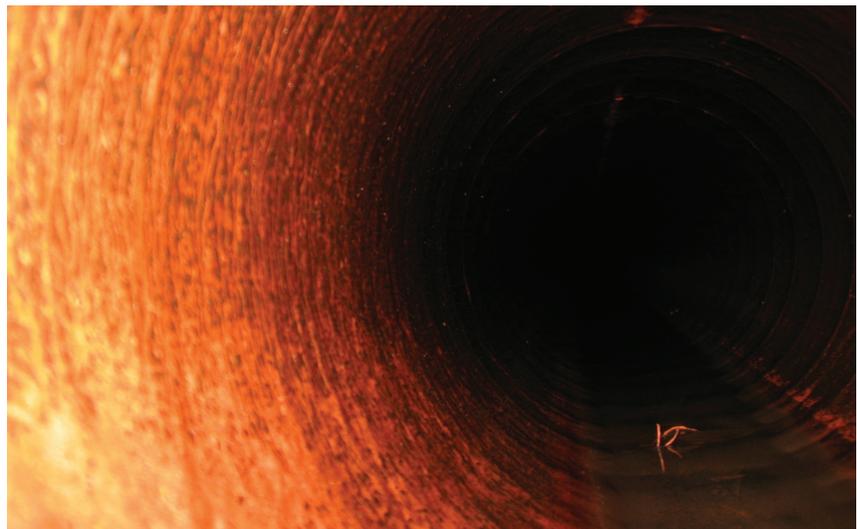
SEDIMENT

## Iron and manganese...

...can accumulate as a result of poor filtering at the water treatment stage, or as a result of deterioration of the drinking water network. Sediments can significantly affect the appearance of drinking water and can easily appear at customer taps when only the slightest changes to the operation of the system occur.

## Biofilms...

...are biological growths on the inside surface of the pipe. Typically, water with high manganese or aluminium content, or in any network where chlorination is not allowed can be susceptible to biofilm growth. In networks carrying water treated with chlorine or chloramines, reactions with biofilms can lead to the creation of TriHaloMethanes (THMs) which in turn have been associated with public health risks.



BEFORE ICE PIGGING



AFTER ICE PIGGING

# Ice Pigging versus...

## ...Water Flushing

Ice Pigging requires at least 50% less water, takes around half the time, and is up to 1000 times more effective. When considering mass of sediment removed, Ice Pigging is significantly more cost effective than flushing and results in lower intervention intervals.

## ...Foam Swabbing

Ice Pigging is less expensive than foam swabbing as typically no excavations are required. Ice Pigging is vastly less disruptive, with pipe outage of a few hours, compared with days for swabbing. An Ice Pigged pipe can be immediately returned to service – no need for lengthy chlorination process -, and uses less than 50% of the water used in a typical swabbing operation.

## ...Air Scour

Ice Pigging is a non-aggressive process that does not damage pipes, pipe linings or ferrules, and by not introducing abnormal stresses to the network reduces the likelihood of leakage. Ice Pigging is faster and can be performed over larger diameters and greater lengths than air scour.

## Our Service

**We produce ice in our local ice factories and deliver to site using specially designed ice tanks. Ice loads of up to 35,000 litres are possible. All Ice Pigging operations are carefully monitored by our specialist engineers using our monitoring system.**

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