

# WATER INDUSTRY INSIGHTS



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**NATURAL  
RESOURCES**



Preventative  
leakage strategy



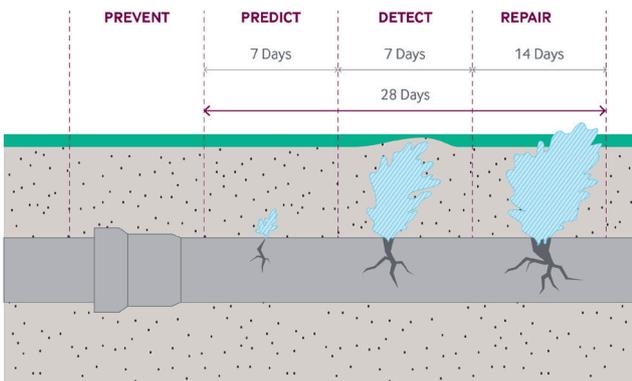
# PREVENTATIVE LEAKAGE STRATEGY

that isn't based on averages and assumptions

2020 marks the start of a journey to deliver ambitious leakage targets agreed between the UK water companies and their regulators. Company business plans have outlined investments to deliver over 800 megalitres per day (Ml/d) of new capacity and demand reductions by 2025 – through short-term supply options, leakage reductions, and water efficiency programmes<sup>1</sup>.

The new regulatory targets were always going to be a challenge, and no more so than with the flooding across the UK during February, the onset of the COVID-19 pandemic, and the drought like conditions some parts of the country are experiencing this summer.

We often get asked what the cheapest way to reduce or maintain leakage levels is. Our clients expect us to identify novel ways of finding more leaks or fixing leaks faster, but in fact, the best answer is not to let them happen in the first place – prevention is better than cure.



## Life of a leak

To help understand how and where to make efficiency gains in leakage, we use a methodology based on the 'life of a leak' which we break down into four parts - Prevent, Predict, Detect, Repair - this allows us to review each activity that goes into fixing a leak. The most efficient way to reduce leakage is to Prevent it from occurring in the first place. Secondly, the ability to Predict where leakage is likely to happen ensures that we can target resources efficiently. And lastly, using the right technique to Detect leaks as early as possible facilitates fast and efficient Repair, and ultimately leakage avoidance.

This simple Life of a Leak model also helps us to broadly look at the "leakage challenge" in terms of "real life leaks". What actions must be taken every time a leak occurs? How do these build up to impact the holistic cost of leakage programmes? If you can prevent a leak from happening, it doesn't affect your leakage calculation; you don't have to spend a lot of time finding the leak; and you don't have to spend a lot of money fixing it and reinstating the site of excavation.

So why then hasn't this been the operating model of all water companies since privatisation? The answer is varied, but comes down to three main points: the economic level of leakage policies that have driven the water sector for the past few decades; the belief that leakage is an operational cost problem; and the perceived cost of the end product. Let's consider each point, to examine why water company leakage operations are more reactive than proactive; and how some of the initiatives that are starting to be implemented have the potential to drive proactive investment.

## Economic leakage policies

Since privatisation in the late 1980s, leakage targets have been determined based on the process that the cost to find and fix the leaks should be lower than the cost of water production. This has led to an industry that sees little advantage in improving efficiency, and therefore an industry constrained by limited innovation. However, the determination of leakage targets has evolved considerably in recent times and in line with the most recent price review, the economic level of leakage was all but removed from target setting. With Ofwat's suggested reduction adopted by most companies combined with limited additional funds to achieve these targets has already caused the biggest shake up in terms of leakage management for some time.

## Operational costs

Often leakage is deemed to be an Opex problem where the solution is more people finding and fixing leaks to improve performance. This drives inefficient behaviour and leads to short-term solutions to address the problem rather than

addressing the root cause – the benefits of which have already been seen. The benefits of fixing the root cause have already been adopted by several water companies. The approach they've taken is to implement full asset renewal or extensive pressure management leading to lower leakage levels. These strategies now form a key part of their leakage reduction strategy in future years.

### Water is cheap

Water is significantly cheaper than other household utilities with the average water bill approximately £186<sup>2</sup> a year compared to gas at £610 and electricity at £680<sup>3</sup>. This is a significant difference and means that there has been limited funds available to invest in addressing leakage, and the vast majority of these funds have been put into solutions with immediate returns rather than solutions that deliver long term benefit. The perception of water company financing has also not helped with the customer view that service is worsening, while dividends are increasing. Water company initiatives for customers to look more at the environmental cost of water than the economic one has the potential to move the debate, but it seems water is yet to have its “plastic revolution”.

So, what can water companies do to meet these challenges in AMP7, and where are the opportunities to move to a more preventative mindset for leakage strategy?

### Using data to target proactive investment

High quality data from the network and the operations teams allows for the underlying leakage issues to be identified and rectified faster. A spike in stop tap failures might highlight a faulty batch in one area; an increase in mains and customer side failures may suggest that the pressure is too high in another.

Too often leakage strategy is based on averages and assumptions, a burst main is approximately 1m<sup>3</sup>/hr; a district meter area takes 4 weeks to survey. These averages and approximations mean that it's harder to identify where investment is needed and the potential benefits it will deliver. However, much of this data can be collected easily, without impacting on the efficiency of current activities. For example, using mobile apps we can track how long it takes to survey an area, and simple analytics can provide the flow rate of all failure and how quickly they grow. This wealth of data will assist leakage optimisation engineers to identify the corrective action needed, not based on averages, but the exact results from that area.

### Pressure control

Pressure control isn't a new technique for managing leakage, it's probably the most widely used preventative measure for reducing leakage in an area. If designed, operated and maintained in the correct way, pressure management is a very effective tool to reduce “existing” leakage, but also addresses the root cause. Pressurised water will find the weak spot in the network – if the force of water applied to this weak spot is lowered, the chance of a leak occurring is reduced.

Pressure controlling systems are more advanced than ever. While often seen as a bad thing by customers – the shower is not quite as powerful, or the paddling pool takes longer to fill up – the debate around environmental impacts from water use continues, the argument for them to simply become part of what must be a new normal to preserve our natural resources for future generations is irrefutable. And it's not just about pressure reduction – identifying pressure transients and tackling route causes removes pressure ‘spikes’ and shocks to the network, such as from pump start/stop and erratic large customer use, which cause weaknesses and leak outbreak.

### Additional benefits

Most, if not all, proactive interventions to reduce leakage have benefits for other regulatory drivers: water meters show high usage as well as customer leakage and allow for targeted water efficiency campaigns to improve per-capita consumption figures. Mains renewals deliver assets that could last 160 years, reducing interruptions to supply and customer minutes lost. Historically these additional benefits rarely made it into a business case for a leakage driven scheme, but now with the pressure of AMP7 on cost, efficiency and performance, all these benefits should be fully examined.

### The last word

The time for preventative long-term leakage solutions is now. The AMP7 targets and the predicted AMP8 targets mean that short term fixes are no longer appropriate to be the main tool to reduce leakage, they have their place, but targeted investment using improved data is the only way that these targets will be met.

1 Ofwat, 2019

2 Discover Water

3 Adapted from UK Energy Statistics, 2019 & Q4 2019, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/877047/Press\\_Notice\\_March\\_2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877047/Press_Notice_March_2020.pdf)