

Leakage and future investment

Thames Water's network of pipes stretches for 31,550 km, which is almost long enough to wrap around the world. Through these pipes we supply 9.8 million people in 3.9 million properties (households and businesses) with high quality drinking water.

The challenge of running our water network is considerable, with 55% of our pipes being under the streets of London and almost two-thirds of our pipework being over 60 years old (with around a third actually being over 100 years old). In addition, about two-thirds of the leaks we repair on our pipes are non-visible leaks, with no indication of the leak ever being visible at ground level or to the naked eye. These leaks seep into the ground below the surface and are not easy to find. We have an extensive team of over 500 that work around the clock to find them using data, and technology (eg acoustic listening devices and metering).

What is leakage?

Leakage is made up of any water that we are unable to account for as having been used by someone. This includes any water that is lost from the pipe network into the ground. It also includes any water use of which we are not aware, such as illegal use and any higher-than-estimated use by households and businesses that don't have a meter.

To estimate leakage, we compare the measured volume of water we put into supply against the volume we estimate is being used. The difference between these two values is what we record as leakage. We measure leakage in millions of litres per day (MI/d). As an idea of scale, an Olympic-size swimming pool (50m x 25m x 2m) contains 2.5 million litres of water.

Around a quarter of the leaks we fix are on pipes that belong to our customers, and although we are not responsible for those pipes, any leakage from them counts towards our leakage figures.

What's our target and how are we doing?

In agreement with our regulator Ofwat we've set annual leakage targets up to 2020. Leakage levels change throughout the year, therefore to measure and report our performance we take our daily leakage figures ((MI/d) and average them for each month and in turn across the year.

For the last four years actual leakage compared with our targets is shown in the table below. We beat our target in 2015/16 but have missed it for the last three years. (These results have been externally audited and confirmed). This has resulted in an extensive investigation by our regulator and Thames Water signing a legal undertaking to commit the necessary resources to bring leakage back down to the target level by 31 March 2020.

	2015/16	2016/17	2017/18	2018/19	2019/20
Annual leakage target (MI/d)	649	630	620	612	606
Actual annual leakage level (MI/d)	642	677	695	690	-

In essence our target for 2019/20 of 606 MI/d now requires a reduction of 12% from our 2018/19 annual average. This reduction would be the highest level of reduction seen since 1999/2000. We're committed to doing all we can to hit this target. .

While we continue to do all we can, we recognise that achieving 606 MI/d will be a significant stretch. This is due to the inherent challenge of reducing leakage below our all-time lowest level and the uncertainty around how our network will respond to the significantly increased levels of planned activity needed to achieve our target. When taking these risks into account, we believe 627 MI/d is a more realistic leakage forecast for 2019/20. Even at this level, the reduction would be 9% and represent the highest level of leakage reduction in one year since 2007/08

Leakage reduction remains one of our top priorities and we continue to strive to deliver our 606 MI/d target. Keeping our stakeholders updated about our leakage performance and forecasts also remains a priority.

Action to tackle leakage

Our average leakage level has been higher than our targets over the last few years. Because of this, leakage is a top priority for us and we have a strong focus on our performance. This is producing results, with our leakage level in November 2019 being 13% lower than a year ago.

Our latest performance is in the context of the 27% reduction in leakage that we have delivered over the past 15 years. We know our customers want us to do even better, so we have developed ambitious plans for the future. Our plans focus around two key areas. First, innovation to more effectively and efficiently identify leaks, and improving the productivity of our leak repair work.

Innovation and productivity

We've increased the resources we're putting into tackling leakage, which means we're spending more than £1 million every day on leakage prevention and maintenance of our network. We're already fixing a record number of leaks – more than 1,400 every week on average. We achieved this by increasing the number of teams dedicated to fixing leaks by 21% in 2018/19, which delivered a 22% increase in fixed leaks. But we want to do even more, so this year have recruited more repair teams and changed the way we work to improve the productivity of those teams.

Separately, we know that around a quarter of the leaks we fix are leaks on customer's own pipes. While these are private leaks, which customers are responsible for fixing, we continue to work with our customers to repair these leaks.

We're also constantly looking for new technology and approaches to help us in our mission.

For example, we're doing this through:

- Special in-pipe cameras to help locate difficult leaks.
- 'Fingerprinting' our water zones to create a baseline and help us better understand where and why leakage occurs
- Trialing new leakage detection technology and techniques including training a leakage sniffer dog

Improving our data

To help us make good decisions on resources and leakage reduction initiatives, it is important that we have the most accurate and up-to-date data possible. This is because our leakage figures are affected by more than just the water that leaks from our pipes.

A key part of updating our leakage data is refining the assumptions we make about water use by unmetered households, which is affected by factors such as population growth and development of housing stock. In the past we made these updates on an annual basis, but we have now accelerated the process to a six-monthly cycle. As part of this acceleration, we've also reviewed our approach to the analysis of population and customer usage and have brought in new data to cross-reference against the information we already hold.

Updating our leakage data in this way is important as it will help us improve our leakage reduction capability and delivery. This is because having more accurate data will allow us to more accurately understand the locations where "unaccounted for water" (as described earlier) is highest and hence on where leakage is occurring to allow us to concentrate our detection and repair efforts on the parts of our network where we can reduce leakage the most.

Preliminary indications from this work for the first half of this year suggest that we've underestimated unmetered household demand, which means we've overstated our leakage figures. A conservative initial estimate suggests our leakage figures have been overstated by at least 20 million litres per day (Ml/d), although the work is still subject to further validation and external audit. We have included this provisional adjustment in our leakage figures in this report and have backdated it to April 2019.

In addition, we have used better data to help us target parts of our network where taking action will save the most water. For example, we:

- Used data from the 327,000 smart meters installed to date to more effectively target leakage reduction work that's prevented over 20 Ml/d of leakage since April 2019.
- Installed 27,000 acoustic loggers to date, which helped us detect around 44 Ml/d of leakage since April 2019.
- Developed tools to reduce the time taken to locate leaks and identify areas requiring leakage detection activity or the resolution of data anomalies.

Preventing future bursts on our trunk mains network

Surveys have been carried out on the three trunk mains in this part of the network since the burst, identifying nine, minor leaks at joints in the pipes. This is not unusual as this is the mechanism for the majority of leakage on our network, as iron pipework expands and contracts during the year. Of these, six leaks have now been repaired and we are planning the repair of the remaining three small leaks, before returning the main into service.

We have increased the frequency of surveys through all three parallel mains passing across Queen's Drive to monitor the asset's performance. Any leaks identified will be prioritised and repaired proactively.

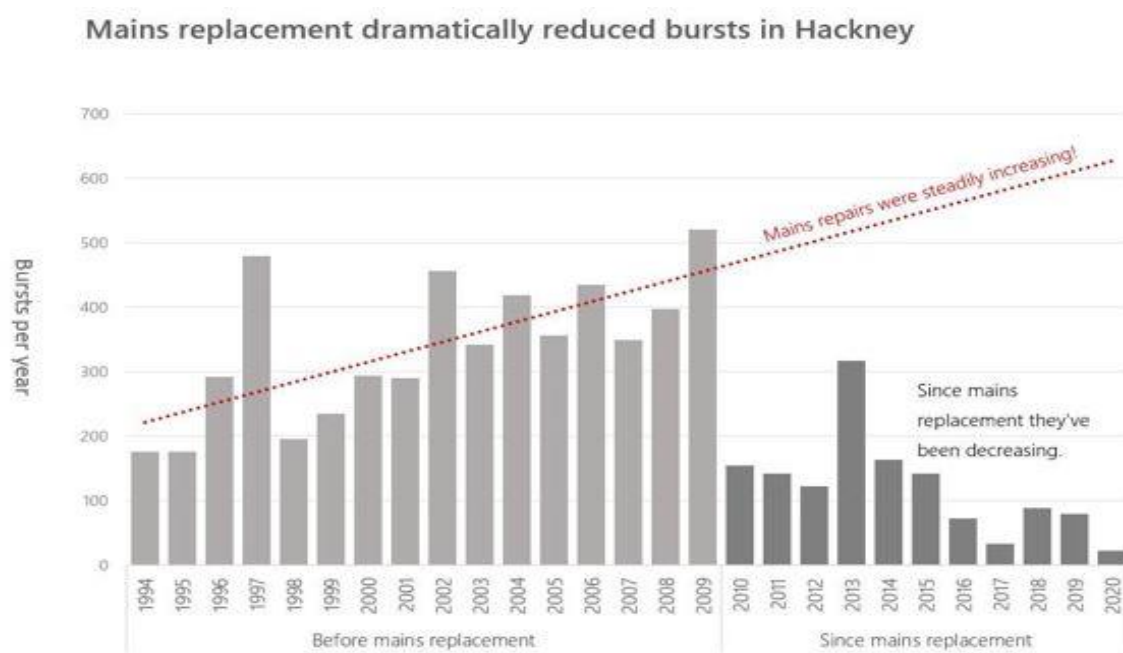
The main itself is being brought back to service in January. We have taken the decision to initially return it to service at reduced flows and pressures, when we will reassess this with the intention of returning the main to its normal operating conditions.

We have trunk main monitoring units on this main and one main that runs parallel. These provide flow and pressure data to our Control Room, giving us a detailed understanding of these sections of trunk main and can give us an early warning of potential issues.

We have also put in place a team of dedicated analysts in our control room to review data from our network of monitors and to improve our understanding of some of our highest risk sections of trunk main. Also, we are developing a software and process tool to improve visibility of data in our control room.

London Borough of Hackney mains replacement:

In the London Borough of Hackney there are 357km of distribution mains and a further 63km of trunk mains, which are our largest pipes with a diameter of over 12". Around two thirds of Hackney's distribution network has been replaced since 2010 with plastic pipes – meaning that Hackney has one of the highest rates of mains renewal of any borough in Thames Water supply area.



The pipe that burst at Queen's Drive is not scheduled for replacement. Following any burst on our trunk mains we carry out a full investigation, including analysis of the damaged section of pipe. If this concludes the rest of the pipe could need relining or replacing, then it will be factored in to our investment plans for the future.

We've not replaced any pipes in the Queen's Drive area in recent years. We have fixed ad-hoc leaks as and when they've appeared, but there have been no major mains replacement schemes needed in the area.

When we look at where to focus our investment, we will replace those pipes which are most in need first, so this doesn't always mean the oldest are replaced first, as several factors cause pipes to deteriorate including the geology of the area.

Our business planning process

We set a business plan over 5 years through a price review process with our regulator, Ofwat. This is an important process as it determines the level of investment, allowed revenue and returns, customer bill profiles and corresponding performance targets

Some key dates:

September 2018 – Our Draft Business Plan submitted to Ofwat

January 2019 – Ofwat provides a complete response to our draft plan

April 2019 - Revised plan resubmitted to Ofwat

December 2019 – Ofwat publish final determination of our plan

Our investment plans 2020-2025

Since receiving Ofwat's final determination, we are analysing the very lengthy and detailed documents. From receipt, there are eight weeks to decide whether to accept - or challenge - the determination. We will now carefully consider our options and announce our decision shortly.

Because of this, we are not yet in a position to say what we will be doing to invest in water mains in Hackney – or any other area in our region.

However, we would like to continue our conversation with you as the picture becomes clearer and would be happy to write and or meet to explain this in due course. We are also very keen to talk about how we can work with the Borough to make sure we have the access we need to make improvements in the least disruptive way possible.

Longer term investment

We are now looking beyond the next five years. London's water supply infrastructure has developed piecemeal over a period of centuries, and we have reached the point where we need to think strategically about how we ensure it is fit for the challenges of the future, specifically population growth and climate change. This includes, for example, ensuring that

we have the capacity that is needed to serve areas of growth; and putting in place a greater level of resilience to water supplies and distribution where there is not enough at present.

We will also be examining where the water comes from, how we evolve the London Ring Main that moves huge volumes across the city, the trunk mains network it feeds and the local distribution networks.

We will shortly be launching a new transformative project which will consider how we “re-plumb London” and will be working closely with stakeholders and our regulator to develop the plans and justification for this exciting project.

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