

IAP Response

Ref B2.17.WSH.CE.A1

Leakage

1 April 2019

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1. IAP challenge

Ofwat have stated that:

“We consider that companies should achieve upper quartile performance through their base maintenance allowance.”

Ofwat have made funding allowance for leakage reduction where companies forecast to go beyond upper quartile performance in 2024-25 or where they propose reductions in leakage greater than 15%. The allowance had been determined through a unit cost approach using the minimum of the company proposed and industry median forecast unit cost for 2020-25.

2. Revised leakage delivery plan

Our September Business Plan included £71.0 million enhancement expenditure during AMP7 to reduce leakage by 15%. This is equivalent to a reduction of 26 MI/d from our end of AMP6 forecast leakage rate of 169 MI/d to a value of 143 MI/d by the end of the AMP7 period.

Since the submission of our Business Plan we have revisited our leakage delivery plan taking into account new information from our programme trials and concluded that we can achieve our 26 ML/d reduction target at a cost of £38.2 million and supported by Project Cartref.

Revised assessment of leakage savings and associated enhancement expenditure.

AMP7 Leakage Programme Total by Investment Area	Estimated AMP6 End Assessment (MI/d)	AMP 7 Savings (MI/d)	Investment (£m)	Enhanced Unit costs (£m / MI/d)
Upstream Losses	32.6	6.3	23.2	3.68
Distribution Losses	96.4	2.2	15.0	6.82
Project Cartref	40.0	14.0		
Productivity gains in Distribution		3.5		
Total	169	26.0	38.2	

2.1. Upstream Losses

We have continued, since the submission of our plan in September, to trial new network monitoring technologies to identify leakage on our trunk main system. This activity builds on our work to estimate more accurately the level of real loss in zones in the upstream network. The work has identified sections of main where there is scope for reduction in leakage. Our plans include further investment in deploying the innovative monitoring technologies to key trunk main systems for the purpose of leak localisation. This investment will not only reduce leakage but will also increase our ability to predict incidents on the trunk main network, reducing the time it takes us to respond to incidents and further reduce interruptions to supply.

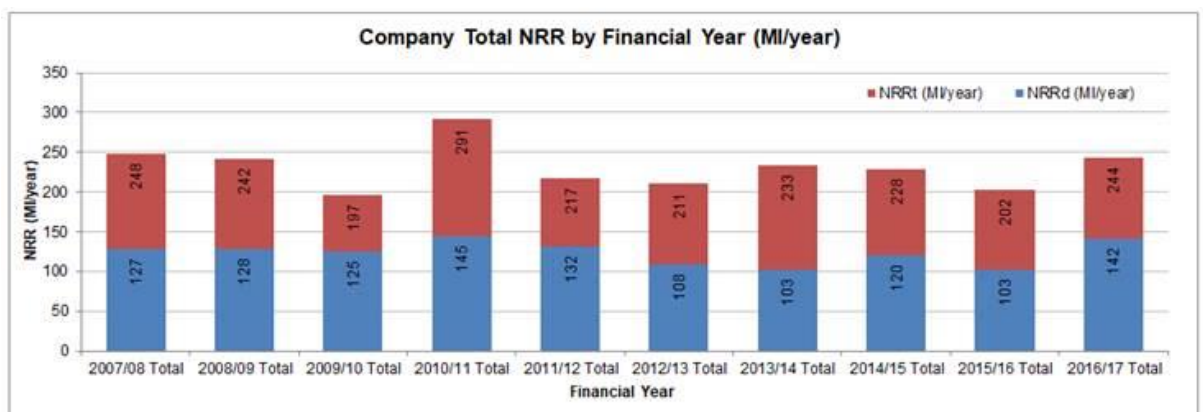
The configuration of our trunk main network makes isolating some sections of main in order to effect repairs difficult. We are planning to develop enabling measures for such repairs so that we can tackle these complex issues but our experience is that these repairs are expensive to undertake due to our point to point trunk mains systems and our need on occasions to repair under very high pressure to maintain supplies.

2.2 Distribution Losses

Due to our reassessment of distribution losses, we have lowered our estimate of this aspect of leakage reduction in AMP7. Our enhancement expenditure on distribution losses (£15m) will fund the cost of the one off installation of permanent acoustic loggers. The number required has reduced in line with our understanding of distribution losses and customer side losses. The permanent acoustic loggers will allow us to find leaks which cannot be located with the methods deployed in AMP6. This investment will continue to deliver benefits into future AMP periods as we continue to maintain and operate these new assets.

The new consistent reporting measures for leakage mean that the impact of leaks are realised for each day of the leak’s life cycle, so the early awareness and survey time efficiencies presented by the loggers is key to managing leakage. Through trials, we have seen that the network monitors reduce leakage survey times by approximately 50%. The efficiencies this presents in terms of base maintenance costs have been realised in our plans and apply predominantly to the mitigation of natural rate of rise (NRR) leakage. NRR is split into two parts, reported and detected. The reported volume is managed through reactive leakage investigations, while the detection element is managed through our proactive leakage detection activity. The split between these two elements will change as a result of earlier awareness of leaks before they become customer impacting, although the overall volume is likely to remain consistent in the short term. Due to the seasonality associated with NRR and the impact of severe weather events, we have historically used a 5 year average for use setting leakage targets. In calculating the targets for AMP7, a 7 year average was used so as to include the 2010-2011 severe winter event, resulting in an NRRd (detected) of approximately 120 MI/d.

Natural Rate of Rise Leakage



2.3 Project Cartref

Project Cartref (“Home”) is our innovative new initiative to tackle a range of issues on customer properties including customer side leakage, lead supply pipes, water efficiency and domestic water regulations inspections. Since our September business plan submission our assessment of the potential benefits of this approach has been revised following further trials and site investigations. These trials have provided new information which support a greater level of leakage reduction from leaks in customer side supply pipes, estimates of the reductions achievable in per capita consumption through addressing internal plumbing leaks and firmer cost estimates than were available at the time of our Business Plan submission. Further information is included in document B2.18.WSH.CE.A1 Project Cartref IAP response.

2.4 Productivity gains in distribution

Our leakage targets also recognise that productivity improvements in the management of the water networks will, in addition to addressing the natural rate of rise, deliver a 2% reduction in leakage from 2019-20 levels.

These productivity gains will be achieved through a fundamental re-design and re-configuration of the way we plan and deliver network repairs and maintenance. This includes the re-procurement of the supply chain and the implementation of an integrated work scheduling system. These changes will deliver an improved level of planned activities across different work streams facilitating synergies in high cost activities such as highway reinstatement and more efficient deployment of plant and economies of scale savings through larger ‘single procurement’ of plant, equipment and materials.

Further efficiencies will be delivered through the continued roll out of our ‘Lean’ programme, which during AMP7 will be optimise ‘day to day’ operations and establish preventative maintenance ‘best practice’ in the water network teams. This is an intensive process and involves detailed examination of processes and procedures at single sites and/or small teams and enables those teams to identify and eliminate inefficient processes and working practices.

In its IAP, Ofwat are assuming that productivity gains would lead to a 15% reduction in leakage. We cannot see how this can be achieved. Our targeted 2% reduction is the most ambitious productivity gain that can be delivered.

3 Ofwat assumptions on funding leakage targets

3.1 We disagree with Ofwat’s point of principle that the base expenditure allowance funds forecast upper quartile performance.

Base expenditure is operating costs plus capital maintenance. Capital maintenance is defined in the Regulatory Accounting Guidelines as “expenditure to maintain the long-term capability of the assets and to deliver base levels of service”. Any expenditure which delivers levels of service beyond the baseline including reducing the level of leakage beyond the base is therefore not included in base expenditure and is classified as “enhancement” expenditure.

As companies AMP6 base expenditure delivers 0% reduction in leakage (as explained above), AMP7 base expenditure modelled using AMP6 base expenditure cannot deliver a 15% reduction in leakage.

3.2 Unit cost

Ofwat have allowed companies an industry median forecast unit cost for leakage. Ofwat’s unit cost approach doesn’t take into account the variation that would be expected in marginal costs due to the differing challenges that companies face in reducing leakage and their historic levels of leakage reduction.

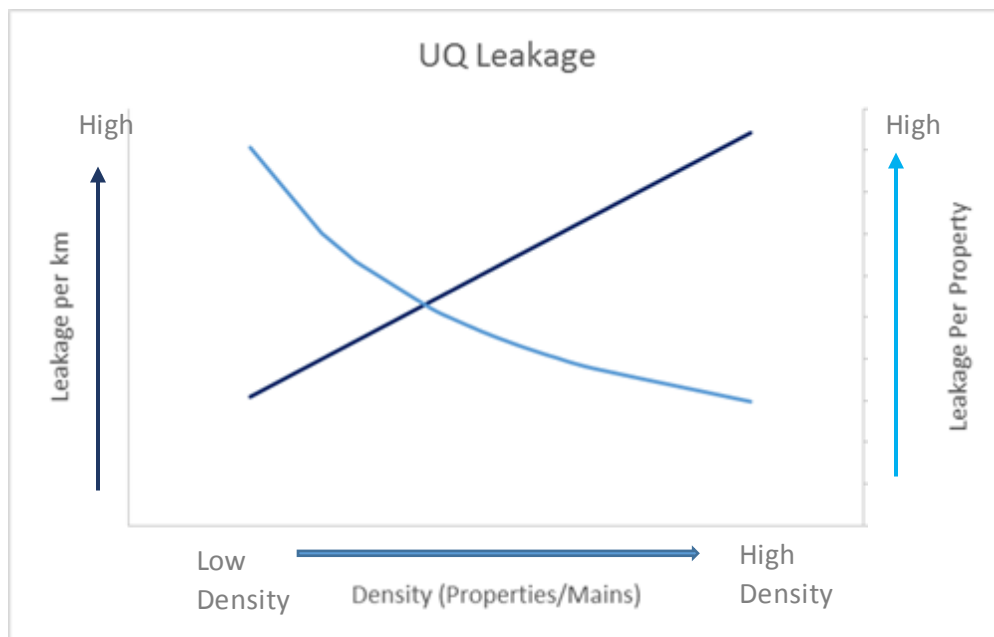
A company that has reduced leakage significantly in the past will now face increasing cost as each marginal Ml of reduction in leakage becomes more difficult to achieve.

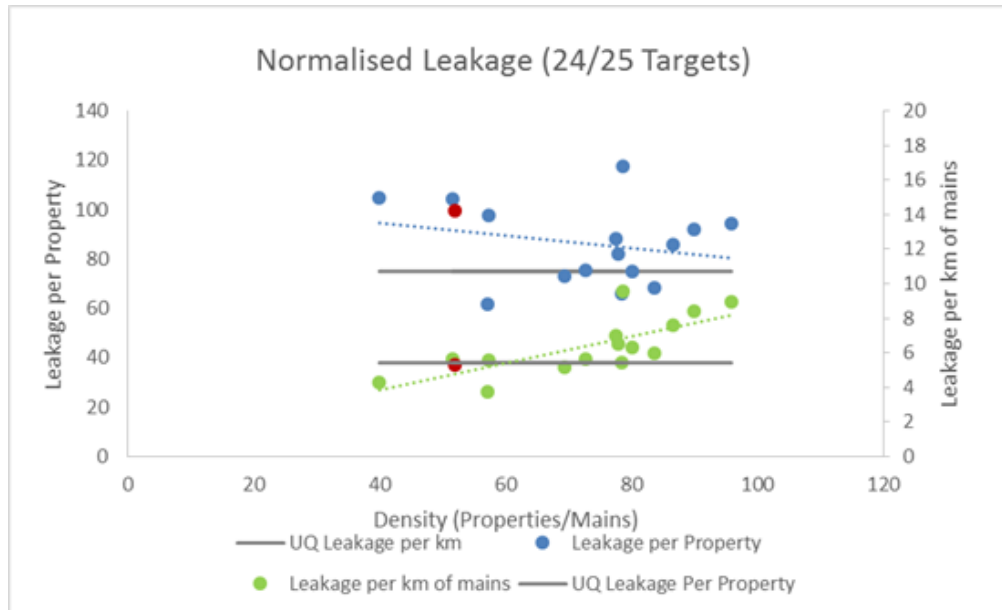
Ofwat’s allowed unit cost for leakage reduction is based in part on ODI out/underperformance rates proposed by companies, which tend to capture marginal benefits, which as Ofwat itself notes are likely to be less than marginal costs. ODI rates are also scaled by a 50 per cent sharing factor, so Ofwat’s calculation may understate the efficient unit costs of leakage reduction.

3.3 Achieving upper quartile on both leakage per km and leakage per property

Ofwat make an allowance where companies forecast to go beyond upper quartile performance on both leakage per km of mains and leakage per property, or where they propose reductions in leakage greater than 15%.

The charts below show the relationship between density and leakage measure by property and by km of mains. The charts suggests that as density increases, companies are more likely to achieve UQ leakage per property. The opposite is true for leakage per km where companies with low density are more likely to achieve UQ.





Companies with average density are therefore more likely to be able to achieve UQ performance on both measures of leakage.

Welsh Water (shown in red in the chart) can only achieve UQ performance on both measures at leakage levels of 112 MI/d and below. Leakage of 112 MI/d in 2024-25 would represent a 34% reduction from 2019-20, more than double the highest performance improvement targeted in PR14 and four times as much as the biggest reduction in leakage seen in the period 2011-12 to 2016-17.

Many of the points that we have made above have also been identified by NERA in its report "Assessing Ofwat's Funding and Incentive Targets for Leakage Reduction" published on 28 March 2019.

4 Other matters

4.1 Independent report "Review of Leakage Management Plans for AMP7"

We have commissioned Stuart Trow, an expert in water loss management, to review our leakage management activities and benchmark these against best practice across the industry.

The report highlights that our plans for AMP7 include innovative approaches and some business as usual processes. It notes that we monitor other emerging technologies with the aim of undertaking trials if they present potentially beneficial solutions.

The report concludes that in order to achieve a 15% reduction in reported leakage by the end of AMP7, we must do more to tackle upstream leakage, and leakage on customer owned pipes, as well becoming more efficient with our leakage control activities through effective use of new technologies. The report confirms our view that a 15% reduction in leakage in our case, given our strong historical record of leakage reduction, will not be achievable by improved productivity alone. The full report is included in Appendix 1.

4.2 Leakage data clarification

Ofwat have identified an error in the leakage reduction described in Business Plan document Ref 5.8J PR19: Leakage Improvement.

The business plan document incorrectly indicated a reduction of 25.5 MI/d. We confirm that the leakage forecast of 169.0 (2019-20) and 143.0 (2024-25) in Table Wn2, line 25, Total Leakage are correct, an overall leakage reduction of 26.0 MI/d.



Appendix 1 - Review of Leakage Management Plans for AMP7

Trow Consulting Ltd

Client: DWR CYMRU WELSH WATER

Project: Review of Leakage Management Plans for AMP7

Title: Review Report

Date: 15th March 2019

Issue: Version 2

Issue Date: 27/03/19

Authors: Stuart Trow

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1 EXECUTIVE SUMMARY

My view is that Dwr Cymru Welsh Water (DCWW) now has a much better understanding of the levels of leakage occurring on different parts of the network and how much is true leakage compared to un-accounted for consumption.

It has been shown that in order to achieve a 15% reduction in reported leakage by the end of AMP7, DCWW must do more to tackle upstream leakage, and leakage on customer owned pipes, as well as making the current ALC focused on mains and communication pipes in DMAs more efficient by use of new technology.

DCWW has undertaken trials of innovative systems and has adopted some as business as usual processes. They are monitoring other emerging technologies with the aim of undertaking trials if they consider there is potential for adoption.

2 BACKGROUND

This report sets out a summary of leakage management activities being carried out by DCWW and those proposed for AMP7. It has been prepared at the request of DCWW with the request that their activities be compared with industry best practice.

I am familiar with Welsh Water having been requested by their Executive team to assist with leakage strategy since 2010. I was involved in the preparation of the Company's business plan for leakage in 2018.

I have been asked to undertake this review as a recognised expert in water loss management, having been directly involved with leakage for almost 40 years as a water company manager, consultant, field service operator, equipment supplier and regulatory assurance provider. Between 2009 and 2015 I was the Ofwat reporter for Anglian Water with responsibility for their table 10 water balance. Since 2009 I have been the leakage reviewer for Scottish Water and WICS reviewing the annual water balance and ELL targets, and since 2012 I have provided advice on leakage to the board of Welsh Water including a commentary on their water balance. Since 2016 I have also helped Irish Water to set their ELL target and since 2017 have been retained to advise their board on progress against that target. I am a member of the management committee of the IWA Water Loss Specialist Group.

3 OVERALL STRATEGY

The over-riding strategy of DCWW for AMP7 is to refocus effort into areas of leakage that have not yielded savings in the past, and to work toward covering the costs of these new measures by making current ALC operations more efficient by use of innovative techniques.

Traditionally, ALC has focussed on mains and communication pipes in DMAs with some customer supply pipe repairs where these have been located through routine ALC operations. Of the 172.8 MI/d of leakage reported by DCWW in 2017/18, 32.6 MI/d was estimated to be upstream of DMAs and 33 MI/d was estimated to be on customer underground supply pipes. Therefore, only 62% of reported leakage was on company owned assets in DMAs.

Furthermore, of the SELL (re-assessed for 2018) an estimated 51.6 MI/d was established as the background level of leakage based on historic minimum achieved night lines in DMAs (known as MAL) and an assessment of the theoretical minimum achievable level of leakage (MAbL) based on industry default values. It should also be noted that, unlike some other companies, the SELL for DCWW is constrained i.e. across the 26 water supply zones if the modelled SELL is higher than the current level of leakage, then the lower value is taken. The true unconstrained SELL is significantly higher. This means that there is less scope to reduce leakage in several zones and the level is already below SELL.

So, to achieve a reduction in reported leakage of 15% in AMP7 by focussing solely on company assets in DMAs would effectively require a 27% reduction in that component. This was deemed to be not possible, and therefore a policy decision was taken to focus greater attention on upstream losses and losses beyond the customers boundary stop tap.

4 LEAKAGE ESTIMATION

A key element of the DCWW strategy for leakage is to better understand the current position on the basis that better measurement will lead to better management. DCWW was actively involved in the review of leakage estimation leading to the report prepared by Water UK which is commonly known as Consistency. The following bullet points summarise the activities that have been carried out during AMP6:

1. A new leakage management system (Waternet) has been introduced to replace the LMARS system that had operated for over 20 years. The new system is fully compliant with the new reporting guidance.
2. The company has undertaken pioneering work using a new system for evaluating consumption in unmetered properties. A Stop.Watch device fitted to the external stop tap in the footpath monitors the flow of water through the service pipe and can determine intermittent usage flow and continuous flow due to internal or external leaks. DCWW has surveyed 20 of the consumption monitoring areas and the information has been used to determine new values for plumbing loss, and also to support estimates of night use used in the bottom up leakage calculation.
3. Stop.Watch and other data has also been used to derive relationships between average daily use and night use and how these change seasonally. Together with methods of characterising DMAs and improving the estimates of occupancy rates, this data is currently being used to develop DMA specific night consumption estimates which will lead to improved targeting of ALC works.
4. Following the hot summer of 2018 when demand peaked over a prolonged period, DCWW began to investigate ways of separating increased consumption from increased leakage. The company has taken part in a project to model customer demand and to understand the factors affecting daily inflow to the network. Using these relationships, the company is now able to better understand the seasonal variation in consumption and therefore improve ALC targeting to areas that exhibit true increases in leakage.
5. An exercise has been carried out to re-assess MUR on household and non-household meters
6. A pioneering project has been carried out to review night consumption allowances in non-household properties.
7. A review is ongoing in water being used at DCWW's own water and waste water treatment works and sewage pumping stations.
8. A programme to undertake annual verification and right sizing of the 181 DI meters has begun.
9. A review of hour to day pressure correction factors has commenced in order to improve the translation of night flow leakage estimates into daily averages for each DMA.

The impact of moving to fixed hour and 50th percentile for estimation of minimum night flow results in a 20ML/d increase in reported leakage. The outcome of the measures listed above is expected to result in an equivalent reduction in leakage such that the reported value at the end of AMP6 will be the same as the value compliant with reporting guidance at the start of AMP7.

5 PRESSURE MANAGEMENT

DCWW has an extensive estate of pressure management devices in the network. Over the course of AMP6 an exercise has been completed to audit all the pressure reducing valves (PRVs) in order to establish a new maintenance strategy. At present there are 6521 PRVs in the system of which 5191 are in use and 315 have active pressure management controllers fitted to them. This level of pressure management is necessary for the nature of the DCWW operating environment which contains large rural DMAs with undulating topography, as well as an unusual arrangement of terraced properties running along the hillsides in the south Wales valleys.

With the extensive pressure management assets, DCWW has been able to control average night zone pressure to 43 mH, a level similar to other water companies with less challenging topography. There is a formalised policy and procedures document for pressure management that was completed in AMP6 to ensure common standards are applied across the region.

Whereas prior to AMP6 responsibility for pressure management design, operation and maintenance was contracted out to a specialist company, all this work has been taken back in house with a team responsible to the Leakage Delivery Manager.

The team:

- Review potential schemes generated from the zonal studies programme using network models to optimise the configuration of each zone and to identify rehabilitation works etc. The zonal studies programme uses models to estimate the theoretical pressure in each area compared to the logged minimum pressure.
- Review the performance of each PRV from the servicing programme. There is a criticality matrix used to select the servicing intervals for each PRV based on a number of relevant factors.
- Work with Water Distribution staff and ALC staff to identify opportunities for new PRV installations

In AMP6 a project has been carried out to create a pressure management hierarchy within Waternet so that pressures can be tracked from source to tap enabling the scope for further pressure management to be assessed.

Many of the PRVs have dedicated pressure logging and each pressure managed area now has a permanent pressure monitoring point for CML purposes, providing data that shows whether pressures can be further optimised without affecting customer service.

For AMP7, pressure management is a key element of the DCWW strategy for leakage reduction despite the considerable work that has been undertaken to date, and the difficulties of managing and controlling the DCWW network given the environment and topography in which the company operates.

The Company has reviewed available new technology for pressure management and is considering the economic argument for more active remote control. It is also looking to further develop the zonal studies programme, and the take a source to tap approach from treatment works through to customers to include pressure management of its upstream assets such as service reservoir and pump controls.

6 LEAKAGE MANAGEMENT

6.1 RESOURCES

For many years DCWW has employed a mix of its own leak detection staff and contract staff. The current mix for 2018/19 is 18 DCWW leakage inspectors and 148 field based staff from RPS working on leakage detection.

During AMP6 different systems have been trialled for performance management of the ALC staff, and a new system has recently been developed which is based on actual volumes of water recovered by ALC interventions rather than estimated based on detected ESPBs, or some other estimated value. The system allows performance to be monitored at company level right down to individual technician and will allow DCWW to monitor the performance of its staff and promote targeted improvement measures.

In common with other water companies, DCWW has always encountered issues in recruiting, retaining and incentivising ALC staff. With increased focus on leakage reduction in the UK, the market for experienced, skilled and motivated staff is such that demand outstrips supply. Therefore, DCWW has been investigating ways of systemising and standardising the ALC operations to reduce reliance on high grade staff.

6.2 LEAKAGE ESTIMATION AND TARGETING

DCWW have introduced a new method of targeting DMAs for ALC survey using a measure called EVI (economic volume index), which will provide a link between the operations procedures and SELL analysis. The EVI method will be used during periods of low leakage breakout.

At times of the year when there is a sudden increase in leakage due to winter frost periods or autumn ground movement, DCWW has established processes for recovery back to pre-break out levels by focusing on the DMAs where the increase has occurred and aims to return the leakage to pre break out levels.

Trials are also being undertaken with systems that monitor the flow into each DMA and alert if there is a variation from the normal flow pattern. This advance warning can help to reduce the time taken to be aware that a new leak has occurred in a DMA.

Work has also commenced to categorise DMAs by looking at the characteristics of the area, the properties supplied and the typical demand profile. This work will help to determine the methods used for managing and reducing leakage in each DMA.

6.3 NEW TECHNOLOGY

For AMP7, the aim is to utilise new technology to make current leak detection operations more efficient. DCWW plans to invest in equipment and systems to improve the efficiency of 'find and fix' operations by better localisation of leaks in order to reduce the level of human resource employed on this activity. The approach will allow resources to be freed up to tackle leakage on trunk mains and beyond the customer boundary.

6.3.1 MOBILE TECHNOLOGY

DCWW propose to introduce new working methods utilising new technology to systemise the routine ALC processes for detecting leaks on mains and communication pipes by working with equipment suppliers to trial innovative solutions.

The aim is to reduce reliance on highly skilled staff by using hand held mobile devices. Some of these track activities, and provide points of interest based on either local or remote data processing. These points of interest are then followed up by more experienced staff. The devices being used at present include:

- Lift and shift acoustic loggers are already being used with great success
- A flow key device is being used to step test areas to localise a leak
- Hand held units such as iQuarius, Stop Check and DX Mic are being used

6.3.2 PERMANENT MONITORING OF LOCAL DISTRIBUTION NETWORKS

The future strategy will involve a greater degree of permanent monitoring of the network using emerging technologies. Trials are currently being undertaken on three types of permanent monitoring system:

- Acoustic loggers permanently installed on valves and hydrants. This now an established method of locating new leaks as they occur. The trials will test a number of different makes.
- Pressure transient loggers. Transient loggers attached to hydrants can detect
- Thermal loggers. DCWW is taking part in a club contract in which live thermal models are being used to determine abnormal flow patterns that are due to network events such as new leaks, or valve and hydrant operations

Each of these systems has its own advantages and disadvantages. Aims of the trials are to determine which system works best in which DMA, whether a combination of sensors gives a more reliable result, and what the economic level of coverage should be given that the rate of new burst frequency varies considerable from one area to another.

Until these trials are complete later in 2019, DCWW will not commit to wide scale deployment. An investment decision will be taken following a thorough evaluation process.

The permanent monitoring will be targeted towards those DMAs that have a high rate of rise of leakage.

6.4 TRUNK MAINS

Leakage from trunk mains and service reservoirs represents 19% of the DCWW reported leakage.

During AMP6 the company established a team to collate information about upstream losses and to trial different approaches to finding leaks or unaccounted for water.

A contract was awarded to WRc to develop "tile balances" taking the input from the DI meters and the exports to the DMA meters across every part of the DCWW network. This work helped to identify a number of issues:

- potential meter error
- unaccounted for consumption from areas upstream of DMAs

- areas of potential leakage
- areas of potential reservoir losses due to seepage or overflow.

Trunk main correlators have been used successfully to locate several leaks on trunk mains.

Trial have been undertaken of new technology during AMP6 including:

- Sahara
- A device for monitoring known problem areas by recording noise at the ground surface and detecting changes
- A tool for undertaking routing surveys along the lines of TMs by recording noise at the ground surface and identifying point of interest using remote analytical routines
- Pressure transient logging (e.g. the Syrinix system)

For AMP7 the Company proposes to further develop this work, and to establish a team focused on locating trunk main and service reservoir leaks. The team will comprise analysts to determine possible causes for tile imbalances and to direct operations, field technician carrying out regular surveys using mobile devices, and permanent monitoring systems installed in high risk locations.

6.5 RURAL AREAS

A key feature of the DCWW region is the extent of rural areas some of which are extremely remote. West Wales in presents a particular challenge.

The use of drones fitted with imaging devices has been trialled to identify and locate high volume leaks in remote areas in a reduced timescale.

6.6 OTHER NEW TECHNOLOGY

The Company is monitoring trials being undertaken by other water companies and will make a decision during AMP7 on whether there is potential for these to assist in its leakage reduction challenge. Of note are the following:

- **Sniffer dogs.** There has been much publicity about the use of trained dogs to detect leaks by sniffing for the smell of chlorine. Whilst the use of novel techniques such as this is of media and public interest, DCWW has yet to determine whether or not they could be deployed operationally to any great effect.
- **Satellite imagery.** A number of companies have undertaken trials with mixed results. Although some leaks have been found using these systems it is not clear whether they could have been found using other techniques already in use by DCWW.

7 CUSTOMER SIDE LEAKAGE

7.1 LEVEL OF LEAKAGE

Leakage from underground supply pipes is estimated (2017/18 water balance) as 33MI/d or 19% of reported leakage. There is emerging evidence to show that this component of total leakage could be higher than has been reported. Underground supply pipe leakage is estimated once total leakage has been calculated through the top down bottom up MLE process. It can't be measured directly and there is uncertainty over the accuracy of the method which relies on an industry standard value for background leakage and an estimate of detectable leakage based on what has been found from surveys. By implication, if less focus is placed on supply pipe leakage, it is likely that the estimated level will be lower.

In addition, internal plumbing loss (which is part of consumption and not reported leakage) is estimated to be 31 MI/d. In order to meet PCC targets for AMP7 DCWW plan to focus greater attention on locating properties with internal plumbing leaks that are worth repairing and also determining a policy to tackle very high users or wasters of water.

7.2 PROJECT CARTREF

For AMP7 the Company plans to achieve significant reduction in customer side losses by a number of measures which have been piloted in AMP6 under their over-arching Cartref project; Cartref being the Welsh language word for home.

DCWW is planning to establish a private leakage repair strategy, in which supporting policies will allow for work to be undertaken on the private side for all domestic properties regardless of the ownership status and the Private Leakage policy has been amended to incorporate this.

DCWW has been working collaboratively with an innovation partner over the past 2 years, to provide the capability to monitor customer usage and customer side leakage without installing a physical water meter. This work, and collaborative studies with other UK Water companies, has the support of Water UK and OFWAT and also allows for a more structured approach to proactively identifying customers with private leaks or continual usage.

Through engaging with its customers DCWW propose an enhanced customer service offering which takes into account Leakage, Water Regulations and Water Efficiency. The Cartref project will also have links with, and open opportunities with other corporate strategies such as Metering, Social Tariffs and Stop the Block.

Using data from the pilot studies outlined, DCWW estimate a potential saving of c.14 MI/d in customer side leakage could be achieved economically i.e. two thirds of the 15% reduction target. Further work which has been undertaken since the production of the business plan has led to a greater level of confidence in this value.

In undertaking this work on customer side leakage, DCWW will review whether there are synergies available to other Welsh Water functions, namely Water Regulations and Water Efficiency. They will look to improve water efficiency as part of the initiative to educate and save water for the customer with medium to long term benefits. This has the potential of reaching vulnerable customers proactively.

Greater focus will be placed on locating underground supply and communication pipes leaks during routine ALC operations and targeted surveys of DMAs which continue to have a high level of background leakage despite intensive ALC operations.

7.3 CUSTOMER METERING

7.3.1 METERING POLICY

Given that DCWW consider a significant level for water loss is customer side, and also the need to proactively manage per capita consumption, there is a clear link between these targets and the policy on customer metering.

At present only about 44% of household properties supplied by DCWW are metered, and there are no plans to significantly increase the rate of meter installation. In line with other companies all new properties are metered and there is an optant scheme for individual householders to decide on whether to be charged by meter. However, there is no policy to enhance the rate of meter installation in AMP7.

7.3.2 SMART METERING

DCWW plan to continue to trial the deployment of digital smart meters in their deficit or marginal water resource zones and continue to collaborate with CCWater and Welsh Government on metering research and the implications for our future metering policy. A pilot project involving circa 250 smart meters in Grangetown is being used to learn about the costs and benefits of smart metering.

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8 REPAIRS AND RENEWALS

Towards the end of 2018, the Company awarded a contract to Morrison Utilities to undertake repair and maintenance, mains rehabilitation and other works on the water distribution system. The form of contract is an innovative Network Alliance in which each party is incentivised to achieve targets and efficiency savings.

Already, this cooperative way of working has led to benefits for leakage by better management of the basket of outstanding repair jobs, and by management of service level agreements (SLAs) to reduce leak run times. In AMP7 DCWW proposes to introduce innovative ways of working following detailed process reviews in order to provide cost efficiencies and to reduce the time between detection and repair

A key element of the AMP7 strategy is to replace customer supply pipes that are found to be leaking, and which can't be easily repaired. The focus will be on lead pipes in order to gain a water quality benefit under the Lead Free Wales initiative. Of course, simply replacing pipes without certainty of gaining a leakage reduction benefit will not produce the desired saving. Therefore, DCWW has been considering the approach to be taken using lessons learned from the Cartref pilots.

For customer side leaks, DCWW has been trialling the Aquapea system for supply pipe repairs; a non-invasive technology which avoids the need for excavation. Once current pilots are complete a procedure will be developed setting out when and how to use the system.