INNOVATION REPORT 2019

Wessex Water
YTL GROUP

FOR YOU. FOR LIFE.

INTRODUCTION

This year is a landmark for the water companies in England and Wales. This year, Ofwat and the companies it regulates will decide on the standards to be achieved for customers and the environment during 2020-25, and what we need to do to make improvements.

To prepare for this, the last three years saw exhaustive dialogue and extensive research with our customers, as well as the full range of other interests. Our plan was submitted in September.

We are very proud of our achievements over the last 25 years. All aspects of our service now operate at higher standards and with greater reliability and consistency than in the past. There are still major challenges – ageing physical assets, unpredictable extreme weather events, population growth, and, more widely, questions over the role of private companies delivering public goods.

Moreover, we are pushing ourselves to hit even higher customer service standards and to better join together the environmental work delivered by different players in our region. Meanwhile, others' expectations of what constitutes 'adequate', good' and 'great' service moves on all the time.

So 'more of the same' is not going to be enough. Indeed, finding better ways to do things is crucial, a view shared by Ofwat who consider that innovation underpins their goals of affordable bills for all, great customer service and resilience in the round.

The innovations that we are introducing are multi-faceted: there are new technologies, new working arrangements with others to bring about more effective improvements, and new service offerings to customers. We have also been pioneering market-based measures through our environmental trading startup, EnTrade.

This has shown that cost-effective solutions to water and environmental challenges could come from almost anywhere – farmers, tech developers, academic researchers, local communities, other businesses – and we are launching an open platform called the Wessex Water Marketplace (see page 26-27) to make use of such possibilities.

We think this truly breaks the mould in terms of how water companies operate, and are excited at the opportunities it could bring.

This report sets out ways in which we have used innovation in the recent past, our plans for 2020-25 and possibilities that may lie beyond. I hope you find it an interesting read and look forward to hearing your views.

David Elliott

Group director, Strategy and New Markets

Cover image: Wessex Water are the first British water and sewage company to introduce calcium aluminate cement shotcrete veneers to protect concrete structures against biogenic corrosion resulting from hydrogen sulphide attack.

FOREWORD

Innovation is a word we often use. We talk about new gadgets, new ways of doing things, and – frequently – how it can help us save money. All those things are true, of course, but as this report shows, at Wessex Water it's as much about an attitude of mind, or approach, as new kit.

In a world that's changing fast, we need to be agile, flexible, and ready to respond to unexpected events: the weather; new social or economic circumstances; new fashions and trends. And people change too: we no longer stick with established service providers, whether banks, water or electricity companies; or do things the way we always have.

A company like Wessex Water therefore needs to be ready to respond, and where possible anticipate these trends. We need to be open to adopting new ideas and techniques, using new technology and, above all, creating a culture where new ideas are welcome and we grasp opportunities to do things better as they arise.

So we work with universities, tech companies and designers to work out how we can serve our customers better, deliver for the environment and run an ever more efficient company. You'll see here new ideas for getting phosphorus out of sewage, enabling our customers to report leaks and give feedback in real-time, new ways of reducing nitrates and slug pellets applied by farmers and using ultraviolet disinfection instead of chlorine to improve water quality. All these have environmental, customer and financial benefits – a real triple bottom line.

But innovation also means challenging every aspect of the way we work, and we're proud this year to have developed ideas for a new business model that will more explicitly demonstrate the public service benefits we deliver as we go about our job of providing clean water to and taking away sewage from – and everything that surrounds these functions – people's homes.

We're looking forward to discussions with Ofwat and the government about how to make this a reality.

Fiona Reynolds DBE

Independent non-executive director and chair of the Futures Panel

OVERVIEW

Definitions

For us, innovation means applying new ways of working, new knowledge or new technology for the benefit of people, the environment or our bottom line. Our vision is to be acknowledged as a leader and exemplar for introducing innovations that serve these purposes.

Drivers for innovation

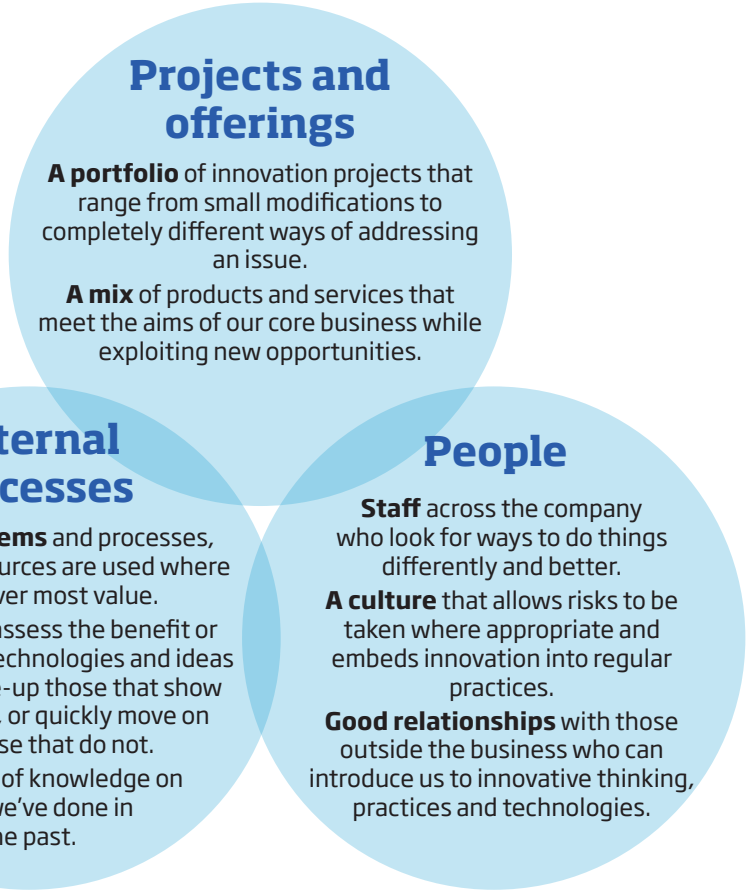
The reasons for innovating are straightforward, revolving around the rapid pace of change, globally and locally. People's expectations of service providers are changing, as are the standards we must meet, operating costs, the level of returns to investors deemed acceptable, the amount of competition we face, and employees' expectations of their employers.

There are also wider changes, such as a warming climate with more unpredictable weather patterns, new pollutants and rapidly advancing technology. Standing still is not an option – to continue being a leading company, we need to look constantly at new opportunities and better ways to do things.

Our approach

- We aim to understand emerging challenges and opportunities.
- We are open to trialling new approaches.
- We build on and improve our own knowledge, skills and processes.
- We partner with others where we don't have the knowledge or expertise ourselves.

Our strategy for making innovation happen has three main themes: projects and offerings, our internal processes, and the people involved, as shown opposite.



Rather than having a large research and development department, we are building a culture of innovation throughout the organisation. This is co-ordinated by a small innovation team that monitors the full cross section of work and builds links within and outside the company.

Employees' ideas

Eureka, our employee suggestion scheme, gathers and implements original ideas and offers a reward depending on their success. Improvements can potentially be scaled up to help reduce operating costs or improve our performance. We also run specific open innovation challenges, set by our directors, to which anyone in the company can respond.

Trials and pilot projects

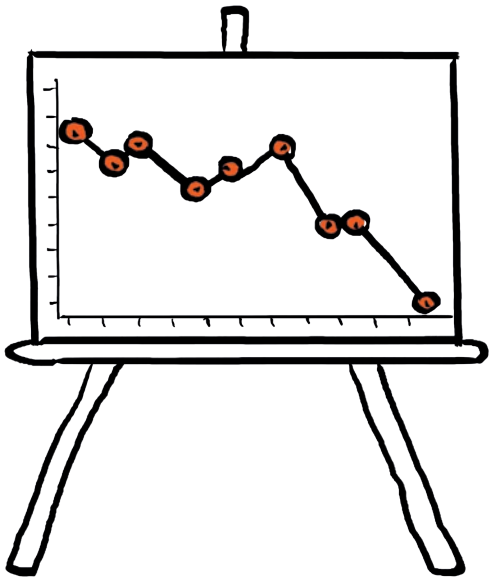
Some innovations happen when a new way of working or the inclusion of a new technology is needed to best deal with a problem or opportunity. We work with external companies to trial new products and, occasionally, completely new technologies. This can occur through direct contact or via third parties such as Isle Utilities' Technology Approvals Group, British Water or the Future Water Association.

Placements

We host students on placement as part of our links with universities, principally from the University of Bath. Their fresh perspective and focused attention on specific areas of our work offer us clear benefits while also helping develop the skills of individuals. In some instances, the students have become full-time employees.

Internal collaboration

We encourage the sharing of innovation work and experience from across functions, assisted by our inter-departmental innovation forum and online platforms such as Yammer.



Environmental investigations

We carry out field based environmental investigations to make sure subsequent improvement works are well targeted and proportionate. The investigations include leading edge projects such as:

- two UK-first trials of new methods for removing phosphorus from sewage (magnetite and high rate algal ponds)
- the use of piezometers to give better detail about groundwater flows
- the controlled release of spate flows from Durleigh reservoir to remobilise phytoplankton and improve ecological conditions downstream.

UK Water Industry Research (UKWIR)

This is the main vehicle for collaborative research between water companies. The programme comprises projects addressing common interests and concerns, providing a sector wide perspective and enabling larger scale research to take place than would otherwise be achieved.

Links with universities

We work directly with academia where there are clear benefits for our activities as well as new insights for researchers. Since 2013 we have supported the Water Innovation Research Centre (WIRC) at the University of Bath, which includes work with PhD students on the Water Informatics – Science and Engineering programme.

2015-20: what we've been doing

Innovation has been crucial to achieving the goals we set out in our business plan for 2015-20. To lower bills while also delivering significant investment and improvements, we are focusing on efficient, innovative methods with an emphasis on low-cost partnership approaches, as preferred by our customers. The following pages set out what we have been doing for each of the eight priority areas shown opposite.

Affordable bills

Between 2005 and 2015 we introduced new ways to help vulnerable and lower income households that have since become mainstream. These included the first social tariff in the sector (Assist) and partnerships with debt advice charities. We believe our award winning tailored assistance programme (**tap**) is one of the most extensive, innovative and mature affordability support programmes across the water industry.

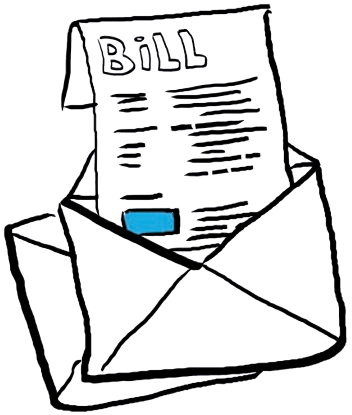
Through **tap** we offer a range of schemes and very low-rate tariffs to enable customers to afford their ongoing water charges and repay their debt, along with practical help to reduce water and energy bills and a tailored solution to meet individual circumstances.

Our affordability work is widening and we now support projects that offer training in household money management, or work with harder to reach groups and individuals who may be eligible for social tariffs or have other needs.

Newer methods include:

- the use of mapping and analytical tools to plot areas of deprivation
- targeted mailshots to pensioners in such areas
- doorstep sign-ups to social tariffs and payment plans.

We launched our innovative, digital Partner Hub in April 2018 as part of our drive to improve two-way digital engagement, increase opportunities



INNOVATION AND PRORITY THEMES

Environment

- Multi-agency catchment partnerships.
- EnTrade online auctions for environmental benefits.
- Novel methods for reducing phoshorus in sewage effluent.
- Working with public health practitioners on pharmaceutical residues.
- Local engagement on beach litter.
- Coastwatch interactive bathing water app.
- Food waste digestion, biomethane export.

Drinking water quality

- Diverse forms of catchment management.
- Reservoir mixing systems to reduce problems caused by manganese.
- Constructed wetland to control sediment and nutrients at Durleigh Reservoir.

Minimising sewer flooding

- Campaigning to reduce blockages from wet wipes.
- Monitors in sewers at flooding hotspots.

Resilient services

- Predictive modelling of deterioration hotspots in water mains.
- Partnerships for surface water, flooding risk and environmental resilience.
- Optimiser system for operating our water supply grid.

Excellent service for customers

- Real-time feedback from customers.
- Online interactive map of live jobs.
- Money back meter option garantee.
- Sharing data with energy providers to help vulnerable customers.

Efficient use of water

- Devices that pinpoint the location of leaks from customers' pipes.
- Hydrophones that detect leaking pipes via their sound signature.
- Water use graphs on metered bills.
- Online 'smart engagement' portal.

Affordable bills

- The first social tariff in the sector.
- Partnerships with debt advice charities.
- Training projects for household money management.
- Mapping tools to plot areas of deprivation.
- Online portal for partner organisations.

Community engagement

- Local engagement on water issues.
- Public information on asset performance.
- Development of 'citizenship approach' to support greater customer participation.
- Social media, digital communications and game apps.

for self-service and to better serve our growing number of partners.

The hub has been co-created with our partners and allows them to order from a range of free, standard or bespoke resources, and to raise awareness of our customer support schemes. It has information on our schemes, details of community projects and events, links to online application forms and bulletins, and a booking service for Wessex Water staff attendance at events.

Work in your area

Excellent service for customers

Introducing new and smarter ways to serve customers is essential to keep satisfaction levels high. Our website hosts an online interactive map showing all the live jobs we are carrying out in our region and we have been diversifying ways for customers to give feedback in real time.

We also run a scheme called 'Go the extra mile' which encourages customer facing staff to wow the people they encounter. We are open to input from those outside the business to improve our customer offering; a recent example is a cash back meter option guarantee devised with our Young People's Panel. Other novel approaches we are trialling include:

- real-time feedback dashboards
- sharing data with energy providers where it helps the most vulnerable customers
- an improved online portal through which customers can pay bills.

Tackling leakage/efficient water use

Our current level of leakage is significantly below the sustainable economic level of leakage. This means that reducing leakage further will cost more than the cost of producing the water. This is in part because we have a surplus of resources compared with predicted demand.

Despite this, leakage reduction remains a priority for many of our stakeholders and is an important area for innovation. We have been reviewing the many technologies available, and those in development, with the aim of selecting those that can help with further reductions.

Alongside a fast, reactive service, we have introduced new technologies that help to detect leaks before they are noticeable to others, or make it easier to find their exact location. Examples include hydrophones which detect pressure waves and the specific sound signature of a leaking pipe, and the Ferret probe which helps us pinpoint leaks from pipes joining customers' homes and the water mains.

Meanwhile, we have added water use graphs to bills to help customers compare their use over time and potentially identify leaks from their pipes. These are complemented by an online 'smart engagement portal' that helps customers understand their water use and compare it to other households.

Excellent quality drinking water

Safeguarding drinking water sources was the original reason for starting our well-established catchment management work. Our approach was considered highly innovative when it began 13 years ago, especially as it involved working with farmers and landowners beyond our own landholding.

Through a mix of technical advice and subsidies for more benign land management methods, we have successfully postponed additional water treatment in several locations. This work has also led to the development of our pioneering environmental trading platform, EnTrade.

Additionally, we are trialling technology led solutions, such as reservoir mixing systems to reduce problems caused by soluble manganese. And, at Durleigh reservoir, we are introducing several innovations including:

- a constructed wetland to reduce inputs of sediment and nutrients in the main watercourse entering the reservoir

Acknowledging the help of our leakspotting customers

- a silt curtain to contain cloudy, silted water in one area
- flow cytometry, a method of more rapidly and accurately assessing the microbiological content of water.

Resilient services

Our integrated supply grid has been our biggest single capital project to date. Now up and running, we are using it as efficiently as possible through an intelligent Optimiser system. We have also been using modelling techniques to predict hotspots of deteriorating water mains based on what we know about the age of pipes, soil types and other factors.

We have participated in a multi-agency project – Sponge 2020 – to better manage surface water and reduce flooding risk in Somerset and in Weston-super-Mare we assisted in developing a superpond for the same purpose.

The Grid

We are also involved in an environmental resilience project covering the Bristol Avon catchment, and working with Wiltshire County Council and the Environment Agency to provide a consistent response to planning applications regarding surface water management.

Minimising sewage flooding

Countering the pressures imposed on the sewerage network, such as climate change, population growth and changing consumer behaviour, requires different approaches to the past. We now undertake more active campaigning on typical causes of blockages, eg, wet wipes being flushed away and problems with fat, oil and grease from cooking.

Highlighting the problem of wet wipes

We are installing monitors in sewers at flooding hotspots and looking at ways to encourage greater citizenship that can benefit sewerage infrastructure. Our sector leading sewer rehabilitation team has also been adding further innovative tools for surveying and repairing sewers and tunnels (see page 16), with recent examples including:

- use of an extensometer for very accurate, non-destructive testing of tunnel wall strength
- introduction of cured-in-place linings of rising mains
- robots that can re-round deformed pipes from within, restoring their circular profile prior to lining.

Environment

Innovation has been an important theme across our environmental work in relation to:

- the water we abstract for public supply
- our impacts on the quality of freshwater, estuaries and bathing waters
- efforts to reduce our carbon footprint
- enhancing ecosystems
- improving waste management.

Where the effects of abstraction on the environment are uncertain and formal licence changes are not required but concerns exist within the local community, we use innovative ways to reduce it when possible.

In 2013 we began working with the Environment Agency and local community to reduce abstraction at our Mere source, using the abstraction incentive mechanism (AIM). Since this work began we've reduced the volume of water abstracted for export from the local catchment by around 40%. In addition, we liaise regularly with the community on abstraction, the effects of weather on river flows, and water conservation.

To improve the quality of the water environment we combined catchment management with the concept of environmental markets through the creation of EnTrade, the online environmental trading platform originally created to reduce diffuse nitrogen pollution.

We are working to improve end-of-pipe treatment and have trialled three novel approaches for reducing phosphorus in sewage effluent during the last four years:

- Bio-mag, a material that uses magnetite (an oxide of iron) to improve settlement in sewage treatment
- an algal pond designed by the University of Bath
- catchment permitting – a new system for setting effluent standards for a group of treatment works within a catchment, devised in partnership with the Environment Agency.

We are also working with local public health practitioners on ways to encourage people to take more exercise and have more contact with the environment. This could in turn alter medicine prescribing and reduce the risk of pollution from pharmaceutical residues.

Coastwatch is our online map of bathing waters with almost real-time data on the operation of sewer overflows that might affect water quality. The first of its kind when introduced in 2010, it responded to public demand for better information about bathing waters.

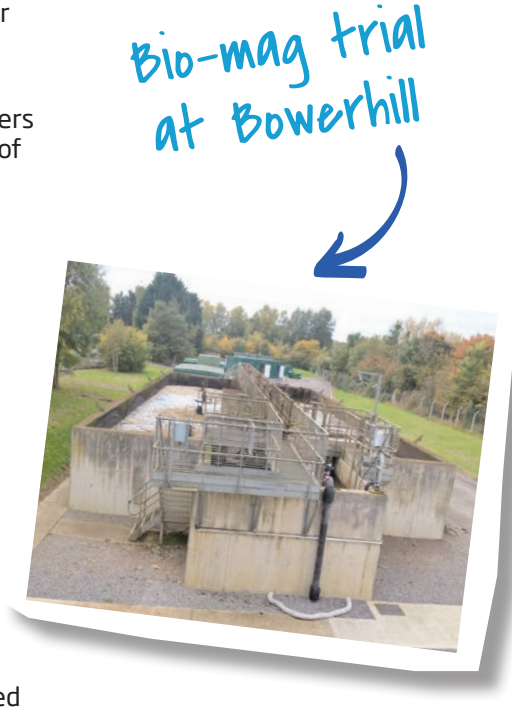
Since then we have increased involvement with projects engaging local communities and visitors, like Litter Free Coast and Sea which promotes behaviour that benefits beaches and their immediate surroundings. We have carried out innovative scientific investigations to better measure our impacts on bathing waters.

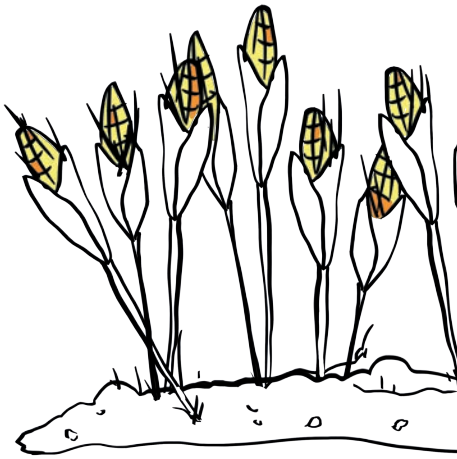
A recent example involved a tracer survey using a short-lived bacteriophage dosed at Taunton water recycling centre, to calculate how long treated effluent takes to travel down the River Tone to Burnham Jetty bathing water.

At Highbridge water recycling centre, we have also installed ultraviolet disinfection of the overflow from storm tanks for the first time.

Energy efficiency and avoidance are the first stages of carbon management. We have introduced dynamic demand technology that helps balance supply and demand on the local electricity supply network, while innovations in catchment management and water demand reduction are helping to manage energy use.

We continue to introduce new methods for improving energy efficiency, such as the optimiser system for our new water supply grid, because they provide a strong return on investment and significant emission reductions. In terms of renewable energy, Bristol water recycling centre converts sewage sludge and





food waste to biogas which can be used in three ways – to produce electricity, to be exported to the local gas grid, or for fuelling vehicles.

In November 2017, GENeco was named the winner of the sustainability award at the Institute of Chemical Engineers (IChemE) Global awards, in recognition of the transformation of Bristol water recycling centre into a resource and energy factory, converting wastes into green electricity, gas and vehicle fuel.

Engaged communities

In the past five years we have actively introduced new methods for engaging with communities and outside interests. These can involve specific topics and locations, eg, the effects of water abstraction in Mere and reducing blockages in sewers, or bringing together various interests to look at interconnected issues, as in the catchment partnerships that we lead.

To increase customer participation and grow the trust that customers and organisations in our community have in us, we are developing a new, innovative approach to engagement. This views customers less as consumers of our services and more as citizens of the shared water environment.

Current trials of more innovative methods of engagement include:

- work with public health practitioners related to green and social prescribing

Getting involved with Waterforce

- publishing more information about how our sewerage network is performing and the location of sewer overflows
- the addition to our home water efficiency packs of devices to help protect sewers, such as 'gunkpots' for collecting cooking fat.

Expanded use of social media and digital communications now includes behavioural messaging, eg, to encourage customers to take up water meters or not flush wet wipes.

Following work with the New Citizenship Project, we recently undertook a citizenship project trial in Chippenham and have started with two co-creation workshops involving local staff, councillors and environmental groups.

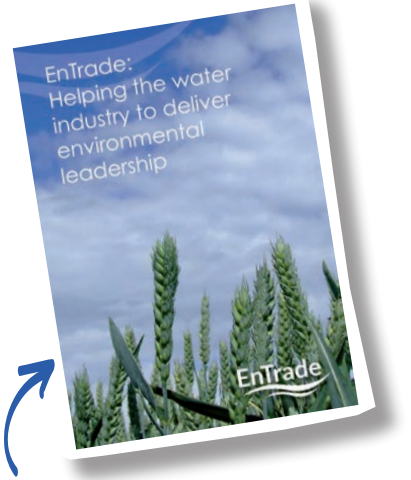
Beyond the core business

In addition to the innovations described above, which mainly concern our core, regulated activities, we have been looking for ways to add to the services we offer to our customers, or to increase the reach of our current work.

In all cases, we look for a good fit with what we do already, eg, providing services to homes and businesses, working with the natural environment and the water cycle, and creating value from society's waste. Progress in recent years includes:

- our subsidiary company GENeco diversifying the types of value created from the materials brought into our large water recycling centre
- building on our established catchment management work with the creation of EnTrade, which promotes multi-benefit land use among farmers and facilitates a range of environmental trades
- gaining a controlling stake in Albion Water which provides sustainable water solutions to housing and commercial developers.
- purchasing energy switching company Flipper, which is helping us to better understand customer behaviour and decision making, as well as what it takes to excel in a competitive market.

Gunk pots – helping to 'stop the block'



Promoting good catchment management

SEWER REHABILITATION

When was the team formed?

Originally in 2004, based at our Kingston Seymour office in North Somerset.

What does the team do and what are the main drivers for your work?

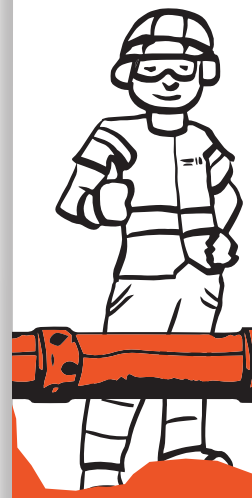
We maintain and reinforce existing sewers and tunnels using a range of methods, with a focus on avoiding ground excavation. This minimises costs, reduces our carbon footprint and gives our customers a better experience while we are carrying out work because there is less disruption such as road closures.

What's different and innovative in the way we you work?

Minimising excavation while maintaining sewers is good practice and we do this by using various innovative technologies from around the world, such as resin-based liners. We also develop our own solutions and are leaders in our field. It helps that we own the sewers we are working on and fully understand what's needed.

Where in the region do you mainly work?

In all corners of our region and not necessarily weighted towards the large conurbations.



What types of skills and professional disciplines are there among the team's members?

All the team are civil engineers and trained in cured in place pipeline design, liner manufacture and resins. Also each member has a separate expertise such as highways law, hydraulic modelling, tunnelling and so on.

Our award winning sewer rehabilitation team

What are the main challenges your team faces in its work?

One is designing bespoke lining for a range of sizes, from small sewers to 3m diameter tunnels, to world standards. Another is that we are often introducing new products and developing solutions where none are readily available.

What's the next big thing in your area of work?

We lead the British water industry in setting standards, such as the first protocol for styrene and the first cured-in-place pipeline specification. We have commissioned some new technologies such as our first robotics. Overall innovations are developing exponentially and we are cross-fertilising with some industries beyond water.

2020-25: innovation in the next five years

The next five years will be challenging, with a bill reduction at the same time as our biggest ever environmental investment programme. There will also be sustained competition to lead on customer service. To continue being a leading company, we'll need to look constantly for better ways to do things and new opportunities.

The following pages give examples of how we will innovate in each of our priority themes, as set out in our business plan for 2020-25.

Affordable bills

We will continue to diversify the methods we use for helping those who struggle to pay bills and fund a variety of community projects that have been shown to be effective and innovative.

These will include:

- assistance for debt advice agencies' financial capability work, aimed at preventing the onset or recurrence of debt problems
- efforts to ensure those in the most deprived and hardest to reach areas are aware of, and can access our support schemes
- close work with the Money Advice Service (and its successor the Money and Pensions Service) and national debt advice bodies such as the Money Advice Trust, StepChange and Citizens Advice.

We will assess the impact of our funded projects and share learning locally and nationally so that others may benefit.

We will evolve our innovative Partner Hub based on user feedback, to increase the number of partners using it and maximise the opportunities for joint working and self-service. We will identify further and more innovative touchpoints such as improved bill design, meter installations, welcome packs, signage, social media, van sides, and giveaways that promote support services.

We will also learn from other sectors and behavioural science to help reduce bad debt, especially regarding those who we believe are able to readily pay their bills.

Excellent service for customers

Innovations will be needed to make sure our communication channels are accessible for customers of all ages and backgrounds. For example, we will look to vastly expand the capacity for online customer interactions and aim to introduce an online tracker of operational jobs affecting customers – another idea being developed with our Young People's Panel.

Leakage and efficient water use

We will reduce leakage by 15% by 2025 alongside reductions in average per capita consumption. This will require a step change in our leakage activities and innovation to reduce losses from our distribution network as well as further innovation and continued customer support and engagement.

This is in line with our customers, who would like to see investment in innovative, technological solutions for better detection and repair of leaks, and education on how to use less water to ensure leaks do not challenge supply.

We will continue to seek means of reducing leakage in less disruptive and more cost-effective ways, through new equipment and technology that improves the speed of leak detection and delivers cost effective repairs. We plan to reduce losses from our water mains through:

- additional active leakage control
- improved data collection and analytics
- further sub-division of district meter areas
- innovative pressure management.

Encouraging customers to 'save every drop'

Encouraging customers to switch to a meter

...and to save water

We also plan to reduce losses from customers' pipes through an enhanced metering programme and by promoting ways in which customers can contact us to report leaks.

Options for improving water efficiency more widely in innovative ways include:

- greater use of insights from behavioural science
- customer rewards for meeting savings targets
- extending the scope of our smart engagement portal, with potential links to other parts of our group, such as energy switching service Flipper
- going further with home water audits.

Excellent quality drinking water

In the next five to 10 years we plan to use the latest technology to help maintain our water treatment works and distribution system. This will include potential implementation of the use of ultraviolet disinfection instead of chlorine, looking at ways of controlling types of water that have more corrosive effects on pipework, and trialling online water quality monitors for the supply network.

Resilient services

Heavy rainfall is likely to continue posing the biggest threat to our operational resilience in the future. So, we will look for innovations that help increase adaptability, such as greater adoption of sustainable drainage, natural flood management techniques, new methods to stop groundwater entering sewers and more use of flood models to inform investment.

We will include more real-time monitoring and control in various aspects of our work, so we are more proactive and can provide a more resilient service to our customers. We'll also be improving the use of the data we collect.

Reducing supply interruptions will require a significant programme of works over many years to improve the interconnectivity of our system, building on our integrated supply grid. Innovation and new technology will be needed to detect leaks before they become bursts and to make repairs before customers go out of supply.

Looking beyond our physical assets, there is growing awareness of our dependence on natural capital and the risks from climate change, development pressures and resource constraints. We recognise the need to embed long-term climate adaptation and build resilience in the natural ecosystems that support our business. This requires innovative ways of working with others to deliver shared benefits for the water systems in our area, so we will develop our partnerships in catchments and continue with catchment management.

We will further engage with customers on water efficiency and avoiding blockages in our sewers, to help support resilience, and welcome innovation from other approaches including water resource trading with neighbouring water companies and measures to improve cyber security.

'No-dig' repairs = less disruption

Minimising sewage flooding

Looking ahead, we are likely to see a bigger in-sewer monitoring programme. However, further innovations are just as likely to occur through behavioural aspects and we envisage staff proactively engaging customers and more investment in messaging about sewer misuse, alongside support for environmental officers in local authorities to focus on sewer misuse.

We will continue to take a campaigning stance toward policy makers, and manufacturers and retailers of products that do not conform to flushable standards.

We will continue to build on our sector leading work in trenchless 'no dig' methods for survey and repair of sewers [see page 16]

Helping communities and the environment

Environment

In the next five to 10 years we will favour an innovative, low carbon programme to improve the water environment with catchment management at its centre and more integrated management of land and watercourses.

We will work to improve efficiency and obtain more benefit from existing treatment processes, while building on more flexible ways to set water recycling centres' permits, combined with catchment management using tools such as EnTrade.

We also aim to introduce more monitors within the sewerage system, tracking pressure in rising mains and conditions at pollution hotspots.

Our innovative approach for removing phosphorus from effluent in the Parrett and Dorset Stour catchments, as required under the Water Framework Directive, will see a combination of measures.

Firstly, new phosphorus removal will be installed at water recycling centres where permit limits of not less than 1 mg/l can be achieved cost effectively. Secondly, we will optimise existing and proposed phosphorus removal processes using catchment-wide permitting, building on the success of the current Bristol Avon trial. Thirdly, we will use catchment interventions, including work with farmers and the use of market tools such as EnTrade. Fourth, we will update river water quality modelling to ensure that all investments are based on the best available scientific evidence.

We will continue to build our understanding of emerging pollutants, especially through research with other water companies and universities. We also aim to expand work with clinical commissioning groups and healthcare providers, to identify novel ways to fund environmental and social projects which improve people's health and wellbeing while reducing pharmaceutical use.

Regarding bathing waters, we aim to upgrade our online information system, Coastwatch, and provide more information about overflows from the sewerage system. Development of behavioural activities will also take place, such as awareness raising among beach users about how to keep beaches clean, while also modelling river catchments to establish where action to reduce pollution risks would be best placed.

Natural capital is a theme growing in prominence in our sector. We are developing tools for assessing how we interact with it, and championing schemes with catchment partners to improve natural capital beyond our own landholding.

We expect innovation in carbon management to involve a combination of technology, environmental management and human behaviour. Technology solutions, such as advances in sensors and the ability to manage big data in real time, should give further impetus to energy efficiency work over multiple sites. There are possibilities for heat recovery from various parts of our asset base and for further integration of wind and solar as their capital costs fall.

We will keep a close eye on trials of advanced thermal technologies that can gain extra energy from sludge and lock organic carbon into virtually inert forms. As we develop as a service company, we will also look at how we can encourage efficient use of hot water – the most energy intensive part of our product lifecycle.

Engaged communities

We will continue to explore new and better ways to encourage individuals, households and community groups to participate in efforts for their local water environment. This might, for example, include encouraging customers to become flood wardens, as well as supporting our own employees to become involved in their own communities through volunteering opportunities.

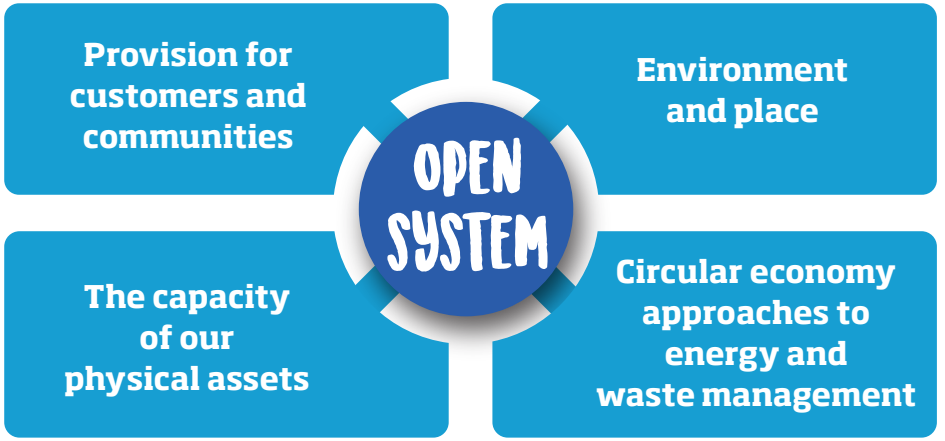
Hydrate, feel great!

Meanwhile, we will continue to adopt new digital technologies that help us form virtual communities interested in the water cycle. We will build on tools we are developing, such as our new customer engagement portal and our partner hub, as well as offering even more information online about the performance of our physical assets.

Wessex Water Marketplace

Past investment and changes in how we work have brought great benefit in terms of the quality and reliability of our services – but more of the same is not a good plan.

So, in our 2020-25 business plan we describe a new business model that embraces our public service ethos while capitalising on the ambition and innovation that markets empower. This is an 'open system' which allows markets to create value across four main areas:



This is an approach that we have already tested through our environmental trading platform EnTrade, which has found that in the case of water quality, farmers can often deliver improvements more cheaply than investment in new water assets such as treatment systems.

And payment for results is a model widely used in other sectors, so why not water? It could also create multiple benefits; for example, farming measures that improve biodiversity and soil retention as well as reducing groundwater contamination.

However, we want to go further. We see greater opportunities for other providers to take more active roles in finding solutions at the lowest cost, eg, we want communities in our region to be involved as part of the market of solution providers. There is largely untapped potential in working with such groups to reduce pollution or the amount of water we need to take from the environment, and this is one aspect that will differentiate the open system from other, similar exercises.

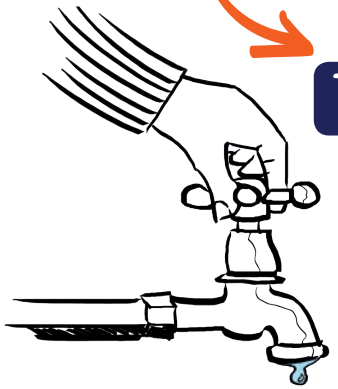
Overall, we are optimistic this approach can create open ways to deliver social and environmental benefit in which new parties can participate.

We envisage three main participants in an open system approach.

FIRSTLY **the system architect**, typically national regulators – they decide the overall outcomes to be achieved and timescales for delivery.

SECONDLY **the local system co-ordinator** – this would be Wessex Water. With our knowledge of our customers, the catchments in our region and our physical assets we would deliver improvements by working with others from a wide market of potential partners.

THIRDLY **a range of commercial and non-commercial interests** who would be invited to bid with their solutions, in response to the challenges we set as the open system co-ordinator and assisted by us opening up the data we hold.



CATCHMENT DELIVERY

When was the team formed and what do you do?

The team was initially established in 2004. We try to protect drinking water quality from agricultural contaminants such as nitrate and pesticides. We also offset the nutrients in discharges from water recycling centres by engaging with farmers in our catchments. We do this by offering expert advice, paying for improvement measures and monitoring those activities to demonstrate their impact.

What is different and innovative in the way you do things?

We were the first company to tackle diffuse pollution of groundwater from agriculture on any scale and the first to pay farmers to switch from metaldehyde – a pesticide that is very difficult to remove from water.

We trialled EnTrade (see page 12) in Poole Harbour to allow us to reach a wider number of farmers and to derive a market based price for agri-environment work. We were also the first company to directly employ agricultural experts to engage with farmers.

We work across the region, contributing to Wessex Water's drinking water safety plans which include all our water sources, plus several river catchments for water recycling centre offsetting.

What types of skills and professional disciplines are there among the team's members?

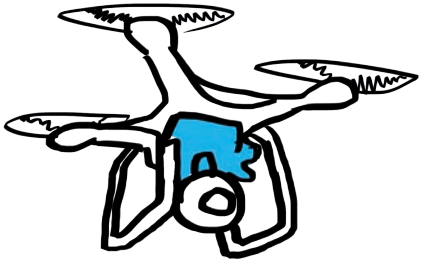
All have significant agricultural experience and most have been trained under the Fertiliser Advisers Certification and Training Scheme. One of the team has recently completed a Nuffield Scholarship and another holds the engineering equivalent of a PhD.

What are the main challenges your team faces in its work?

Successfully engaging the agricultural community to move them to better practice and implement pollution reducing measures. Also, demonstrating the impacts of measures – especially for groundwater due to the long transport times through aquifers.

What's the next big thing in your area of work?

Phosphorus offsetting is potentially a big part of our work during 2020-25 and achieving it in the timescales required will be a big test. Dealing with agriculture through the changes likely to occur with Brexit and domestic agricultural reform, while retaining the confidence of farmers will also be a major challenge. Additionally, there are interesting opportunities developing in the external market place for catchment approaches.



BEYOND 2025:

long-term innovation

As noted earlier, change is afoot in our workplaces, our homes and the environment around us. Some changes we can foresee, while some will be beyond what most of us can imagine or predict. There will be exciting opportunities; new technologies will bring both possibilities and challenges, adding to a complex and uncertain world.

The need to keep up with change, as well as the desire to benefit our customers and environment, lies behind many of the innovations we have already introduced and propose for the next five to 10 years.

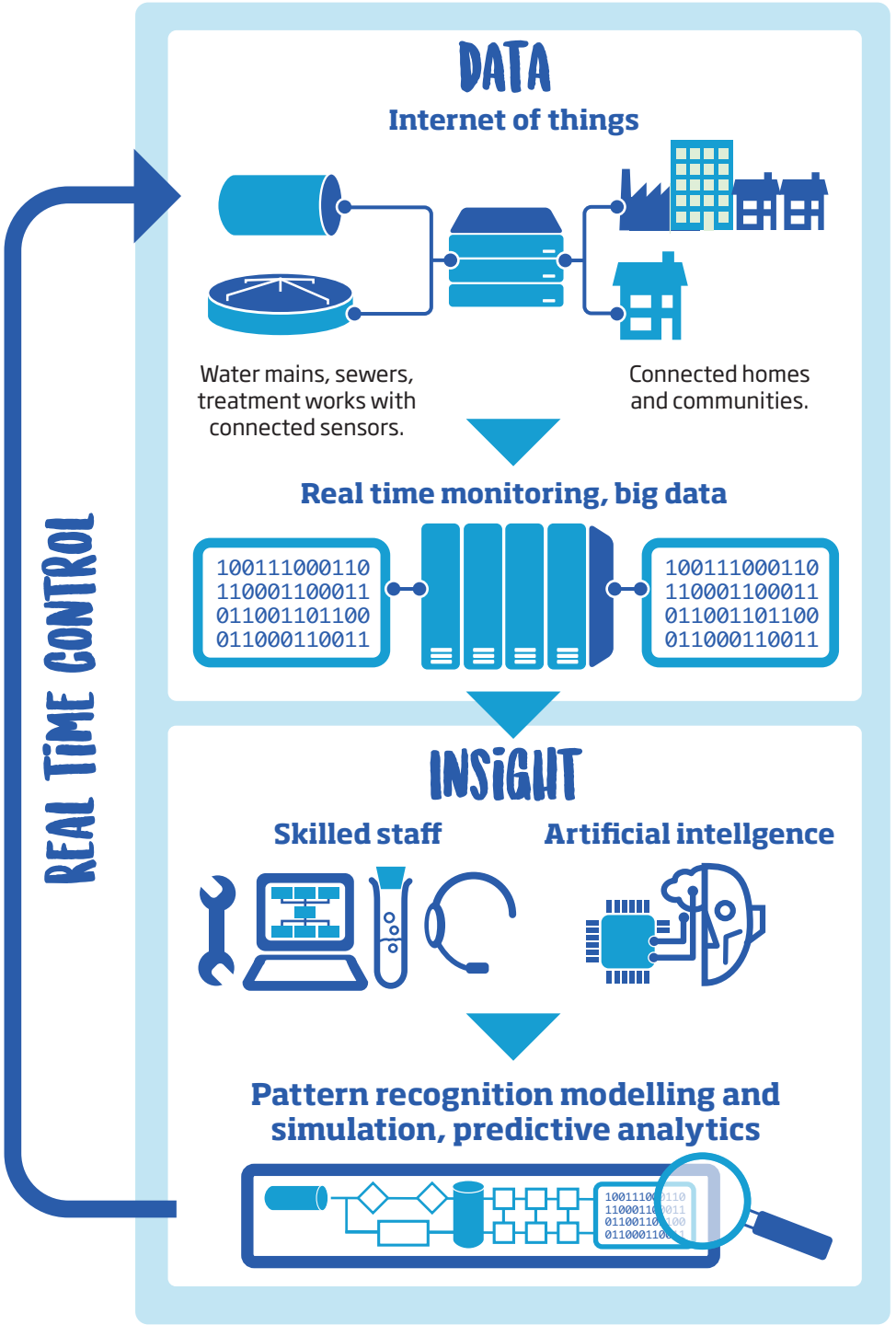
We see great opportunities arising from new, disruptive technologies that have a good fit with utilities. These include:

- much wider use of sensors linked to the internet of things, providing big data, machine learning and artificial intelligence
- predictive analytics and modelling which allow real-time control
- virtual and augmented reality
- advances in aerial and underground survey, integrated renewable energy generation.

Linked together (as shown opposite) these will be highly influential in asset management. Additionally, they are set to enter the home in more meaningful ways, allowing opportunities for more responsive and personalised services to customers.

Our 2017 and 2018 Futures reports explain these and many other technologies that have disruptive potential over the next 10 years or more.

We will not focus solely on technology innovation by any means. As in recent years, it's likely that a lot of future innovation will be centred on partnerships and relationship building – with farmers, regulators, social charities, wildlife organisations and others – as well as customers themselves.



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