

Ref 5.8U

PR19: Cross Service Maintenance

September 2018



Contents

Summary	1
1 Emergency Planning	2
2 Non-Operational Assets	4
3 Education, Conservation, Access and Recreation	5
4 Facilities and Buildings	7
5 Laboratories: Equipment Maintenance	8
6 Technology and Change	9
7 Research and Development	11
8 PR24	13
9 Transport	14
10 Systems and Change	16
11 Automation, Telemetry and Controls	18
12 Health & Safety	19
13 Efficiency Investment	21
14 Assurance	22

Summary

The Investment

We are proposing (£220.39m) maintenance expenditure on our Cross Service functions (Table 1) that act as enablers for all our Price Control services. Failure to invest in maintaining these functions would lead to a deterioration in all of the services we provide to both our customers and the environment. This investment is also a key enabler for our plans to enhance our service and meet the challenges of the future, as set out in our Water 2050 strategy.

This investment is needed to ensure the overall delivery and back office support can be provided to ensure that our operational parts of the business are able to manage our customers' expectations as effectively as possible.

To deliver maintenance investment we use a mix of reactive and proactive approaches. For many assets the impact of failure can be managed for a reasonable length of time due to the flexibility built into our network so a reactive programme is the most cost effective approach. As we develop our analytical capability we will move to a more proactive approach but will always require some reliance on reactive investment. We prioritise our proactive investment using a risk based methodology, taking into account the impact on customers. We have assessed the programme for AMP7 looking at individual investment classes separately then brought all the information together to take a balanced view of risk across the whole asset base. We will continue to review this through delivery of AMP7 and rebalance the programme to manage emerging risk.

Whilst developing each of our investment proposals, we have taken into account the views expressed by our customers in our comprehensive Customer Research programme where relevant and considered the future trends that will have an impact upon our business and the services we provide, as identified in our Welsh Water 2050 long-term strategy document.

Investment category	£m
Emergency Planning	5.42
Non-operational assets	1.19
ECARE	8.96
Facilities	5.48
Laboratories: Equipment Maintenance	2.09
Technology and Change	3.30
Research and Development	5.85
PR24	7.78
Transport	14.89
Systems & Change	64.21
Automation, telemetry & control	46.35
H&S at work	48.64
Efficiency Investment	6.23
Pre-Efficiency Total	220.39
Post-Efficiency Total	194.92

Table 1: Cross Service investment for AMP7

1 Emergency Planning

Investment Need

Our proposed expenditure is linked to The Security and Emergency Measures (Water and Sewerage Undertakers) Direction 1998, which places requirements on water undertakers and sets out our duties to maintain water & sewerage services in the event of emergencies. Further to this, there are strict requirements for the provision of a minimum of 10 litres per person per day increasing to 20 litres after 5 days once a Major Incident is declared.

Any lack of investment in Emergency planning will put at serious risk our ability to respond to any incident that may occur within our network. This would have a consequential impact on our serviceability measures and the customer's perception of us as a whole. Additionally, we would fail to meet regulatory obligations by not complying with the requirements set out by section 208 of the Water Industry Act 1991.

This investment allows us to maintain the ability to respond to an incident or event in the manner required by legislation, regulations and to the level that our customers would expect. The emergency planning equipment has been extensively used this year in our response to Storm Emma and the recent dry weather. In the event that we reduced our level of investment we would be:

- Unable to meet our customer expectations continuing with the provision of water and sewerage services.

The current stock of emergency equipment and vehicles has a set life expectancy and the investment levels are based on a five year life span for the majority of equipment. As such some of the current vehicles and equipment will need to be replaced in a phased approach. The current storage location requires investment to ensure that the equipment and vehicles are held in a condition where they are able to be used when called upon.

Our Emergency Planning equipment and procedures/plans are managed by a dedicated team who monitor compliance and equipment condition/suitability. The activities of this team provide us with an understanding of future investment requirements.

Failure to invest in Emergency Planning will have a detrimental effect on our customers, employees and other stakeholders.

Regulatory Requirements

We have a statutory requirement to comply with the Security and Emergency Measures Direction (Water and Sewerage Undertakers) [SEMD] 1998 which is issued as a Direction, as provided for in Section 208 of the Water Industry Act 1991.

The Direction sets out Water Undertakers' in England and Wales obligations in terms of securing supply in the event of an emergency. Failure to comply with the Direction would be considered as failing to meet the requirements of the Water Industry Act.

The SEMD places us under a requirement to "keep under review and revise such plans as it considers necessary to ensure the provision of essential water supply....and wastewater services at all times". Other documents taken into consideration in the development of our plans include:

- Civil Contingencies Act – 'Emergency Preparedness' and 'Emergency Response and Recovery', as statutory regulations and non-statutory guidance.

Historical Investment

During AMP5 and AMP6 our strategy for this investment area has been to ensure that we can respond as effectively and efficiently as possible to any unforeseen incident, thereby reducing the impact on our customers to the minimum. During AMP6 we have invested in the following areas:

- Emergency equipment storage.
- Command and control centres.
- Business continuity facilities.
- Emergency equipment.
- Planning around emergency situations (e.g. a review of our impounding reservoir inundations plans).

Our forecast outturn emergency planning investment at the end of the AMP6 is £2.68m.

Planned Investment

Proposed expenditure levels will ensure that we have the ability to respond effectively to most incidents without having to rely on Water Industry Mutual Aid. Whilst industry aid may be an option in certain circumstances, the fund comes under strain where an emergency simultaneously affects multiple Water/Sewerage Undertakers (for example, the current dry weather).

Table 2 sets out our proposed AMP7 investment £5.42m (Pre-efficiency) to minimise the impact on customers or the environment as a result of an emergency incident, whilst delivering plans and providing resources to minimise the time before a situation returns to “Normal”.

Investment area	£m
Water	2.32
Wastewater	0.37
Plans and Depots	2.73
Total	5.42

Table 2 AMP7 proposed expenditure on Emergency Planning

Our proposed AMP7 expenditure is more than AMP6 due to a greater focus on resilience and greater preparedness from our experiences and lessons learnt from recent spells of extreme weather. Our proposed investment will target the following aspects of emergency planning:

- Production and updating of Water and Wastewater plans to meet our obligation under SEMD, enabling us to recover from incidents more quickly and minimising the impact to customers.
- Provision of new technologies, or replacement of aging communication equipment, allowing us to improve our response to incidents and

maintain reliability of supply whilst protecting the environment.

- Additional emergency planning storage facilities in North and South Wales to provide a faster response to incidents and improved service to more vulnerable customers.
- Improvements at depots to ensure adequate power supply during emergencies, ensuring business continuity, operational support and maintaining a high level of customer service.
- Provision of new, or replacement of emergency equipment, to maintain a fast response to incidents, ensuring that the reliability is maintained during incidents and preventing pollution and flooding to the environment and customers.

Uncertainties and Risk Management

Inherently, emergency planning and preparedness is there to manage risk and uncertainty.

- The frequency and intensity of incidents is often extremely difficult to predict. There is a wider expectation that the number and severity of extreme weather events will increase. Consequently, we may face more or larger incidents that require an emergency response.
- At present we are not aware of any proposed changes to legislation by the Government which may result in a change in what we will be required to deliver. Any change to this will impact our plans.
- Public awareness of the emergency incident provision has increased due to incidents, such as Storm Emma. This awareness could increase customer’s expectations and needs.

All of these may well change the level of spend on emergency planning and response in the future.

2 Non-Operational Assets

Investment Need

Non-Operational Assets (NOA) are sites that we own but are no longer in use for operational purposes. We are still liable for managing risks associated with them so must invest to manage risk. We achieve this based on the following principles:

- Reduce the risk associated with the assets.
- Reuse the asset for another part of the business.
- Reduce our overall risk by preparing the asset for sale.

Our current register of NOA holds records of 850 sites.

We need investment in AMP7 to continue the management of our NOA.

Historical Investment

The approach to date included a review of the assets designated as NOA and these have been maintained on a register for monitoring and tracking purposes. Each site has been subject to a risk categorisation (Table 3) which drives the frequency of site visit to inspect the security and condition of the NOA site and to ensure the correct categorisation.

Risk Category	Inspection Frequency
Back to Nature	Once per AMP
Low Risk	Annually
Medium Risk	Quarterly
High Risk	Monthly

Table 3 NOA Risk Visits

Our AMP6 outturn forecast for managing the risk on our NOA is £0.8m.

Planned Investment

We are proposing to invest £1.19m during AMP7 to continue the management of our NOA following the same principles set out above.

The investment will focus primarily on:

- Delivering the inspection programme over AMP7 and maintaining the records.
- Ad-hoc minor capital maintenance where identified as part of the regular inspection (e.g. fix fencing, remove fly tipping or cleaning warning signs).
- Using the above to identify the opportunities at NOA to cost-effectively downgrade the risk category to reduce the burden and cost of regular inspection.

Uncertainties and Risk Management

No allowance, or inclusion has been made to carry out any major planned capital maintenance at these sites.

We have experienced an increasing number of customer contacts reporting issues relating to the appearance of our NOA (e.g. overgrown state, fly tipping etc.). We will endeavour to identify these issues proactively by incorporating our experiences at a site into the frequency of our inspection regime. This will both reduce customer calls and ensure we earn the trust of customers.

3 Education, Conservation, Access and Recreation

Investment Need

As the third largest land holder in Wales, we own and manage an estate that comprises of 42,000 hectares across Wales and the Marches. We are landlords to approximately 100 tenants and we have maintenance liabilities at many of these non-operational properties.

To both deliver our statutory obligations in relation to our landholdings and deliver the maximum value from their use, we need investment in AMP7.

We presently have four visitor centres, with Llandegfedd having opened in 2015 and a fifth in construction at Llanishen, North Cardiff. These centres include facilities for recreation activities such as; walking, cycling, bird watching, sailing, canoeing, windsurfing and diving. They consistently receive over half a million visitors each year.

In order to support improvements in customer behaviours particularly around water efficiency and the correct use of sewers we need to improve our education offering. This relates to our performance commitments for per capita consumption and sewer flooding / pollution.

Our customer research showed a consistent theme of the weight that customers place on being educated about our service and the contribution they can make to reducing failures.

Our assets are managed by local operational teams who, with support of mechanical and electrical expertise, identify maintenance and upgrade requirements of the assets. This provides us with an understanding of future investment requirements.

This investment case outlines our proposals for investing £8.96m to maintain our Education, Conservation Access and Recreation (ECARE) services.

Regulatory Requirements

Our ECARE services assist us in the discharge of duties as required by these directives to include the Water Industry Act, 1991 (imposing duties on water companies to manage the assets within its estate), The Countryside and Rights of Way Act, 2000 whilst The DEFRA statutory Code of Practice on conservation areas and recreation for water and sewerage is used as a guideline. We are able to

demonstrate continuous compliance to these directives.

Historical Investment

We planned to spend £3.23m in AMP6. Our outturn cost forecast for AMP6 stands at £10.72m, which includes an additional £7.49m assigned for the land purchase and construction of an additional visitor centre at Llanishen, injected by our Board. This new site is located in north Cardiff adjacent to a large population centre that may not otherwise seek to visit one of our more remote sites. This will complement our other visitor centre sites and is a fantastic opportunity to spread our customer education messages.

Planned Investment

We are proposing £8.96m expenditure in AMP7 to maintain the portfolio of land and assets our ECARE team manage (Table 4) and enhance our education offering.

This investment will deliver compliance with our statutory maintenance obligations at designated conservation sites, and improve standards at our visitor attractions where our offering can influence customer perceptions of our business.

As part of our investment planning process we have explored means to demonstrate that our investments are worthwhile and represent value for money for customers.

- To ensure we maintain our facilities and continue to provide and improve our visitor facilities we propose to invest £4.05m. These activities will assist in increasing the number of visitors and allow us to continue raising awareness of the work we do, not only in supplying water, but also the wider environmental work we deliver.
- We propose to invest an additional £4.81m to improve our educational offering. This will include revitalising our existing education centres and providing new ones so that we have a wider coverage across our region. We will also provide additional interpretation at our recreational sites and build additional resources to support the National Curriculum and Welsh Bacalaureate.

- Changes to the rural economy may have implications for our tenanted land-holdings and the viability of farm land use.

Investment area	£m
ECARE – Base activities	4.05
Enhancing our educational offering	4.81
Total	8.96

Table 4 AMP7 proposed expenditure on ECARE

Uncertainties and Risk Management

Our ECARE activities have been established to both raise awareness in the function and operation of the business, and conservation activities we support.

4 Facilities and Buildings

Investment Need

This investment case is driven by the need to maintain our work place facilities to ensure that they:

- Meet service expectations and regulatory requirements.
- Meet business demands on the property portfolio.
- Maintain asset value.
- Provide a suitable working environment.
- Maintain good environmental standards with regards to energy use and waste management.

The strategy for this investment area is to proactively maintain the condition of our work place facilities at the most whole life cost efficient manner, whilst addressing any Health & Safety issues that may arise, in line with our duties under the Health and Safety at Work Act, 1974.

These assets are managed by a dedicated team who, with support from supply chain expertise and resource, identify maintenance and upgrade requirements of the assets. This provides us visibility of future investment requirements.

Historical Investment

Our forecast outturn AMP6 expenditure is £5.37m. AMP6 expenditure included a major purchase of a new office building in Newport, allowing co-location of our Alliance partners and asset teams to improve efficient delivery of our capital programme. Investment in comprehensive asset condition surveys over previous AMP cycles has

allowed us to move from a reactive based programme to our current, planned preventative state with management plans for each site. Our historical investment has also supported the achievement of our strong health and safety performance to date.

Planned Investment

Our proposed expenditure for AMP7 is £5.48m (Table 5) which is consistent with AMP6 expenditure. Although we do not anticipate any major purchases of work place facilities in AMP7, we have identified the need to undergo a major replacement of keys and access systems across our sites, as the patent is due to expire leaving us with a major security risk.

Investment area	£m
Facilities and Buildings	3.34
replacement of keys / access systems	2.14
Total	5.48

Table 5 AMP7 proposed expenditure on Facilities and Buildings

Uncertainties and Risk Management

Or plans for the management of our work place facilities over AMP7 may be influenced by various external factors (regulatory, service expectations, environmental standards etc.).

5 Laboratories: Equipment Maintenance

Investment Need

We own and operate two analytical laboratories. The Bretton Laboratory provides microbiological analysis for samples collected in North Wales, whilst the Glaslyn Laboratory provides microbiological analysis of samples collected in South Wales and chemical analysis for samples collected across our region. Investment in AMP7 is required to ensure the capability and reliability of the equipment used in the operation of our two laboratories.

Using manufacturer guidelines, analytical equipment typically has a service life of between 5 and 7 years (with consideration to throughput the equipment can achieve whilst maintaining its accuracy). Manufacturer support for older equipment also reduces over time, until such a point that they are no longer serviceable. New technology also provides the opportunity for sampling to be carried out more quickly, and allows us to test to better accuracy or with smaller quantities of samples. Such changes allow for a more efficient operation of our laboratories.

Historical Investment

Analysis to support our statutory and risk based sampling programmes were brought in-house during 2012, phased between the 13th February 2012 (Bretton) and 31st December 2012 (Glaslyn). During AMP6 we reviewed and commenced the replacement of analytical equipment in Glaslyn and Bretton as it reached the end of its serviceable life. Our outturn cost forecast for AMP6 stands at £0.77m.

Planned Investment

We are proposing £2.09m AMP7 expenditure for our two analytical laboratories (Table 6). This case is based on a continuation of the investment level through AMP6, plus an additional £1.12m to reflect the need to replace laboratory equipment that will be beyond its expected lifetime. Our proposed expenditure is more than AMP6 as we have identified a significant number of analytical machines and associated equipment that during AMP7 will reach the end of their service life.

Investment area	£m
Laboratory maintenance	2.09
Total	2.09

Table 6 AMP7 proposed expenditure on Laboratories: Equipment Maintenance

Uncertainties and Risk Management

This investment is classified as low risk as it involves commodity assets that will require replacement when their lifespan is reached. However, where this falls short, we will respond appropriately. We will monitor the following:

- new legislative requirements may result in the need to purchase new, unplanned equipment
- We will continue to monitor our performance based on a target standard the number of samples completed on time and savings made through the in-sourced services, compared to costs associated with the outsourcing of the analysis and sampling costs.

6 Technology and Change

Investment Need

Along with the increasingly higher standards that our services need to meet (e.g. water quality standards), the costs of delivering the services we provide are also increasing. This is against a scenario of future trends that will effect both our business and our customers. We are constantly looking for ways in which we can manage these issues whilst continuing to provide a high quality and affordable service.

The application of innovative technologies and processes will provide the opportunity to reduce operating costs and increase the performance of assets, helping to create a sustainable future while ensuring we continue to provide excellent services.

There are three pillars to our approach to Technology and Change, these are:

- **Technology Development:** (e.g. Weed Wiper pesticide application).
- **Surveys:** (e.g. thermal mapping to identify uncontrolled discharges to the environment).
- **Monitoring:** (e.g. SMART meter trials in Grange Town, Cardiff).

This investment case outlines our proposals to invest £3.29m to investigate new technologies, or alternative ways of delivering great service, generate better value and to prepare ourselves for and to offset future trends (Welsh Water 2050).

Historical Investment

During AMP6 we have pioneered several new innovative approaches in our business. For example, we have developed a demand driven dynamic model of regional service reservoir stock that uses live data in conjunction with predicted demand to ensure that we have sufficient potable water resource at peak times and during incidents.

Within the Aberdyfi Water Supply Zone we implemented a ‘live’ mains flushing technique to cleanse potable water mains by using changes in hydraulic flow and pressure which has reduced burst frequency and discolouration events. We will build upon the success of this innovative project in AMP7 by taking it to other areas in our regional water networks.

Our outturn cost forecast for AMP6 stands at £2.93m.

Planned Investment

Table 7 shows our proposed expenditure for AMP7 of £3.3m, which is comparable to expenditure in AMP6.

During AMP7 we will continue with our strategy for innovation by:

- Informing decisions through science and research.
- Encouraging research internally
- Seeking opportunities for co-creation across the water cycle
- Creating resilience
- Sharing ideas internationally.

During AMP7 we will continue to implement and embed those successful innovations from AMP6 along with continuing to investigate and trial new initiatives falling under our three pillars in order to reduce costs whilst improving our services. Examples of innovations we will look at during AMP7 include (but are not limited to):

- Leakage detection utilising the data generated from the latest monitoring technology installed within our and users network (using artificial intelligence).
- Development of and utilisation of ‘live’ pesticide detection monitoring in raw water sources.
- Alternative coagulants and chemical free treatment by exploring oxidising coagulants and advanced oxidation processes to reduce chemical use.

Investment area	£m
Technology and change	3.30
Total	3.30

Table 7 AMP7 proposed expenditure on Technology and Change (water)

Uncertainties and Risk Management

With any change process, there is an in-built level of risk and uncertainty that targets and outcomes are not met. Typical risks as a result are;

Cross Service Maintenance



- Identified solutions and change do not deliver the intended operational improvements leading to a higher level of investment to manage customer expectations.
- Technological advancement (from our Research and Development programme) provides

opportunities for new solutions to issues to come forward. We will review these as they happen to determine the benefit they may provide.

7 Research and Development

Investment Need

The costs of mitigating the challenges and harnessing the opportunities from now until

2050 will only be affordable for our customers if we are committed to gaining a thorough understanding of the issues and their resolution.

One of the primary purposes of our Welsh Water 2050 long-term strategy is to help us shape and prioritise our long-term science and research agendas, to ensure that the considerable expenditure that we make is focused and efficiently invested on the issues that will matter our customers now and in the future.

We need investment in AMP7 to undertake research and development to enable us to explore issues and opportunities to improve the way we manage our business, support our own employees and serve our customers to realise their expectations.

This investment case outlines our AMP7 proposals for investing £5.85m in research and development.

Historical Investment

Prior to AMP6 we had chosen not to influence new or emergent environmental standards or the number of environmental designations in our area to the same extent that other water companies have. However, through organisational change we now have a platform in place, with appropriate governance and stakeholder support that enables us to shape and influence new standards before they are applied to our abstraction licences and discharge permits.

The current AMP6 research programme includes (but is not limited to) investment supporting:

- UKWIR Research.
- WATER UK 21st Century Drainage Project.
- Coastal water investigations.
- Water Framework Directive research.

- Hydro-ecology and climate change research.
- Research Projects to support our Operational vision.

Our forecast expenditure for AMP6 is £4.57m for Research and Development.

Planned Investment

We have consulted across all service areas of the business to identify areas where they consider investment is needed to explore and address issues that may alter our “business as usual” position.

Our planned expenditure for AMP7 Research and Development is £5.85m (Table 8). The overall aims of our AMP7 investment proposals are:

- Continued benefit from the outputs of collaborative research - mainly through our contributions to UKWIR.

and, gaining evidence to support:

- Smarter investment and operational planning.
- Engagement and negotiation with regulators.
- Better understanding of our impact, and the impacts of others, on the environment.
- The delivery of our aims as set out in our long-term strategy Welsh Water 2050, offsetting future trends and realisation of our Strategic Responses.

We will work with research partners to gather data and apply rigorous evidence to make sure we are making the correct investment decisions on behalf of our customers. This includes research to better quantify the effects of climate change on our water resources, monitor our treatment systems and networks more effectively, investigate resilient localised treatment systems and build an understanding of the effects of emerging contaminants on our ability to provide safe water into the future, amongst many others.

Investment area	£m
Research and Development (Water)	3.40
Research and Development (Wastewater)	2.45
Total	5.85

Table 8 AMP7 proposed expenditure on Research and Development

Uncertainties and Risk Management

If we were to undertake all the research we have highlighted that will be needed to deliver our 2050 Visions we would require ~£16.5m. Consequently we will seek to leverage our research investment on a 1: 4 basis with UKWIR, NERC and University funding to allow a greater level of research to be completed.

The rapid pace of technological change offers the prospect of providing services more efficiently and reliably in the future. Moreover, new methods of working together, including co-creation between water companies, their customers and other organisations could enable society to deliver its goals more efficiently. We will seek to understand and exploit these opportunities.

8 PR24

Investment Need

Our approach for the Periodic Review (PR) 24 planning process will require a number of feasibility studies along with a comprehensive Customer Research programme to be undertaken to inform the scope and costs of our plans going into AMP8.

Some of this work requires expertise outside of our own knowledge, and beyond our resource capacity and we will need to procure additional support to assist in its delivery and quality.

This investment will provide the means to procure additional support and so assist the delivery of a robust PR24 business plan submission ensuring that our future business can meet the needs of our customers in the most cost-effective manner.

Historical Investment

Our AMP6 investment in PR19 has enabled us to undertake our Customer Research to both inform our plans and provide customer and key stakeholder ratification of its aims, costs and risk. We have also invested in scheme development. This includes the additional resource required to develop costed solutions for named schemes to determine the scope and costs of investment plans going into AMP8. Our AMP6 PR19 investment has been overseen by our dedicated PR19 Governance structure (internal governance processes and external validation/audit) which has provided both a rigorous challenge throughout the development of our PR19 plans and a clear 'line of sight' from our customers, the Board and all the way through to our front-line operational teams.

Our outturn forecast to develop the PR19 Business Plan in AMP6 is £9.13m.

Planned Investment

We are proposing £7.78m expenditure in AMP8 (Table 9) to support the delivery of our PR24

Business Plan. We will continue to develop the capability of our in-house investment planning team and build on lessons learnt from the PR19 process to identify and implement a more efficient planning process for the benefit of our customers. Our in-house team will be supported as and when required by additional support secured from our supply chain.

Our approach for the PR24 planning process will, on the whole, be similar to that undertaken for PR19, and include (but not limited to) the following activities:

- Customer Research: Understanding customer priorities and testing the impact on our proposals
- External reviews: Validating our modelling and assumptions around key issues
- Audit: Internal governance process
- Scheme development: Asset feasibility studies to determine the scope and costs for AMP8.
- Resources: To support the team at peak times

Investment area	£m
PR24	7.78
Total	7.78

Table 9 AMP7 proposed expenditure on PR24

Uncertainties and Risk Management

Review of the regulatory planning cycle will undoubtedly lead to changes in approaches.

We have assumed that in general the level of anticipated analysis and reporting required will be equivalent to that required for PR19.

9 Transport

Investment Need

Our fleet of vehicles and plant are fundamental to our ability to operate our assets and ensure we are able to deliver the best service possible to our customers.

We have a fleet of over 1,600 vehicles and plant equipment that enable us to carry out the day to day tasks required to deliver our services. Like our other assets, this fleet is subject to condition and performance deterioration and has an identified optimum life expectancy. We need investment in AMP7 to manage and maintain this fleet to ensure vehicles and plant are fit for purpose, safe, and reliably support our employees in their daily duties.

This Investment Case outlines our proposals for investing £14.89m to maintain a fleet of vehicles and plant equipment.

Historical Investment

Each vehicle and plant equipment in our fleet is managed on a whole life costs basis and individual records of cost and performance are held. The cost of owning and operating the fleet is accurately reflected in our systems and allows for informed investment decisions to be made. Our approach to fleet management considers factors beyond specific detail for each vehicle such as:

- Whole life CO₂ emissions and fuel costs.
- Warranty periods and whole-life maintenance costs.
- Safety factors including obvious issues such as vehicle age along with less visible issues such as driver welfare and ergonomics.
- Factors such as purchase prices, residual values and other commercial arrangements.
- Operational (customer service) criticality.

The combination of these factors, existing fleet data and industry recognised good practice serve to inform our strategy, a fixed replacement interval

model that maintains the approach we adopted during AMP5.

Our outturn forecast for AMP6, is £22.88m this includes ~£8.0m investment on Remote Operated Vehicles.

Planned Investment

Our proposed investment for AMP7 on our fleet of transport is £14.89m (Table 10).

We will continue with our strategy to retain / replace vehicles at optimal time periods. These are on average:

- 5 years for light commercial vehicles.
- 7 years for the sewer jetting fleet.
- 8 years for 4x4's¹.
- 10 years for Heavy Goods Vehicles (HGVs).
- 15 years for plant and equipment.

A key consideration in the turnover of vehicles is the environmental impact of the fleet. We are able to make informed decisions that have a beneficial impact on reducing CO₂ emissions by selecting newer vehicles with better environmental performance. This also often delivers an improvement in cost efficiency through a reduction in fuel use.

Our AMP7 expenditure proposals are based upon granular fleet information. The costs of every vehicle and item of plant are known and can be forecast. This is done by our dedicated transport team that manage the fleet, its maintenance and supporting functions and workshops.

Our investment programme will focus on optimising the whole life cost of our asset base through:

- Continuation of our fixed interval vehicle replacement policy.
- Reviewing our maintenance workshop capability and commercial status.

¹ The 7 and 8 year replacement cycles reflect the extent to which these vehicles carry additional equipment as well as their anticipated use, fuel and operational conditions.

- Installing up-to-date vehicle tracking systems to in-scope vehicles.

Investment area	£m
Transport	14.89
Total	14.9

Table 10 AMP7 proposed expenditure on Transport

Uncertainties and Risk Management

There is a high-level of confidence in the quantity of vehicles planned to be replaced and the associated costs. However, during AMP7 we will monitor for the following which may impact our ability to deliver our proposed plans:

- The investment is based on maintaining the current number and type of commercial

vehicles in the fleet on an appropriate replacement cycle.

- They do not allow for any significant changes to the make-up of the fleet (e.g. replacing small / standard panel vans with HGV's at five times the capital cost).
- There remains a risk that unplanned replacement of high-cost equipment is needed, such as a high-pressure jetting rig.
- Our AMP7 approach will be to maintain ownership of our fleet and continue to retain in-house capability in fleet management and vehicle maintenance. Although this approach gives us the greatest flexibility to manage our fleet of vehicles, we will continue to assess the effectiveness and efficiency associated with in-house management versus out-sourcing.

10 Systems and Change

Investment Need

Our day to day operations already rely on the provision of IT services, including e-mail, internet, data transfers, Tough books, work management tools and information security. Each service needs regular updates to keep track with changes in technology and to improve the efficiency of our business units.

From the point at which a customer request is received, our employees are reliant upon IT systems: job details and maps can be delivered directly to field agents equipped with mobile devices; the speedy transfer of job data shortens the response time and increased preparedness. Our ability to plan also requires the speed and accuracy of data access that can only be gained through modern IT systems. Without these, the number of employees required to achieve the speed & appropriateness of response would be significantly increased.

Consequently, failure to invest in the maintenance and support of our IT systems and equipment will have a detrimental effect on the performance and capability of our business, with a subsequent negative experience for customers, employees and other stakeholders.

Historical Investment

We have made major investments over the past few years in systems to support business change, resulting in a significant improvement in services since 2010, and continue to work to optimise our use of technology. We also have to ensure that we meet the changing demands of our operating environment, including cost challenges and changes to environmental and business circumstances.

AMP5 & 6 have seen investment schemes delivered to stabilise service, principally through CAPEX schemes to replace/enhance aged infrastructure assets and their control systems, but also investment in end-point device assets (laptops etc.).

Our outturn forecast for AMP6 is £113.63m. This investment allowed our in-house IT systems to grow our internal service offering and restructure to retain more intellectual property internally, with

the outputs enshrined in a major out-sourced services contract.

This stabilisation has allowed performance to be improved and updated Service Level Agreements captured as part of our IT contract renewal.

Planned Investment

Our planned investment is £64.21m across our IT systems during PR19 (Table 11). We anticipate continuing to invest in long-term IT systems. Current business needs are prioritising speed and agility/flexibility in provisioning of solutions; this is likely to guide change in the IT spend.

The major out-sourced contract which commenced in March 2017, has an inbuilt contract breakpoint and will require a review of needs in the first year of AMP7 ahead of the first break point in 2022.

The growth in demand for digital assets across the business will drive different patterns of investment – with investment solutions characterised by pace of change in technology.

Investment area	£m
IT Maintenance	53.51
IT Support	10.70
Total	64.21

Table 11 AMP7 proposed expenditure on Systems and Change

During AMP7 we will start investment in innovation and faster evolving solutions to support our customer promises and meet the Strategic Responses set out in Water 2050.

Uncertainties and Risk Management

The rapid rate of change and innovation within IT presents a significant challenge when planning how to deliver against investment outcomes. Capital interventions planned now may be impacted by the emergence of new technologies and products in the market place; such is the intensity of innovation that a dominant vendor, or product set, could easily be supplanted completely within the space of an AMP. The challenge is further compounded by the fact that the pace of innovation is greatest in the consumer sphere, driving rapidly evolving expectations amongst employees and customers. These expectations must be balanced against our

stated objectives of ensuring maximum value from asset investments and more practical concerns relating to security and privacy.

The corporate IT system extends across all operating parts of the business and the risks can be categorised into two overarching areas:

- Consideration of IT corporate systems at a strategic level (external threats, internal service provision, detailed technical risks).
- Focusing on the impact of failure of a specific system, application or service (corporate IT system support, storage areas, service tracking tools, billing systems etc.).

The major uncertainty around regulatory change poses a significant risk / influence on the delivery of

our proposed plans. These are summarised as follows:

- Changes in UK legislation & guidance relating to CPNI / Cyber Security
- Creation of new standards which require investment in IT infrastructure and/ or software systems
- Uncertainty around Brexit / EU Regulatory change.

We anticipate that developments in the IT marketplace will see a more diverse range of asset-investment options where security, cost and agility variables can be balanced according to business needs.

11 Automation, Telemetry and Controls

Investment Need

This investment case considers the investment required to maintain our Automation, Telemetry and Controls (AT&C) systems across all our water and wastewater treatment works, water distribution assets and wastewater collection assets.

These AT&C systems and equipment, like our other assets and equipment, have a limited design life and are subject to ongoing use and wear. They are also vulnerable to underlying obsolescence issues such as outdated and unsupported hardware and operating systems, whilst being increasingly susceptible to cyber security threats.

In 2016 we engaged supply-chain expertise to carry out a root & branch review of the whole automation estate with regard to the current cyber security vulnerabilities. A three phase plan was produced. The results of this review provide a decision tool for our maintenance program for the next AMP, the replacement of multiple legacy products removes a major cyber threat from products that are either unsupported or unable to be patched to the latest revision of operating system or firmware.

With our significant reliance upon AT&C equipment to support customer service, failure to invest in the maintenance and support of our AT&C estate will have a detrimental effect on the services we provide to our customers and the environment.

Historical Investment

Investment of our AMP6 plan focused on addressing risks associated with obsolete legacy Supervisory Control and Data Acquisition equipment (SCADA), Programmable Logic Controllers (PLCs) and associated Operating Systems.

In light of better information in AMP6 as a result of the root and branch review², the level of investment for AT&C was increased to enable the replacement all ‘at risk’ sites caused by operating systems that are no longer supported and have

obsolete hardware. Whilst we increased the level of investment, replacement of these systems will need to continue into AMP7. Our outturn forecast for AMP6 is £33.66m.

We have identified a phased controlled migration and upgrade to allow equipment to be replaced and allow future spare holding until investment is realised in AMP7 and future AMPs.

Planned Investment

Our proposed expenditure for AT&C in AMP7 is £46.35m (Table 12). Our proposals will continue the replacement of the remaining ‘at risk’ SCADA equipment and to commence the PLC replacement programme.

Investment area	£m
Water maintenance	22.96
Wastewater maintenance	23.39
Total	46.35

Table 12 AMP7 proposed expenditure on AT&C

The programme is designed to support our business aspiration to become a truly world class, resilient and sustainable water service for the benefit of future generations. This investment will also contribute towards our Water 2050 ‘Smart Water Business’ strategic response and support a number of other Strategic Responses.

Uncertainties and Risk Management

The scope of the investment is wide and impacts on a large number of our assets. We will ensure we are able to capitalise on technological advancement opportunities which will improve the service performance and resilience of our assets through remote sensing, data analysis and automation.

As we have chosen to take an affordable phased approach to the maintenance and replacement of our aging and often outdated AT&C equipment, there remains some uncertainty as to how robust the residual ‘non-upgraded’ equipment will be to cyber security threats.

² This detailed survey this identified a further 1,100 assets, with the majority deemed legacy assets and some even unsupported.

12 Health & Safety

Investment Need

We believe that everyone who works on our behalf, or is affected by what we do, has a fundamental right to return home safely at the end of each day.

We are the sixth largest of the ten water and sewerage companies in England and Wales and employ over 3,000 employees. As a major employer we have a duty to protect our employees (and where relevant wider society) in the day to day delivery of the services we provide. As a duty holder we are obliged to focus on controlling significant risks by thinking about how accidents and ill health could happen and concentrating on those risks that are most likely and could cause most harm.

This investment case outlines our proposals for investing £48.64m during AMP7 to maintain our responsibilities toward the protection of our employees and the general public within our organisation's working environments. We are aiming to reduce the number of RIDDOR incidents to five per annum by 2025 by managing health and safety and our statutory compliance risk in a more controlled environment.

Regulatory Requirements

The law on health and safety at work in Great Britain is regulated by the Health and Safety Executive (HSE) and local authorities (LAs). Between them, HSE and LAs regulate a diverse range of work activities and workplaces that have different levels of health and safety risk. The primary responsibility for managing these risks lies with the business or, in some instances, the person that creates the risk.

We have a legal duty to protect and safeguard our employees under the Health and Safety at Work Act, 1974, which, along with adhering to a suite of complementary regulations and supporting range of Approved Code(s) of Practice (ACoP), which provide a clear framework for us to understand, assess and implement the requirements.

Historical Investment

At the end of AMP6 we forecast to have spent £27.22m under the umbrella of health and safety, including major programmes that have delivered our statutory maintenance obligations. This

investment also included the provision of a number of surveys which have informed the need for investment in AMP7.

Our AMP6 investment has delivered sustained improvements in our health and safety performance. The RIDDOR Incident Rate (per 100,000 employees) for 2017/18 was 278; this is the lowest it has been in the last 10 years.

During AMP5 we commissioned a study to identify the risks associated with compliance with the Electricity at Work Regulations 1989 (EaWR) across our asset base in order to understand the current status. The findings of this study have allowed us to develop our approach to maintaining compliance and informed our proposals for AMP6 and AMP7 expenditure.

Planned Investment

We are proposing £48.64m of expenditure in AMP7 to deliver our Health and Safety obligations (Table 13). This figure is greater than our forecast AMP6 outturn as we have budgeted for significant expenditure on our high and low voltage electrical assets which are aged assets that are at increasing risk of being not compliant with EaWR. Also their age and condition threaten the resilience of our treatment plants through reliability issues that are exacerbated by obsolete components and limited access to spares.

Our AMP7 investment will continue to be anchored to the themes within our Health, Safety and Wellbeing Policy:

- Maintaining a health and safety management system (conforming to BS OHSAS 18001).
- Allocating health and safety roles appropriate to our organisational and management structures.
- Ensuring that our employees and those working with us are competent to meet the requirements of our health and safety management system and are able to minimise health and safety risks.
- Setting and reviewing, at least annually, health & safety objectives as part of our improvement strategy and continually monitoring and improving our health and safety performance.

Cross Service Maintenance

- Identifying, and where reasonably practicable, adopting ‘best practice’ in managing health, safety and wellbeing. With a minimum standard of compliance with all relevant legal and other requirements designed to prevent injury and ill health.
- Consulting with our employees on matters relating to their health, safety and wellbeing while at work.
- Ensuring that all who work on our behalf are familiar with this policy, our expectations and the arrangements in place to prevent injury and ill-health.

We intend to build on the behavioural changes that have been put into place in this AMP so that they still remain in the forefront of all employees and continue to make sure colleagues lives are safe and happy both in work and at home.

Targeted items which we will focus AMP7 investment on include (but are not limited to):

- Health and safety initiatives for all employees.
- Major and minor health and safety interventions on structures and equipment at our operational sites.
- Adherence to relevant ACoPs and other guidance to ensure compliance with our statutory maintenance obligations.
- Delivering the 2nd phase of our EaWR work to ensure our High and Low voltage electricity assets and equipment are safe and reliable.

Investment area	£m
H&S at work	48.64
Total	48.64

Table 13 AMP7 proposed expenditure on Health & Safety

Uncertainties and Risk Management

Although the size of the asset base has not changed significantly, our increased investment in AMP7 compared to previous AMPs reflects our desire to understand the risks associated with our assets and move towards a greater level of control in the management of risk, developing the transition into

planned life-cycle maintenance, for example or proposed EaWR expenditure.

Given our long history of installing, operating and maintaining our assets, the risk modes and remedial techniques are well understood. However, where possible, we will always seek innovative solutions to resolve health and safety issues within our asset base and be willing to accommodate recommendations for improving the integrity of our workplace health and safety systems. This in turn will enable us to manage elements of uncertainty whilst managing, mitigating and / or removing risks to our employees.

Our strategy document WW2050 identifies future trends that will have an impact upon our business and the services we provide. We have taken these into account when developing our proposed programme for AMP7 and are beginning to take measures to manage these impacts. To enable us to react to a changing risk profile in the future, we will maintain flexibility in our investment portfolio. The known high priority risks will be addressed in the first few years of the AMP, thereby retaining the ability to address additional risks if they are realised. Our processes have been designed to react to changing risk priorities.

Allowance has been made for detailed investigations of high consequence assets to aid with contingency planning in the event of a failure.

We will continue to review the appropriateness and costs of our specialist providers to seek opportunities for more efficient delivery of the services we require.

Where possible, and recognising the cultural change required in doing so, we will explore the opportunity to deliver remedial work via our existing operational craft teams thus reducing our reliance on external organisations, whilst developing the skill sets of our own employees.

Cross Service Maintenance

13 Efficiency Investment

Investment Need

In order to realise further opportunities for cost savings through efficiencies, we have developed a programme of initiatives for AMP7 that will accelerate the delivery of savings. In order to realise these savings, initial 'start-up' expenditure in AMP7 will be required to unlock these opportunities.

Historical Investment

Our approach to Efficiency Investment has been phased over AMPs 5 and 6, where we have identified and invested in projects that deliver defined efficiency benefits within a defined time frame. These have been funded as and when from the overall programme budget.

By the end of AMP6 we will have delivered schemes to improve efficiency that included (but are not limited to):

- Closure of a depot.
- Pumping efficiency improvements.
- Installation of maintenance free flow meters.
- Project to avoid re-work in water network distribution.
- Work management scheduling.
- Treatment / Network re-configuration.

Planned Investment

We are proposing to invest £6.23m in AMP7 initiatives that will deliver efficiency over and above their capital outlay over a defined payback period (Table 14). The total TOTEX efficiency saving from these initiatives within the AMP7 period will be ~£141.0m.

Areas of focus will be around (but are not limited to) a continuation of AMP6 initiatives and:

- Set up of our water Network Alliance.
- Optimisation of treatment processes.
- Development of a more efficient pro-active and planned maintenance environment.
- Further pump control and efficiency improvements.

Investment in our initiatives will continue to be undertaken against a set of criteria that ensures that the initial outlay is paid-back within a defined pay-back period, along with monitoring the delivery of future savings.

Investment area	£m
Efficiency Investment	6.23
Total	6.23

Table 14 AMP7 proposed expenditure on Efficiency Investment

Uncertainties and Risk Management

With this type of investment there are instances where there is uncertainty around the potential success of the project. This can happen when unforeseen issues arise during the delivery phase of the project (e.g. a like for like replacement in terms of fittings requires unexpected additional capital maintenance expenditure). We will ensure our Efficiency Investment programme continues to identify new means of achieving efficiency through up-front investment and we will retain flexibility in our programme to ensure that the most lucrative projects in terms of efficiency savings are prioritised over those delivering comparatively less.

Cross Service Maintenance

14 Assurance

Governance

Best practice governance is at the heart of our PR19 approach. Our internal planning processes and external stakeholder activities have been subject to rigorous challenge, whilst also providing a 'clear line of sight' from our customers, the Board and all the way through to our front-line operational teams. Our hierarchy of PR19 governance (established in 2016) each level with different responsibilities, track the plan as it develops through the PR19 programme at defined and regular milestones. Each iteration and subject area of the programme being subject to review and challenge by the Executive and Board.

Our approach provides those informed and accountable within our TOTEX Groups (Heads of Service and senior leaders) with both the opportunity to positively influence the scale and content of the Investment Case whilst providing them with first-hand assurance of the plans' content and objectives. The TOTEX Groups take account of the latest constraints, performance, customer sentiment and wider issues to challenge proposals in order to determine optimal programmes for their respective areas. Outputs from the TOTEX groups are the basis for our Executive's and Board's decision making. Once the overall plan is signed-off through the PR19 Governance Structure, it is taken forward to form the basis of our submission and AMP7 plan.

We have a gateway approval process that all capital projects must pass through to ensure there is sufficient scrutiny and challenge from senior management.

We will continue to apply these effective governance systems during the delivery of our proposed AMP7 investment programme.

Cost Assurance

We have developed the proposed cross service investment plans through consultation with our dedicated teams responsible for their respective

delivery. The majority of the costs within this investment case are from:

- Actual rates from current, identical activities.
- Direct quotes from supply chain providers.
- Our Unit Cost Database³.

Customer Consultation Assurance

Although there is minimal direct customer engagement on the specific investment categories presented in this investment case, we have taken the wider results and themes from our comprehensive Customer Research into consideration during the development of this case.

In doing this, it is only right that we seek assurance that both our approach to engagement and the results are a true reflection of customer and wider stakeholder preferences. We have done this by commissioning an independent peer review of the Willingness to Pay (WtP) research methodology and its findings by a subject matter expert. This peer review stated that the research has been '*expertly undertaken*' and that the '*WtP values, results, in terms of impact scores for customer preferences for improvements, appear to be accurate, and most seem to be intuitively reasonable*'.

We have also contributed to an industry-wide comparative review of the WtP results from PR19 WtP research from across the Water and Sewerage Companies to provide assurance that our WtP results are not over or understated in comparison with the rest of the industry.

As a result, we are confident in the findings from our Customer Research and their application within our Business Plan and within AMP7.

Future Assurance

We have strong governance procedures for the planning and delivery of our capital investment. We will make sure that the required processes are in place to assure the successful delivery of our maintenance projects. As per PR19, we will also

³ Costs for our PR19 projects are produced using our Unit Cost Database (UCD) which holds the historical costs associated with delivering projects in the current and previous investment programmes (AMP 4 through to and including AMP6). The UCD generates cost

models using the industry standard 'Engineering Estimating System' package, the capture mechanism for historical costs and subsequent statistical cost analysis (utilising 'Engineering Statistical Services Limited' software).

Cross Service Maintenance

have strong Governance structure around PR24 to ensure that we develop and deliver affordable investment plans that have been influenced by our customers and key stakeholders.

During PR19 we have developed a challenging set of Performance Commitments for our Business Plan and AMP7. By delivering the proposed in this

Investment Case during AMP7, we will be supporting the wider business in the achievement of these targets (further information can be found in the supporting document 5.2 PR19 Performance commitments).