Anglian Water

IAP RESPONSE

IAP Response April 2019

RESPONSIBLE BUSINESS OF THE YEAR 2017
BUSINESS IN THE COMMUNITY

THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2015

love every drop.
anglianwater

EXTERNAL RECOGNITION

Winner

Utility Week
Utility of the Year

WINNER
UtilityWeek AWARDS 2018
Utility of the Year

Glassdoor Best Places to Work
Employee's Choice 2019

glassdoor 2019 BEST PLACES TO WORK

Business in the
Community Responsible
Business of the Year

RESPONSIBLE BUSINESS OF THE YEAR 2017 BUSINESS IN THE COMMUNITY

ROSPA Gold - Anglian
Water and @One Alliance

2018 ROSPA Gold Award

Queen's Award for Enterprise:
Sustainable Development

THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2019

Glassdoor Highest Rated CEOs
Employees' Choice 2017

glassdoor 2017 HIGHEST RATED CEOs Employees' Choice

Leading Utilities
of the World

LEADING UTILITIES OF THE WORLD

Green Finance Award

DEALS OF THE YEAR

British Construction
Industry Award

bcia 30th anniversary 2017 · mabey · british construction industry awards WINNER · CARBON REDUCTION PROJECT OF THE YEAR AWARD

Utility Week Awards

UtilityWeek Awards 2017 WINNER Capital Project Management Award

UtilityWeek Awards 2017 WINNER Supply Chain Excellence

IAP RESPONSE 1 APRIL 2019

1. EXECUTIVE SUMMARY

1.1 Our Plan

Our September submission set out the Plan that we considered was the right plan for our customers, our region and the environment, for now and for the long term. Our Plan builds from our refreshed 25 year Strategic Direction Statement which we published in 2017 after extensive consultation with customers. We remain committed to our SDS ambitions, and to our Plan, but note that they cannot be delivered unless the gap between our view of the necessary costs and the position Ofwat has currently set out can be very significantly reduced.

We are pleased that Ofwat's Initial Assessment of Plans (IAP) recognised many of the strengths of our Plan. It noted the sector leading breadth and depth of our customer engagement and that this has been reflected in our Plan.

Ofwat also viewed positively the outcomes we propose to deliver for our customers, also designed with reference to the evidence provided from our customer engagement. This includes proposals to take the leakage frontier from sector leading to world leading.

We were also glad that Ofwat's assessment acknowledged the strength of our approach to addressing affordability and supporting vulnerable customers. The scale of this, offering support to 475,000 customers in each year of AMP7, is unprecedented.

In total, our Plan proposes a 30% increase in investment compared to the previous AMP. The bulk of this increase relates to the delivery of plans to ensure our region is resilient to the risks of drought and flood, whilst also facilitating the delivery of our statutory WINEP programme and responding sustainably to growth pressures.

Ofwat is challenging our Plan on the basis of both scope and efficiency. The difference between us is around £1.25 billion, with a challenge of around £590 million on the enhancement elements of our Plan and around £660 million on our base operating expenditure.

However, Ofwat's view of Anglian Water's current position is that the company is reasonably efficient. It is hard to reconcile this with Ofwat's view of the Plan we submitted, which was built up from that reasonably efficient baseline position, with efficiencies achieved during AMP6 baked in, and additional efficiency challenges then added.

Delivering the investment we propose is in line with the clear priorities of our customers, who support taking early action to address the resilience risks we face, rather than delay. We believe our plan also fits with the policy objectives set out in the Government's Strategic Policy Statement, and the conclusions of the National Infrastructure Commission in its recent report "Preparing for a Drier Future".

To enable the delivery of these outcomes, we proposed in our September Plan to increase bills by less than one percent in AMP7, after applying an additional stretch efficiency challenge to reduce the impact on customers. This increase was well below what the majority of customers considered acceptable, was in the context of restraining dividends through to 2025 resulting in a significant reduction in the company's level of debt and gearing, and against a backdrop of our having delivered the largest reduction in bills in the sector in PR14.

With the changes we can now make to our Plan, in particular as the announcement of the metaldehyde ban allows us to remove previously proposed expenditure to address the impacts of metaldehyde, customer bills will now reduce slightly during AMP7.

1.2 Overview of this IAP response

This IAP submission serves two main purposes. Firstly, it sets out in full our responses to each of the specific actions that Ofwat has requested in the IAP. These are clearly signposted throughout this document, which we publish alongside our completed action tracker, updated data tables and associated commentaries.

Secondly, it provides analysis, evidence and comment on the approaches used by Ofwat in deriving policy positions in the IAP which have a significant impact on the overall assessment of our Plan. This includes evidence which suggests some changes to Ofwat's approach may be needed. Of particular importance are proposals on:

- the approach to botex modelling;
- the approach to enhancement modelling;
- the allocation of costs between botex and enhancement and
- the approach to leakage, including the calculation of our leakage cost adjustment claim, and the proposed outcome delivery incentives for frontier performance.

We have also provided evidence which supports a review of Ofwat's initial decision to:

- disallow 20% of costs related to elements of our Water Resource Management Plan for reasons related to "insufficient justification of scope", which is in addition to the cost efficiency challenges being raised;

We believe changes are needed in these areas so that robust conclusions can be reached on the right amount of costs required to deliver the necessary outcomes for customers and the environment. These changes are also important beyond PR19. Given the scale of future challenges on drought, flood and growth, it is essential that PR19 provides a sound investment base to maintain asset health over the longer term. We ask Ofwat to consider all of this evidence as it works towards a Draft Determination.

In relation to ensuring adequate capital maintenance expenditure we remain concerned to see that the work which we and others put into the 'Market Place for Ideas' on capital maintenance, and which aimed to inform this Price Review, does not appear to have been taken into account. These contributions aimed to address concerns arising during PR14. We plan to undertake further analysis of this issue and would welcome the opportunity to work with Ofwat further on this important set of questions.

1.3 Customer protection

We agree with Ofwat that customers should be appropriately protected from either inefficient investment or instances where investment is no longer required.

In recognition of the scale of our proposed AMP7 investment we propose the following mechanisms:

- **WINEP adjustment mechanism**: An adjustment mechanism to return expenditure associated with investment in current "Amber" schemes which do not in future receive ministerial support. This proposed mechanism returns 90% of assumed expenditure. We have actively sought customers' views on this approach; the majority agree that this proportion is an effective way to incentivise us to continue to challenge whether schemes are required in this area;
- **Growth uncertainty mechanism**: Our Plan has been developed in accordance with local authority growth planning assumptions, which mirrors the approach in our Water Resource Management Plan. Our local authorities forecast significant future housing growth in the region, including flagship new town developments at sites such as Northstowe, Waterbeach and Alconbury. We have not added in the potential for additional needs resulting from the planned developments along the Oxford-Cambridge Arc so we believe we have taken a measured approach. However, in this submission we propose a mechanism to protect customers in the event that growth is slower than anticipated in our Plan, and which would also allow for adjustments should additional growth pressures materialise during AMP7. We believe that this mechanism should be considered alongside further assessment of the allowance that should be made for growth expenditure.

In the IAP, Ofwat makes it clear that it does not consider that the Outcomes framework provides sufficient protection for customers in areas of significant enhancement expenditure. The investment proposed in our Plan relating to strategic interconnectors and smart metering is drawn from our Water Resources Management Plan and is necessary to ensure that we protect both today's and tomorrow's customers from the resilience challenges created by climate change, reduced levels

of abstraction, and growth. Investments of this nature and scale are not discretionary; they are vital to ensure our region has sufficient water to meet future demand. We have proposed further mechanisms to ensure customer protection in these areas.

In relation to the strategic regional solution development, we provide further evidence to address Ofwat's specific questions.

1.4 Cost efficiency

We have carried out a comprehensive review of Ofwat's models and its approach to deriving an initial view of our expenditure requirements. Our response draws on independent third-party input in areas which have a material impact on setting efficient allowances such as botex and enhancement modelling, approaches to inflation, the treatment of enhancement opex, approaches to Real Price Effects and future productivity assumptions.

Where our review has identified either errors in calculation (for example in the leakage base cost adjustment factor) or shortcomings in the analysis undertaken by Ofwat (for example the treatment of enhancement opex), we provide, where possible, suggested remedies to resolve them. We believe these will serve to increase customer confidence that the right level of expenditure required to deliver these essential investments has been determined.

Where, as part of this assessment, Ofwat has requested further information and/or justification for expenditure proposals we provide this.

As part of this chapter, we also provide Ofwat with further information on our overall approach to the development of our Plan and further evidence on the robustness of our processes and outputs.

1.5 Outcomes

Overall, we were pleased to note that Ofwat believes that we have provided good evidence to support our approach to Outcomes. In the Outcomes chapter we provide responses to Ofwat's questions and present additional evidence in areas where we have undertaken further research.

We accept Ofwat's recommendations that we should add both an additional affordability performance measure and a measure to achieve the British Standards Institution (BSI) standard for inclusive services to our suite of outcome measures.

Our customers support the retention of a reward for delivering our performance commitment for the Priority Services Register (PSR), which Ofwat has acknowledged is a sector leading target.

However, regarding leakage, we disagree with Ofwat's views on the appropriate incentives needed to help move forward the industry frontier. Our customers view leakage as a totemic issue and repeatedly indicate it as their highest service priority. The incentives proposed in our September plan are reflective of that customer engagement, consistent with the desire of our customers that we should continue to prioritise leakage reduction, and provide appropriate incentives for the sector as a whole to aspire to reach frontier levels of performance. However, we have revised our original leakage ODI proposals and set out for Ofwat's consideration an alternative approach.

1.6 Customer engagement

We have no specific actions to complete in the customer engagement test for IAP. We have, however, asked customers for their views regarding the relatively minor changes to our Plan now being proposed. We have also obtained additional evidence from customers relating to their view on issues such as executive pay, our WINEP adjustment mechanism, and the use of deadbands for ODIs. The detailed results of this further engagement are set out within each relevant section of this document. We have also continued to engage our Customer Engagement Forum on areas where we have conducted further engagement.

1.7 Financeability and financial resilience

The Board has considered further evidence to assure itself that the business plan is financeable on both the notional and actual capital structures, based on Ofwat's indicative WACC.

Specifically, the Plan achieves the credit metrics for Baa1 rating under the notional and actual capital structure at Ofwat's indicative WACC, but only just. We have published in the Marketplace for Ideas a paper that builds on analysis we shared with Ofwat in Summer of 2018, to show the relationship between WACC, credit ratios and target credit ratings and how this affects the assessment of the financeability of the notional company.

1.8 Further commitments

In its IAP, Ofwat requests a small number of further commitments across several test areas. We have reviewed these requests and confirm that:

- Securing long-term resilience: We believe that our systems-based approach to resilience, which we developed with Arup, and which has now been adopted by a number of other companies, including United Utilities, is a strong one. We want to build on this over the coming year, and will set out an action plan by August 2019 to set out those further improvements.
- Securing long-term resilience: Asset Health metric development - In collaboration with United Utilities, we have developed a proposal for UKWIR to develop a suite of measures with common, industry standard definitions.
- Targeted controls, markets and innovation: In September 2018, we became the first company to publish our Long term Water Recycling Plan. Following IAP feedback, we commit to provide Ofwat with a detailed workplan by August 2019 which builds on work already underway.
- Accounting for past delivery: We will provide updates to our forecast performance commitment outcomes by mid-July.
- Securing confidence and assurance: Our IAP response sets out further detail to explain how we propose to create a stronger, more visible link between Executive Pay and delivery for customers in AMP7, and explains how we have engaged customers on this topic.

No further customer protection mechanism is proposed for investment relating to metaldehyde as we have removed this expenditure from our Plan as part of this IAP response.

1.9 Board assurance

Our Board has responded to the eleven IAP company actions relating to 'Securing confidence and assurance' by providing a revised Board Assurance Statement. This updates the one submitted in September 2018. The revised document includes compliant statements for each of the eight specific areas set out by Ofwat.

Assurance has also continued to play an important role as we have developed our IAP Response. Additional assurance activity has included reviews by third parties of our responses to Ofwat's post-submission queries, changes to data tables, technical and financial models, further customer engagement activity and changes to performance commitments. Assurance in a wider context has also been sought from a range of subject matter experts who have provided evidence to support this IAP response.

The Board has continued to challenge management in the development of this IAP Response. This included participating in a workshop held in March 2019, organised at the request of the Board, where Board members reviewed evidence and provided challenge to ensure we had considered all relevant elements and had addressed all of Ofwat's areas of concern.

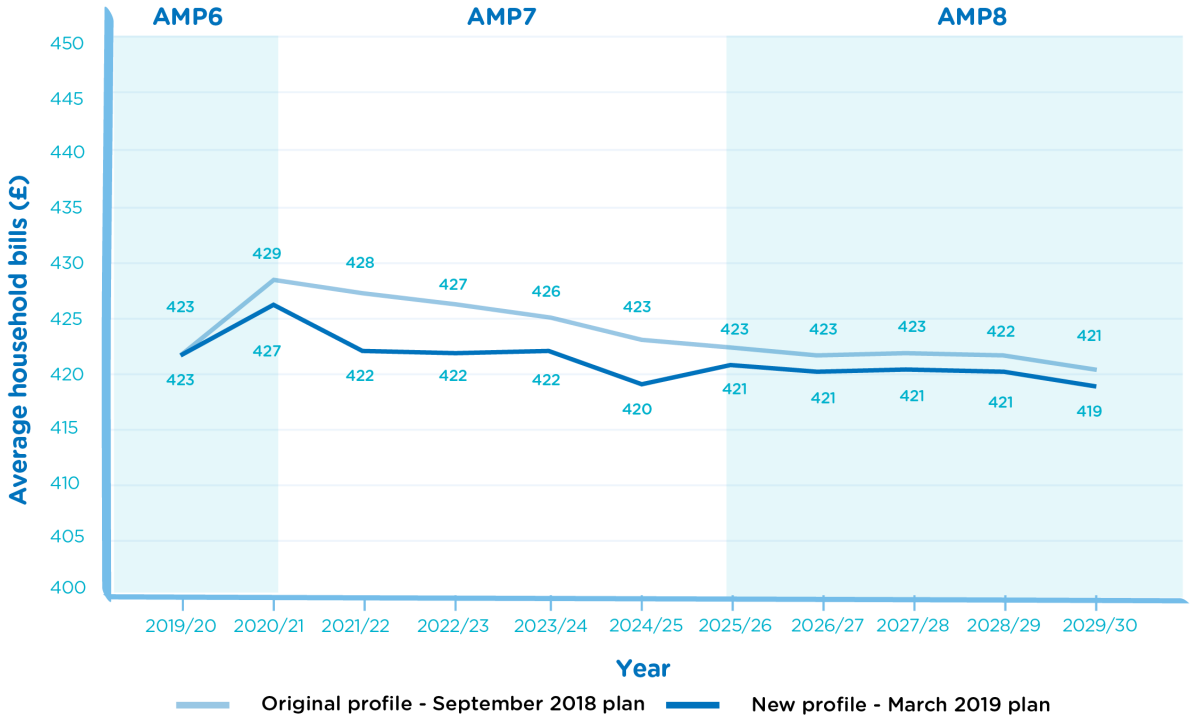
1.10 Bill impact

Subsequent to the submission of our Plan in September 2018 there have been a number of changes which affect our proposed AMP7 investment programme. Firstly, in response to the proposed metaldehyde ban we have removed the associated £68 million investment from our Plan. Secondly,

we have continued to work with the Environment Agency to clarify the AMP7 requirements for storm tank and flow investments under WINEP. This has resulted in a decrease in the total number of WINEP schemes required in AMP7, offset by adopting EA guidance which increases the costs of some investments. Finally, we have updated our forecast expenditure in 2018-19 reflecting the fact we now have more actual data than was available to us when we submitted our Plan in September.

The net impact of these changes reduces bills from the September profile. Overall bills will now decrease by 0.1% over AMP7.

Anglian Water Future average bills 2017/18 price base, AMP8 based on projections



We have engaged customers through acceptability research and via our online community. 91% of respondents viewed our revised plan as acceptable when assessed on a like for like basis with our September 2018 plan.

2. GUIDE TO OUR RESPONSE

Our IAP Response to Ofwat is comprised of the following documents.

Title	Supporting documents	Detail
Ofwat Template tracker		As requested.
IAP Response Document	3a. Incling Report: Feedback from Love Every Drop online community. 3b. Executive Pay Incling Report. 3c. Accent acceptability research on revised plan, March 2019' 4a. Joint statement on strategic regional solution development 4b. WINEP Expenditure Profiles 5a. Professor David Saal Report: A Review of Ofwat's January 2019 Wholesale Water and Wastewater Botex Cost Assessment Modelling for PR19 5b. Reckon: Review of the treatment of enhancement opex in Ofwat's PR19 Initial assessment of business plans 5c. First Economics - A review of Ofwat's PR19 approach to estimating frontier shift 5d. Vivid Economics: Enhancement cost assessment modelling for the PR19 Initial Assessment of Plans 5e. Vivid Economics WWW models audit log 5f. Vivid Economics WW models audit 5g. KPMG Smart metering benchmarking 5h. KPMG SPA report 6a. NERA Assessing Ofwat's Funding and Incentive Targets for Leakage Reduction 8a. PR19 Notional financeability document 8b. Social Impact Assessment and Assurance 8c. E&Y Target credit ratings for water companies at PR19 8d. Shareholder letter 8e. Moody's covenented financing structures help mitigate growing risks 10a. Jacobs PR19 IAP Technical Assurance Report 10b. Deloitte Financial Assurance Release Letter for Ofwat 11a. KPMG DPC for Customers IAP Response	Main document responding to Ofwat's IAP. It has two main purposes: • firstly sets out in full our responses to each of the specific actions that Ofwat has requested in the IAP; • secondly, it provides analysis, evidence and comment on the approaches used by Ofwat in deriving policy positions in the IAP which have a significant impact on the overall assessment of our Plan.

Revised Board Assurance Statement		As required by actions ANH.CA.A1-ANH.CA.A6 and ANH.CA.A9.
Revised Data Tables	Table Commentaries • Appointee (including Financial Model commentary) • Wastewater • Water • Retail	Updates made to data tables since our September Plan are detailed in the front of each table commentary. Enhancement business cases providing company specific evidence in response to assessment of costs included in table commentary for WS2 and WWS2.
ANH Financial Model	Financial Model narrative included in Appointee table commentary	
Revenue adjustments feeder model		As requested.
RCV adjustments feeder model		As requested.
Totex menu model		As requested
Bill Waterfall Model		As requested

3. ENGAGING CUSTOMERS &ADDRESSING AFFORDABILITY AND VULNERABILITY

Ofwat's test area assessment: Engaging customers

Overall test area grade	Overall test area summary assessment and rationale
A	Anglian Water's business plan provides a wide range of convincing evidence to demonstrate an overall high quality, ambitious and innovative approach to customer engagement and participation. It also provides convincing evidence of how customer engagement has been reflected in the business plan and in ongoing business operations. The company provides sufficient evidence of a high quality, innovative and ambitious approach in the following areas: • The effective use of a wide range of customer engagement techniques, (both on triangulation and segmentation) including innovative multi-stage willingness to pay research for which assurance was provided. • The approaches to customer participation and adopting the four areas of action in the Tapped In report including involvement of customers in situations of vulnerability and future bill payers. • The approach to engagement with its customers on longer-term issues and its on-going operations. This includes acceptability and valuation research as well as specific research on resilience and intergenerational fairness. • The company shows how it has taken into account the needs and requirements of future customers in its business plan, such as conducting extensive in-school research with secondary school children on the longer term issues facing the company. The company provides sufficient evidence of a high quality approach in the following areas: • Demonstration of a clear line of sight from the results of its customer engagement to the outcomes its business plan will deliver for customers. Its package of performance commitments has been developed on the basis of robust customer valuation research which has been appropriately triangulated to set incentives that reflect customer preferences and priorities across its package of outcome delivery incentives (ODIs). • Demonstration of on-going engagement with customers via its tracking research, 'the My Account' portal and a customer panel. • Segmentation which allowed it to meet the needs of a range of customers. The company provides insufficient explanation of the reasons for selection of particular groups of vulnerable customers for participation in research and why use of focus groups was the appropriate method of engagement.

Summary

We were pleased that Ofwat recognised the work we have carried out in engaging customers and awarded us an A grade. This reflects the high quality, innovation and ambition of our engagement and how this was used in our Plan. We have no specific actions to complete in the customer engagement test for the IAP.

There are a small number of changes we are making to our plan, and areas where we wish to seek additional customer views. We have sought to test these with customers. The detailed results of this engagement are presented within each relevant section of this response. In summary we have:

- Engaged with 1,122 household and 73 non-household customers on the affordability and acceptability of our slightly revised bill profile. The minor difference is slightly lower average bills. 91% of customers found our plan acceptable and 85% found it affordable. The full report can be found in appendix 3c.
- Engaged through our online community to test:
  - Their views on adopting the two new ODIs on affordability and providing an inclusive service – participants were positive about the introduction of the new ODIs
  - Their view on whether the bathing waters ODI should be reflected in bills annually or at the end of five years – 71% supported this being end of period
  - Their views on deadbands around the performance commitments for leakage, sewer collapses, external sewer flooding and bathing waters – a majority of customers considered these were valuable, support ranged from 53% to 67%
  - Their views on the WINEP incentive mechanism, where we would be incentivised to challenge unconfirmed (i.e. amber) obligations – a majority think our proposal of 10% of scheme costs is acceptable, and most of those who don't support this think we should at least be able to cover the costs incurred
  - The new slightly revised bill profile – was tested and was positively received by participants
  - Our plans on how executive pay should be set - 82% of participants supported a move to structure Exec bonuses around performance rather than profit

We provide the full report as appendices 3a and 3b.

We have also met with our Customer Board to discuss the feedback from Ofwat and our response. The Board are supportive of our approach to amend our plan for changes to legislation and environmental obligations, and to provide additional evidence to support our plan. We provide the minutes in appendix 3d.

Ofwat's test area assessment: Addressing affordability and vulnerability

Overall test area grade	Overall test area summary assessment and rationale
B	Overall Anglian Water's business plan demonstrates high quality with convincing evidence that covers the company's approach to affordability and vulnerability because it: • While it proposes a 1% bill increase, its evidence suggests than its customers were willing to accept a higher increase. The company had high quality engagement on overall affordability; • undertook high quality engagement on long-term bills, including testing bill profiles for the 2025 to 2030 period with customers, and proposed marginally falling bills for the 2025 to 2030 period;

- displays a holistic approach to improving affordability for customers who struggle to pay, including increasing its capacity to the extent it could help 500,000 customers; and
- has a high quality approach to vulnerability, suggesting a performance commitment with frontier performance of 15% for the proportion of customers on its Priority Services Register (PSR) and a stretching commitment on third parties rating the quality of its vulnerability schemes.

The business plan falls short of high quality in one area because:

- The company's approach to performance commitments is not consistent with our PR19 methodology as it proposes two outperformance payment only performance commitments (PCs) for vulnerability. In addition, the company does not have a performance commitment on affordability.

Overview of our IAP response

We are pleased with our IAP assessment in this area. The only actions and potential changes to our Plan in this area relate to performance commitments.

In March, we met with the Vulnerability and Affordability Customer Engagement Forum sub-group, to highlight the customer engagement which had taken place in relation to:

- The new performance commitments for affordability and inclusive service provision (BSI)); and
- Our proposed approach for the common PSR performance commitment and the qualitative performance commitment.

The group supported our approach and emphasised the expectation of the role that customers' views should play in the annual review of our affordability performance commitment. The group agreed that our response to the PSR and Panel performance commitment queries align with the interests of customers as presented in our September plan.

We provide our full response to the actions related to Affordability and Vulnerability in the 'Delivering Outcomes for Customers' chapter of this document.

4. FOCUS AREA: CUSTOMER PROTECTION

Summary

Our Plan represents a fair deal for customers, with an appropriate balance of risk and reward.

As part of our response to the IAP, we are proposing the targeted use of uncertainty and regulatory protection mechanisms. This principally provides customers with additional protection for larger scale components of our proposed enhancement expenditure programme.

These are:

- An ODI type mechanism, that we have developed in conjunction with other water companies, associated with the development of strategic regional solutions.
- A mechanism associated with our Strategic Interconnector Programme.
- A symmetric adjustment mechanism linked to the roll out of our smart meter programme during AMP7 and AMP8
- An uncertainty mechanism for growth.
- A formal true-up mechanism for uncertain WINEP obligations.

No further customer protection mechanism is proposed for investment relating to metaldehyde as we offer full protection to customers by removing this expenditure from our Plan.

Unlike our other chapters in this response, customer protection was not a formal IAP test assessment area, but Ofwat has given prominence to the role of customer protection in the IAP, specifically the protection afforded to customers associated with significant investment and where Ofwat's view is that the Outcomes framework provides insufficient protection.

We support the principle that customers should appropriately be protected from either inefficient investment or instances where investment is no longer required. In this section we propose customer protection associated with the following areas:

1. Water resources strategic scheme delivery
2. Internal interconnection programme (strategic grid)
3. Smart meter rollout
4. Delivering growth
5. Uncertain WINEP schemes

No further customer protection mechanism is proposed for investment relating to metaldehyde as we offer full protection to customers by removing this expenditure from our Plan.

4.1 Ofwat Action: Strategic regional solution development

Action reference: ANH.CE.A3

Strategic regional solution development - We have identified from the plans that at least one strategic supply solution is required over the next 5-15 years to secure drought resilience in the south-east. The strategic regional solution development allocation is to allow the delivery of consistent and transparent investigations, planning and development of strategic options with the overall aim of optimum solutions being construction ready by 2025.

The company's allocation is made on the basis of having clear deliverables and customer protection for the gated delivery of the development of an eastern regional solution/transfer. The following actions are required to ensure the efficient delivery of this development programme.

- *In conjunction with the other companies involved, jointly propose methods for collaborative working including setting up the joint working group for individual schemes, and how consistent assumptions and decisions will be made within these groups and between them.*
- *Provide more detail on the gated process, the deliverables, timings and expenditure allocations at each gate.*
- *Propose ODI-type mechanisms to allow allocated funding to be recovered by customers in the event of the scheme not progressing through each gate and for the non-delivery or late delivery of outputs.*

Our response

We welcome Ofwat's support for proposals on strategic regional solution development and commitment to supporting the delivery of the necessary infrastructure to achieve future resilient water supplies. This is in line with the Government, the NIC and the EA's position.

We have been working jointly with the five other companies and the regional groups to develop a unified, consistent joint response to this action. The companies have met to discuss and progress this work multiple times since the IAP was published. Details of the work that has been completed by the group is presented in the Joint Statement on Strategic Regional Solution Development, provided in Appendix 4a. The report details the proposed methods of collaborative working (including the joint working group that has been established), as well as detail on the gated process, proposals on an ODI type mechanism and a work plan to July Draft Determination.

Ofwat has been engaged in the working group meetings. As a group we are committed to remain open and collaborative to ensure we collectively develop an effective mechanism for delivery of the strategic regional solution programme of work across the companies, and with the regional groups.

We are also working with Affinity Water to set up the joint working group for the eastern regional solution / transfer option.

The current allocation list of schemes proposed by Ofwat is based on draft WRMPs and company business plan submissions. This list of schemes needs to reflect dependencies between company plans and schemes that are developed collaboratively. We do not agree with the current allocation and list of schemes and proposed some suggested amendments. Specifically, the eastern regional solution / transfer option is dependent on the development of the South Lincolnshire Reservoir. Without this resource scheme, there is no upstream water available to deliver a transfer from Anglian Water to Affinity. We present further details of this option and our justification for its inclusion in the strategic regional solution programme below. At this early stage we have not made any amendments to the TOTEX values in put tables to reflect the proposed allocation.

Ofwat's proposals on the regulatory alliance and the recognition of the need for coordinated leadership to facilitate the delivery of joint water resources schemes are supported. This reflects the recent highlighting of the urgency of addressing water scarcity by James Bevan, Chief Executive of the EA. The joint company working group will continue to work with Ofwat to establish the

details of the alliance's role in the gated process. We are committed to ensuring that the role of the regulators as part of the alliance remains clear and aligned with existing statutory processes, specifically the WRMP.

Our views on the Strategic Regional Solution Development Proposals

We see Ofwat's proposals as a significant step forward in supporting the delivery of the future infrastructure required to achieve resilient water supplies in the long term. We also recognise that strategic options have long lead times for delivery and pre-planning activities must be progressed ahead of the final confirmation that a scheme has been selected as a preferred option in a final WRMP, in order to allow timely delivery following confirmation of the need. This is why we, along with other companies in the south east, are advocating an adaptive planning approach that accounts for future uncertainty in the following areas:

- Higher climate change scenarios
- The need to deliver resilience to extreme (1 in 500 year) drought events
- Long-term savings delivered via demand management programmes such as smart metering
- The scale of future sustainability reductions.

Our neighbouring company plans will also include similar levels of uncertainty and therefore we must plan to be able to support these potential future needs together. We have stress tested our WRMP19 preferred plan under future long term scenarios (accounting for the uncertainties described above) and the need for additional resource options has been identified, including the need for a strategic reservoir to support our own needs and a transfer to Affinity Water. Affinity Water have included this option in their revised draft WRMP as part of their adaptive planning approach, and the pre-planning work for this option features in our adaptive planning programme. We also included this option in our Direct Procurement for Customers submission, as the work to prepare for the procurement process is required in AMP7. Adopting an adaptive planning approach allows options to be kept on the table as long as possible, allowing choices that deliver best value for customers and the environment in the long term. We are of the view that the Ofwat proposals should take account of schemes identified in company's adaptive planning programmes, as well as those included in WRMP19 preferred plans as these adaptive planning schemes may be selected in preferred plans at WRMP24 for delivery in AMP8.

The current Ofwat strategic regional solution proposals include the transfer from Anglian Water to Affinity, based on the costs that Affinity Water presents in their WRMP19. However, these costs are not the full development costs for the option, rather are based on an indicative commercial trading agreement provided by Anglian Water for the purpose of supporting Affinity Water's option appraisal process. In order to deliver the 100 Ml/d transfer between Anglian and Affinity the South Lincolnshire reservoir scheme would also need to be delivered. We therefore propose that the strategic regional solution programme includes an allowance for the development of the South Lincolnshire Reservoir option as well as the infrastructure needed to deliver a transfer from Anglian to Affinity. We have included some high level details of the option here for reference, but will continue working with the joint company working group, Affinity Water and Ofwat to finalise a set of consistent scheme costs ahead of draft determination, as set out in the work plan in the Joint Statement on Strategic Regional Solution development document (Appendix 4a). We are in the process of establishing the scheme working group for the eastern regional solution transfer, including the South Lincolnshire Reservoir.

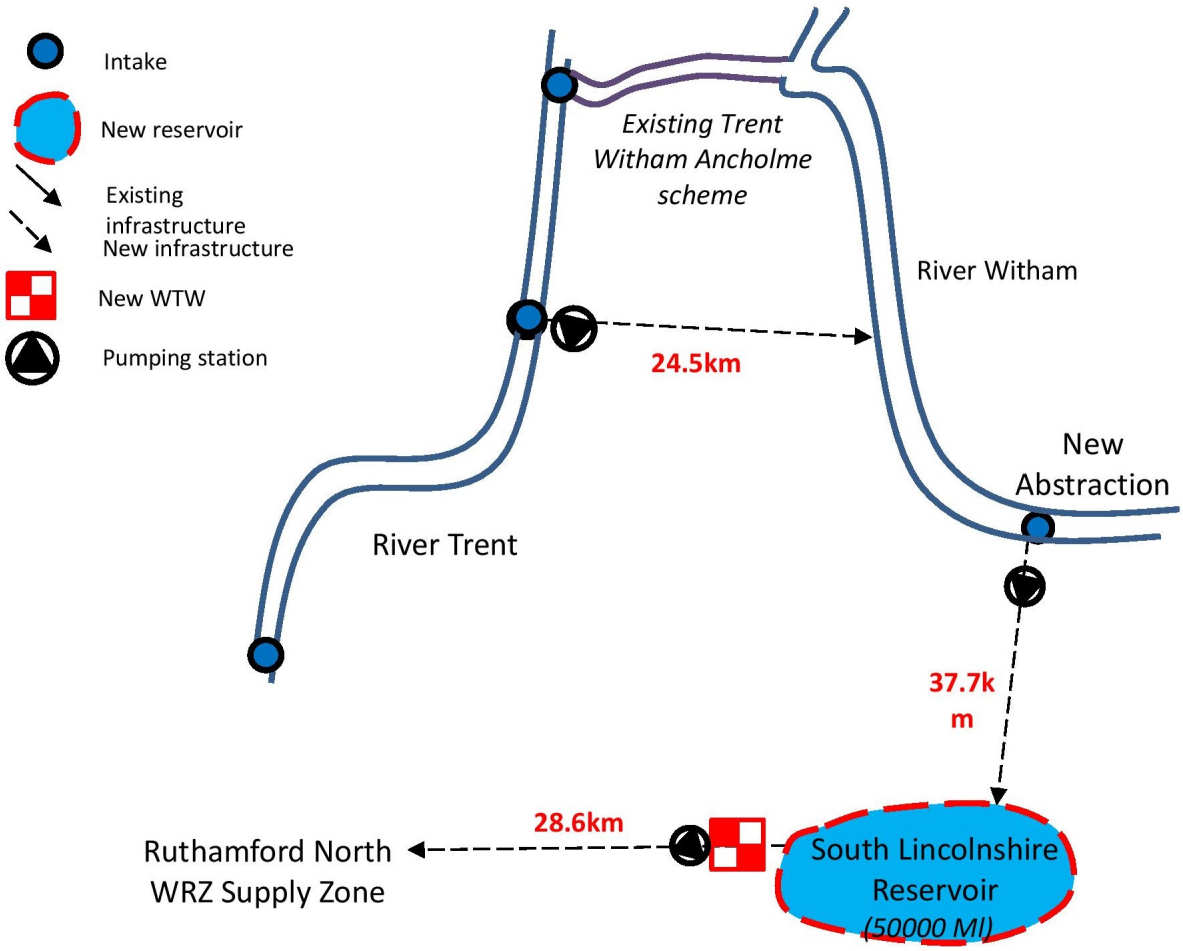
Ofwat's proposals also currently include the Grand Union Canal option for which Anglian Water and Affinity Water are both identified as beneficiaries. The first scheme working group meeting for this option has taken place between Anglian, Affinity and the Canal and Rivers Trust. It was agreed between the companies at this meeting that Affinity Water should be considered the only beneficiary for this option as the scheme is not included in Anglian Water's feasible option list in their revised draft WRMP. We will continue to support the group to identify any synergies with their plan but will not be a core member of the group.

South Lincolnshire Reservoir and Anglian to Affinity Transfer

The South Lincolnshire Reservoir forms part of our set of feasible options in our WRMP19. The eastern regional solution included in the Ofwat proposals is dependent on the delivery of the South Lincolnshire Reservoir in order to provide the upstream resource for the transfer. The scheme is

designed to deliver up to 150 Ml/d from a new bunded pumped storage reservoir of 50,000Ml capacity. The reservoir will be refilled from a new abstraction on the Witham at Boston. The option includes the intake and intake pipelines, as well as a new WTW and a potable supply pipeline into existing network. In addition, there is a new 300Ml raw water transfer scheme from the River Trent to the River Witham for abstraction at Boston. This scheme combined with a transfer pipeline to Affinity Water with a capacity of 100 Ml/d represents a strategic water resources option to support the needs of the south east. A schematic of the option, as taken from our WRMP, is provided below.

Figure 1 South Lincs Reservoir Schematic



The total indicative capex for the reservoir and the transfer to Affinity combined is £952m. Applying Ofwat's 6.4% allocation, as outlined in the supply demand feeder model, would result in an allowance of £61m, split between Anglian Water and Affinity Water.

We have already completed extensive work to prepare for the future delivery of this option, including site selection studies, scoping work for environmental surveys and stakeholder engagement with the South Lincolnshire Water Partnership.

The reservoir scheme has also been assessed as suitable for Direct Procurement for Customers, the results of which were presented in our September Plan.

The Gateway Process and the Regulatory Alliance

We welcome the Ofwat proposals around the gate process and have developed worked with the joint company group to develop some proposed amendments, as set out in the Joint Statement on strategic regional solution development (Appendix 4a).

We recognise that the thinking around the decision making process at each gateway is still in development and we are working collaboratively with Ofwat as part of the joint working group to inform this thinking.

It is imperative that the roles of the regulators in the alliance are clear in the decision making stages of the gateway process. It is our view that EA / Defra have the role of determining the need and preferred options as part of their assessment of draft and final WRMPs. This is clearly set out in existing statutory process. There is also an important role for the regional plans being developed by Water Resources East and Water Resources South East, aligned with the EA National Planning Framework, in determining the need and preferred options being taken through the gateways. These plans will be incorporated within individual company WRMPs.

Ofwat's role should be focused on ensuring that the the work being delivered by the scheme working groups meets the criteria required to pass the gateway, ensuring that the quality of the work delivered aligns with the level of expenditure, that customers are protected and that necessary regulatory approaches are aligned. This is also reflected in the customer protection mechanism proposals as set out in the Joint statement on strategic regional solution development.

4.2 Ofwat Action: Internal Interconnection programme

Action reference: ANH.CE.A2

There is significant investment proposed in delivering the internal interconnection programme and therefore the company is required to propose an outcome delivery incentive in order to ensure customer protection for efficient delivery. The company should provide evidence to justify the level of the performance commitment and the outcome delivery incentive (ODI) rates proposed, in line with our Final Methodology. We expect to receive evidence of customer support for outperformance payments, where proposed, and that the incentive rates proposed are reflective of customer valuations.

Our response

We are clear that the investment we propose in our strategic interconnectors and smart metering are required to ensure that we protect both today's and tomorrow's customers against the risks presented through increasing population, sustainability reductions, drought risk, and a changing climate. Investments of this nature and scale are not discretionary; they are vital to ensure the region has sufficient water supplies in future. These threats have recently been highlighted by James Bevan, CEO of the EA.

We have carefully considered how customers are appropriately protected for delivery of the interconnector programme. In order to provide Ofwat with the confidence required we propose a formal mechanism in this area.

There are strong incentives on us to deliver our WRMP and meet our duty to supply. The WRMP is a statutory process and our licence reductions are legal requirements. We face prosecution for failure. This is supported by further financial and reputation incentives from a number of performance commitments and ODIs that relate to the supply-demand balance. These include:

- Leakage
- Percentage of population supplied by a single supply system
- Risk of severe restriction in a drought
- Per capita consumption

Any further mechanism will overlap with our percentage of population supplied by a single supply system performance commitment. The incentive rate for this ODI is based on customer valuations of improved service (namely resilience against long term interruptions to supply) and our marginal

costs of delivering this improvement. Significant delay and disruption to our customers would result in a negative impact on our reputation with our customers, impacting C-MeX. The total scale of the ODI is significantly smaller than the proposed enhancement expenditure for the interconnector programme.

We are therefore proposing additional customer protection in the form of an 'end of AMP' mechanism to return expenditure associated with our interconnector programme, in the event that certain solutions are not required. This will work in a similar way to a logging mechanism from previous price controls. This is where the required output or outcome is 'logged' up or down and expenditure either recovered from customers in the event of logging up or returned in the event of logging down.

Definition and commitment level

The mechanism will be measured on the basis of "provision of committed solutions to avoid supply-demand balance deficits". This will be measured on the basis of megalitres per day. The mechanism does not proscribe how deficits will be avoided to allow scope for innovation and the most efficient delivery route for the required outcome.

We define committed solutions as those that have been delivered and are in operation or have passed Delivery Milestone 1 of our project delivery governance. DM1 is the Delivery Milestone at which the business, having scrutinised and evaluated an identified need through a collaborative planning process, confirms that it is committing to a financed intervention to be delivered through one of its defined delivery routes. This commitment is formalised by a contractual engagement of the delivery route with an agreed scope of the desired outcome together with agreed financial parameters. Our project delivery governance is well document and audited.

The deficits to be mitigated are derived at the company level from our revised draft WRMP. This is effectively the level of deficit we would expect across our region with no intervention from us. This aligns with our WRMP and is also reflected in our Water Resources Market Information tables. This figure may change slightly as part of the final WRMP.

Table 1 Internal interconnection programme - deficits addressed

Time period	Unit	Deficits addressed
AMP7	Ml/d	76.45

Reporting and adjustment

During AMP7, we will conduct an annual review of our WRMP. This will include the status of the supply-demand balance and whether events have matched the assumptions and forecasts made in the WRMP. This will include the status of deficits and our progress in addressing them. Additional deficits are identified or expected deficits do not occur due to factors outside of our control (e.g. distribution output is written down by the EA or climate change) will be captured through this process. Where the WRMP review identifies that this means additional or fewer solutions are required, the expenditure would be returned, or additional investment sought, by logging up or down through this mechanism.

Financial element

We have considered the financial element of the mechanism. This will work on a similar basis to a logging mechanism. We have not yet proposed a unit rate for the mechanism on the basis that our cost sharing rate has not yet been finalised and the totex associated with the programme may change. As a logging mechanism and in the presence of other incentives for timely delivery, the financial reconciliation will occur at the end of AMP7.

*Unit rate = ((Interconnector totex – totex captured by singly supply ODI) * totex sharing rate) / units of measurement*

Links to Green Bond

Our business plan detailed how we were the first European utility company to issue a sterling Green Bond. We are using this to fund work that is independently certified as being beneficial for the environment. Crucially, we did not have to change anything about our operations to meet the high standards required of companies wishing to issue a Green Bond and we raised £250 million.

We will continue to raise capital through Green Bonds in AMP7. The significant investment in the interconnector programme could be financed by its own Green Bond. This would add an additional layer of reporting for the programme as we would report to the market how the money has been invested alongside environmental outcomes.

The Green Bond and our two Carbon performance commitments will drive a strong sustainability focus on the project. We have an excellent track record in reducing our carbon footprint and our experience has been that reducing carbon associated with projects also reduces cost.

We will continue to work with Ofwat after the IAP submission to finalise the detail of this mechanism to be in the Final Determination.

4.3 Ofwat Action: Smart metering installation

Ofwat's wholesale Water Enhancement feeder model: Metering - deep dive feedback

Anglian Water reference the 'Anglian Water PR19 Technical Assurance Executive Summary for 13 August 2018' completed by Jacobs which finds that the estimating and planning process was robust from a technical perspective.

For demand management the company refers to its PCC and leakage reduction performance commitments as providing protection for its customers in the form of underperformance penalties however it is noted that the penalties are lower than the significant enhancement expenditure proposed.

Marked as a fail overall because the company needs to demonstrate that it is committed to installing the proposed number of meters and that in the case of a shortfall in numbers expenditure will be returned to the customers.

Our response

Our WRMP and business plan are clear about our commitment to a 'two AMP' smart metering rollout. The proposed investment is required to ensure that we protect both today's and tomorrow's customers against the risks presented through increase population and a changing climate. This need has recently been highlighted by the EA and NIC. We have also updated our smart meter enhancement case with further detail on existing and additional benchmarking evidence to demonstrate the robustness of the costs for this investment.

Investments of this nature and scale are not discretionary; they are vital to ensure the region has sufficient water supplies in future. If we do not install these meters we will fail to meet our obligations under that framework, risk security of water supply in our region and be incentivised through our PCC and Leakage ODIs.

We have used the full smart meters expenditure when setting incentive rates for these ODIs. The total scale of PCC and Leakage incentives is different compared to the scale of our metering enhancement programme. To respond to Ofwat's concern, we propose a simple symmetric true up mechanism, applicable at the end on AMP7 to protect customers in the event that the number of meters installed during the AMP is different to those set out in our Plan.

This mechanism will ensure that customers do not pay twice for any smart meters but also needs to ensure flexibility in the precise profile of roll-out to maximise the benefits to our supply demand balance.

The basis of this mechanism will be that for any meters not installed during AMP7, we will transition the enhancement expenditure associated with the cost of the individual smart meter unit and meter installation costs into AMP8. This would exclude the expenditure associated the wider delivery of the fixed network or customer engagement and behavioural change programmes that form part of the smart metering programme as these costs are considered fixed.

This means that any investment requested at PR24 to complete our smart meter rollout would be net of any expenditure we had already received in AMP7 for the cost of smart meters and the installation costs and carried into AMP8. Customers would be protected as we would not request this expenditure again as part of the PR24 process. Conversely, if the amount of meters installed

during AMP7 exceeded our forecast (i.e. our actual output performance proves to be faster than the current forecast delivery profile on which, the two AMP period roll-out is based) we would expect an equivalent adjustment to be made at PR24 reflecting the additional outputs delivered.

We will continue to work with Ofwat after the IAP submission to finalise the detail of this mechanism to be in the Final Determination.

4.4 Growth mechanism

4.4.1 Background

One of the key objectives of our 25 year Strategic Direction Statement is to Enable Sustainable Economic and Housing Growth in the UK's fastest growing region.

One in five of new homes being built now is built in our area. In the AMP7 period, we expect over 200,000 new homes will connect to our sewer network; about 180,000 will connect to our water network. To enable this growth, we will invest more than £250 million to enhance capacity in our sewer network, including Sustainable Drainage Systems, and more than £280 million on water pipes for new homes. We have innovative smart systems that allow developers and others to 'self-serve' and track progress on-line as well as visualise assets and growth.

In our Plan we set out the rigorous, risk-based approach we have taken to determining the level of investment associated with growth. However, we recognise the materiality of growth and the potential impact on our customers. We have based our forecasts on local authority plans, in line with the Government's guidance on water resources planning [1] . We believe these are reasonable forecasts, and note that they do not include the potential additional growth pressure from the Oxford-Cambridge Arc proposals (expected to deliver a million new homes), the bulk of which will fall within the Anglian region.

However our experience shows that a wide variety of factors can influence the speed of growth. This issue was raised by the Chairman of Ofwat during our interview after our September Plan submission, and our Board subsequently discussed the point. This led to Alex Plant signalling our willingness to use a growth true-up mechanism in his letter to John Russell of 7 December 2018. Since then, we have explored the potential for a growth true-up mechanism over and above the current wholesale revenue and developer services incentive mechanisms set out in the Final Methodology. We set out below the detail of that proposed mechanism.

The mechanism is targeted on 'off-site' expenditure, as we are confident that the on-site costs related to growth and how this affects our developer customers are already effectively adjusted for through the developer charging scheme. There is therefore no need for additional mechanisms in this area of growth costs. These protections include:

1. Revenue Forecasting Incentive (RFI) – which excludes developer services
2. Developer Services Revenue Adjustment (DSRA)
3. Forecasting incentive mechanism

The proposal to keep on-site costs separate is also consistent with Ofwat's decision document "Newconnections charges rules from April 2020 – England" published in November 2017.

We explained in response to query ANH-IAP-CA-008 how some of the costs of catering for growth are recovered through Grants and Contributions. The costs of contestable connection work on development sites are recovered directly through Grants and Contributions and are therefore covered by the DSRA mechanism. Likewise, about 80% of the non-contestable off-site work is recovered through Grants and Contributions and is therefore also covered by this DSRA mechanism.

However, for off-site costs related to growth, we believe there is merit in adopting a mechanism to ensure that, should the outturn position on growth prove materially different to the levels projected, customers are not exposed to undue cost, and nor should a company be left having to cover additional costs. We believe the risk of this is low, but would nonetheless want to insure against such eventualities.

1 Department for Environment, Food and Rural Affairs : Guiding Principles for Water Resources Planning, May 2016

Our Board supports our proposal for an additional symmetric adjustment mechanism should actual growth be materially higher or lower than the projections underpinning our Plan. We propose that this should be calculated at the end of AMP7 so that an accurate comparison between projections and actual growth can be undertaken.

4.4.2 Proposed mechanism: detail

The component of our plan where customers lack protection from the uncertainty of growth forecasts relates to the spend that is not recovered through Grants and Contributions and is therefore covered only by the RFI mechanism. The main elements of this spend are as follows:

- £163.823m for increasing capacity at sewage treatment works - WWS2 line 26
- £60.052m for non-chargeable infrastructure network reinforcement (Sustainable Drainage Systems) - App28 line 20
- £99.153m for approximately 20% of chargeable infrastructure network reinforcement (to maintain the balance of payments between developers and domestic customers as per the developer charging regime).

We propose a supplementary mechanism to work in conjunction with the existing mechanisms, whereby any variance in the spend described above (that is not recovered through Grants and Contributions from developers), is reviewed in the true-up and shared with customers through an AMP8 revenue adjustment. We believe this mechanism should occur prior to the RFI mechanism.

Our role as a responsible water company is to enable growth and protect existing customers from deterioration in service by providing the capacity in our systems ahead of the new development. This mechanism would focus on the capacity provided by these investments for new Population Equivalent (PE) to connect.

The calculation proposed is:

Amount to return = (1 - Actual PE capacity provided / Forecast PE capacity provided) x PR19 Forecast totex

A worked example where during AMP7 we have created 20% less capacity at sewage treatment works, and 30% less capacity through sustainable drainage, but completed all the planned chargeable work is:

Amount to return (sewage treatment works)=(1- 118,400/148,000)×163.823 =32.765

Amount to return (sustainable drainage)=(1- 35,000/50,000)×60.052 =18.016

Amount to return (network reinforcement water)=(1- 322,000/322,000)×47.527 =0

Amount to return (network reinforcement sewerage)=(1- 267,000/267,000)×51.626=0

In this worked example we use indicative figures for forecast capacity provided. We have taken capacity data from the modelling work completed for the Water Recycling Long Term Plan (WRLTP) and our Development Services team and converted to Population Equivalent (PE). As part of the discussions after IAP to finalise this mechanism we would agree baseline figures with Ofwat, including any limit on the size of development which the mechanism would consider.

As part of the discussions after the IAP submission to finalise this mechanism we would wish to agree baseline figures with Ofwat, including any limit on the size of development which the mechanism would consider.

4.5 Ofwat Action: WINEP Adjustment mechanism

Reference: ANH.CE.A4

We note the company's proposal that 10% of the costs of any Amber WINEP scheme for which ministers do not confirm the need, be retained by the company to cover any initial spend made prior to the decision not to proceed with the scheme. The company should submit evidence to justify this scale of retention and identify what actions the company is taking / intends to take to minimise the possibility of abortive expenditure and why this risk could not be eliminated with appropriate scheduling.

To further inform our view of the reasonableness of the company's proposal it should provide assumed expenditure profiles (capex and opex) for each of the Amber schemes included in its investment plan and give a breakdown of this expenditure between the lines in business plan tables WS2 and WWS2.

Our response

The purpose of the sharing rate in our proposal is not to compensate us for abortive costs.

Our proposal for the sharing rate in our WINEP uncertainty mechanism extends the thinking that has been applied historically to regulatory sharing mechanisms, such as those for Business Rates. The sharing rate should reflect the relative risk borne by customers and companies and the ability of each stakeholder to determine the out performance.

It reflects our belief that both parties should benefit from the exclusion of schemes from the WINEP. Given that companies have greater influence over the shape of their WINEP programmes (through their interaction with the Environment Agency) than they do over the outcome of a rates revaluation, it does not seem unreasonable that their shares equates to 10% when 25% was used in the case of rates. Very importantly, by allowing them this share, companies retain the incentive to argue schemes out of the WINEP which they consider provide poor value for money.

We have tested our proposal to retain 10% with our customers via our Online Community.

A majority, around two thirds, support the incentive mechanism.

From the 11 customers who did not support the incentive mechanism, 9 of them felt that we should be able to keep any abortive costs.

"Initially I thought higher than 10% so if AW feels that's enough then I am more than happy to accept that. "

An example of work we have undertaken recently to ensure only those schemes that are required to be delivered in AMP7 are included in the WINEP for our customers is the work on U_IMP5 and U_IMP6 obligations.

We worked with the EA to develop selection criteria to identify U_IMP5 and U_IMP6 obligations which can be phased into AMP8 thus removing costs from AMP7. This has involved a large amount of time liaising with the EA and providing the information to answer the 6 questions poised before they could make the decision. Criteria included the current water quality status of the receiving water body and whether or not there is an associated scheme requiring investment in new treatment processes planned for AMP7 at the same WRC.

Through this process the EA have agreed to phase 47 schemes in total into AMP8. This substantially reduces the risk of abortive spend.

If this situation were to occur the value retained by the companies through this share would also cover the inevitable development and investigation costs they will have abortively incurred. We note that other companies have proposed to exclude these costs from any sharing mechanism. This mechanism rightly recognises the significant senior management time and effort expended across the business proactively engaging with regulators to minimise any unnecessary obligations.

When considering the profiling of investments in our Plan, we have a number of things to consider such as resource planning and coordination with other work planned at the same site. We have sought, where possible, to deliver quality investments close to the obligation date to minimise the additional opex required to run the new assets and to minimise the abortive costs which may be incurred if an obligation is no longer required.

Expenditure Profiles

The expenditure profiles as requested are set out in Appendix 4b.

4.6 Ofwat Action: Metaldehyde

Reference: ANH.CE.A5

There may be significant impacts in terms of investment or type of investment as a result of the metaldehyde ban. The company should investigate and agree with the DWI the scale and timing of any potential changes compared to its submitted plans. Significant changes and uncertainty may require an outcome delivery incentive to protect customers in the instance of expenditure not being required. Should the company propose a performance commitment and outcome delivery incentive, the company should provide evidence to justify the level of the performance commitment and the outcome delivery incentive rates proposed, in line with our Final Methodology. We expect to receive evidence of customer support for outperformance payments, where proposed, and that the incentive rates proposed are reflective of customer valuations.

Our response

We have adjusted our costs following the announcement of a UK wide ban on metaldehyde announced December 19th 2019.

Metaldehyde costs were in two main places in our plan:

- WRMP Supply side - We have recosted 5 investments to remove UV/peroxide treatment steps. This has removed -£47.404m totex from our Plan (further details are provided in PR19 Water data table commentary, WS2 WRMP deep-dive)
- Catchment Management - The change in law requires us to make alterations to our catchment management proposals for metaldehyde control only. All other elements of our catchment management investment proposal for AMP 7 remain the same (further details are provided in Water data table commentary, WS2 Catchment management shallow dive)

Existing catchment management proposals for metaldehyde control are based on product substitution e.g. paying farmers the cost difference between metaldehyde and the more expensive slug control alternative; ferric phosphate. We have been advised by the Environment Agency that once metaldehyde becomes illegal, we are not expected to include product substitution in our WINEP plans to control it.

- Costs of farmer subsidies removed (slug it out programme with ban) -£20.661m totex.

Given we are removing the costs for metaldehyde treatment in its entirety from our Plan we do not need to propose a performance commitment or ODI to protect customers.

5. SECURING COST EFFICIENCY

Ofwat's test area assessment: Securing cost efficiency

Overall test area grade	Overall test area summary assessment and rationale
D	Overall, Anglian Water's plan falls significantly short of required quality in this area. We do not consider the company's projected costs for 2020 to 2025 to be efficient. Its projected costs are 32% above our view of efficient costs in wholesale water and 19% above in wastewater, even though its retail costs are close to our view of efficient costs. The company's enhancement programme does not appear efficient in both water and wastewater. The company is proposing to reduce leakage beyond upper quartile performance levels and we make an associated cost allowance for the proportion of it that is above upper quartile. The company scores highly in relation to the use of cost adjustment claims because it only proposes two claims, even though one was not of high quality and we reject the basis of the claim. We assess the other (frontier leakage reduction) as a partial pass and make a partial allowance for it in our view of costs. The low number of claims and reasonable quality of one of them means the company grade for this test is an A.

Cost efficiency summary

Botex

Our review of the approach Ofwat has taken to wholesale botex cost assessment has identified many flaws including:

- that the models fail to capture the complexity of our industry;
- failure to deal appropriately with enhancement opex;
- the inclusion of a poorly-substantiated additional continuing productivity challenge related to the totex and outcomes regime; and
- the deviation from the now-standard regulatory approach to forecasting frontier shift.

We provide detailed comments about the choice of cost drivers used in models, the driver forecasts, triangulation and the indexation of historical costs. We also raise a concern about whether Ofwat is testing the adequacy of capital maintenace to ensure long term asset health, where we are proposing to undertake additional analysis.

Ofwat has accepted that maintaining our current leakage requires an adjustment to our base cost allowance. We welcome this, but have identified a mathematical error in Ofwat's calculation, which causes the adjustment to be understated by £71 million.

Our conclusion is that the number and materiality of the flaws identified are such that Ofwat's approach is unreliable and materially understates the botex needed to deliver our plan. Our plan botex therefore remains unchanged.

Where possible, we have suggested remedies to the flaws we have identified.

Enhancement

Our review of Ofwat's assessment of enhancement requirements has identified a number of areas where we have serious concerns including:

- A predominant emphasis on modelling enhancement capex in isolation of enhancement opex;
- The removal of circa £86 million of supply demand investment based on "insufficient justification provided for scope" when the need for this investment is demonstrated in our WRMP which has already been through a rigorous testing process;
- Weaknesses across a range of Ofwat's favoured benchmark approaches which have derived unstable estimates of companies' expenditure requirement. We provide in this IAP Response new market testing evidence in relation to our strategic pipelines programme. [redacted] This evidence also questions the validity of Ofwat's generic assumptions that have informed its view of our efficiency.
- Weak evidence on the justification, and application of, company specific efficiency factors to enhancement expenditure.

We provide detailed comments on Ofwat's derivation of enhancement leakage costs and the approaches taken to move some costs from enhancement to base costs. We also provide a systematic 'model-by-model' assessment for each area of assessment.

For areas where Ofwat considered the evidence in our Plan insufficient we have provided either further clarity drawn from previously submitted information (such as the WRMP) or further new evidence not previously presented to address the concerns raised.

Taken together, we conclude that the materiality of these issues is such that Ofwat's assessment does not produce appropriate, robust estimates of the enhancement expenditure required to meet need. With the exception of reductions to expenditure associated with treatment of metaldehyde (£68m) and the net impact of changes to investments associated with Flow / Storm tank WINEP drivers, our Plan remains unchanged.

Again, we have where possible, suggested remedies to the flaws we have identified.

5.1 Ofwat Action: Cost Efficiency

Action reference: ANH.CE.A1

We provide our view of efficient costs for the company along with our reasoning. We expect it to address areas of inefficiency, or lack of evidence, in the revised business plan. Where appropriate, we expect it to withdraw investment proposals if either:

- the need for investment is not compelling; or
- there is no need for a cost adjustment claim beyond our existing cost baseline.

Our response:
Chapter 4 Focus area: Customer Protection, chapter 5 Securing Cost Efficiency, chapter 6 Focus area: Leakage, appendices 4a, 4b, 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 6a and the documents in WS2 and WWS2 set out our response to this action.

5.2 Botex cost assessment

5.2.1 Summary

In its Initial Assessment of our Business Plan, Ofwat made an assessment of the efficient level of base costs ('botex') we require to deliver our obligations and performance commitments in 2020 to 2025. Its assessment is £662m lower than the figure we set out in our September plan. To understand the reason for this gap we have analysed in detail the approach Ofwat has taken to derive its botex assessment. In this section we set out the findings of that analysis.

We have reviewed the approach Ofwat has taken to derive its assessment of our future wholesale botex needs with support from a number of economists and econometricians with experience and expertise in relevant areas.

There are aspects of Ofwat's botex approach that we welcome:

- Restricting the use of econometrics to botex rather than totex
- Recognition that demographics and topography are critical variables that need to be controlled for
- Recognising the need for multiple models and triangulation
- Recognition of the importance of including drivers for sludge transport cost
- Exclusion of abstraction charges from cost modelling

However, we have serious concerns with many aspects of Ofwat's approach. In this part of our response we set these out.

A sense check of the outcome of Ofwat's approach on botex suggests that the methodology may be flawed. The efficiencies required of us are implausible and the findings inconsistent with historical benchmarks.

Academic review of Ofwat's botex models, which lie at the core of Ofwat's assessment, has revealed many concerns:

- The rules Ofwat has set itself for modelling have resulted in models which are far too parsimonious to capture the complexity of our industry and result in a failure to take account of critical factors
- There is no proper triangulation, by which we mean a range of models which differ meaningfully from each other, including a lack of an integrated waste water model
- The use of random effects models means that errors arising from model misspecification are misinterpreted as inefficiency
- The lack of time dummies implies efficiency and technology are static over the period of the panel, making the models inappropriate for forecasting future expenditure

There is a major difference between our plan and Ofwat's approach on the indexation of historical costs. Ofwat has specified the dependent variable for the models by inflating historical costs using purely CPIH. This is inconsistent with the approach Ofwat has used for the purpose of financial

modelling which uses a hybrid of CPIH and RPI and which we applied for indexation of historical costs for our Plan, consistent with this position. The value of this is about £170m. This also has a major effect on our respective perceptions of how our plan differs from the past.

Beyond the models, we have a further set of major concerns:

- Ofwat has failed to deal appropriately with the substantial sums of enhancement opex included within 'botex'. We think about £170m has been understated in the assessment.
- Ofwat has included an additional continuing productivity challenge related to the totex and outcomes regime for which the evidence is very weak. The value of this is £44m.
- Ofwat has deviated from the now-standard regulatory approach to forecasting frontier shift to one which assumes that price effects are automatically captured within CPIH without acknowledging that CPIH also captures a non-trivial level of ongoing productivity growth. Our plan included RPE of £114m on botex.
- There is a mathematical error in the calculation of our cost adjustment allowance for leakage. This is error amounts to £70m.

Finally, notwithstanding our overall comments on the models, we offer some more detailed comments about their specification and use. In particular, we comment on:

- A number of the control variables that have been selected and the way in which some of those drivers have been specified
- Omission of any variables related to leakage or metering, when these have been widely adopted by some companies to address the major challenges of meeting future water demand in water stressed areas
- The principle of replacing companies' forecasts for cost drivers with trended or averaged numbers and decisions around specific drivers. The effect of Ofwat's assumptions is to understate Botex by £55m.

Individually, each of these issues is problematic. Our conclusion is that the number and materiality of the flaws identified are such that Ofwat's approach is unreliable and materially understates the botex needed to deliver our plan. Our plan botex, based on more robust models and our knowledge of the costs of running our company, therefore remains unchanged.

Our approach to cost modelling for this price review has throughout been one of collaboration and support. We regard ourselves as one of the more proactive members of the Cost Assessment Working Group which Ofwat established in 2016. We have continually sought to work with Ofwat and others in the industry to build robust cost assessment tools. We have also been very transparent in sharing the findings of our own modelling, with the publication of reports on our work in October 2017 and March 2018.

We would like to continue this approach in the continuation of the PR19 process. Rather than just point out problems, we have in this document, wherever possible, suggested alterations and remedies. For example, Professor Saal's report includes several alternative models which seek to illustrate the deficiencies he has identified. Reckon's report suggests remedies for addressing the problem with the allocation of enhancement opex. We stand ready to continue this work to help achieve an outcome that delivers the right answer to the questions we face.

Finally, in the limited time available since Ofwat announced its IAP we have focused on the material gap between Ofwat's assessment for the wholesale botex and our plan. The corresponding gap in retail was comparatively small so we have not conducted any detailed review of the approach Ofwat has applied to derive its retail forecasts. We intend to consider Ofwat's approach to retail cost assessment once our response to the IAP has been completed.

5.2.2 Assessment sense check

As the CMA observed in Bristol Water (2015), one of the reasons why cost modelling should be understandable and intuitive is so that we and our customers can cross check that the outputs of the models make practical sense when applied in the real world [1]. In essence, this also suggests

1 Para. 4.53 Bristol Water (2015) where CMA considered that Ofwat had not presented 'the results and implications of its models in a more understandable and intuitive way' which was important, inter alia, because 'it might reveal aspects of the models that do not make sense (or at least require further investigation or explanation) … .'

that cost modelling should always be considered as indicative, not determinative. In this section we stand back from the analysis and conduct a sense check of Ofwat's findings against some fixed reference points.

It is generally understood that cost assessment is a difficult task, dependent on large datasets, statistical models, assumptions and forecasts. Errors or differences of view in any of these will lead to different outcomes. As a first test of the reliability of any cost assessment process it is appropriate to cross-check the outcome against known benchmarks.

The first cross-check we have performed on Ofwat's overall finding is to consider the practical implications of its conclusion. This analysis says that if we are truly £662m inefficient on botex we need to reduce our costs by an average of £132m per annum. To address this challenge we would look initially at employment costs, our biggest expenditure item. At an average cost to employ of, say, £44k per person we would need to remove the equivalent of 3,000 people, over half of our headcount, from our botex cost base from 1 April 2020. The idea that we could do this without serious impacts on service levels is fanciful.

Our second cross-check is to consider Ofwat's proposals for future expenditure in the context of what we have observed from the past. For any individual company a suitable benchmark for botex expenditure is its level of historical expenditure. The company's level of base expenditure is influenced by its efficiency and attitude to risk but is primarily driven by the scale of the company and the nature of its operating region and asset base. Because these factors do not vary significantly over the medium term our expected findings are that (1) the future allowances for any company will not be significantly different from its historical expenditure levels and (2) the relative allowances across the industry (on a normalised basis) will remain broadly constant.

We have compared the botex allowances proposed by Ofwat for each water and sewerage company in the IAP against that company's actual base expenditure during the last complete regulatory cycle (that is, the period 2010 to 2015, or AMP5). We considered other comparator periods and concluded 2010 to 2015 was the most appropriate. We decided that periods prior to 2010 were too distant in time and that evidence from the current period could be unreliable because of the cyclical nature of expenditure within a period and the reliance on unproven forecasts of expenditure in the remaining two years of the period.

In this analysis all prices are in 2017/18 prices. Historical expenditure has been inflated to 2019/20 prices using year-average RPI then deflated to 2017/18 prices using CPIH, in order to ensure consistency of approach with the methodology prescribed by Ofwat for the financial model. We have expressed expenditure on a per connected property basis, using actual property numbers for AMP5 and Ofwat's property forecasts for AMP7.

The chart and table below shows the results of this analysis for wholesale water. Companies vary significantly in the extent to which Ofwat's allowances deviate from their AMP5 outturns: most companies see a fall in their allowances and two companies enjoy a rise. The reduction for Anglian is the joint highest in the sector at 14%. In terms of the relative sums allowed to each company we by and large see the expected stability, with eight of the ten companies moving at most two ranks. However, Anglian is again an outlier, moving from being the fifth highest spender in AMP5 to having the second lowest allowance in AMP7.

Figure 2 Wholesale Water unit cost: AMP5 vs Ofwat AMP7 allowances

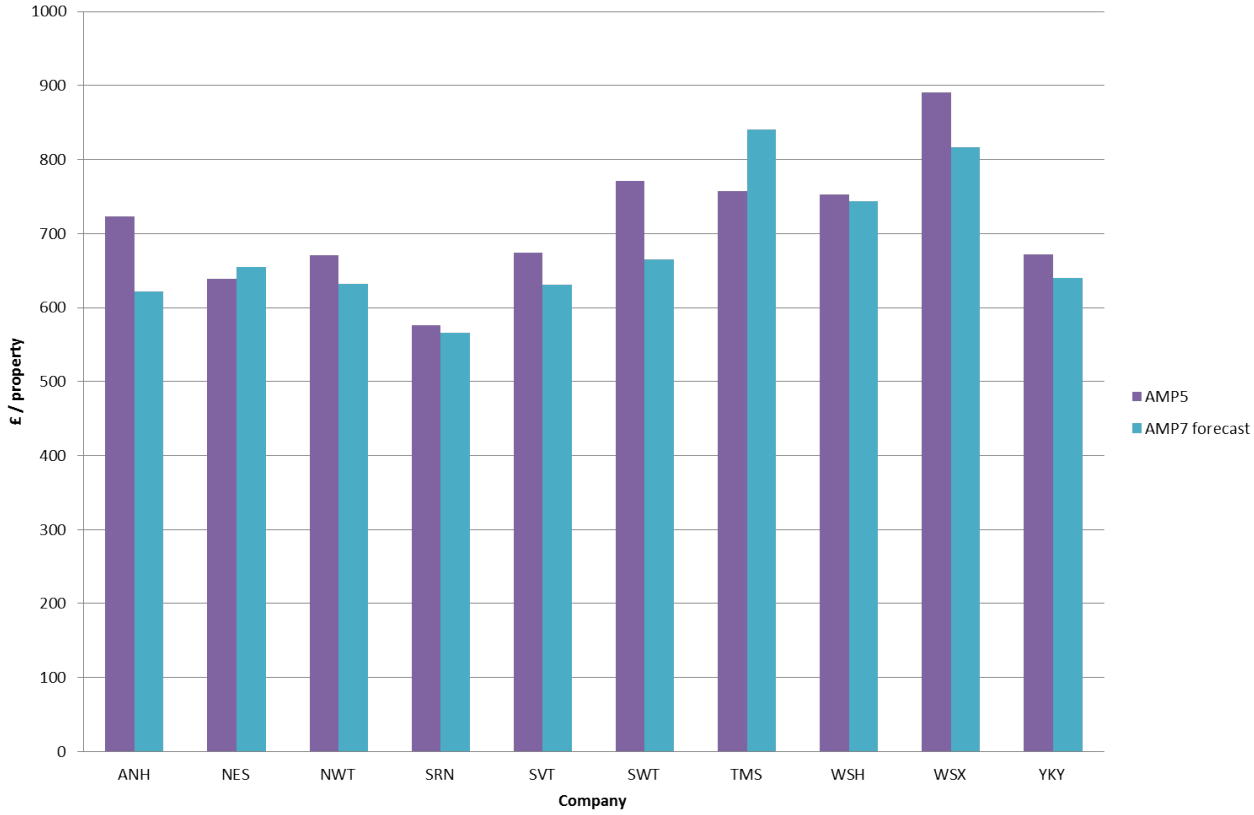


Table 2 Wholesale Water unit cost: AMP5 rank vs AMP7 rank (1 being highest spend)

Comapny	AMP5 rank	AMP7 rank	Change AMP5 to AMP7
ANH	5	9	-14%
NES	9	5	2%
NWT	8	7	-6%
SRN	10	10	-2%
SVT	6	8	-7%
SWT	2	4	-14%
TMS	3	1	11%
WSH	4	3	-1%
WSX	1	2	-8%
YKY	7	6	-5%

The chart and table below show the same results for wholesale waste water. In this service all companies see a reduction from AMP5 but the falls vary significantly, from 3% to 36%. The reduction for Anglian is the second highest in the sector at 30%. In terms of the relative sums allowed we see much more variation than in water, with half of the ten companies moving by three or more ranks. Anglian is again an outlier, moving from being the second highest spender in AMP5 to having the fifth lowest allowance in AMP7.

Figure 3 Wholesale Water Recycling unit cost: AMP5 vs Ofwat AMP7 allowances

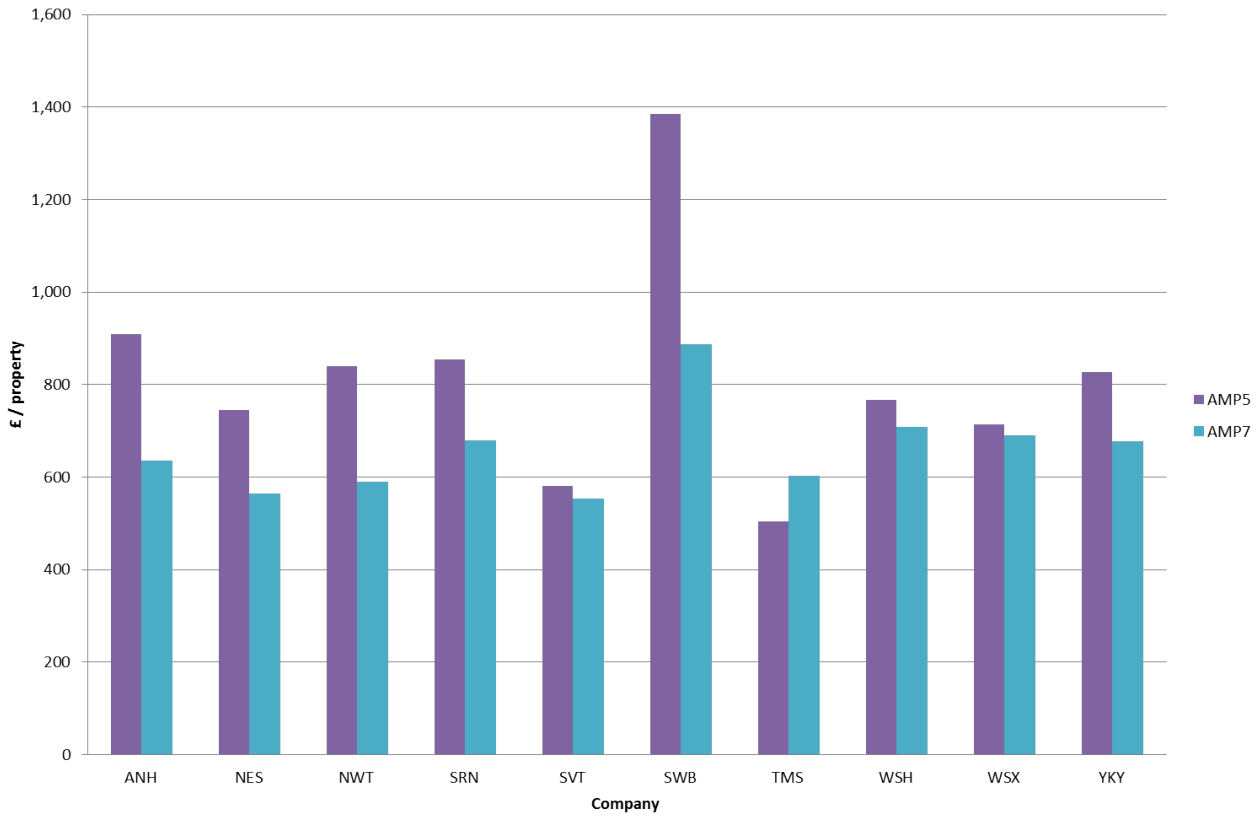


Table 3 Wholesale Water Recycling unit cost: AMP5 vs AMP7 allowances

Company	AMP5 rank	AMP7 rank	Change AMP5 to AMP7
ANH	2	6	-30%
NES	7	9	-24%
NWT	4	8	-30%
SRN	3	4	-21%
SVT	9	10	-5%
SWB	1	1	-36%
TMS	10	7	19%
WSH	6	2	-8%
WSX	8	3	-3%
YKY	5	5	-18%

The most obvious reason why a company's AMP7 allowance might show a reduction from its AMP5 expenditure would be that Ofwat had found it to be an inefficient performer. However, this is not the case. Ofwat's analysis finds that in both water and waste water Anglian is a mid-placed performer, with four companies below it in relative efficiency. So Ofwat's own efficiency analysis does not provide the answer to why the company should be given the second biggest reduction in the sector.

We find all of these results puzzling and lacking adequate explanation and justification: the scale of the reduction between historical and future allowances for some companies, the change in the relative allowances across the sector, the lack of correlation with the efficiency analysis which underpins those allowances and the actual implications of the challenge. The findings do not align with what we expected to observe at the outset of the analysis. This initial cross-check leads us to be sceptical about the process which has given rise to Ofwat's AMP7 forecasts. They would also undermine incentives for companies to improve efficiency as the results seem to be so unpredictable.

5.2.3 Botex models

The foundation of Ofwat's botex assessment is the suite of models which it built to describe the relationship between historical costs and cost drivers. In this section we review those models. Firstly, we present a summary of an independent academic analysis of the models. Notwithstanding the fundamental problems with the models revealed by that analysis, we offer comment on aspects of the approach: we present concerns about the treatment of enhancement opex in the models, share concerns about the inflation of modelled costs, and finally offer comments on some of the cost drivers Ofwat has used.

Academic review of the models

Over the last two years, Professor David Saal and colleagues at Loughborough University have critiqued the work Anglian has undertaken to develop botex cost models for PR19. Professor Saal is an acknowledged expert in the field of utility network cost efficiency and is a Professor of applied economics with wide experience in econometrics.

Professor Saal's detailed review of Ofwat's approach to botex modelling at PR19, and to the wholesale botex cost assessment models used by Ofwat at the IAP in particular, is included as Appendix 1 to this report.

Professor Saal makes four key points regarding the modelling approach followed by Ofwat.

i. The modelling framework which Ofwat has developed for PR19 was developed in the light of the strong criticisms raised to its PR14 approach made in the 2015 CMA Bristol Water determination. The framework results in poor models due to its excessive parsimony and rigidity

and its inability to allow for sufficient complexity. The result is that the models Ofwat has put forward can be shown to be underspecified and are not sufficiently robust to be used for regulatory cost assessment. Moreover, Prof Saal has demonstrated that the inclusion of additional variables improves the quality of the models.

ii. Notwithstanding the suitability of the models used, Ofwat's approach to triangulation between models is not appropriate: its approach amounts to changing control variables that control only a small portion of overall explanatory power of the model. In waste water Ofwat does not put forward an integrated model with which to triangulate its disaggregated models, preventing any ability to confirm the findings of its separate disaggregated models.

iii. Professor Saal has made a detailed econometric point concerning the approach taken by Ofwat which has significant implications for the way in which Ofwat interprets its results. The implication of using random effects models is that it misinterprets the errors arising from model misspecification as inefficiency.

iv. Ofwat's approach excludes any use of time dummies or trending, thus assuming that both efficiency and technology are static in a seven year panel and cannot change. This does not appear to be a robust basis for forecasting future expenditure where efficiency and productivity growth are expected.

Professor Saal's comments have echoes in the case of Bristol Water (2015), where the CMA observed that one of the key flaws with Ofwat's econometric modelling was that it was not sufficiently flexible to take proper account of the 'wide range of factors that affect companies' expenditure'[2]. Ofwat risks repeating this failing from PR14 if it does not allow for greater flexibility and robustness in its botex modelling at PR19.

Given Professor Saal and colleagues' conclusion that the models Ofwat has used for the IAP are of inadequate quality for regulatory cost assessment, we have not adopted Ofwat's models in reviewing our plan. Saal's analysis recommends a full reappraisal of the wholesale models is needed.

Notwithstanding Professor Saal's rejection of Ofwat's models, later in this part of our response we provide further observations on aspects of its approach. Addressing any or all of the issues we raise would not overcome the fundamental problems we have identified above. However, we suggest they should all be considered if Ofwat were to undertake the full modelling reappraisal.

5.2.4 Modelled costs and the treatment of inflation

For the PR19 Financial Model, Ofwat required companies to deal with the transition from RPI to CPIH as the Notified Index by inflating historical costs from price of the day prices to 2020 using RPI and then to deflate back down to 2017/18 prices using CPIH. We followed this approach in preparing historical industry cost data for our own botex modelling.

For the purposes of developing its botex cost models, Ofwat has used cost and cost driver data from 2011/12 up to 2017/18. The cost data, reported in 2017 in the Information Request and the 2017/18 APR, are all in price of the day. Ofwat has taken these nominal costs and inflated them using CPIH alone, ignoring their own prescribed RPI-CPIH hybrid approach to indexation. By doing so, it has ignored the wedge between RPI and CPIH, the fact that at PR14 costs relating to AMP6 were all dealt with exclusively using RPI and the fact that RPI remains the Notified Index until 2020. It was for these reasons that the discussions between the Financial Modelling Working Group and Ofwat resulted in the RPI-CPIH hybrid approach. Using CPI(H) alone here, undermines the coherency of Ofwat's overall cost modelling. Furthermore, this risks repeating the use of incorrect inflation indices that was noted in the Bristol Water (2010) referral where the Competition Commission overturned Ofwat's approach to inflation indices in relation to the "MEA revaluation exercise" because 'Ofwat's use of RPI as the inflation index … was inconsistent with its use of COPI in its financial model.'

As our Business Plan figures all used the RPI-CPIH hybrid approach to arrive at the 2017/18 prices, this issue alone accounts for 25% (£168m) of the gap between Anglian's Business Plan botex figure and that put forward by Ofwat at the IAP. We note also that differences between Ofwat and ourselves has a major effect on our respective perceptions of how our plan differs from the past.

2 Para. 4.46 Bristol Water (2015) where the CMA observed that it was 'ambitious to seek to model the entire wholesale water business through this type of high-level econometric model, which may fail to take proper account of the wide range of factors that affect companies' expenditure requirements.'

Our recommendation is that Ofwat applies to all aspects of its price review methodology, including cost assessment, the approach to indexation that it has prescribed for the financial model.

5.2.5 Enhancement opex

Ofwat's approach to total cost assessment has been to separate base costs (opex and capital maintenance) from enhancement costs. Its intent has become confused because the data that companies were required to submit in their business plans on opex included not only their genuine base opex but also enhancement opex. This latter category includes the cost of operating new assets created under enhancement drivers but also the cost of solutions not involving capital investment which companies have proposed to deliver enhancement outcomes. These latter costs are particularly important because they are the sort that Ofwat has encouraged companies to propose under the totex framework, to address a perceived historical bias on the part of the industry towards capital solutions. As a consequence of this incentive, the scale of enhancement opex proposed by companies is considerably greater than has been the case at previous price reviews. For Anglian Water, enhancement opex comprises 10% (£144m) of its total opex for the water service and 5% (£81m) for water recycling.

Ofwat's botex modelling has treated all opex as base, ignoring the fact that a substantial proportion of it represents enhancement opex. Some of this enhancement opex has been considered within the process for assessing enhancement costs but the majority has not received this treatment. Because Ofwat's botex models have not included the drivers that would be necessary to account for them, a substantial proportion of companies' enhancement opex has therefore effectively been excluded from Ofwat's process. Of the £220m of enhancement opex in our plan we think about £170m has been overlooked.

In conjunction with Northumbrian Water and Wessex Water, we commissioned a review of the treatment of enhancement opex in Ofwat's IAP from the economic consultancy Reckon LLP. In their report, which is attached as Appendix 2, Reckon describe the problem which has arisen and suggest remedies that Ofwat might adopt to ensure that their cost assessments at draft determination consider fully the proposals and associated costs that companies proposed in their plans.

We recommend that Ofwat gives serious consideration to the remedies which Reckon has proposed. In order to assist this, we and the other sponsoring companies have invited Reckon to propose a second phase to their project in which they might develop their initial thoughts into more detailed implementation proposals. Should this further project materialise, we would make the outputs available to Ofwat at the earliest opportunity.

5.2.6 Frontier shift: Ofwat's approach to productivity and RPE

In reaching its IAP estimates of companies' botex requirements, Ofwat has made assumptions about Real Price Effects (the extent to which changes in companies' future costs will not be captured by the AMP7 Notified Index, CPIH) and scope for ongoing productivity improvements. Its assumptions on these two matters were informed by analysis by Europe Economics (EE) and KPMG respectively. Our Plan included £114m of botex attributable to RPE and £247m productivity improvements.

A group of ten water companies (five WaSCs, including Anglian, and five WoCs) have commissioned a report from First Economics to review the approach taken by Europe Economics on RPEs. First Economics' report is attached as Appendix 3 of this section.

The key observation of First Economics is that EE have made a fundamental error in claiming that all RPEs will be automatically captured within CPIH, without acknowledging that CPIH also captures a non-trivial level of ongoing productivity growth. In combining EE's conclusion on RPE with a stand-alone productivity assumption, Ofwat has made what First Economics describes as a 'pick'n'mix error'.

First Economics made three further observations about EE's analysis:

- EE set a high materiality threshold for the cost items they were prepared to consider in their analysis, which had the effect that they considered only two – labour and materials, plant and equipment. Cost items excluded from their analysis comprise almost half of industry expenditure.

- In considering the ability of companies to control costs, EE equates the management of short-term price volatility with total cost avoidance. EE fails to acknowledge that while it may be possible to defer pressures on costs for a period it is not possible to do so indefinitely.
- EE dismisses forecasts by the Office of Budget Responsibility (OBR), and the Department for Business, Energy and Industrial Strategy (BEIS) in favour of is own opinions which sit some way outside current consensus views.

On future productivity growth, Ofwat's forecast has two elements: a base element of 1% pa and a further 0.5% pa which is expected to flow from the industry embracing a totex approach to budgeting and business planning. We do not challenge the first component, which matches the assumption we factored into our business plan. We note First Economics comment that while 1% pa has become something of a regulatory standard, it is arguably overdue for review in view of the stalling of productivity growth in the general economy since 2008. We recognised the significant challenge posed by this observation in selecting 1% pa for our business plan.

The further 0.5% pa productivity challenge accounts for £44m of the gap between our plan and IAP. We remain of the view that KPMG's analysis, on which Ofwat's assumption is based, is flawed, as set out in our letter of 29 March 2018. The key points of that letter were that:

- KPMG has confused totex outperformance (which is dependent on regulators' determination of expenditure) and efficiency
- There is no clear transmission mechanism between the regulatory innovations to which super future productivity improvements are ascribed and those improvements
- The overall conclusions are not credible when considered alongside the marginal areas where those regulatory innovations are likely to take effect.

We agree with First Economics that Ofwat's assumption is 'still worryingly reliant on a simplistic and subjective interpretation of recent experience in the energy industry. More fundamentally, it is not at all clear why the kinds of regulatory innovation that Ofwat is talking about – totex and outcome regulation – should lead to in-period reduction in recurring expenditures'. We also note First Economics' observation that Ofwat's incentives will typically lead to companies incurring higher ongoing expenditure as part of a drive towards whole-life cost optimisation.

Ofwat has not provided a robust justification for its move away from the standard approach taken by regulators (including itself at previous price reviews) of combining forecasts of RPEs, productivity improvements and CPIH. On the basis of First Economics' analysis, Ofwat needs to consider other material cost items ignored by Europe Economics; take account of the government's own economic forecasting bodies otherwise summarily dismissed by EE; and set out more clearly how totex and outcomes will lead to the expenditure reductions assumed.

5.2.7 Cost Adjustment

We put forward a cost adjustment claim for leakage based on the fact that we are already the frontier company for addressing leakage and intend to continue to drive down leakage over AMP7. We demonstrated the association between the level of leakage and the costs associated with reducing leakage using a graph which showed our opex and capital maintenance costs for leakage reduction from 2006 to 2018 compared to the leakage level achieved. The costs were all in 2017/18 prices and were taken, up to 2011, from the June Returns. After that date, the costs were taken from our internal accounting systems.

We are pleased that Ofwat accepts our case for a cost adjustment claim to address the additional costs we will incur in meeting our challenging (continuing) frontier level performance in leakage reduction. We are also happy that the methodology used by Ofwat in assessing the level of its claim is based on the approach we set out in our cost adjustment claim. However, there is a mathematical error in Ofwat's calculation.

At the heart of our claim was a graph. The graph displayed an exponential curve of the form:

$y = ke^{-ax}$ (1)

Where y was the level of leakage in Ml/d and x was the cost incurred. The logic behind this approach is that in order to achieve a particular level of leakage, a company needs to allocate the appropriate level of financial resources. Hence it is the level of expenditure which is the driver of leakage level and not vice versa.

So, in order to solve for x given a particular level of forecast leakage (in this case 172Ml/d), you take the natural logarithm (ln) of both sides of the equation and solve for x

$\ln(y) = \ln(k) - ax$ (2) which can be rewritten as

$x = (\ln(k/y))/a$ (3)

Unfortunately, Ofwat's approach to solving this equation in FM_CAC_ANH_IAP.xlsx mistakenly used the base 10 logarithm rather than the natural logarithm. This error resulted in a significant understatement of the correct cost: instead of the £55m cost across AMP7, the correct figure based on the same Ofwat approach gives £126m, a difference of £71m.

There is no valid basis for using a base 10 logarithm rather than the natural logarithm and this mathematical error needs to be corrected for in Ofwat's final assessment of the leakage costs adjustment claim.

Earlier in this part of our response we set out our fundamental concerns with the approach Ofwat has taken to wholesale botex modelling. Notwithstanding this rejection of Ofwat's models, in the following sections we provide further observations on aspects of its approach. Addressing any or all of the issues we raise would not overcome the fundamental problems we have identified above. However, we suggest they should all be considered if Ofwat were to undertake the full modelling reappraisal we have recommended.

5.2.8 Cost drivers

In this section we set out comments on some of the specific cost drivers Ofwat has used in its models. We deal separately below with water and water recycling but first consider Ofwat's use of weighted average density, the measure of population density that it has used widely in its models across both services.

Weighted average density

During 2016 and 2017, Ofwat convened a Cost Assessment Working Group (CAWG) as a forum for discussion with companies on matters relating to cost assessment. One of the products of the work undertaken by the CAWG was the development of a set of density and sparsity measures to address the widespread understanding that population density and sparsity are important determinants of costs in the water industry.

The measures were computed on the basis of Lower Super Output Areas (LSOA). The percentage figure is based on the proportion of each company's customers who live in LSOAs above or below agreed density and sparsity thresholds. Ofwat co-ordinated the production of these measures and they were widely used by companies in preparing cost models for PR19.

Ofwat has made use of a new measure of density in its cost modelling for IAP without adequate explanation for its change in approach, raising issues of transparency and consistency as well as concerns about the measure used. Ofwat's measure takes as its starting point the population density of the Local Authority Districts (LADs) within the appointed areas of each of the WaSCs and WoCs. These populations are weighted by the population in the individual LADs to give a weighted average density. The 2018 figures for these weighted average densities are given in the following table.

We do not understand why Ofwat has taken the retrograde step of using the weighted average density measure based on LADs as it provides too coarse a measure of density and sparsity. Two areas with dramatically different settlement patterns can return the same overall population density and the attraction of the LSOA approach defined by the CAWG was that it provided the granularity necessary to identify these differences. Moreover, as there is only a single overall density measure per company defined by Ofwat's weighted average LAD measure, the measure does not have the same flexibility as the earlier measure which allowed for direct measures of both density and

sparsity within the appointed area. This point is particularly critical given that there is not a constant relationship between population density and cost: Ofwat's own IAP documents describe the J-shape curve produced by plotting the two variables [3] .

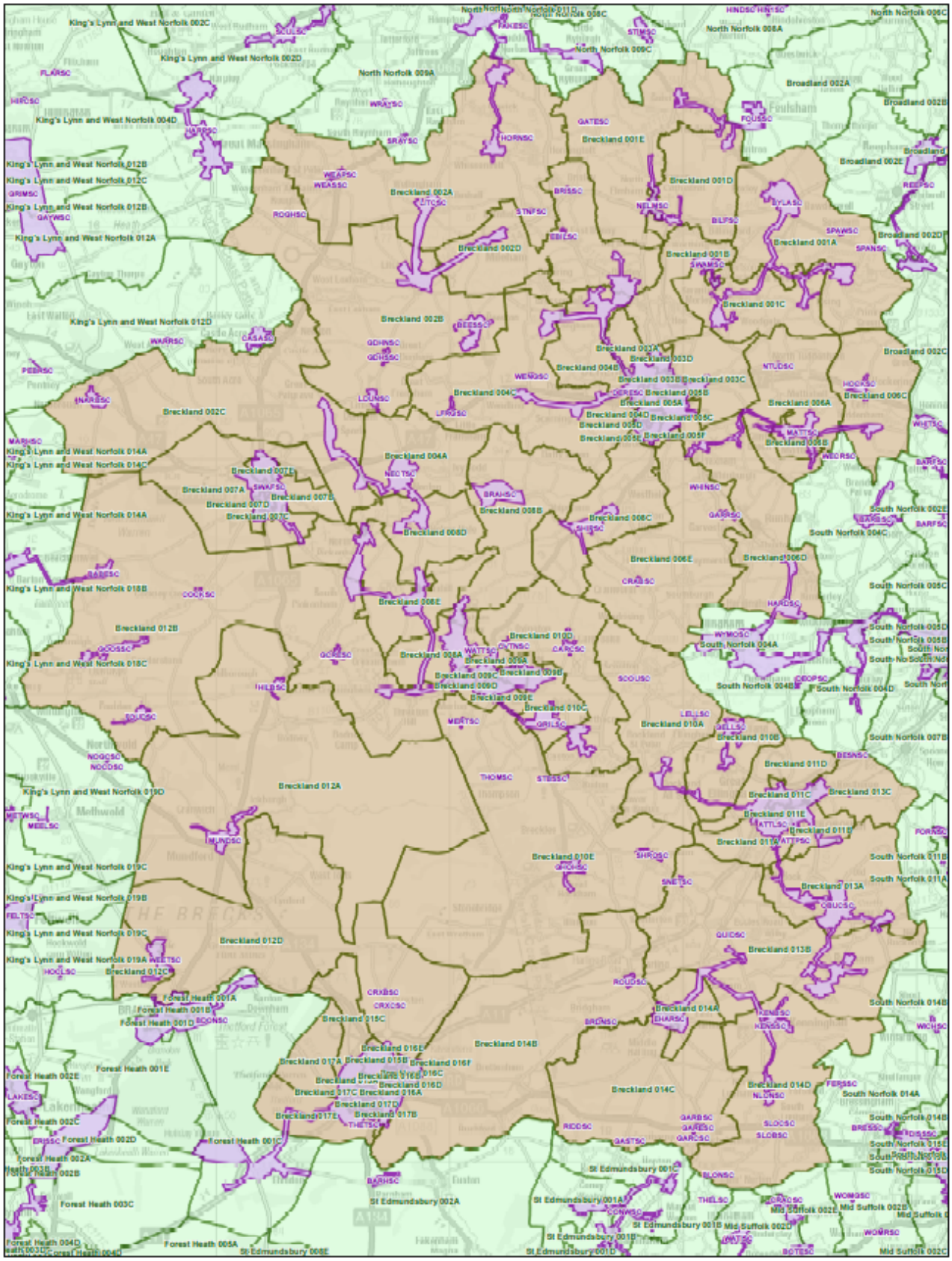
The granularity of the two measures is central to our concerns with Ofwat's approach. There are 32,844 English LSOAs and a further 1,909 Welsh LSOAs. These have an average population of 1,670 and an average area of around 400 hectares. By comparison, the mean area of Anglian Water's 1,128 Water Recycling networks is 360 Hectares. It can thus be seen that the LSOA measure of density and sparsity is working at the same scale as the networks whose costs the density and sparsity measures are designed to capture.

By contrast, there are 326 English LADs, with a further 22 in Wales. The average population of an English LAD is 168,000 and its average area is 40,000 hectares. It can thus be seen that LADs are on average 100 times larger than LSOAs - and of the same order of magnitude larger than the networks whose costs they seek to help explain.

This point is made very clearly if you consider an actual example. On the following page we show a map of Breckland District Council in Norfolk and the sewered areas within that Local Authority District area. The Breckland LAD area is shown in brown, with the sewered areas in purple. The dark green boundary marks show the areas covered by the LSOAs within Breckland. The area covered by sewered networks covers around 6.5% of the land area of the LAD. It is possible to draw a straight line across the whole of Breckland DC without passing through a sewered area, yet all these unserved hectares contribute to a calculation of Breckland's average population density.

3 Supplementary technical appendix: Econometric approach, Ofwat, February 2019, page 14

Figure 4 Breckland - sewered area



5.2.9 Cost drivers: Water

Scale variables

Ofwat uses number of connected properties as the scale variable for all five of its water models except the model for treated water distribution, TWD1, where it uses mains length. A notable feature is the exclusion of any measure of water volume as a scale driver. Ofwat explains that it chose to exclude Distribution Input (DI) as a scale driver on the grounds that it gives a perverse incentive regarding leakage. While this is indeed true – DI after all includes leakage - it ignores the approach historically taken by Ofwat and the CMA in the 2015 Bristol Water appeal of using water delivered as the scale variable. Water delivered is, by definition, net of leakage and as such is not subject to Ofwat's concern over rewarding high leakage.

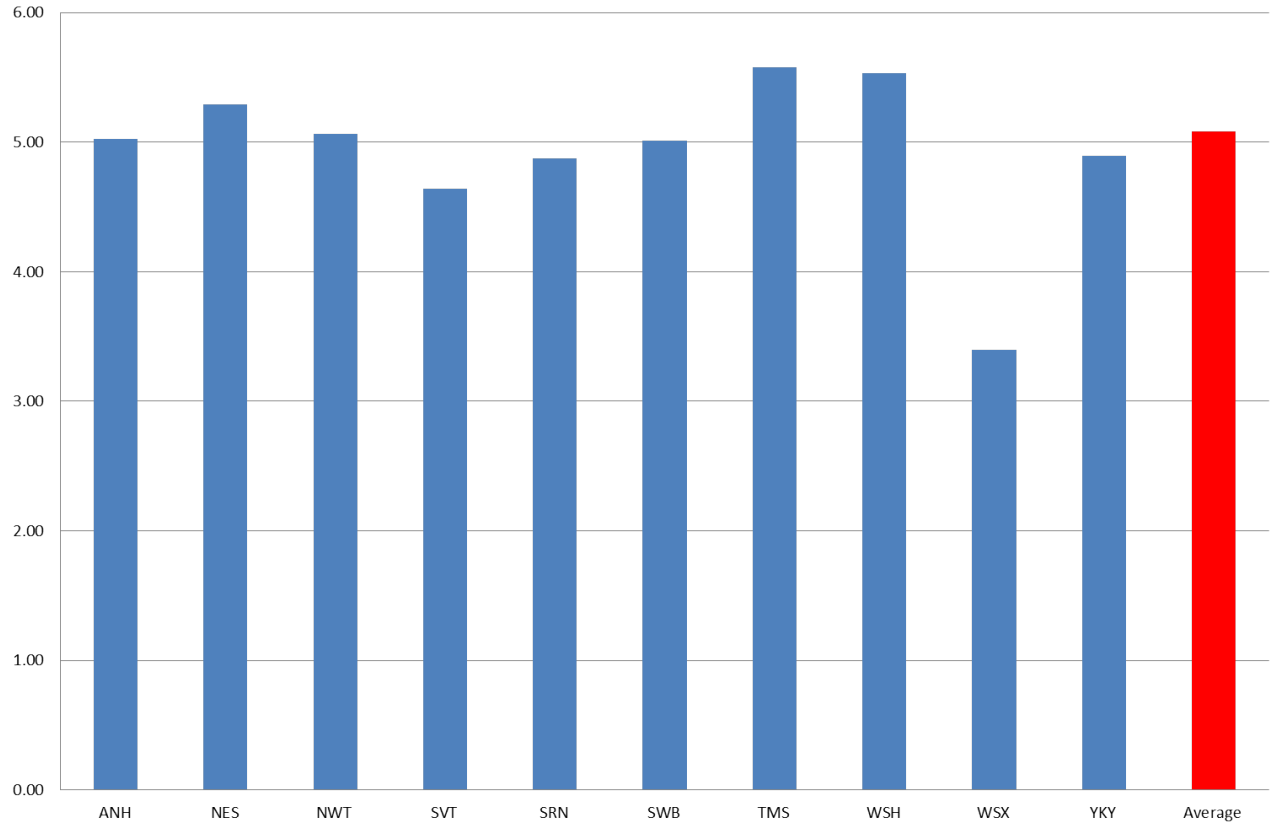
Not including volume in any water model formulations appears in itself perverse. Intrinsic to Ofwat's approach to cost modelling is triangulation. Given that all three classes of scale variable (mains length, properties and volume) capture different core aspects of the interrelationship of costs and cost drivers, it is odd not to have a single model which focuses on volume (as defined by water used) to triangulate with the models which rely on connected properties and length of main alone.

Weighted average treatment complexity

Ofwat's measure of weighted average treatment complexity (WATC) is used in one of its Water Resources Plus models, WRP2, and one of its integrated water models, WW2. The WATC seeks to represent the average level of treatment complexity at each company's water treatment works (WTWs) through a simple weighting of the proportion of water treated at WTWs in each of the 7 complexity bands. The lowest band (simple disinfection) is given a weight of 1; the most complicated treatment level (level 6) is given a weight of 7. The provenance of the raw water is deemed to be captured by the complexity assessment.

The following graph sets out the WATC for 2018:

Figure 5 2018 Weighted average complexity



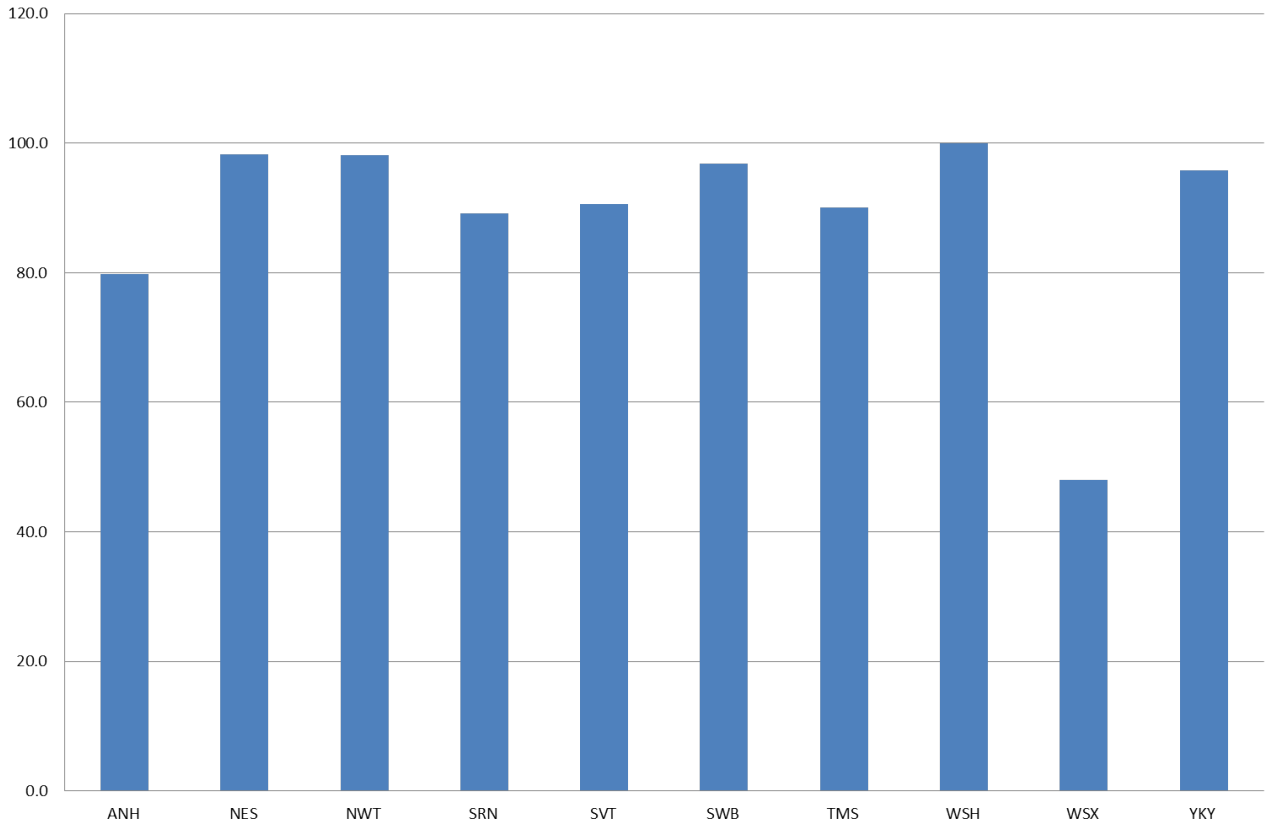
Given the potential range of value for WATC is from 1 to 7, the narrow range of values around an average of 5 is striking. While we consider that the approach of taking a weighted average level of complexity is a sensible and valid one, we are concerned that insufficient thought has been given to the question of what the weights should be. The clustering of the results around 5 suggests that the approach taken may be overly simplistic.

Leaving to one side the question of whether the WATC measure adequately represents companies' overall treatment complexity, a separate issue is the way in which individual WTWs are self-classified by companies into the various categories. In particular, the differences between categories 2 and 3 and between 4 and 5 is whether one or more of a list of treatments is used at the treatment works: if one, then the works goes into the lower category; if more than one, then it goes into the higher category. While superficially this appears to be a clear-cut approach, in practice there are many cases where there may be a matter of judgement as to which category a particular works should fall. In our response to the January 2019 consultation on the regulatory accounting guidelines we proposed developments for the reporting requirements for this area which would improve inter-company consistency.

Share of water treated at levels 3-6

Ofwat's alternative variable for capturing water treatment complexity is the share of water treated at levels 3-6. In reviewing the numbers reported for the volume of water treated at each level of complexity, we have noticed that some companies appear not to have followed Ofwat guidance which states that the sum of water treated at works in each band should be equal to the total DI of the company: the sum of the DI from the 14 different categories (table wn1 lines 9-22) for some companies does not match their reported DI (table wn2 line 12). We have not had the time to ascertain whether this anomaly has any bearing on the surprising gap between its reported share of water treated at 3-6 and that of all but one of the other WaSCs.

Figure 6 Share of water treated at levels 3-6 in 2017/18



Omitted variables

We have considered whether there are any variables missing from Ofwat's water models that we might have expected to see. For this, we first looked to the models that the CMA built for the 2015 Bristol Water appeal. As a reminder, the CMA used ten drivers, of which six do not appear in any comparable form in Ofwat's IAP models.

- **Water sources**

At the IAP Ofwat has not taken any account of the sources of water used by companies. The CMA followed the PR14 (and previous Ofwat opex) approaches of including variables to take account of different water sources. These variables (share of DI from boreholes and reservoirs) capture two aspects of water cost causation

- That borehole water tends to require less complex treatment before being put into distribution and therefore incurs less cost
- That boreholes are generally much smaller than reservoirs and that they are therefore unlikely to be able to recognize any economies of scale.

There is a third aspect of cost which is lost without use of a water source variable: while impounding reservoirs are filled by gravity and thus require no pumping, boreholes and pumped storage reservoirs both, of course, require pumping.

Neither is there any consideration given to water scarcity in Ofwat's modelling. Water stressed parts of the country are obliged to make use of more marginal sources of water which may be smaller, less accessible and / or more costly to treat. We feel that failure to include any variable to take account of types or number of water sources is an omission which will materially affect water stressed companies.

We note in passing that amongst the water enhancement models, the water growth model computes a cost per Ml of additional capacity with no consideration given to the level of treatment complexity. It seems perverse for Ofwat to have included treatment complexity variables in the assessment of its base costs while ignoring treatment complexity for the purpose of enhancement capex assessment.

- **Non household water**

The CMA included a variable to take account of differences in the supply of non-domestic water. This was handled through the share of water delivered to non-household (NHH) customers. As this accounts for around a quarter of water supplied by WaSCs, ignoring this variable altogether is a material omission.

- **Time dummies**

Another omission from the IAP approach is the exclusion of any variables taking time into account. While we accept that time variables can be problematic, it is not appropriate to ignore the dimension of time altogether,

- **Non CMA omitted variables**

We would focus on three variables in particular which were not used by the CMA but which have a significant impact on costs. The first is metering. Companies engage in metering as a means of demand reduction but their dependence on it is highly variable, with meter penetration varying across the industry between 40% and 90%. The installation and maintenance of the meters is a significant component of botex - Anglian expects to spend £55m on meter maintenance over AMP7. It is unsurprising that the companies which have been most active in installing meters are those suffering the highest levels of water stress. Excluding metering from botex cost models disadvantages companies which have adopted this strategy for addressing water stress.

It is less surprising that leakage – or more precisely – leakage reduction is not included as a cost driver in Ofwat's models. As an industry leader in leakage management, we fully understand the rising marginal cost of leakage reduction and the value of capturing leakage performance in botex

models. Our own modelling efforts, however, have shown us the difficulty of incorporating leakage effectively into cost models. Ofwat has implicitly recognized this omission in that Anglian Water's cost adjustment claim for maintaining leakage at 172Ml/d in AMP7 was accepted.

More generally, water stress imposes significant operational costs upon companies facing potential shortages. These include metering, as mentioned above, and taking water from more marginal sources. We believe that these factors could realistically be incorporated into cost models by consideration of the ratio of water abstracted to the maximum volume of water permitted to be abstracted.

Number of booster pumping stations

In its treated water distribution model, TWD1, and both of its integrated water models, WW1 and WW2, Ofwat seeks to control for differences in the topography of the regions served by different water companies. The measure used in all three models is pumping capacity per length of main, where pumping capacity is measured by the number of pumping stations in the treated water distribution network of each company.

We strongly agree with Ofwat that topography is a key determinant of costs and support the inclusion of a variable to control for it. We also share Ofwat's disappointment that there remains insufficient consistency in reporting across the industry to allow the use of its preferred variable, average pumping head (APH). Efforts to address this issue must continue.

We recognise why Ofwat has selected pumping activity as a proxy driver but believe that there are numerous problems with using number of pumping stations. Firstly, the measure counts only the number of pumping stations rather than the number of pumps, which can be material. More importantly, the measure takes no account of the size of the pumps, which varies significantly across the network. The measure treats equally a local booster pumping station maintaining pressure across a small part of the network and the three high-lift pumps at Grafham WTW which send water in three directions across our Ruthamford system.

In our business plan we counted only booster pumping stations within the distribution network. Following Ofwat's clarification of the reporting requirements response to a company query we have now counted also borehole pumps which contribute to network pressure. Were Ofwat to continue with this variable in its models, it should use the number in our revised plan. With reference to the following paragraph, we note that this revised number still does not include all borehole or other abstraction pumps.

There is a further problem with this measure when it is used in the integrated water models. These models purport to model costs across the entire water service, including not just the movement of treated water through the distribution network but also the abstraction of water from borehole or surface water sources and the transport of raw water. Differences in the costs of these activities are also driven by topography but the pumps required for raw water abstraction and transport are not included either. This is wrong in is own right but also inconsistent with the fact that the normalising factor for the pumping station measure is the sum of the treated water mains and the raw water mains.

The following table confirms the importance of including abstraction and raw water pumping in a topography control driver. It shows that companies estimate the APH attributable to water resources and raw water distribution represents up to two thirds of the total APH.

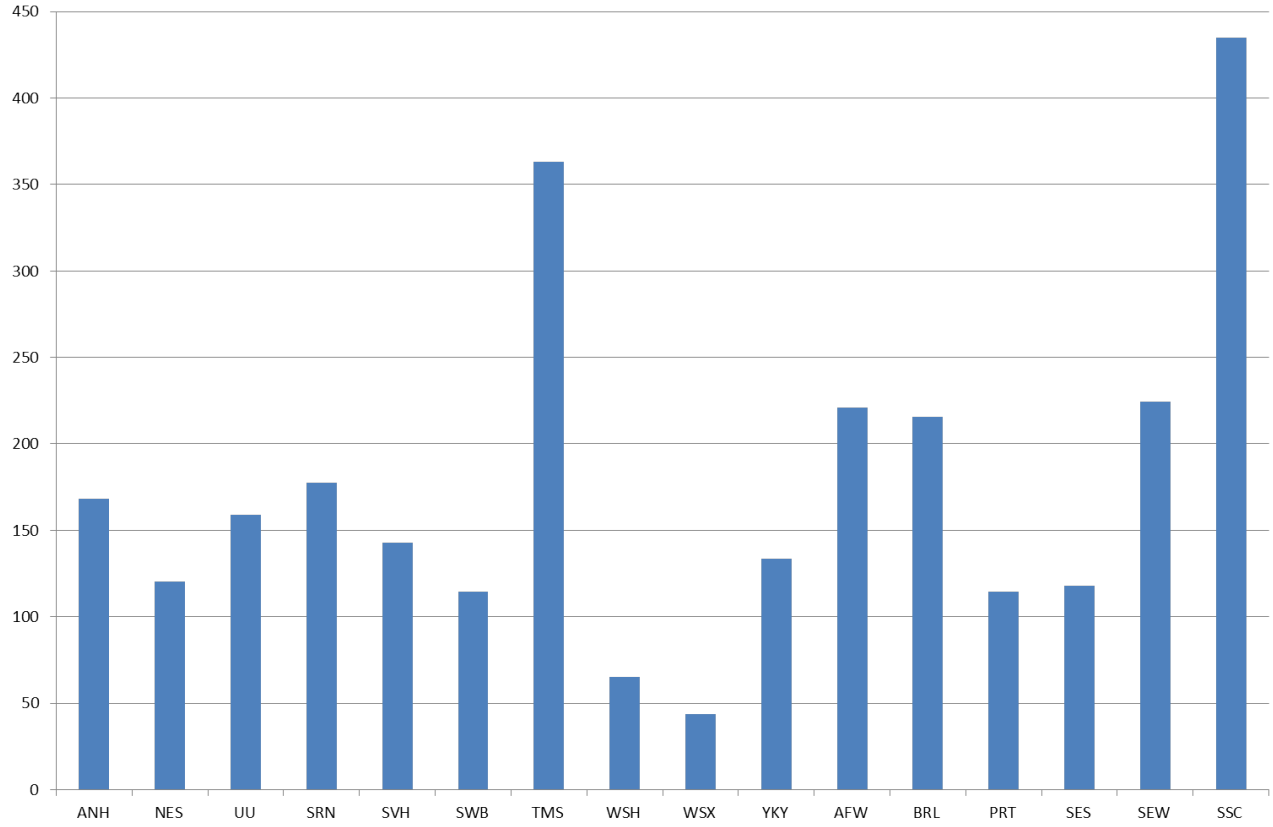
Table 4 Resources and Raw Water Dist-n APH as % of total APH

Company	Resources and Raw Water Dist-n APH as % of total APH
ANH	49%
NES	49%
NWT	32%
SRN	22%
SVT	29%
SWT	33%
TMS	31%
WSH	45%
WSX	26%
YKY	33%
AFW	28%
BRL	35%
DVW	65%
PRT	47%
SES	35%
SEW	27%
SSC	26%

In addition to our concerns about the use of the booster pumping station variable we also have a concern about the consistency of company reporting of this measure. The following graph highlights that there are some companies with very low average booster station capacity. A possible explanation is that single property booster pumps might be included in the numbers of some companies. These pumps have been widely fitted by some companies in recent years to address localised low pressure problems, but they typically serve a handful of properties and are in no way comparable to booster pumps designed to maintain pressure for all customers in the main network. While the guidance notes are silent on whether such pumps should be included, it can easily be seen that their inclusion would seriously compromise the integrity of any cost modelling using the number of booster pumping stations alone. It underlines our view that pumping capacity would be a superior measure than pump number for water botex modelling, as Ofwat has done for its waste water botex models.

For the avoidance of doubt, the revised number of booster pumping stations we have submitted in this revised plan does not include any single property boosters. We recommend that RAG4 should be clarified to ensure consistency between companies in future reporting of this variable.

Figure 7 Average Booster pumping capacity (kW) in 2018



Cost drivers: Water Recycling

Sewer length

Sewer length is used as the scale variable in both of Ofwat's collection models, SWC1 and SWC2. We fully support this but have concerns about the quality of data used for this key variable.

In its collection models Ofwat has included within sewer lengths the sewers which transferred to water companies by law in 2011 and 2016. We question the inclusion of the transferred private sewers on the grounds that these lengths have very questionable accuracy. No company has any clear view of the total length of sewer which transferred to their ownership because by and large there are no maps or other records of these sewers. Companies were explicit about this lack of certainty in the run-up to transfer and none has taken material steps to address the uncertainty since transfer.

Companies confirmed this view in the confidence grades they assigned to transferred sewer lengths in the 2017 Information Request (IR17):

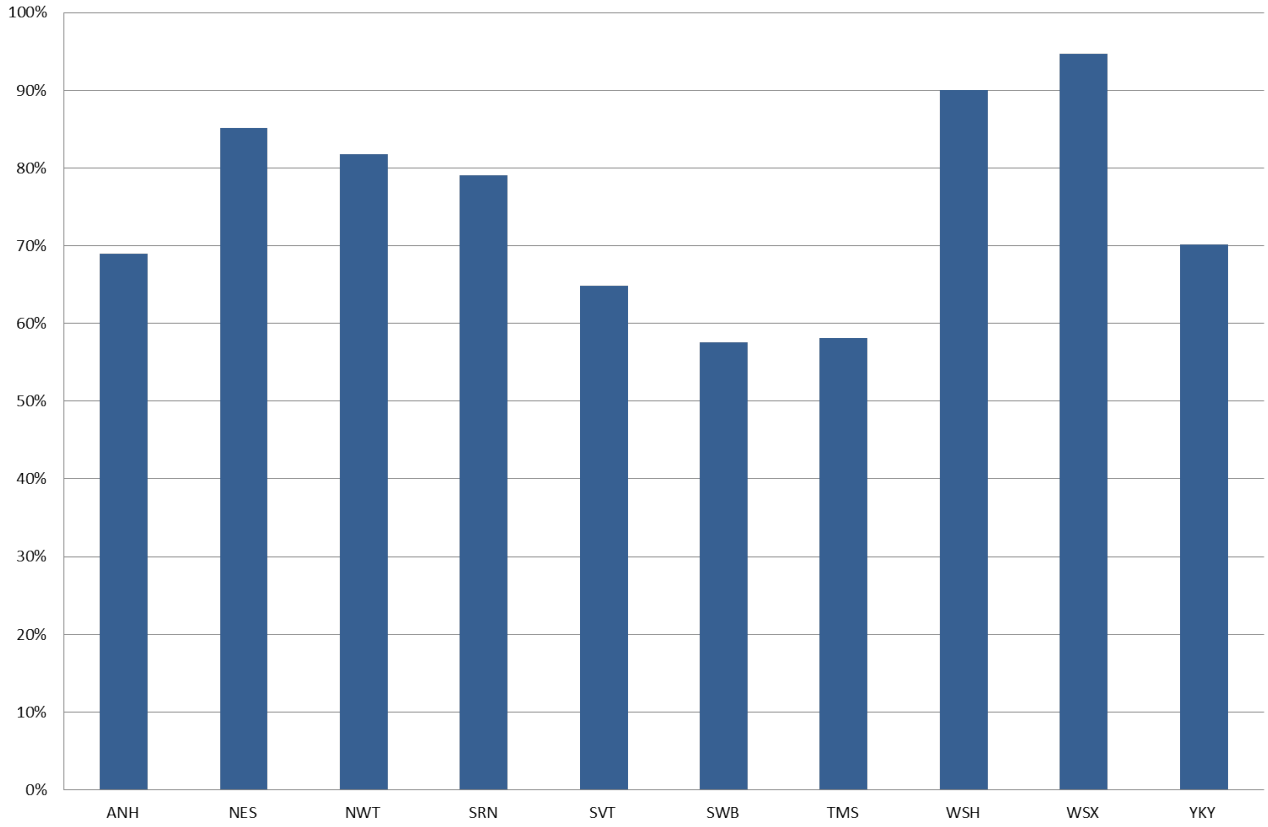
Table 5 Confidence grades assigned to transferred sewer lengths in the 2017 Information Request

# Companies	Confidence grade	Implied accuracy	Comments
3	C4	10-25%	
1	B4		
3	B3	5-10%	
2	B2	1-5%	
1	A1	<1%	A1 only appears to cover 6% of length

One company assigned a confidence grade of A1 but only to a small proportion of the total transferred length. The majority of companies assigned much lower confidence grades, with four (including ourselves) saying that their number could be wrong by as much as 25%.

The chart below shows the uplift on legacy sewer length attributable to private sewers varies across companies between 58% and 95%, with an industry average of 72%. We are not aware of any regional differences in sewer configuration or sewerage practice which would explain this level of variance.

Figure 8 Estimated transferred sewer length as a % of legacy sewer length



Given the critical importance of sewer length as a scale cost driver this issue is too significant to be ignored. Our proposed remedies are that either legacy sewer length is used or that a standard uplift is allowed to reflect transferred sewers. Both approaches would effectively imply that all companies have been equally affected by the transfer regulations.

Before we leave collection, we draw attention to a concern we have around the specification of one of the two models:

In the first of its sewage collection models, SWC1, Ofwat has a scale variable of length of sewer, a topographic variable of pumping capacity per sewer length and a density variable of properties per length of sewer. All three variables are logged. In full, the model is as follows:

Ln Botex = 0.739lnL + 0.170ln(C/L) +1.471ln(P/L) + 8.907 SWC1

Where:

L = sewer length

C=pumping capacity

P= number of properties

SWC1 can be rewritten as:

Ln Botex = 0.739lnL + 0.170lnC -0.170lnL + 1.471lnP – 1.471lnL + 8.907

This in turn can be simplified to:

Ln Botex = (0.739-0.170-1.471)x lnL + 0.170lnC + 1.471lnP + 8.907

Or, more simply still:

Ln Botex = -0.902lnL + 0.170lnC + 1.471lnP + 8.907

A negative relationship between the length of the sewer network and botex is counter-intuitive. It would seem sensible to consider not logging the two control variables in this model to avoid this particular problem.

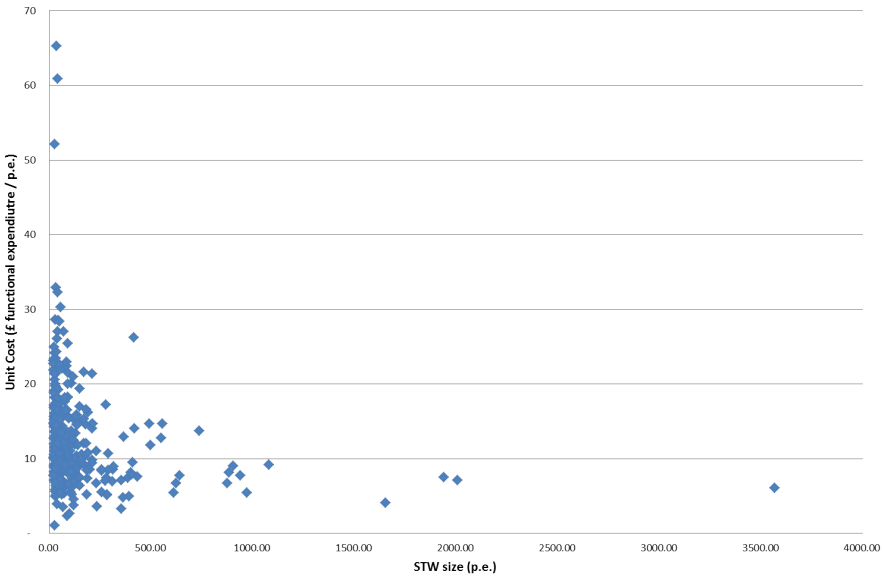
Sewage treatment works size

All four of Ofwat's sewage treatment and Bioresources Plus models use a cost driver relating to the size of sewage treatment works (STW). Models SWT1 and BRP1 use the total sewage load received by STWs in size bands 1, 2 and 3 as a proportion of total load received by all STWs whereas models SWT2 and BRP2 use the proportion of total sewage load received by STWs greater than size band 5 (this effectively means band 6 because further bands have not been specified). The first approach intends to control for the diseconomies of scale from having lots of very small STWs while the second approach seeks to control for the economies of scale achieved by having lots of large STWs.

We support the use of STW size measures among the control drivers. Firstly, treatment of sewage is the most costly aspect of the waste water service. Secondly, there are substantial differences in unit cost between operating large and small STWs. Finally, there are significant differences between companies in the composition of their STW estates. However, we have questions about the specific measures that have been chosen.

Our first concern relates to the large STW driver. Band 6 includes all works serving a population equivalent (p.e.) over 25,000 and therefore treats identically Wessex Water's Westbury STW, which serves 25,480 p.e., and Thames Water's Beckton STW, which serves 3,569,820 p.e. The chart below plots the functional expenditure for running each of the 391 large STWs in England and Wales against their size. Evidently the unit cost of sewage treatment reduces significantly with increasing size but this scale economy effect cannot be captured with such a broad definition of the large STW band.

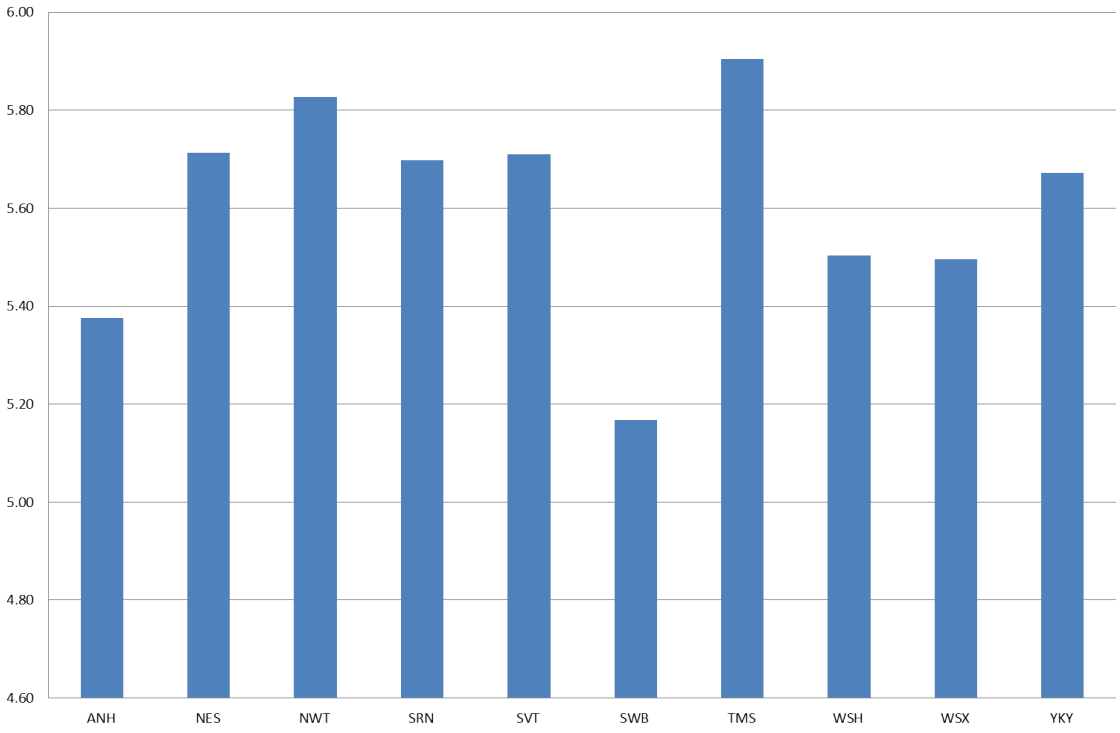
Figure 9 Unit cost of Band 6 STWs



Our second concern relates to the other STW size driver, which captures only the very small STWs. These are defined as STWs which serve up to 2,000 p.e. We have seen no evidence to justify band 3 as an appropriate break point between higher and lower unit costs. Our own experience of operating the largest share of STWs in England and Wales does not point to such a break-point. Rather, we observe a continuum of falling unit costs as we move from our smallest to our largest works.

Given this observation, we propose an average STW size measure which captures for all companies the distribution of their STWs across all the size bands. This measure is directly analogous to the weighted average treatment complexity measure Ofwat uses in its Water Resources Plus model WRP1 for the water service where each successive treatment complexity band is assigned an additional unit of weight. We take the same approach for our average STW size measure, assigning a weighting of 1 to size band 1, 2 to size band 2, etc. The scores for this measure, shown in the chart below, pass the sense-check of experts familiar with differences in companies' different STW estates.

Figure 10 Weighted average STWs size (2017/18)



Finally, we note that in the bioresources model BR2 Ofwat uses sewage treatment works per property as a measure of STW size. However it uses this as a logged measure. Restatement of the maths as we did for the logged measures normalised for sewer length in 2d.2.a shows that this amounts to a negative relationship between the number of properties and botex.

Tight sewage treatment consents

All four of Ofwat's sewage treatment and Bioresources Plus models use a cost driver relating to the STW discharge permit standards to which companies must operate. In every case the same driver is used, one which measures the total sewage load received by STWs where the ammonia consent is "3 mg/l as a proportion of total load received by all STWs.

Again, we support the principle of using a tight consent driver on the grounds that it is a material driver of cost differences and a factor on which we see considerable variance across the sector. Our question is whether the ammonia driver which has been selected adequately captures the tight consent effect.

The parameter which has driven substantial historical investment, and which will drive substantial investment during AMP7, is phosphorus (P). To check whether Ofwat's ammonia measure provides an adequate control for investment in P removal we have examined the correlation between proportion of load with a <3mg/l ammonia consent and proportion of load with a P consent. The charts below show this correlation for both 2017/18 and 2024/25. The R-squared values show the correlation is poor. We propose that the ammonia measure does not alone control adequately for this important variable.

Figure 11 Load treated to NH3 <3 mg/l vs Load treated for P removal (2017/18)

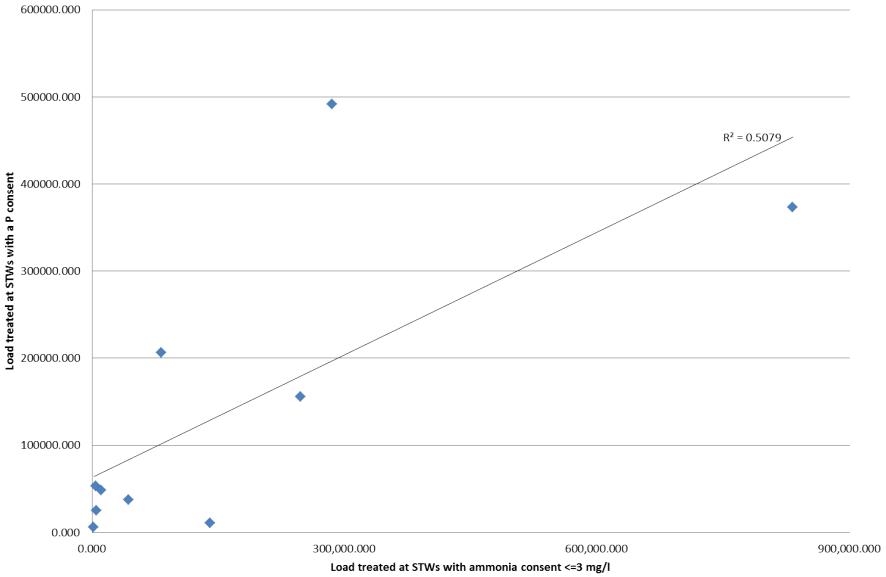
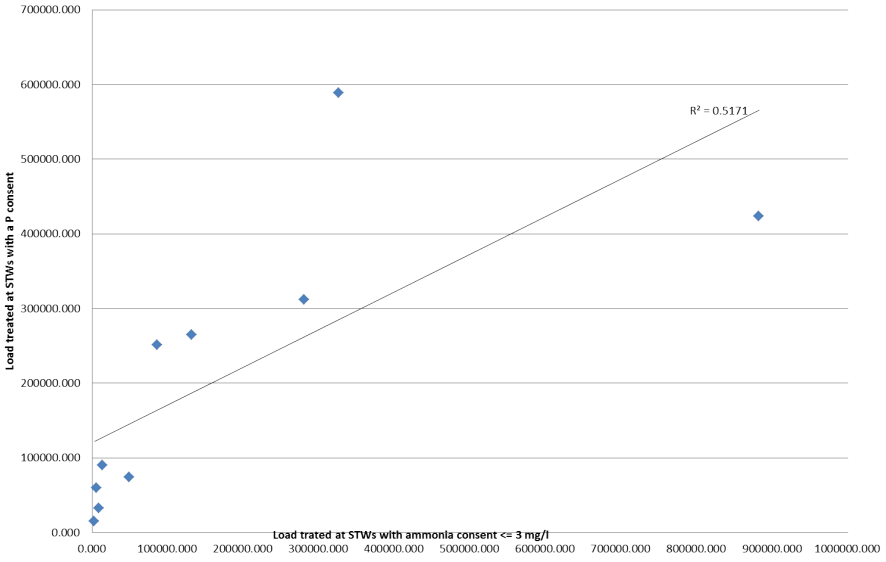


Figure 12 Load treated to NH3 <3 mg/l vs Load treated for P removal (2024/25)



Pumping capacity

Both of Ofwat's sewage collection models SWC1 and SWC2 include as a driver the total capacity of pumping stations, measured in kW, per km of sewer. This driver is intended to capture differences in topography between the regions which companies serve. Such differences will affect the extent to which companies have to pump sewage to their sewage treatment works and particularly affects companies which cannot enjoy the natural benefit of gravity flow which is, wherever possible, exploited in intelligent network design.

We support the principle of including a driver for topography and the selection of pumping capacity for this purpose. We note that a capacity measure does not capture differences between companies in the number of pumping stations that they manage and nor, therefore, the fixed costs associated with that. We note also that using this measure means that companies are allowed very little additional cost for dealing with the adoption of private pumping stations in October 2016. Because of private sewer adoption we saw a 28% increase in the number of pumping stations but only a 4% increase in total pumping capacity. However, although these differences are material, on balance and to be consistent with our view on pumping in water, we support the use of capacity.

The precise variable used in the model is pumping capacity per km of sewer. We set out above our concerns with the quality of data on sewer length. This issue caries forward into the pumping capacity variable because of the use of sewer length as the denominator.

We have further concern with this variable through its specification as a logged measure. We set this out in section 3d.3.a above.

Finally on this subject, we raise a concern with the number submitted by Southern Water. We are surprised that Southern reports a total pumping capacity 10% higher than our own when its network is only half the length and there are no immediately obvious topographical features about the region it serves that would suggest such a variance. We note also that Southern's projected proportional uplift in pumping capacity over 2020-2025 is three times higher than that of the next highest company. We suggest that Ofwat seek reassurances from Southern Water about its methodology for reporting this measure.

5.2.10 Driver forecasts

To derive its estimates of companies' future botex requirements Ofwat has multiplied the coefficients from its suite of models by its own forecasts of the values for each relevant cost driver. Ofwat states that it requires these forecasts to be independent but we note that the forecasts depend almost exclusively on companies' historical data, being derived typically as extrapolations of past trends, continuation of current values or – in some case – companies' own estimates. We do not understand why Ofwat's approach in this area differs from what it does everywhere else in its assessment of companies' business plans, which is to weigh evidence presented by companies and accept or reject to varying degree. The impact of Ofwat substituting its forecasts for ours is £55m.

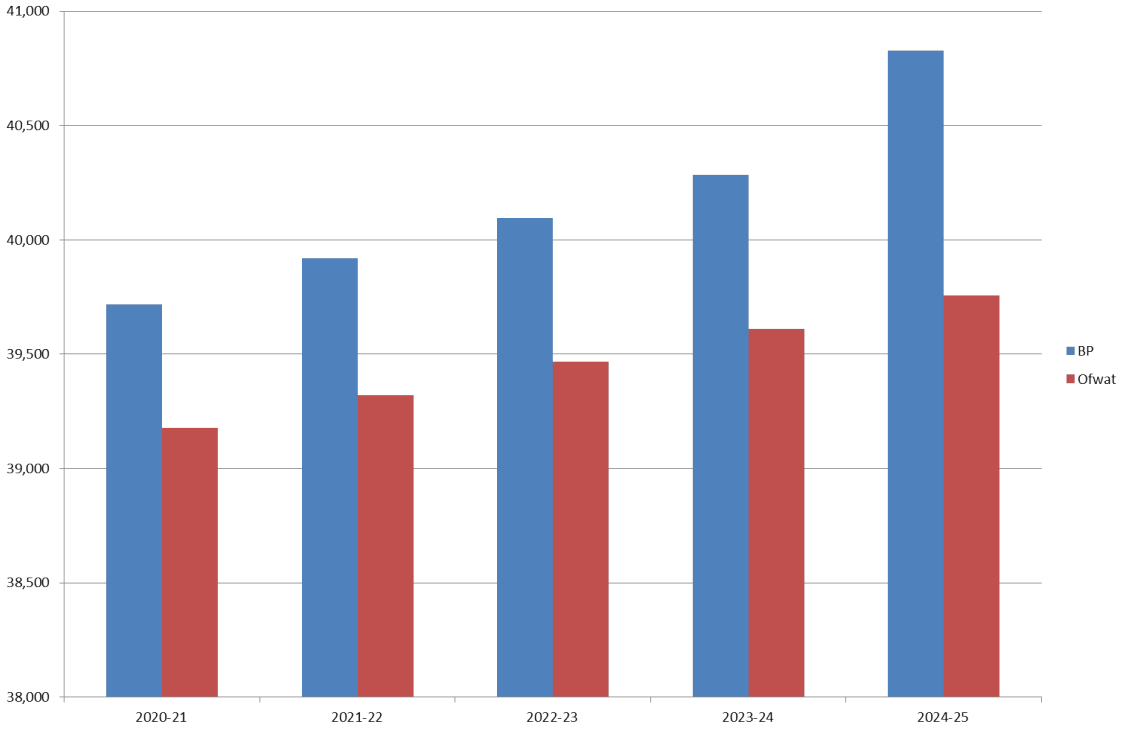
Apart from this general comment, we have specific observations about some of the individual measure forecasts:

We have a particular concern on the forecast values for weighted average density (WAD) in the waste water models, where Ofwat has used the average of the values for 2015/16, 2016/17 and 2017/18. This assumption is not appropriate given population is forecast by the ONS to increase across most parts of the UK including in the region we serve. It is also inconsistent with the approach for the water models, where the WAD forecasts follow what we regard as a more sensible approach of using actual ONS forecasts.

A related concern covers the over-writing of the properties numbers forecast in our Business Plan. These were not our figures, they are the Local Authority forecasts and are consistent with government expectations regarding population and household formation. Basing the forecasts on the extrapolation of the trend data over the years since 2011/12 also bakes into the forecast the period of low household growth following the economic disruption of a decade ago.

As part of our Business Plan, we are intending to develop a Strategic Water Grid which will involve building 550km of water main during the forecast period. Since in the period 2011/12 to 2016/17 we built less than 450km of mains, unsurprisingly this proposed development is not taken account of in Ofwat's trending approach to forecasting mains growth.

Figure 13 ANH Length of main



We recommend that Ofwat considers the points raised in this section when re-assessing its cost driver forecasts.

5.2.11 Unmodelled costs

Ofwat's botex cost assessment process includes making forecasts of those costs which were excluded from its models and adding those forecasts to the botex total. Of these unmodelled costs the most important ones are business rates, and we do not agree with Ofwat's forecasts of our rates for Water Recycling.

To arrive at its assessment of our waste water rates requirement for 2020 to 2025 Ofwat has multiplied the 2020/21 rates forecast by five. In doing so, Ofwat has allowed all the forecast changes in 2020/21, but excluded further net (post efficiency) increases arising from the change in asset stock for the remainder of AMP7. This is despite the fact that elsewhere in the IAP Ofwat has acknowledged the need for the same investment and made an allowance for its costs. The net effect of this adjustment is a reduction in allowed rates costs of £11m over the AMP compared to our business plan submission.

We are unclear why Ofwat would exclude the impact of the change in asset stock and its associated efficiency, particularly when the impact is specifically identified in table WWS7 of the Business Plan. The forecast change in rates costs is a direct result of our future capital expenditure programme and the resulting increase in the number and/or size of some of our sites. Therefore, the increase in our business rates liability is not reflected in current botex costs or retrospective cost models leaves us with inadequate funding based on the initial assessment of our plan.

We recommend that Ofwat's forecast of our AMP7 water recycling rates recognises the impact on rates from the investments we will make in the period.

5.2.12 Further considerations

The role of capital maintenance approaches in assessing future requirements

Ofwat's approach to botex cost assessment places sole reliability on a suite of econometric models to be able to determine appropriate base costs allowances. As recognised through the significant effort from the sector in recent years there is a need to apply a range of approaches which are capable of capturing the different drivers of costs across companies to determine efficient costs. We have set out previously in the document our views of Ofwat's IAP botex modelling assessment.

Clearly there is a role for econometric models and other benchmarking activities provided their robustness is assured but this should be indicative not determinative.

In our September Plan we set out how we derived our assessment of our AMP7 base cost requirement. We assessed these needs on a bottom-up basis. We have cross-checked this assessment in two ways. Firstly by comparing these costs to our AMP6 expenditure and secondly by comparing these bottom-up estimates with our top-down econometric model analysis.

The outputs of this assessment was set out in Table 8 of our Plan which we replicate below:

Table 6

£m 2017/18 prices	Historical and future needs	Botex modelled	Bottom-up botex
Water Resources	226	210	241
Water Network+	1,561	1,534	1,460
Wastewater Network+	1,749	1,1772	1,693
Bioresources	475	532	485
Retail	411	427	415
Total Botex	4,422	4,475	4,294

This cross-check provides a very important sense-check to ensure we can be confident that they requirements are reasonable and not biased by a single type of assessment. Together they give greater assurance of our future requirements.

We are concerned that Ofwat's sole reliance on Botex modelling and absence of an effective cross-check by significantly lowers the confidence that the outputs of the IAP adequately assess the future needs to maintain base level of asset maintenance. This is further compounded by Ofwat's policy that base allowances also capture the costs of delivering stretching future forecast performance in areas such as interruptions to supply, pollutions and flooding.

We have previously contributed to the Water UK Marketplace for Ideas some thoughts on the historic development of capital maintenance planning approaches (http://www.anglianwater.co.uk/_assets/media/Long_term_investment_-_Final.pdf) and set out some thoughts on the future. This includes the evolution of the Capital Maintenance Planning: A Common Framework (link) and the role of forward-looking risk based predictive modelling and the considerations of performance, cost and risk based on the assessment of future needs. A sole emphasis on econometrics ignores these essential considerations.

In during May 2019 we plan to a publish a report offering further views on maintenance, how approaches vary around regulated sectors, and how these approaches need to evolve to address sector-specific future challenges. We plan to share this work with Ofwat in the first instance, and then as a contribution to the Marketplace for Ideas. We also see this work linking into the UKWIRs Asset Management "Big Question" and may result in further research through this route.

5.3 Ofwat's approach to enhancement expenditure assessment

Summary

Consistent with our approach to botex modelling, we have sought to understand how Ofwat has derived its assessment of our future enhancement investment requirements. We have used independent experts to help conduct this analysis and have actively sought, where possible, to make recommendations to Ofwat for improvements to its IAP analysis.

In preparation for the AMP7 delivery of our strategic interconnections we have carried out a tendering process to determine the potential delivery cost of these pipelines. [redacted]

We welcome Ofwat's separation of enhancement and botex modelling, noting that this change is an improvement relative to Ofwat's PR14 totex econometrics.

In light of the scale of enhancement investment in PR19 and the emphasis on best value totex solutions it is vital that the approach to setting enhancement allowances is robust.

We are sympathetic to the challenge that assessing enhancement investment presents. However, we consider there are clear alternatives to the approach in the IAP which would deliver a more robust outcome.

There are several areas of Ofwat's IAP approach where we have serious concerns. At a high level these include:

- Emphasis on predominantly modelling enhancement capex in isolation (i.e. ignoring enhancement opex) which dilutes the incentives for companies to seek totex solutions;
- Exclusion of expenditure based on a perceived lack of evidence of need being classified as an efficiency challenge;
- Weak evidence on the justification, and application of, company specific efficiency factors to enhancement expenditure;
- The lack of a clear documented, systematic methodology for model development and selection; and
- Weak justification of the type of assessment (deep dive, shallow dive, benchmarking) applied;
- Weaknesses across a range of Ofwat's favoured benchmark approaches which have derived unstable estimates of companies' expenditure requirement. As mentioned above, we provide in this IAP Response new market testing evidence in relation to our strategic pipelines programme which questions the validity of Ofwat's generic assumptions that have informed its view of our efficiency.

In detail, we are concerned about:

- The removal of circa £86m of supply demand investment based on insufficient evidence of need when the need for this investment is set our in our WRMP which has already been through a rigorous testing process;
- The removal of over £100m of capital expenditure Ofwat considers to be base costs rather than enhancement expenditure;
- For wastewater growth, the two modelling approaches produce inconsistent outcomes, e.g. sector costs are forecast as £1.7bn in one model and £3.0bn in another;
- The use of log-log models which distorts modelled allowances across the industry by not accounting for biases introduced by the use of this model specification;
- For leakage enhancement costs, the use of ODI incentive rates to triangulate industry median unit costs derive implausible marginal costs for a company shifting the leakage frontier.

Taken together, we conclude that the materiality of these issues is such that we cannot rely on the findings they produce for efficient enhancement costs.

5.3.1 Further work since our September Plan

WRMP Strategic interconnections - Cost benchmarking

In preparation for AMP7, we have started an OJEU tendering process for our Water Resources Management Plan strategic interconnectors programme.

This has provided us with the opportunity to present new evidence to Ofwat, as we have been able to market test our unit rate with construction companies using tendered cost information.

[redacted]

5.4 Review of Ofwat's assessment of our AMP7 enhancement requirements

In its IAP, Ofwat has sought to assess the efficient level of enhancement costs required to deliver our obligations and performance commitments in 2020-2025. This assessment includes challenges on scope and need for investment and on efficiency of costs.

Ofwat's assessment is £592m lower than the figure we set out in our September plan. This difference is significant and breaks down as follows:

- Circa £400m based on Ofwat's efficiency challenge derived from benchmarking, deep dive and shallow dives;
- In the region of £100m on insufficient evidence of the need for the investment; and
- Over £100m challenge based on Ofwat's view that enhancement expenditure is captured in base expenditure.

To understand the reason for this difference we have analysed in detail the approach Ofwat has taken to derive its enhancement assessment.

In the remainder of this chapter we set out our findings of this analysis.

5.4.1 Introduction

Ofwat has used a number of approaches to assess enhancement expenditure. Specifically:

- Benchmarking of historical data;
- Benchmarking of business plan data;
- Deep dives; and
- Shallow dives.

Unlike for base costs where an upper quartile and frontier productivity assumption is applied to all costs, Ofwat does not apply a common efficiency challenge to enhancement. The resulting efficiency challenge for areas of proposed enhancement spend is therefore dependent on the quality of Ofwat's modelling and choice of benchmark.

Ofwat's principal approach to enhancement is to determine only capex allowances. Exceptions to this approach are the treatment of supply demand balance and some catchment management proposals which have been treated on a totex basis.

Ofwat justifies this on on the basis that their efficient base cost allowances covers all operating costs including those for enhancement. For reasons set out in our botex cost assessment section above, and which we have reviewed as part of our work with Reckon, we do not agree with this.

Our analysis of Ofwat's approach to enhancement opex is covered in section 5.1.5 of this chapter and we do not duplicate this here.

We set out here our high-level analysis of Ofwat's enhancement approaches. Also, drawing on work we commissioned from Vivid Economics, we assess the specific modelling approach undertaken by Ofwat for each area of enhancement expenditure.

5.4.2 Our response

For the majority of enhancement costs Ofwat has sought to use a form of benchmarking analysis stating this is their preferred method of assessment and driver of efficiency applied to companies' proposed investments.

Ofwat provided very little support for this preference, other than noting that most companies incur costs in these areas. We feel this justification is inadequate. Whilst most companies do incur costs, this will mask a wide range of different factors affecting companies' costs, including the viable solutions available to any particular company.

There is no evidence that Ofwat has sought to triangulate between the range of available assessment approaches to determine IAP allowances. We consider this a significant shortcoming.

To illustrate, a company looking to deal with nitrates within raw water sources will generally have two options; blending sources of water to achieve a lower level of nitrates if possible, or alternatively being forced into using a treatment process to remove nitrates. These alternatives will have materially different cost profiles and mixtures of opex and capex expenditure. Unless the benchmarking approaches appropriately control for these differences, it is likely that the modeled expenditures will capture significant differences that are not driven by companies' relative efficiency.

The quality of benchmarking analysis that can be undertaken is heavily constrained by the data Ofwat has at its disposal to generate and test underlying relationships between costs and their underlying drivers. For the IAP, this constraint manifests itself in the form of very limited cost and input data that Ofwat has used to generate plausible relationships.

In light of this constraint, and in the absence of Ofwat having sought information from companies to help generate plausible models or understand variations between companies, we recommend that Ofwat should now place greater emphasis on company-specific evidence through deep dive assessments. As noted earlier, we have structured our enhancement cases on this basis in order to enable this activity to take place.

5.4.3 Challenges to the need for investment

Ofwat's IAP assessment of enhancement costs makes two types of adjustments to company plans. These are collectively labelled as "efficiency", but actually fall into a challenge relating to need or scope, and then an efficiency challenge on costs. This results in:

- The removal of almost £100m expenditure from enhancement areas on the basis of 'insufficient evidence on scope'; and
- A reduction to assumed costs based on Ofwat's view of efficient costs, based on the selected modelling approach.

The three areas where Ofwat has removed proposed expenditure due to insufficient evidence are:

- **Supply demand** - Ofwat has removed 20% of costs from the proposed expenditure for the internal interconnections element of the WRMP supply side investment programme (£86m) due to *"insufficient justification provided for the majority of scope".* This reduction is made before company level efficiency is applied;
- **Water resilience** - Ofwat has removed 20% of proposed expenditure (£4.6m) *"as a detailed cost breakdown is not provided and there is insufficient detail on optioneering";* and
- **Raw water deterioration (Nitrates)** - Ofwat has removed 20% of submitted costs (£4.6m) *"beacuse of a lack of evidence of optioneering and provision of scheme level data".*

The most significant challenge relates to the internal interconnections, the need for which has been established through the WRMP process. Evidence of this justification of scope was fully provided in our revised draft WRMP submission, which we summarised in the Resilient Water Supplies chapter of our September submission. Following our meeting with Ofwat on 19 February we have provided a restatement of information from our WRMP as part of our enhancement business case set out in the commentary to table WS2 submitted with this response.

We also provide updated information in the enhancement cases for water resilience and raw water deterioration which clearly demonstrate the optioneering we undertook to build the Plan submitted in September. As a consequence we expect this expenditure to be reinstated in the Draft Determination.

5.4.4 Derivation of company specific efficiency challenges

As part of the IAP query process (specifically in response to query ANH_040), we requested from Ofwat the derivation of the company specific efficiency challenges which have been applied to specific enhancement areas. Ofwat confirmed:

Ofwat's IAP approach

"We consider whether to apply a company specific efficiency challenge to the costs where the need and scope if justified but there is insufficient evidence"

"Where there is insufficient evidence that costs are efficient we have applied the company specific efficiency challenge to derive our view of efficient costs. We consider it reasonable to assume that the opportunity for efficiency in these areas will be at a similar level to other areas of a company's business plan.

We do not apply this efficiency challenge to areas of enhancement that have very low materiality."

Source: Technical appendix 2: Securing cost efficiency - Section 5

Response to query ANH_040

In wholesale water, the calculation is based on the cost challenge that the upper quartile efficient level of "modelled base costs" presents to your business plan forecast of modelled base costs. In your case it is about 24%, calculated as "efficient modelled based costs"/"business plan modelled base costs"-1, ie (1109)/(1463)-1. We capped the challenge at 15%.

In wholesale wastewater we use a similar approach but also gave weight to information from our p-removal model. We gave the information from our base econometric model a 70% weight and the p-removal 30% weight. The triangulated challenge to you company came to about 13%, which we capped at 10%

5.4.5 Our response

The derivation of these factors is based on an assessment of upper quartile efficiency between our Plan and Ofwat's modelled base costs. Both the value and robustness of these factors will be materially affected by the base modelling approaches and the treatment of enhancement opex. We would expect these to change ahead of Draft Determination and we are committed to working with Ofwat on these issues.

Irrespective of the calculation of these values, we have a number of concerns with Ofwat's approach.

Ofwat's application of company specific factors derived for botex models to material areas of enhancement is not appropriate for a number of reasons. Firstly, the mix of the materiality of investment is not fully within management control, (e.g. it may be driven by statutory drivers). This means that some companies will avoid an efficiency challenge altogether, which does not seem to be in customers' interests, especially if driven by factors beyond company control.

As Ofwat notes, unlike for base costs where an upper quartile and frontier productivity assumption is applied to all costs, Ofwat does not apply a common efficiency challenge to enhancement. The implications of this policy assumption are striking. In some areas of expenditure this will result in some companies having efficiencies applied to enhancement expenditure on the basis of being deemed inefficient for a different suite of activities (base). Conversely efficient companies for base are assumed to be efficient for some areas in enhancement resulting in no efficiency challenge. This is neither logical or is it likely to be in customers' interests. It also creates a significant risk of double jeopardy.

Historically, some differences between companies have been driven by factors other than efficiency - for example different accounting policies for capitalisation of costs. Under the current modelling framework no account for these differences is made. This could materially affect the assessment of base, which under Ofwat's policy, also now affects the assessment of enhancement costs. Historically, these would have cancelled each other out; whereas the IAP approach is now: "win-win" or "lose-lose".

Intuitively this feels incorrect. The logic that if a company is good at maintaining water mains therefore it must be equally good at investing in, say, SEMD, seems irrational and not consistent with previous processes such as Cost Base.

The evidence used for the company specific efficiency challenge is unlikely to be appropriately representative. This is because base cost efficiency reflects investment decisions made in previous AMPs and has a large opex component, whereas for IAP, Ofwat has modelled enhancement efficiency exclusively concerning future looking capex decisions.

Neither is the assumption that base efficiency flows through to enhancement consistent with the conclusions of the CMA in the PR14 Bristol Water referral. It is also at odds with Ofwat's historic approaches and current wider regulatory practices.

In the CMA review of Bristol's PR14 determination that the results of the CMA's opex/botex modelling were used to derive their view of capex efficiency challenge for Bristol's enhancement expenditure. [4]

Taking an example of other current regulatory practices, in assessing Northern Ireland Water's 2015-21 Price Determination, the regulator has always applied different efficiency targets for opex and capex derived from different methods. Capital efficiency targets have been derived through a triangulation process of Cost Base analysis, and views on Capital Procurement Efficiencies from independent sources. [5] This leads to different efficiency targets; specifically the opex efficiency challenge being typically much higher than the challenge applied to capex.

In previous Water and Sewerage price reviews up to and including PR09, Ofwat has deployed a deeper range of techniques to determine efficiency. Central to this was Ofwat's Cost Base. This consisted of a suite of capital unit cost estimates for standardised projects across all companies.

4 For example see para 47 https://assets.publishing.service.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf

5 See para 5.7.2 : https://www.uregni.gov.uk/sites/uregni.gov.uk/files/media-files/UR_PC15_FD_-_Final_Determination_-_Main_Report.pdf

The main objective of Cost Base is to assess the current comparative position of companies specifically for the types of activities to be carried out in the future AMP. The Cost Base submission acknowledged the differences between capital maintenance and capital enhancement expenditure.

These approaches derive materially different efficiency factors to those derived from opex efficiency models, as demonstrated by comparing assessments from the PR09 Final Determination [6] It is logical that these assessments reach different conclusions.

It is for the reasons set out above that we believe Ofwat's IAP application of company specific efficiency challenges is inappropriate.

5.4.6 Ofwat classification of base and enhancement costs

Ofwat has reallocated costs from enhancement expenditure areas where its view is that these are part of base costs. The affected areas of our plan are:

- smart metering;
- water resilience;
- low pressure; and
- cyber security costs.

The total of these adjustments exceeds £100m. These costs have been entirely removed from enhancement expenditure as a net reduction, as Ofwat assumes such costs are included in base cost allowances with no further adjustment needed.

We disagree with Ofwat's rationale that these costs are part of base expenditure. We assert that they are a means of achieving enhancement outcomes using totex approaches. Where Ofwat has removed costs from enhancement investment we respond directly in the commentary in the enhancement cases in the commentary to tables WS2 and WWS2, and in our assessment of each of Ofwat's enhancement cost models. This is notwithstanding our comments on the functional form of the models and the need to demonstrate that, where Ofwat assumes costs are covered in base expenditure, there are appropriate explanatory factors to capture the drivers of these costs.

5.4.7 Benchmarking approaches

Ofwat's IAP approach

"Our preferred method of assessment is benchmarking analysis. For enhancement activities where most companies incur costs and we identify appropriate cost drivers we develop econometric or unit cost models. We use historical and forecast data depending on appropriateness and availability.

We use benchmarking to assess about 60% of enhancement expenditure for water and close to 90% for wastewater.

Unlike for base costs, where we apply an upper quartile plus 1.5% per year frontier shift challenge for all costs, we do not apply a common efficiency challenge for all enhancement costs. Our efficiency challenge is dependent on the quality of the model and the spread of company cost projections around our benchmarks. In some models we do not apply a further challenge beyond the average predictions. That is, we set as an allowance the cost predicted by the model (e.g. the regression line in econometric models). In other models we apply a discretionary efficiency challenge above the average cost performance. For example, to set allowances for expenditure on storm tank capacity we developed benchmarking analysis and added a 5% efficiency challenge to the model cost predictions. In our phosphorous removal model 'flow to full treatment model we apply an upper quartile challenge (which is about 6% and 14% challenge respectively)."

Source: Technical appendix 2: Securing cost efficiency - Section 5.2.1

6 Specifically tables 38 and 42 for wastewater: https://www.ofwat.gov.uk/wp-content/uploads/2015/11/det_pr09_finalfull.pdf

5.4.8 Our response

In reviewing Ofwat's IAP benchmarking analysis, we draw on a report we commissioned with Vivid Economics (Appendix 5d) to review Ofwat's use of benchmarking for modelling enhancement investment in IAP.

The key findings of the Vivid report are:

- An overarching limitation of the IAP is the lack of a documented, systematic methodology for model development and selection. Furthermore, it is clear that the models adopted in some specific lines are deficient in ways that have material impacts on allowances. Reasons for this include:
  - Lack of fit with engineering or economic logic. For example, growth models do not account for the drivers of upstream spending that are recovered through customer bills, while the functional form used in sanitary parameter models lacks an engineering rationale.
  - Lack of statistical fit. Many of the models produce implausibly wide ranges of efficiency scores, including P-removal, leakage, and storm tanks.
  - Lack of stability. This is evident in a gap between industry wide allowances yielded by the wastewater growth models: whereas one produces an estimate of £1.7bn, the other gives £3bn
  - Inconsistency of approach. This is reflected in mistakes in the implementation of some the models and decisions that are difficult to reconcile with each other, such as the choices of functional form for water and waste growth models.
- Enhancement opex: By modelling enhancement opex with base costs, the IAP skews coefficients in the enhancement models and understates the efficiency of some companies in the base cost models
- Most of the effective efficiency challenge in the IAP arises due to the choices of model specifications rather than explicit adjustments for efficiency.
- The IAP's use of log-log models distorts modelled allowances across the industry by failing to account for biases introduced by the log transformation. Modelled estimates of logged costs cannot simply be transformed by the exponential function to estimate costs, as in logged models the error term, expressed in unlogged terms, has a skew distribution with a positive expected value. The log transformation bias is greater in enhancement models than in botex as the distribution of industry spend in individual enhancement areas tends to be more uneven than in botex. Of the IAP enhancement models, only flow to full treatment models account for this in any way, and do so in a theoretically incorrect manner. All other IAP models do not apply any adjustment to log-log model allowances – affected enhancement areas represent £4.4bn in Business Plan capex. A 'smearing factor' could be one means of correcting for the bias and producing more appropriate log-log model allowances.
- There is an opportunity to substantially increase the robustness of enhancement cost assessment during the remainder of the PR19 process. Ideally, Ofwat would undertake and document a systematic process of model development and selection as it has for base cost models. If this was unfeasible in the time available, this report proposes a number of other ways by which to substantially improve existing modelling work.

Consistent with our approach to other areas of the IAP, where we find shortcomings in the assessment through review, we actively seek to make recommendations as to how improvements can be made during the remainder of the PR19 process. For each area of enhancement expenditure we have assessed the models and made recommendations. These range from recommendations of improvements to the models to increase robustness to, where there are sufficient shortcomings, the use of a deep dive.

A summary of the Vivid review and the recommendations is set out below:

Table 7 Vivid Economics review and recommendations

Expenditure line	Model assessment	Recommended improvements
Growth		
Growth (overarching)	Assessment of costs are gross rather than net of grants and contributions. This creates downside risk for customers	Estimate net costs using appropriate drivers Revert to a deep dive on net costs if modelling unsuccessful
Growth (wastewater)	Unstable RE models, divergence between historical and forecast. Inclusion of sewer flooding, which is funded by ODI	Estimate net costs using appropriate drivers Revert to a deep dive on net costs if modelling unsuccessful
Growth (water)	More stable than wastewater model. Unreliable company data yields implausible unit cost ranges	Estimate net costs using appropriate drivers Revert to a deep dive on net costs if modelling unsuccessful
First time sewerage	Two companies dominate expenditure, causing instability	Use a deep dive
Waste quality		
P-removal	Some errors in implementation, implausible ranges of efficiency scores, absence of complexity driver	Correct errors, triangulate between models, including data on P<1.1mg consents
Chemicals removal	Low fit, which disappears when SWB removed	Attempt totex modelling, with clearer approach to inclusion of companies in sample. Deep dive if unsuccessful
Event duration monitoring	Reasonable specification but undermined by inconsistent company data	Attempt to improve data. Consider shallow dive if unsuccessful
Flow monitoring	Concerns on data comparability	Attempt to improve data
Flow to full treatment	Variable model performance, with log specifications weaker than linear	Triangulate among the linear models
Sanitary parameters	Power and exponential specifications inconsistent with engineering logic	Test more transparent specifications, including log model suggested
Spill frequency	Good fit, but instability related to SRN	Diagnose issues in SRN data, consider dropping from sample
Storm tanks	Good fit, range of efficiency scores implausibly wide	Diagnose efficiency score variation, reflect in approach to efficiency challenge
Water quality		
Meeting lead standards	Merger of orthophosphate dosing and replacement of lead pipes does not reflect distinct regulatory drivers. Model highly unstable and produces implausible efficiency score range	Use distinct model for replacement of communication pipes, use shallow dive for orthophosphate

Supply demand		
Metering	Reasonable statistical fit and stability. Implausible range of efficiency scores	Small improvement possible from including meter penetration
Leakage	Not valid to use WTP figures to estimate costs. Unit costs highly variable, do not account for increasing marginal costs	Do not use WTP figures, attempt modelling that uses leakage as explanatory variable
2020-25 schemes	Very wide variation in unit costs, reflecting diversity of schemes	Use a deep or shallow dive

We list out full details of our model-by-model assessment and suggested improvements, in section 5.10.

5.4.9 Deep dives

Ofwat approach

"We consider a greater level of supporting evidence is required for more material investments. In a deep dive, we assess the evidence provided by the company for the need for investment, options appraisal, robustness and efficiency of costs and customer protection for the proposed expenditure, similar to our assessment of cost adjustment claims (see chapter 7 and annex 6). In very material cases we also look for evidence of affordability and board assurance. Where a compelling case is presented, that is well supported by a cost-benefit analysis of intervention options, and a transparent breakdown of appropriate costs, we allow the expenditure.

Where we accept the need for the investment, but the company has not provided a thorough options appraisal that demonstrates it has chosen the best option for customers, we challenge the proposed costs. We apply a 20 percent challenge unless we have evidence which suggests a different challenge. This is on the basis that a rigorous appraisal may have led to more innovative and efficient solutions, and we are protecting customers from consequences of inadequate options appraisal.

Where there is insufficient evidence that costs are efficient we have applied the company specific efficiency challenge to derive our view of efficient costs. As set out previously we consider it reasonable to assume that the opportunity for efficiency in these areas will be at a similar level to other areas of a company's business plan."

Source: Technical appendix 2: Securing cost efficiency - Section 5.2.3

Ofwat's IAP has conducted 9 deep dive assessments on specific areas of our material enhancement expenditure. These assessments followed the suite of questions Ofwat set out in Information Note 18/02. We structure our enhancement investment cases to present the information in the manner requested to aid Ofwat's assessment.

The IAP assessment has highlighted, where applicable, areas where Ofwat consider the evidence contained in our Plan was sufficient (pass), partially sufficient (partial pass) or insufficient (fail). As a result, in certain cases, (for example Water Resource Management Plan, Raw Water deterioration and Water resilience) Ofwat has removed investment proposed in our Plan based on insufficient evidence of need or optioneering. The removal of this investment has been included in the derivation of the overall difference between our Plan and Ofwat's IAP view.

The table below outlines the deep dives on our Plan, their value and the location of our detailed response; including further evidence as required.

Table 8 Deep dive enhancement cases

Enhancement Case	Totex (£m)	IAP Assessment (£m)	Location of response
WRMP Supply Side Strategy	580.709	428.372	WS2
Smart Metering	181.844	96.766	WS2
Resilience Programme	66.777	15.200	WS2
Nitrates (Raw Water Deterioration)	25.520	15.489	WS2
Water Resources Environmental Measures (water)	34.516	17.787	WS2
Addressing Flow at Water Recycling Centres	259.747	213.734	WWS2
Bioresources	23.396	0.000	WWS2
Medium Combustion Plant Directive (MCPD)	7.768	0.000	WWS2
Water Resources Environmental Measures (wastewater)	0.130	0.000	WS2 (With WREM (Water))

5.4.10 Our response

We provide further additional evidence for each investment case where Ofwat has carried out a deep dive (except for the WRMP case where all evidence was already presented as part of the WRMP process). We do this specifically for elements where Ofwat's assessment considered our evidence either partially sufficient or insufficient. This information is contained in the updated enhancement businesses cases set out in the table commentaries to tables WS2 and WWS2.

5.4.11 Shallow Dives

Ofwat approach

"Where the investment area does not lend itself to statistical modelling we rely more on the written evidence provided in the business plans. We follow a risk-based process of shallow diving or deep diving company proposals depending on the materiality of each company's proposals.

We carry out shallow dives on less material investment lines. As a general rule if the expenditure is less than 0.5 percent of the water or wastewater wholesale totex, we carry out a shallow dive assessment. However, we apply discretion for investments close to this threshold and may choose to carry out a deep dive assessment instead.

The first part of this process is to check that there is a need for the investment (for example, whether the investment is required by legislation or there is convincing customer support). We consider whether to apply a company specific efficiency challenge to the costs where the need and scope is justified but there is insufficient evidence that costs are efficient. The company specific challenge is informed by the cost efficiency of base costs and, where appropriate, models of enhancement investment that we consider are sufficiently robust. We consider it reasonable to assume that the opportunity for efficiency in these areas will be at a similar level to other areas of a company's business plan. We do not apply this efficiency challenge to areas of enhancement that have very low materiality."

Source: Technical appendix 2: Securing cost efficiency - Section 5.2.2

Ofwat has carried out a number of shallow dives for areas where the investment area does not lend itself to modelling and where the scale of investment is low (i.e. low enough in Ofwat's view not to warrant a deep dive).

5.4.12 Our response

The application of the shallow dive assessment hinges on Ofwat's discretion of the scale of the investment. Relative to the deeper dives, in the IAP models Ofwat has published, there is very little evidence of how the written materials companies submitted have been used.

The concerns set out above on company specific efficiency factors also apply here.

5.5 Enhancement model by model review

Summary

We have undertaken a systematic review of Ofwat's approach for each enhancement area. This builds on the Vivid Economics review of Ofwat's benchmarking approaches their recommendations. This review specifically highlights:

- The impact of Ofwat's treatment of enhancement opex on efficiency
- the suitability of Ofwat's preferred analysis by expenditure area;
- the robustness of Ofwat's approaches to treating costs and modelling techniques

Overall this review highlights that there are number of shortcomings in a range of models which result in a less than robust cost assessment. As a result we retain our view that our costs as submitted in our Plan remain appropriate.

We highlight the areas where improvements to the models approaches can be made.

5.5.1 Introduction

In this section we review the approaches Ofwat has undertaken for each area of enhancement expenditure. We have ordered the review of the models water and then water recycling and in order of scale of the proposed enhancement expenditure, as out in our Plan.

In some instances, we provide further detailed supporting evidence for specific enhancement investment cases, specifically those areas which Ofwat has subjected to deep dive assessment as additions to the previous enhancement business cases in the table commentaries to WS2 and WWS2.

Scope of review

Where our Plan proposed capex only solutions that Ofwat has considered low materiality and have not applied further efficiency challenge we do not set out detailed comments on Ofwat's modelling approach. This applies to the following areas:

- WINEP/NEP investigations (water)
- WINEP/NEP Flow monitoring at Sewage Treatment Works (STWs)
- WINEP/NEP Chemicals monitoring / investigations / options appraisals

Where our Plan proposed no AMP7 expenditure we have not sought to review Ofwat's modelling approach. This applies to the following areas:

- WINEP/NEP Making ecological improvements at abstractions (Habitats Directive, SSSI, NERC, BAPs)
- Improving taste, odour and colour and investment to address raw water deterioration
- Improvements to river flows
- Company specific freeform water enhancements
- WINEP/NEP Eels Regs (Wastewater)
- WINEP/NEP Groundwater schemes
- WINEP/NEP Nutrients (N removal)
- NEP discharge relocation
- Monitoring of pass forward flows at CSOs
- Flow 1 schemes
- Transferred private sewers and pumping stations.

5.5.2 Supply Demand Balance

Ofwat's IAP Approach

"For our assessment we consider the totex expenditure for supply and demand options for both critical period and dry year annual average scenarios in a combined supply-demand balance enhancement assessment.

For companies where the expenditure does not represent a material amount we undertake a shallow dive approach applying the company efficiency. Where expenditure is material we complete a deep dive using the information provided within the companies' submissions. See 'Supply-demand balance – feeder model summary' supporting document for more details.

In the deep dive we disaggregate the totex expenditure into six supply-demand balance enhancement components which we assess separately.

- *2020-25 supply-demand balance enhancement (supply-side and non-leakage demand) - This component considers the supply and water efficiency schemes delivering supply-demand balance benefits in the period 2020-25. We determine this allowance through a unit cost approach using the minimum of the company proposed and industry median forecast unit cost for 2020-25. Unit costs are expressed in units of £m per Ml/d. The cost driver is our validated assessment of the companies' proposed benefits for schemes in the period 2020-25. As metering is assessed separately we remove the supply-demand benefits associated with metering from our assessment.*
- *Long-term supply-demand balance enhancement - This component considers schemes delivering supply-demand balance benefits beyond 2025. We assess if there is a valid need for these options based on the information provided and where possible challenge valid options against the average scheme-type unit cost from industry-wide WRMP19 option analysis. We assess regional strategic options separately.*
- *Leakage enhancement - This component considers the demand benefits through leakage reduction activities in the period 2020-25. We consider that companies should achieve upper quartile performance through their base allowance. Therefore, we allocate companies a leakage reduction allowance where they are forecast to achieve performance beyond upper quartile in 2024-25 or where they propose reductions in leakage greater than 15%. We determine this allowance through a unit cost approach using the minimum of the company proposed and industry median forecast unit cost for 2020-25. Leakage benefits associated with metering are assessed implicitly in the metering enhancement model and excluded from this analysis.*
- *Strategic regional solution development - This component considers joint schemes that benefit the south-east addressing the long-term deficits facing Affinity Water, Thames Water and Southern Water. We determine an expenditure allowance for companies based on the need to develop multiple strategic regional projects through the planning stage to identify the optimum long-term solution for the region.*
- *Internal interconnections - This component considers internal network improvement schemes that provide supply benefits to overcome localised deficits. We assess if there is a valid need for these options based on the information provided and challenge valid options in the context of their cost benefit and construction cost.*
- *Investigations and future planning - We assess if expenditure has been allocated to investigations and future planning such as water resources management plan or regional plan development based upon the information provided in the companies' submissions. We consider these costs are included within base allowance as part of normal company activities to maintain supply-demand balance and meet statutory obligations."*

Source: Technical appendix 2: Securing cost efficiency, Annex 4, pages 48-49.

Table 9 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	571.441	428.372	152.337	26.2
Opex	9.268			
Totex	580.709	428.372	152.337	26.2

5.5.3 Analysis of Ofwat's approach

Our assessment of Ofwat's approach to setting enhancement expenditure for leakage is presented in a separate chapter (Chapter 6), as is our detailed response to Ofwat's strategic regional solution development proposals (Chapter 4).

In this section we provide our assessment of each remaining area of Ofwat's supply demand feeder model.

Overall, we are disappointed that Ofwat has disallowed expenditure for future planning and investigations, especially in relation to supporting the work of the regional planning groups. We have provided additional evidence relating to our proposals in our updated enhancement case within WS2 table commentary.

2020-25 supply-demand balance enhancement

Although this category of the model is stated as covering "supply-side and non-leakage demand" Ofwat has used it category solely to assess our totex for new water treatment capacity. Our Plan includes a programme of customer engagement work to reduce consumption which is included as enhancement opex in our smart metering totex. This spend is assessed separately.

The new water treatment works capacity included in our Plan is assessed as three new water treatment works with a total new capacity of 62Mld. Ofwat sourced the cost data for these three investments from two different locations. The capex data was taken from the Mott MacDonald benchmarking appendix 10d to our September Plan. The opex data was taken from our Water Resource Management Plan appendices. As explained in section 2.3 of that appendix, in order to carry out the benchmarking, the data was adjusted to remove site specific add-ons. For this reason the capex data in this report cannot be used for this benchmarking activity. The result is that Ofwat has assessed our expenditure using incorrect data.

The individual option costs from our WRMP are not appropriate to be used in the manner Ofwat has to derive our expenditure allowance for IAP, as the costs are quoted prior to adjustment for productivity gains. They are also full year opex costs, whereas in our Plan we adjust down for the first year of commissioning the new WTW.

The individual scheme costs in our WRMP also assume that that each option could operate in isolation. Once we have our preferred plan, the scope of each scheme is assessed in conjunction with the rest of the schemes in the business plan to remove any duplicated scope and associated cost.

A full breakdown of capex and opex for all new WTW capacity between 2020-2025 has been provided in our updated WRMP Supply Side enhancement case in the table commentary for WS2. It is these costs that are appropriate rather than those Ofwat has used.

By using the Mott MacDonald benchmarking appendix, Ofwat has not taken into account three more water treatment works that have also been benchmarked. These three are similar to the "East Lincs to Central Lincs (CLN15) treatment for existing transfer", in that they treat potable water from one zone to enable it to be transferred to another zone. Including these additional investments increases the new capacity from 62Mld to 87Mld. Again, details of these water treatment works are provided in our updated enhancement case, located in the WS2 table commentary.

The Ofwat feeder model summary for supply demand balance explains that:

> "*The schemes included in this component are generally small supply-side option such as groundwater development, additional treatment/removal of constraints*".

In our case, two of the treatment plants assessed are treating raw water either from final effluent (in the case of the Pyewipe effluent re-use plant for our industrial customers on the Humber Bank), or from surface water requiring extensive treatment (in the case of the new works at Elsham).

The schemes assessed in the feeder model do not exhibit the treatment complexity assumed for "small supply side options such as groundwater development". We therefore believe that this model uses a median rate as it is based on much simpler treatment processes than those required for our proposed investments. Ofwat's approach produces a unit rate that is unreasonably low for the complex new WTW included in our proposed programme.

As part of our IAP response to action ANH.CE.A5, we have adjusted the scope of all of the water treatment works in our Plan to remove any scope associated with the treatment of metaldehyde. This has resulted in a £47.4m reduction in totex. The changes we have made have been audited by our external assurance provider Jacobs, who confirm they are happy with the approach. We provide a breakdown of the savings in our updated enhancement case, located in the table commentary for WS2. Ofwat's action requires that we agree the scale and timing of changes we make with the Drinking Water Inspectorate (DWI). On the 19 March 2019 we met with representatives from the DWI and explained the changes we have made. The DWI confirmed their acceptance and support for the changes we have incorporated into our Plan.

We propose that between IAP and Draft Determination, Ofwat re-runs the modelling taking into account the additional treatment capacity described above and the updated cost breakdown provided. We also suggest that Ofwat takes into account the findings of Vivid Economics report. We realise our plan is ambitious and complex to analyse. We are happy to work with Ofwat to support.

Long term enhancement

Ofwat has removed much of this funding on the basis of *"Insufficient evidence provided to justify the development of options identified"*. The evidence to support the need for this investment, including our options appraisal approach and scenario modelling, is fully set out in our revised draft WRMP, The investment we propose is critical to enabling the timely delivery of the future water resource options that may be required at WRMP24. The ability to deliver pre-planning for AMP8 resource schemes is fundamental to the adaptive planning approach which underpins our WRMP strategy.

In order to support Ofwat's analysis we present a more detailed breakdown of the costs and activities for long term enhancement expenditure in our updated WRMP supply side enhancement case, located in the table commentary for WS2.

Internal interconnectors

In this category, Ofwat assesses the efficiency of our proposed investment in strategic transfers between resource zones to improve our resilience to drought, and climate change, and to enable us to meet our environmental obligations to reduce abstraction as set out in our revised draft WRMP. Ofwat presents three areas of challenge to this part of the plan which we address in our WRMP Enhancement Business Case in WS2 table commentary. Ofwat has:

- firstly applied a 20% cost challenge on the basis of "insufficient justification of scope";
- secondly applied the company specific efficiency challenge (15%);
- finally challenge the unit rate of two specific investments.

Scope

The need for the scope of the investment is clearly set out in the Resilient Water Supplies chapter of our September submission document and our revised draft WRMP 19. The statutory WRMP process sets out detailed technical guidance for option development and option appraisal. Defra, supported by the Environment Agency, are accountable for ensuring this process is fully adhered to. This includes assessing whether the WRMP strategy represents best value for customers and the environment whilst meeting the challenges of growth, climate change, severe drought and environmental needs. Ofwat has been fully consulted as part of this process and provided a detailed representation on our draft WRMP in response to the formal consultation process, which closed in June 2018. In its response, Ofwat raised concerns around the clarity of our options appraisal and identified the need for further evidence to justify the options selected in our preferred plan.

We provided a full response to these points in our Statement of Response and revised draft WRMP. Specifically, we included a new chapter in our revised draft WRMP to strengthen the justification for the options selected in our preferred plan. We also updated the supporting graphics specifically to help explain the drivers for each of the interconnector schemes. This updated justification was summarised in our Resilient Water Supplies chapter, along with the new graphics. Further detail can also be found in our revised draft WRMP on our company website. Ofwat also had direct access to our full revised draft WRMP submission to Defra (including supporting technical documents) in September 2018 via the Defra 'huddle'.

We believe we have fully responded to all challenges around the justification of scope or need for our preferred plan as part of the statutory WRMP consultation process. We received a letter from Defra in February 2019 requesting additional information to support our Statement of Response, ahead of a decision by the Secretary of State on the publication of our final WRMP. This letter did not request any further information relating to the justification of scope or need for our preferred plan.

In the light of the above this challenge to the scope of our Plan from Ofwat at this very late stage in the WRMP process presents a significant risk to our ability to deliver our AMP7 WRMP supply side plan which is essential to secure resilient water supplies for our customers.

Further, there appears to be a significant inconsistency in Ofwat's analysis of our plan between the supply demand feeder model assessment on the one hand, and the test area assessment on the other. An extract from the test question assessment is provided below for reference, which clearly shows support from Ofwat for our strategy, describing our sufficient, high quality evidence:

> *"Test Question CMI3: To what extent has the company set out a well evidenced long-term strategy for securing resilient and sustainable water resources, considering a twin track approach of supply-side and demand-side options and integrating third party options where appropriate, to meet the needs of customers and the environment in the 2020-25 period and over the longer term?*
>
> *Ofwat response: Anglian Water provides a high quality plan on its long-term strategy for water resources incorporating the use of markets to this aim.*
>
> *The company provides sufficient and high quality evidence to using markets and engaging with third parties, with some evidence of an ambitious and innovative approach. On supply-side, the company has reached out neighbouring companies such as Affinity Water and Cambridge Water to explore regional solutions, with an export to Affinity Water likely to begin in 2025-2030. Demand options, include their work with equipment manufacturers for enhancing leakage detection and developers for use of grey water and rainwater harvesting technology. The company also demonstrates ambition in exploring solutions that go beyond what is required of the WRMP process, by setting up a goal oriented innovation shop window which has already produced actionable solutions on leakage management. On the future deployment of bilateral markets the company does not go beyond providing the required business tables WR6 and WR7.*
>
> *The company also provides high quality evidence for its long-term strategy on water resource management. A minor issue related to limited information around variance between the 'least cost' and 'best value' plan. The concerns are mitigated by the customers expressing support for the overall business plan."*

We believe this is clear, and should remove any doubt about the sufficiency of evidence we have provide on "scope" or "need". However, we recognise that the WRMP process is complex and we are keen to support Ofwat in helping to understand the options appraisal process, and the justification for the difference between least cost and best value plans. We have therefore prepared a presentation pack which provides a detailed description of our option appraisal process. We are happy to take Ofwat through this material face to face, and look forward to the opportunity to do this ahead of Draft Determination.

Company specific efficiency challenge

The 15% company specific efficiency challenge is discussed earlier in more detail in this chapter and in the Vivid Economics appendix. However, in relation to our WRMP, we note that this 15% challenge would compromise our ability to implement the ambitious objectives we set out in our WRMP and to secure resilient water supplies to our customers.

Unit Rate Challenge

In addition to the above, Ofwat also selects two transfers on the basis of costs presented in the WRMP appendix (which did not form part of our formal PR19 submission). In the options presented in the WRMP, both of the transfers selected have treatment works mid-transfer included in those costs, hence the perceived high unit rate per Ml transferred. In our September Plan we removed the treatment costs from one of these investments (NTM1) on the basis that the metaldehyde would already have been removed by an upstream works at Elsham. Therefore the costs used to assess this scheme are incorrect.

Metaldehyde adjustment

As part of our IAP response to action ANH.CE.A5, we have adjusted the scope of all of the water treatment works in our Plan, resulting in a £47.4m reduction in capex. To make the analysis of the costs of each transfer simpler for Ofwat we now quote the costs of the transfer pipework and boosters separately from the treatment plant. Corrected figures for investment specific capex and opex are provided in our updated enhancement case, located in the table commentary for WS2.

Further work

We propose that, between IAP and Draft Determination, Ofwat re-runs the modelling taking into account the changes described above and the corrected cost data provided, and considers our findings as described in the Vivid Economics report appendix. We realise our plan is ambitious and complex to analyse and we are happy to work with Ofwat in this period to support the updated analysis.

5.5.4 New developments and new connections (water growth model)

Ofwat's IAP Approach

"We assess the gross investment (that is, before the impact of grants and contributions from developers) of new developments and the new connections element of new developments in one model. We calculate costs per new connection for each company in two ways: (i) one for the period from 2011-12 to 2017-18 and (ii) another for the period 2020-21 to 2024-25. We triangulate the median unit cost of the two periods. We set allowances by multiplying the triangulated median unit cost by the company forecast of new connections for the period 2020-21 to 2024-25.

Our efficiency challenge for each company is based on the industry median unit cost of new connection. We do not apply an additional efficiency adjustment. However, where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment.

For the related developer contributions, we look at the amounts companies anticipate receiving in their business plans. For the water service we assume a recovery rate of 100% for new connections costs i.e. all of those costs are offset by developer contributions. We apply an industry average level of recovery for new development costs. In calculating this, we exclude the impact of a small number of outlier companies. Where these companies make a convincing case for particular circumstances or assumptions, for example the impact of discounts where water efficient appliances and fittings are installed, then we take into account those differences and modify our assumptions accordingly. It is important that we challenge any company assumptions where recovery rates look low compared with the rest of the sector. If we do not, then there is a possibility that customers in general pay for costs which should be covered by developers who are benefiting from expenditure which allows new properties to receive services. Companies assumed lower recovery rates for new development costs than for new connection costs."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, pages 49-50.

Table 10 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	274.893	183.131	91.762	33.38
Opex	1.364	0	1.364	100
Totex	276.257	**186.131**	**93.126**	**33.71**

Analysis of Ofwat's IAP approach

Ofwat has modelled growth the investment gross of grants and contributions from developers. Ofwat uses the following capex costs within their models:

- New connection work at the developer's site for individual properties;
- Housing and Estate water mains connecting the new development site to the existing network and providing the mains within the development site;
- Reinforcement work in the existing water network; and
- 50% of our low pressure customer enhancement expenditure.

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics and submitted as part of this IAP response.

Vivid Economics review found several significant inconsistencies with cost data used in this assessment. For example, some companies in their Business Plan tables have reported costs per connection that are significantly lower than their published standard charges per connection.

The Jacobs review makes six recommendations:

1. Separate assessment – new connections, requisitions and network reinforcement should be assessed separately
2. Cost consistency – Ofwat should recognise different companies have included costs as capex, opex or as cash items
3. Missing data – Ofwat should use a comparison of income and costs to identify companies with missing data
4. Benchmarking using existing data – Ofwat should use other benchmarks such as the casework for developers to cross check PR19 modelled values (currently the PR19 median value is lower than the previously issued medians from casework)
5. Volume consistency – a reconciliation of stated volumes in different data tables should be carried out to rectify inconsistencies between reported 'properties' and 'connections'
6. Diversions – Whilst not part of the model, there is significant inconsistency across the sector on this issue, which should be corrected to ensure these costs are not accidentally included in the growth model

Jacob's view which we support is that to avoid a significant issue on Ofwat's ability to derive robust cost relationships, these issues need to be resolved pre-modelling.

Consistency of models with underlying engineering and economic principles

Using the number of new connections as the single cost driver is unlikely to yield the most appropriate cost relationship to all the areas of expenditure Ofwat has reallocated and combined in the growth model.

This is particularly the case where Ofwat has included expenditure in relation to low pressure. Our investments relating to low pressure enhancements are not driven by growth in new connections.

As part of facilitating growth, we specifically design our solutions to ensure no detriment to existing customers. We do not recover from developers, costs to address existing issues in our network. Our extensive customer engagement work underpins our strategy to tackle persistent low pressure in certain areas, but this is not always related to growth. It is therefore not appropriate to allocate expenditure to improve service on low pressure to new development and growth.

We are also concerned about the use of connections as a driver for network reinforcement costs. Network reinforcement is complex and dealt with on a site by site basis, driven by many factors which include existing headroom in networks and changes in peak use, for example with industrial customers changing their demand.

We also design the capacity of the reinforcement works to accommodate connections which are planned to occur well beyond 2025 depending on the build-out rate of the developments. The need for network reinforcement is driven by growth, but we believe that modelling it on a per connection basis could fail to account for the driver of this investment.

Enhancement opex

The treatment of enhancement opex on this investment, in absence of confirmation that that these costs are sufficiency reflected in other modelling approaches, results in an additional £1.4m efficiency challenge for this area of enhancement.

Impact on Investment

The combination of allocation of investment to capital maintenance and Ofwat's treatment of enhancement opex creates a significant difference between our Plan and Ofwat's view of required expenditure. The scale of difference (33%) fundamentally inhibits our ability to meet demand expected from the projected growth in our region and wider government objectives; further .

Customer Protection

We have provided detail on a suggested growth mechanism in Chapter 4 of our IAP Response.

The mechanism is to ensure that, should the outturn position on growth prove materially different to the levels projected, customers are not exposed to undue cost, and nor should a company be left having to cover additional costs. We believe the risk of this is low, but would nonetheless want to insure against such eventualities.

5.5.5 Metering

Ofwat's IAP Approach

"We combine the investment on meters requested by optants, selective meters introduced by companies, and meters for businesses into one metering assessment in order to address inconsistent reporting of expenditure and cost drivers between these three lines. We assess the combined metering costs using a unit cost model based on historical data smoothed over the 7-year period from 2012 to 2018, where the cost driver is the combined number of optant and selective meters installed. We triangulate our cost allowance across two model specifications; level specification (both cost and driver are in levels) and log specification (both costs and driver are in logarithmic scale). We do not use the data from two companies because they are outliers, one on costs and the other on meters installed.

Where companies' requested investment is below our allowance, we reduce the allowance to the company's requested investment. Where companies identify significant metering costs outside of these three enhancement lines, we re-allocate the expenditure to this model and undertake a deep dive using the information provided within the companies' submissions. The deep dive assessment identifies if any additional expenditure beyond the modelled allowance is valid."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 51

Table 11 Difference between our Plan and IAP assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	118.516	96.766	85.078	46.79
Opex	63.328			
Totex	**181.844**	**96.766**	**85.078**	**46.79**

Ofwat's assessment of metering expenditure in our Plan has two specific parts which we address in turn below.

We have significant concerns with Ofwat's assessment of our smart meter expenditure. Our principle concerns are the application of a company specific efficiency challenge which does not take into account the benchmarking we have undertaken to demonstrate our costs are efficient. Secondly, Ofwat has excluded expenditure that is considered capital maintenance.

Overview of Ofwat's modelling approach to metering

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics and submitted with this IAP response.

The assessment uses a comparative model to assess a modelled allowance for the combined capital expenditure for Optant, Selective (meters introduced by companies) and metering for business (WS2 Lines A21, A22 and A23).

Ofwat's assessment also uses a reallocation from Demand side enhancements to supply demand (WS2 line 10).

Analysis of Ofwat's IAP approach

We have reviewed the detail of Ofwat's modelling approaches through the work commissioned with Vivid Economics and submitted as part of this response.

Accounting for meter penetration

Ofwat's benchmarking models do not take into account the increasing marginal cost of meter installations for Optant and Selective meters. For areas with high meter penetration these meters are more costly as a greater proportion of meters to be installed under these programmes will be difficult and costly relative to areas of low meter penetration.

In order to improve the models to account for this cost driver, Vivid Economics suggest meter penetration should be taken into account. Using readily available data, in their testing they proved that modelling including this variable produced an improvement over the IAP models.

Overview of Ofwat's modelling assessment of smart metering

For us, as the only company with a Deep Dive assessment, the calculated model allowance is then included in our Deep Dive assessment along with Smart metering assessment described below.

To assess smart metering, Ofwat reallocate our proposed smart metering totex investment (£162m) from the Supply Demand Balance into the metering analysis. The model brings both capex and opex together, equating the two.

This investment is divided by the total number of residential meters renewed to derive a unit rate per smart meter installed. This rate is then subject to a company level efficiency challenge" of 15% to arrive at a "Revised 'efficient' unit rate".

Ofwat then use a run-rate of meter replacement across 2011 to 2018 to calculate an implicit level of replacement meters, and use this to re-allocate £58.8m of enhancement totex to base maintenance.

The remaining allowance (£78.6m) is then added to the allowance for the optant and selective meter assessment (£18.13m) to give the total allowance as totex of £96.8m.

Analysis of Ofwat's IAP approach

Company specific efficiency challenge

We have provided clarification on our existing benchmarking and also provided additional evidence in our updated smart metering enhancement case in the commentary to WS2. This demonstrates that our proposed unit rates for smart meters have been benchmarked against internationally available data and demonstrates that our costs are efficient.

This makes the application of a further company specific challenge inappropriate.

Meter installation volumes

Ofwat has used the number of meters replaced in AMP7 to calculate the unit rate using data from line 9 in WS3. This is not correct. The number of residential meters renewed is not the same as the number of smart meters we will install in AMP7. In some areas not due for smart roll out we will continue to replace dumb meters with dumb meters.

The correct number of smart meters we will install in AMP7 is 1,141,244 as set out in our updated enhancement case in the WS2 table commentary.

Re-allocation to botex

In the model deep dive, Ofwat has reallocated meter replacement in botex and remove costs from the enhancement case. The rationale for this adjustment is incorrect.

None of the costs in the enhancement case relate to capital maintenance costs. Maintenance costs (£56.4m) were reflected in our bottom-up botex expenditure proposals.

The costs in this case relate only to full smart meter installs for new selective and meter optants (96,131 meters costing £16.8m) and the marginal cost of replacing dumb meters with smart meters in areas of smart rollout in AMP7 (1,045,113 meters costing £94.2m).

To maximise the benefits of our smart meter programme we are rolling out smart meters on a geographical basis. Our prioritisation is based on targeting district meter zones which deliver the most benefit to the supply demand balance.

This approach maximises a number of benefits including:

- Efficient per unit labour costs by replacing meters in close proximity, reducing the need to revisit the area at later dates.
- Allows data consistency on leakage at a DMZ level
- Total coverage of the impact of water efficiency and customer engagement strategies focussed to target whole areas
- Maximising the efficiency of data collection and the fixed networks

In the smart meter rollout areas prioritised for AMP7, there is a mix of meters which would have been replaced in AMP7 because they had reached the end of their life or were due to be replaced, and those which in the absence of the smart programme would not have been replaced in the AMP. Where a meter was due to be replaced within an AMP regardless of smart meter rollout, we have only included the uplift cost of a smart meter over a dumb meter replacement. Only where we would not have replaced a meter in an AMP have we used the full unit costs in the enhancement case.

Treatment of costs

By bringing all of the enhancement totex in this area into the one deep dive assessment Ofwat has generated a unit rate that includes all aspects of the programme, including meter cost, installation, communication with the fixed network and customer engagement programme associated with rollout.

Where we have carried out benchmarking on unit rates we have taken care to exclude costs such as the customer engagement programme and fixed network as these vary substantially with installation programme. We have provided the costs of these sub-components in the updated enhancement case. As explained in the enhancement case, we have not been able to obtain benchmarking data within the UK for smart metering at scale. We have therefore sourced international rates. Because much of our optant and selective meter programmes will fall in areas that are part of the smart meter roll out, the overall unit rate for this area is likely to seem high relative to companies who are not rolling out smart meters. This is not taken into account in Ofwat's model.

Impact on investment

Overall, Ofwat's view of costs would put into jeopardy our ability to delivery the scale of smart meter rollout required to deliver a core component of our demand management strategy outlined in our WRMP.

Further information provided

We have provided additional information on the volumes our smart meter programme, unit cost information and updated benchmarking analysis in our Smart Metering commentary in WS2.

5.5.6 Water Resilience

Ofwat's IAP Approach

"Due to the company-specific nature of this investment we undertake deep dives of all companies' plans. Many of the costs put forward by companies under resilience we re-allocate to different assessment areas, and we make an allowance under the different area where appropriate. We re-allocate investment where we consider it to be related to expected operational activities, for example managing interruptions to supply not related to critical points in the network. In this way we ensure that our assessment is equitable across the industry.

In the resilience line, we allow efficient costs related to addressing low probability– high consequence risks that are supported by customers, including those related to the National Flood Resilience Review."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 50.

Table 12 Difference between our Plan and IAP assessment (£m)

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	65.105	15.20	49.905	76.65
Opex	1.672	0	1.672	100
Totex	66.777	15.20	51.577	77.24

Analysis of Ofwat's IAP approach

Ofwat has undertaken a number of allocations of capex in and out of the resilience assessment.

Reallocations in:

- £0.039m from our freeform line for Pluvial and Fluvial Flood Protection
- -£0.119m from part of the Third Party Services, however, this fails to be allocated into the resilience assessment

Reallocations out:

- £292.945m allocated to the assessment for the Supply Demand Balance
- £42.320m, 65%, is allocated to maintenance, however, there is no evidence of a corresponding reallocation in the base cost assessment.

The total impact of these allocates £335.2m capital expenditure to other areas.

The remaining capital expenditure for assessment under this enhancement driver is £22.8m. This has been subject to a deep dive challenge which removed 20% of expenditure on the following basis:

> *"As a detailed cost breakdown is not provided and there is insufficient detail on optioneering a 20% efficiency challenge and a further company specific efficiency is applied."*

No rationale is put forward for the setting of 20% as the efficiency challenge within the deep dive; nor why in the case of Affinity Water the adjustment applies to this assessment is difference (6%).

Ofwat then applied a company specific efficiency challenge to this lowered value resulting in a final IAP assessment of £15.5m.

We comment more generally on the application of company specific efficiency challenges derived from the assessment of botex requirements earlier in this chapter and do not repeat this here.

Enhancement opex

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers. This treatment, in absence of being sufficiently reflected in botex modelling approaches results in a further £1.7m efficiency challenge for this area of enhancement.

Further assessment

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics. This highlighted a number of issues including the use of hardcoded numbers in the 'Allowance tab' and as stated above, issues with ensuring the reallocations are considered as stated. There are also sums in the 'Allowance' tab which do not total the correct cells. We have shared these audit logs with Ofwat.

Impact on Investment

The combination of allocation of investment to capital maintenance and Ofwat's treatment of enhancement opex creates a dramatic difference between our Plan and Ofwat's view of required expenditure. The scale of difference (78%) fundamentally inhibits our ability to deliver resilient water supplies for our customers.

Deep dive response

Our response to the deep dive in the Resilience Enhancement business case in the table commentary for WS2. Commentary. Here we set out the extensive consideration of options which were undertaken in our Plan. Further we provide justification why the investment is enhancement, and is consistent with the treatment other companies have received where they had investment allowed for this key driver. We also set out the support we have from the Drinking Water Inspectorate.

5.5.7 WINEP/NEP Drinking Water Protected Areas (schemes)

Ofwat's IAP Assessment

"We assess this line using shallow and deep dives using the materiality of the capex requested. We do not apply our company-specific efficiency challenge to the companies that we shallow dive and allow the costs in full, due to the low materiality of these proposals. For the deep-dive assessments, we consider the availability and quality of evidence provided. We also reconcile information that has been identified within the companies' submissions with the list of schemes in the EA's WINEP3,March 2018."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 46.

Table 13 Difference between our Plan and IAP assessment (£m)

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	0.488	0.479	0.009	1.84%
Opex	39.481	0	39.481	100
Totex	39.969	0.479	39.49	98.8

Analysis of Ofwat's IAP approach

Following the announcement of the ban on outdoor use of metaldehyde, we have adjusted our catchment management programme, taking into account the advice from the Environment Agency issued to water companies. This has driven a £20.766m reduction in the totex proposed. This is mainly in relation to costs previously included to cover product substitution payments which are now no longer required.

The majority of our investment in this area relates to our award winning Slug-it-Out catchment management programme, which we have discussed at length with the Drinking Water Inspectorate and the Environment Agency. We now have £19.203m totex investment in catchment management included in our Plan, £0.383m is capex and £18.820m is opex.

Ofwat's IAP assessment allows capex spend of £0.479m for Drinking Water Protected Areas. The model only assesses capex component of our catchment management strategy. Capex only accounts for 1.2% of the proposed expenditure in the September Plan. Full details of our adjusted investment case . is set out in the WS2 table commentary for Catchment Management.

Enhancement opex

This treatment, in absence of confirmation that that these costs are sufficiency reflected in other modelling approaches equates to 98.8% of the investment being disallowed. Therefore we will not be able to undertake any catchment management activities. Our catchment management programme of work is supported by the Drinking Water Inspectorate and Environment Agency

Our response to deep dive queries on whether our investment if the best option for customers, customers are protected and costs are robust and efficient, are provided in the Water Environmental Measures Enhancement Business Case in the WS2 table commentary.

5.5.8 Meeting lead Standards

Ofwat's IAP Approach

"We assess investment on lead reduction using a panel data model where the cost drivers are the number of existing lead communication pipes and the number of lead communication pipes replaced for water quality. We triangulate our cost allowance across two models, one using historical data for the period 2011-12 to 2017-18 and other using forecast data for the period of 2020-21 to 2024-25. Both models use smoothed data over a 3-year period. Where companies' requested investment is below our allowance, we allow the requested investment. For companies whose submissions suggest unique and material costs not captured by our model, we carry out a deep dive using the information provided within the companies' submission."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 48.

Table 14 Difference between our plan and IAP assessment (£m)

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	25.023	9.970	15.053	60.16
Opex	6.131	0	6.131	100
Totex	31.154	9.970	21.184	68

Analysis of Ofwat's IAP approach

Meeting lead standards is a statutory driver set out in the Water Supply (Water Quality) Regulations 2018.

Ofwat has assessed the efficiency of this expenditure on a per output basis. We have reviewed our lead pipe replacement costs on a per meter basis which has shown that our per meter rate of replacement has dropped since PR14. The key change in overall costs between PR14 and PR19 is that (in line with DWI guidance) the length of pipe associated per output is increasing. In AMP6 our records show that the average length of pipe replaced is 6m.

Our Plan proposed to replace the pipe within the customers' boundary up to the house, This increases the average length replaced significantly from 6m average in AMP6 to an average of 20m in AMP7 which includes includes a proportion inside the customer's property.

Treatment of costs

Ofwat has used the full £25.023m capex for the lead strategy set out in table WS2 to assess our efficient unit rate for lead pipe replacement. This total includes £2.718m of treatment costs for either upgrading or installing new orthophosphoric acid dosing at seven treatment works. Our WS2 table commentary explained our approach to capturing expenditure which is consistent with Ofwat's line definition for WS2, line 6:

> *'Capital / operating expenditure to meet lead standards. This includes expenditure to deal with the conditioning of water before entering distribution to reduce plumbosolvency, expenditure on replacing lead communication pipes owned by the company and any other lead related work including investigations.'.*

Ofwat has acknowledged through their query response that the treatment costs for orthophosphoric acid should not be included in the assessment of efficient unit rates for lead pipe replacement.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out both earlier in this chapter and in the full report we commissioned from Reckon LLP.

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics. In addition to the error regarding including costs for orthophosphoric dosing, they highlighted inconsistencies across company plans for how the costs of lead pipe replacement are accounted for, particularly on the split between opex and capex. This will have a material impact Ofwat's assessment in light of the IAP separate treatment of enhancement opex and capex.

The treatment of opex in this case, in absence of being sufficiently reflected in botex modelling approaches, results in a 25% efficiency challenge for this area of enhancement.

Impact on Investment

The combined reduction in capex and Ofwat's treatment of enhancement opex creates a significant difference between our Plan and Ofwat's view of required expenditure. The scale of difference (68%) fundamentally inhibits our ability to carry out the investments required to meet lead standards as set out in the Water Supply (Water Quality) Regulations 2018.

Further information provided

We provide additional information on the cost breakdown of the analysis of pipe replacement in our Lead and Water in Buildings Enhancement Business Case in the WS2 table commentary.

5.5.9 WINEP/NEP WFD measures

Ofwat's IAP Approach

"We assess this line using shallow and deep dives using the materiality of the capex requested. We apply our company-specific efficiency challenge to the companies that we shallow dive and allow the costs in full, due to the low materiality of these proposals. For the deep-dive assessments, we consider the availability and quality of evidence provided. We also reconcile information that has been identified within the companies' submissions with the list of schemes in the EA's WINEP3, March 2018."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 47.

Table 15 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	19.82	16.847	2.973	15
Opex	8.405	0	8.405	100
Totex	28.224	16.847	11.377	40.3

Analysis of Ofwat's IAP approach

We are one of a number of companies where Ofwat has carried out a deep dive. Ofwat has applied the 15% company specific efficiency challenge to capex expenditure in this area.

We comment more generally on the application of company specific efficiency challenges derived from the assessment of botex requirements earlier in this chapter and do not repeat this here.

Our Plan contains a number of totex investments. This includes opex driven spend on partnership working with Rivers Trusts to re-profile river channels to reduce the biodiversity impacts of our abstractions whilst improving natural capital.

Enhancement opex

These proposals for these statutory drivers have been approved by the Environment Agency and making more use of such approaches is strongly supported by customers, and has been a key area of challenge from our Customer Engagement Forum in PR19 and PR14..

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers and creates disincentive for companies to choose totex solutions. This treatment, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches, results in a 30% efficiency challenge for this area of enhancement.

Impact on this investment

By disallowing opex which accounts for 30% of the investment, it has a fundamental impact on the partnership working we can do with the Rivers Trusts to re-profile river channels to reduce the biodiversity impacts of our abstractions whilst improving natural capital. These Plans have been approved by the EA. The combination of disallowing enhancement opex and not allowing the full capex equates to an overall efficiency challenge of 40%.

5.5.10 Water SEMD and non-SEMD costs

Ofwat's IAP Approach

"We combine SEMD and non-SEMD costs into one security assessment as these areas are both driven by the requirement to ensure that the water network is resilient in the event of an emergency situation. We assess the combined security costs by determining the proportion of each company's base totex spent on security for the period 2011-12 until 2024-25. Where companies forecast above their allowance, we reduce this to the average proportion of all companies' security costs. For companies whose PR19 costs are material as a proportion of base costs, we carry out a deep dive using the information provided within the companies' submission."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 51

Table 16 Difference between our Plan and IAP Assessment (£m) post allocation

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	15.14	10.08	5.06	33
Opex	1.87	0.00	1.87	100
Totex	**17.01**	**10.08**	**6.93**	**41**

Analysis of Ofwat's IAP approach

Ofwat make the following adjustments:

- "Disallow £1.7m planned to upgrade its CCTV at its CNI and NI sites" and
- "Propose to reduce cyber costs by 25% as we consider some of these costs includes replacement costs and should be included in base costs".

We do not agree with Ofwat that these the capex costs should be removed.

Enhancement opex

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers and disincentivises companies from choosing totex solutions. This treatment, in absence of being sufficiently reflected in botex modelling approaches, results in a further efficiency challenge equivalent to over 10% for this area of enhancement.

Further information provided in enhancement case

We have provided further information in our Security of Network & Information Systems (NIS) Compliance Enhancement Business Case in relation to our £1.7m planned upgrade in CCTV at our CNI and NI Sites in the WS2 data table commentary. In response to the proposed reduction of 25% to our cyber costs we have provided further detail as to why it is enhancement rather than base costs in Security and Emergency Measures Direction (SEMD) Enhancement Business Case in the WS2 data tables commentary.

Impact on this investment

The combination of disallowing enhancement opex and not allowing the full capex equates to an overall efficiency challenge of 41% which would have a fundamental impact on our ability to upgrade CCTV at our CNI and NI sites and to ensure our sites meet the EU Directive on the security of Network and Information Systems (NIS).

5.5.11 Addressing low pressure

Ofwat's IAP Approach

"All company proposals for addressing low pressure are of low materiality and we follow our shallow dive process. Where companies identified new development as a cause of low pressure we reallocate a proportion of submitted cost to that assessment."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 47.

Table 17 Differene between our Plan and IAP Assessment (£m) post allocation

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	8.713	0	8.713	100
Opex	0.406	0	0.406	100
Totex	9.119	0	9.119	100

Analysis of Ofwat's IAP approach

Ofwat has reallocated totex for addressing persistent low pressure as follows:

- 50% of enhancement capex has been reallocated to growth and
- 50% of enhancement capex has been removed based on Ofwat's rationale that our botex allowance enabled us to achieve forecast industry upper quartile performance for the industry.

We do not accept the argument that the result of the botex modelling produce results sufficient for companies to achieve forecast upper quartile performance; nor are their sufficient cost drivers in Ofwat's base models to justify Ofwat's IAP position.

We have make this point more generally in relation to Ofwat's methodology for leakage assessment.

Impact on Investment

The combination of allocation of investment to capital maintenance and Ofwat's treatment of enhancement opex creates a dramatic difference between our Plan and Ofwat's view of required expenditure. By removing investment for this area it fundamentally inhibits our ability to reduce the number of customers effected by low pressure.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out both earlier in this chapter and in the full report we commissioned from Reckon LLP.

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers. This treatment, in absence of being sufficiently reflected in botex modelling approaches, results in a further efficiency challenge for this area of enhancement.

We have included further information as to why this investment should not be treated as growth or be moved to our botex allowance in our Properties at Risk of Low Pressure Enhancement Business Case in WS2 table commentary.

5.5.12 WINEP/NEP Eels Regulations (Water)

Ofwat's IAP Approach

"We assess this line using shallow and deep dives using the materiality of the capex requested. We do not apply our company-specific efficiency challenge to the companies that we shallow dive and allow the costs in full, due to the low materiality of these proposals. For the deep-dive assessments, we consider the availability and quality of evidence provided. We also reconcile information that has been identified within the companies' submissions with the list of schemes in the EA's WINEP3, March 2018."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 46.

Table 18 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	8.281	7.039	1.242	15
Opex	0.09	0	0.09	100
Totex	8.371	7.039	1.332	15.91

Analysis of Ofwat's IAP approach

Ofwat state within their overall assessment *"We do not apply our company-specific efficiency challenge to the companies that we shallow dive and allow the costs in full, due to the low materiality of these proposals."*

Ofwat's approach to our enhancement investment in this area is counter this statement.

We sought to clarify this through raising a query with Ofwat regarding this apparent inconsistency (ANH_O17). Ofwat responded as follows:

"This is not an error. We follow a risk-based process of shallow diving or deep diving company enhancement proposals depending on their materiality, trying to ensure a proportionate approach by resorting to simplistic defaults only when there is some benefit to customers. As stated in our Technical Appendix 2 (page 17) "We carry out shallow dives on less material investment lines. As a general rule if the expenditure is less than 0.5 percent of the water or wastewater wholesale totex, we carry out a shallow dive assessment". We also explained that "We consider whether to apply a company specific efficiency challenge to the costs where the need and scope is justified but there is insufficient evidence that costs are efficient" and that "we do not apply this efficiency challenge to areas of enhancement that have very low materiality". We therefore did not use a mechanistic approach to shallow dives and efficiency challenges. Where enhancement models at the industry level were of low materiality we generally allowed the costs in full, except when the materiality for an individual company was relatively close to the 0.5% threshold (i.e. where we did not consider it to be very low).

The WINEP/NEP Eels Regulations (Water) is one of the enhancement models that at the industry level are of low materiality. In this area the only company with somewhat material expenditure was Anglian Water (0.3%). However, in other similar lines we also had exceptions to which we applied an efficiency challenge (South Staffs Water in the drinking water protected areas model had a materiality level of 0.4% and in non-native invasive species Yorkshire Water had a materiality level of 0.4%).

We will update the text in the published feeder models to more clearly reflect our approach."

We comment more generally on the application of company specific efficiency challenges derived from the assessment of botex requirements earlier in this chapter and do not repeat this here.

In this specific instance, the threshold for application of the company specific factor is dependent on the consideration of whether it is appropriate to be considered as "somewhat material".

This results in the application of shallow dive efficiency challenges based on looser judgment relative to the fixed rule (i.e. such as Ofwat's 0.5% threshold). A clearer approach would be to continue to apply a rules-based approach.

5.5.13 WINEP/NEP Invasive non-native species

Ofwat's IAP Approach

"We assess this line using shallow and deep dives using the materiality of the capex requested. We do not apply our company-specific efficiency challenge to the companies that we shallow dive and allow the costs in full, due to the low materiality of these proposals. For the deep-dive assessment, we consider the availability and quality of evidence provided. We also reconcile information that has been identified within the companies' submissions with the list of schemes in the EA's WINEP3, March 2018."

Source: Technical appendix 2: Securing cost efficiency, Annex 4, page 46.

Table 19 Different between Our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	2.427	2.427	0	0
Opex	2.877	0	2.877	100
Totex	5.304	2.427	2.877	54.24

Analysis of Ofwat's IAP approach

Investments in this area relate to statutory WINEP obligations that we must deliver. These include options appraisals to mitigate the risk of spreading invasive species through our raw water transfers and also plans to protect and improve natural capital by controlling invasive species ourselves or in partnership with others across our catchments.

We agree with Ofwat's allocation of £0.33m from third party spend in the Freeform line to this area associated with our bulk export arrangements from those sites.

Ofwat has allowed capex investment under this driver in full.

Enhancement opex

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers and disincentives the choice of totex solutions as a result. This treatment, in absence of being sufficiently reflected in botex modelling approaches, results in a dramatic efficiency challenge of 54.2% for this area of enhancement.

Impact on Investment

Ofwat's treatment of enhancement opex creates a dramatic difference between our Plan and Ofwat's view of required expenditure. By removing investment for this area it fundamentally inhibits our ability to ackle invasive non-native species as we have over 50% less investment for a statutory driver.

5.5.14 WINEP/NEP Nutrients (phosphorous removal at activated sludge and filter bed STWs)

Ofwat's IAP Approach

"We assess the investment for these two lines together in order to address inconsistent reporting of costs and cost drivers between the lines. We set allowances based on models that use the number of sites and the population equivalent of these sites as the cost drivers. We consider our models to be statistically robust and derive our estimate of the required capex from a triangulation of the models. We use the overall modelled output to estimate our expected level of capex and apply an efficiency challenge to these estimates. We calculate the efficiency challenge using the upper quartile efficiency predicted by our model across the industry. Where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 56.

Table 20 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	414.183	399.207	14.976	3.62
Opex	36.423	0	36.423	100
Totex	450.606	399.207	51.399	11.41

5.5.15 Analysis of Ofwat's IAP approach

Consistency of models with underlying engineering and economic principles

The phosphorus removal programme is the single largest statutory investment driver in our AMP7 WINEP programme.

We have more projects to reduce phosphorus in our Plan than we have completed in total since privatisation. As historically accepted by Ofwat in previous approaches to efficiency assessment, our region is more affected by the need to invest in and operate phosphorus removal activities than most water and sewerage companies in AMP7.

These investments are significantly different to those of previous AMPs. This is driven by our AMP7 WINEP obligations requiring compliance with significantly more stringent consents. The tightening of consent standards significantly drives costs.

For example, in AMP7 some of our consents require compliance with phosphorus limits at 0.2mg/l. In context, the tightest current consent in operation in our region 0.8mg/l. These revised levels cannot be achieved by extending the application of existing approaches to phosphorus removal.

Achieving compliance with these tighter limits requires investment in new process technology. This is considerably more expensive than the chemical dosing we have installed in previous AMPs. We illustrate this by two examples both of which have a population served of around 10,000:

- Towcester STW has a new phosphorus permit of 0.3mg/l and will cost £4.8m capex,
- Tiptree STW has a permit of 4mg/l and will cost £0.7m capex.

The table below illustrates that costs by consent band for permits below 0.35mg/l are 24% of our obligations, however they account for 44% of our costs:

Table 21 Consent band costs

	Industry average of obligations (%)	ANH (%)	Industry average PE of works in that band	ANH	Split of totex by band (%)
<0.35mg/l	27.2	24.4	240,606	8,222	43.6
<0.5mg/l	19.8	20.3	19,647	12,313	24.3
<1mg/l	26.4	41.6	24,450	14,228	21.6
>1mg/l	26.6	13.7	13,271	12,198	10.5

We have been trialing new and innovative solutions in pursuit of reaching these tighter standards in the most efficient manner. For instance, we have been trialing certain new bespoke elements provided by Mecana.

For some less stringent consents, we are able to invest in operating solutions (enhancement opex) to optimise the existing plant where this equipment has been installed previously. Doing this is an optimal totex solution, to the benefit of keeping bills low but avoiding unnecessary capex investment. The IAP treatment of enhancement opex disincentivises this approach.

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics. They raise a number of issues with the modelling including using only the number of schemes with capex investment, identification of implementation errors, implausible ranges of derived efficiency scores and shortcomings of the model design including the absence of reflecting the tightness of consents as a cost driver.

On the current specification of the model, we are disadvantaged as the number of schemes used relates only to those with capex investment rather than all forms of investment.

The current econometric model IAP models does not account for the consent level. Using available data for the stringency of consent, Vivid have successfully adjusted the IAP model to account for this cost driver and improve the robustness of the relationship derived from the econometric modelling. This improvement can easily be implemented for Draft Determinations.

The quality of this model has a double impact given Ofwat derive their company specific efficiency factors using a 30% weighting from the P-removal models. Given the shortcomings of the P-removal modelling assessment this is further evidence of the need to review the calculation and application of these factors in the remainder of the review.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches results in a further £36.4m efficiency challenge for this area of enhancement which is driven by compliance with statutory WINEP drivers.

5.5.16 New developments, new connections, growth at sewage treatment works and reducing sewer flooding risk (wastewater growth model)

Ofwat's IAP Approach

"Our growth model combines the investment for the lines new developments, new connections, growth at sewage treatment works and reducing risks of sewer flooding. These areas are interlinked with each other and are driven by population and demand growth. We assess the wastewater growth costs gross of grants and contributions. We triangulate two panel data models with the total number of new wastewater connections as a cost driver. One model uses historical data for the period from 2011-12 to 2017-18 and another uses forecast data for the period from 2020-21 to 2024-25. We use the models' predicted costs as our efficiency challenge for companies. We do not apply an additional efficiency adjustment. However, where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment.

For grants and contributions, we assume a recovery rate of 95% for new development costs related to wastewater service, which is based on information that has been identified within the companies' submissions."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, pages 57-58.

Table 22 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP assessment (£m)	Difference (£m)	Difference (%)
Capex	474.610	382.157	92.453	19.48
Opex	11.241	0	11.241	100
Totex	485.851	382.157	103.694	21.34

Analysis of Ofwat's IAP approach

Ofwat has modelled the investment gross of grants and contributions from developers.

The assessment uses a reallocated total capex expenditure including the costs of:

- supervision of new connection work at the developer's site for individual properties and new on-site sewers;
- new sewerage connecting the new development site to the existing network;
- reinforcement work in the existing sewer network;
- capex investment to reduce the risk of flooding for customers.

This is used to derive an unit rate across the industry per new connection.

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics and submitted with this IAP response.

The Vivid Economics assessment found the IAP modelling approach to be statistically highly unstable and that the historic and future wastewater growth models produce implausibly varying estimates of industry costs (£1.7bn and £3bn).

Consistency of models with underlying engineering and economic principles

Using a number of new connections as the cost driver is unlikely to yield the most appropriate cost relationship.

This is particularly the case where Ofwat has included expenditure for different lines, for example in relation to investment increase capacity at treatment works and expenditure for sewer flooding.

As part of facilitating growth, we specifically design our solutions to ensure no detriment to existing customers. We do not recovery contributions from developers to address existing issues in our network.

We do not accept that all of the costs included in this assessment should be assessed on a per connection basis. We do not accept that flooding can be assessed on a per connection basis. Our flooding programme is designed to address existing issues in our sewer network and to mitigate against the increasing incidence of sewer flooding as a result of climate change. We are currently performing beyond upper quartile for the industry and Ofwat has acknowledged that our 2024-25 target of 1.31 incidents per 10,000 properties connected is beyond the future upper quartile. We believe Ofwat should assess the efficiency of this funding on the basis of costs to reduce flood risk.

The model also includes expenditure to increase capacity at Water Recycling Centres (WRCs). Our strategy for AMP7 radically increases the use of sustainable drainage to remove surface water from networks to create capacity for growth. This change has a considerable impact on the required investment at WRCs, since if the WRC was nearing hydraulic flow capacity but not for BOD load capacity, then removing surface water could negate the need for investment. Investment of this nature is not appropriately captured using the number of new connections as the cost driver.

The marginal cost of creating capacity at treatment works is influenced by the existing capacity of the treatment plant. For example, adding 10,000 population equivalent capacity to a works with an existing capacity of 1 million population equivalent would tend to have a lower unit rate than adding the same to a works with an existing capacity of 10,000 population equivalent. In the data tables, Ofwat requested the 'Population equivalent treatment capacity enhancement' in table WWn4 block I line 25. This data provides the ability to model treatment capacity increases if used in conjunction with the existing size of the works.

We are also concerned about the use of connections as a driver for network reinforcement costs. Network reinforcement is complex and dealt with on a site by site basis, accounting for existing headroom in our existing networks and changes in peak use, for example with industrial customers changing their peak seasonal demand.

Vivid has found an issue with the way that Ofwat has implemented the use of log-log models specifications and find that failure to account for biases introduced by the log transformation. This has a material issue on allowances derived from these models. A "smearing factor" could be one means of correcting for the bias and producing more appropriate log-log model allowances.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

The treatment of enhancement opex in this area, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches, results in an additional £11.2m efficiency challenge.

5.5.17 WINEP Storage schemes at STWs to increase storm tank capacity

Ofwat's IAP Approach

"We assess the investment for this line based on the lesser of two figures: (i) triangulation of outputs of two cost models or (ii) the cost requested by the company. The cost drivers we consider in the models are the number of separate schemes included by companies in their business plans and the total additional storage volume provided by those schemes."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 54.

Table 23 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	111.719	81.106	30.613	27.40
Opex	3.552	0	3.552	100
Totex	115.271	81.106	34.165	29.64

Since submitting our Plan in September we have continued to work closely with the Environment Agency to assess the environmental benefit of proposed WINEP schemes and ensure that the included schemes deliver an improvement to the environment. This protects customers from the costs of investments which have no positive impact on the environment.

We have agreed with the Environment Agency that 33 of the investments previously included against this driver are no longer required in AMP7.

We have also reflected updated guidance on the calculation to be used to establish the required storage volume at each site, which has lead to an increase in overall storage required under the WINEP. The net impact of these changes in our updated data tables and explained in more detail in the Addressing Flow at WRCs Enhancement Business Case in table commentary for WWS2.

Analysis of Ofwat's approach

Ofwat has used two models and assesses cost efficiency on a £/m3 created basis. There is a further model, taking into account the number of schemes. Ofwat models outputs are given a 25% and 75% weighting based on 'judgement' to come up with a 'triangulated' result. A further 5% efficiency is then applied, without justification within the assessment.

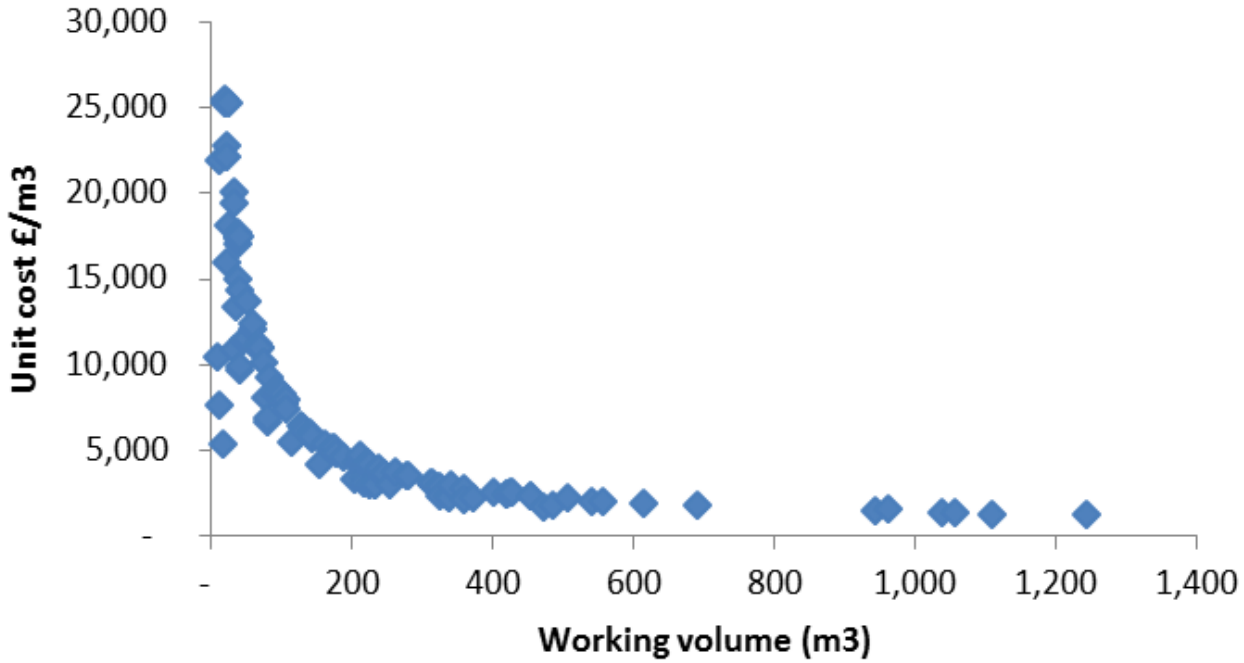
This averaging oversimplifies the relationship between volume and cost.

There is significant variation in the range of investment for the U_IMP6 driver across the industry. Some water companies have a small number of large tanks, and others have a large number of small tanks. It is evident from the data that smaller tanks have a much higher unit rate per m3 created, than larger tanks. This means that for a given total volume, the number of sites, and therefore number of tanks, is significant driver of cost. This can be illustrated in this very simple theoretical example based on the Figure 14; the total capital cost to provide tanks at 10 sites of 100m3 in size each would be approximately £6.8m, and is considerably more expensive than 1 tank at a single site of 1000m3 which would be roughly £1.4m.

United Utilities state in their business plan "*Our experience shows that the cost of storage per m3 increases significantly below 1,000m3 and is cheapest above 5,000m3. A tank of less than 500m3 is on average 6 times the cost of one greater than 5,000m3 when compared using a unit rate per m3 of sewage storage created".*

This is supported by our own analysis of how the costs of storm tanks vary by volume:

Figure 14 Anglian Water Unit Cost per m3 of Volume (EA) (10-1200m3)



Ofwat's modelling approach penalises companies with a low average m3 per site. The nature of our programme is beyond management control and is determined by the investment required at small treatment works. as shown above this disadvantages us relative to others in the industry with larger volumes delivered per investment.

As a further test to prove our hypothesis we have used our own cost models to produce a cost for the profile of sites included in United Utilities' PR19 submission. This demonstrates that our costs are efficient, since our estimate of capex for 60,364m3 of storage over 16 sites is £4.4m lower than the capex quoted in United Utilities' data tables of £69.4m. When these hypothetical numbers are entered into the feeder model, the allowance for ANH is more than the proposed capex. We believe this demonstrates convincingly that our costs are efficient and that the feeder model does not adequately adjust for economies of scale.

We have also reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics and submitted with this IAP response. The models used produce an implausibly wide range of allowances relative to companies' plans which suggest that the model is not capturing genuine variations in efficiency.

Treatment of costs

Robustness of modelling approach

We are concerned with the underlying data used in the models. The table guidance for WWS2 line 10 requests capture of the costs associated with increases in capacity to 68l/h/d or 2 hours at max flow. The corresponding line in WWS4 line 10 also refers to this.

We have populated our tables in line with this – ensuring that only the costs of the U_IMP6 driver are included on these lines. Costs of other WINEP drivers are included on other lines as appropriate. We have reviewed other companies' submissions and companies have included expenditure for different drivers in this line. For example, United Utilities state in their table commentary that they have combined both the costs and the storage volumes for U_IMP6 and other drivers such as Bathing Waters onto these lines.

This has a material impact on the data used in the enhancement feeder models for storm tanks and spill frequencies which can easily be resolved.

We are concerned with the additional and arbitrary additional 5% efficiency factor that has been applied in this model in addition to the relative efficiency being already assessed by benchmarking models. We do not see any justification for the additional step.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers. This treatment, in absence of confirmation that that these costs are sufficiency reflected in other modelling approaches results in additional £3.55m efficiency challenge for this enhancement area.

Impact on Investment

The combination of reduction in capex allowance and reallocation of opex to botex, creates a dramatic difference between our Plan and Ofwat's view of required expenditure. The scale of difference (30%) inhibits our ability to carry out this investment under this statutory driver.

Further information

We respond to Ofwat's feedback on the deep dive assessment and provide full details of changes since our September Plan in the Addressing Flow at WRCs Enhancement Business Case in WWS2 table commentary .

5.5.18 WINEP/NEP Schemes to increase flow to full treatment

Ofwat's IAP Approach

"For most companies, we assess the investment for this line based on the lesser of two figures: (i) the cost requested by the company, or (ii) the triangulated value obtained from the outputs of six cost models (3 linear and 3 log) with an upper quartile efficiency challenge.

For HDD, we undertake a deep dive assessment as there is no scheme with the appropriate driver code in HDD's NEP for 2020-25."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 54.

Table 24 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	95.731	94.365	1.366	1.43
Opex	2.159	0	2.159	0
Totex	97.89	94.365	3.525	3.60

Changes to our Plan

Since submitting our Plan in September we have continued to work closely with the Environment Agency to assess the environmental benefit proposed in the WINEP schemes and challenging their inclusion where there is no beneficial impact to the environment. This protects customers from the costs of investments which have no positive impact on the environment.

As part of our IAP update to the September Plan we have agreed with the Environment Agency that 14 of the investments included against this driver are no longer required in our AMP7 plan. We have therefore adjusted the requested capex in our data tables to reflect this change. The updated capex value is £69.138m. This is fully detailed in the Addressing flow in the water recycling centres Enhancement Business Case in WWS2.

Analysis of Ofwat's IAP approach

Treatment of costs

Ofwat has correctly allocated £0.356m of third party costs to this line. Ofwat has also re-allocated £1.094m into this line from line 35 'WINEP / NEP Schemes at Water Recycling Centres to reduce impact of spills at CSOs'.

We used this freeform line to capture three investments which are U_INV/U_IMP4 drivers (as per investments on line 11 WINEP / NEP ~ Storage schemes in the network to reduce spill frequency at CSOs, etc). We reported these three investments separately as they are on treatment sites and not part of the network. These investments on line 35 should be assessed in the spill frequency feeder model as they have the same driver as those captured in line 11.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

The treatment of enhancement opex in this area, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches, results in an additional £2.16m efficiency challenge.

Modelling

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics which we have shared with Ofwat and resubmitted with this IAP response.

Vivid has found an issue with in the way that Ofwat has implemented the use of log-log model specifications and find that failure to account for biases introduced by the log transformation.

This has a material issue on allowances derived from these models which means that Ofwat should either correct the log models for the biases or triangulate using only linear models.

5.5.19 WINEP/NEP Reduction of sanitary parameters

Ofwat's IAP Approach

"We assess the investment for this line by modelling the number of treatment sites with new / tightened sanitary parameter consents and their associated population equivalents (PE) against the requested capex for the same PE. We base the PE and capex on company reported data, and the number of treatment sites on our best estimate from WINEP3, March 2018 and information provided within company business plans. We triangulate our two models (exponential and power functions) to determine our allowances. Where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 56.

Table 25 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	33.131	30.027	3.104	9.37
Opex	1.332	0	1.332	100
Totex	34.463	30.027	4.436	12.87

Analysis of Ofwat's IAP approach

Consistency of models with underlying engineering and economic principles

The costs of complying with new consents vary significantly with the specific permit conditions.

Consistent with our views in our phosphorus removal model case review, it is necessary to suitably reflect the fact that tighter permit conditions are more costly to achieve than less stringent ones. This is demonstrated explicitly by the fact that around 60% of the costs within the £33.1m included in our Plan relates to 7 schemes (of a total of 24), where the obligations relate to BOD and Ammonia.

Vivid has found an issue with the way that Ofwat has used log-log model specifications. Ofwat has failed to account for biases introduced by using the log transformation. This has a material impact on the allowances derived from these models. Using a "smearing factor" could be one means of correcting for the bias and producing more appropriate log-log model allowances.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of being sufficiently reflected in botex modelling approaches results in an additional £1.33m efficiency challenge to deliver the statutory requirements of our WINEP programme.

Further Information

We have included further information on optioneering in our Addressing Flow at Water Recycling Centres Enhancement Business Case in WWS2 table commentary.

5.5.20 WINEP/NEP UV disinfection

Ofwat's IAP Approach

"We assess the investment for this line using shallow and deep dives based on the materiality of the capex requested and an assessment of the unit cost of each scheme. We calculate unit costs as cost per population equivalent (PE) served by the treatment works with new / tightened UV consents. Given the availability of PE data and the low number of schemes / solutions within this investment line, we incorporate the unit cost assessment to support the need for a deep dive on outlier unit costs. We also reconcile information that has been identified within the companies' submissions with the list of schemes in the EA's WINEP3, March 2018.

We consider the availability and quality of evidence for the deep dives. Where companies' proposals are below the materiality threshold or unit costs are not outliers, we set allowances by applying a company-level enhancement efficiency challenge to the amount requested by companies."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, pages 56-57.

Table 26 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	24.907	22.416	2.491	10
Opex	1.618	0	1.618	100
Totex	26.525	22.416	4.109	15.49

Analysis of Ofwat's IAP approach

In this model Ofwat has assessed 5 companies who proposed investment including Anglian Water. Our costs have been reduced by 10% by a company specific efficiency challenge.

We do not agree with the application of company specific efficiency challenges to enhancement expenditure which have been derived from the assessment of botex requirements. Our rationale is set out earlier in the chapter. Given the materiality of this adjustment, a more robust approach would be to review companies' evidence on the basis of a deeper dive using the evidence set out in the enhancement business case in the WWS2 table commentary.

Treatment of costs

Ofwat's guidance for this line states "*Capital / operating expenditure on the primary cost driver at quality enhancement schemes listed in the NEP (or WINEP) for AMP5, AMP6 or AMP7 where the objective of the primary cost driver is to meet new or tightened consent conditions for microbiological parameters to meet the requirements of the EU Shellfish Waters or revised Bathing Water Directives.*"

For the purposes of modelling, Ofwat's analysis only uses 2 coastal obligations (Southwold and Walton). This omits the other obligations included for shellfish, bathing water and marine coastal zones directives in the WINEP. These include 20 investigations as well as improvement schemes. This error should be corrected.

£12.22m of our proposed investment relates to sewage collection. These investments are substantially different to the UV treatment investments. For example. they involve misconnection campaigns - working in partnership with local communities to disconnect foul sewers from surface water sewers - as well as constructing new storage at CSOs to comply with the obligations. We are one of only two companies who had costs associated with sewerage collection captured in this model.

It follows that Ofwat's unit cost model which uses population equivalent at the STW as a driver is not an appropriate means to calculate efficient costs for these types of investment driver.

Enhancement opex

Our full view on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of being sufficiently reflected in botex modelling approaches results in an additional £1.62m efficiency challenge to deliver the statutory requirements of our WINEP programme.

5.5.21 First time sewerage

Ofwat's IAP Approach

"We assess the investment for this line using a panel data model where the cost drivers are the number of connectable properties served by s101A schemes and the squared of the same driver. We triangulate our cost allowance across two models, one using historical data for the period 2011-12 to 2017-18 and other using forecast data for the period of 2020-21 to 2024-25. Both models use smoothed data over a 3- year period. Where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 53.

Table 27 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	23.367	18.942	4.425	18.94
Opex	0.508	0	0.508	100
Totex	23.875	18.942	4.933	20.66

Analysis of Ofwat's IAP approach

We commissioned Vivid Economics to review the models Ofwat has used. As Vivid recognise, Anglian Water has historically had the largest number of first time sewerage schemes in the industry 77% of properties connected in the historical data set and 47% in AMP7. Over time we have seen the number of requests drop, and at the same time we have seen the number of rejections of duty increase. We believe this supports the point Vivid make about increasing unit costs as the share of unconnected properties falls, and could also be related to their point about the sparsity of communities applying.

Vivid Economics note the model's stability relies on the presence of the our data.

This suggests that the other data points in the model are unsuitable for benchmarking and that this area of expenditure is better suited a deep dive approach.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

The treatment of enhancement opex in this area, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches, results in an additional £0.5m efficiency challenge.

Further information

We have provided further information on the optioneering process we undertook for this investment in our First Time Sewerage s.101a Enhancement Business Case in WWS2 data table commentary.

5.5.22 Sludge enhancement (Quality and growth)

Ofwat's IAP Approach

"For our assessment we combine investment in sludge quality and sludge growth into one sludge assessment area as these areas both drive the need for additional bioresources treatment capacity. We deep dive each company's proposals. We assess the companies' estimated impacts of population growth or sewage treatment quality improvements on sludge production volumes. We also assess if the companies demonstrate an appropriate solution appraisal and whether the solutions are clearly defined."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 53.

Table 28 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	21.881	0	21.881	100
Opex	1.515	0	1.515	100
Totex	23.396	0	23.396	100

Analysis of Ofwat's IAP approach

Ofwat has not allowed any enhancement expenditure on bioresources related to growth or quality for any company.

This is on the basis that Ofwat does not consider that our Plan (and presumably all plans) provided insufficient information:

> *"the company's plan does not provide sufficient explanation for the sludge production volume forecasts. The company should provide further evidence around how the sludge volume forecast was calculated, including any assumptions made or adjustments to model outputs"*

Action ANH.CMI.A1 – Source: Anglian Water: actions summary table

We do not agree with Ofwat's IAP position to remove expenditure for sludge relating to growth. It is irrefutable that as more customers connect for water recycling services that the volume of sludge produced that requires treatment increases. This change increases further with tighter consents at Water Recycling Centres for parameters such as phosphorous removal.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

The treatment of enhancement opex in this area, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches, results in an additional £1.5m efficiency challenge.

Impact on Investment

The disallowance of the whole of this investment means that we cannot increase capacity to cater for growth and additional sludge as a result of tightening environmental standards or provide additional input monitoring in line with Ofwat's Water 2020 strategy for improving monitoring of flow and dry solids at each input boundary point between Wastewater Network Plus and Bioresources.

Further Information

We have provided further evidence in response to Ofwat's feedback in our Bioresources Enhancement Business Case in the WWS2 table commentary.

5.5.23 WINEP/NEP Event Duration Monitoring

Ofwat's IAP Approach

"We assess investment for this line using the median unit cost calculated from the capex requested for the reported number of intermittent discharge sites with event duration monitoring. Where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 54.

Table 29 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	17.235	9.536	7.699	44.67
Opex	0	0	0	0
Totex	17.235	9.536	7.7	44.7

Analysis of Ofwat's IAP approach

Ofwat calculate both the industry average (£15.4k) and median (£12.6k) cost per scheme. There is no rationale for why median is used rather than the average.

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics. The wide variation in companies' costs suggest that factors other than companies' relative efficiency are contributing to these differences and that a simple cost per scheme approach may not be appropriate.

The costs per scheme ranges from £84.9k (SRN) to £141 (HDD). Ofwat note that in the case of HDD: "*WINEP does not show any schemes for HDD, but table WWS4 states 270 schemes for a very low capex, generating a low outlier unit cost. Despite this we [Ofwat] have retained the HDD values within the industry median unit cost analysis.*"

It is clear there is a significant range of costs. E.g. excluding HDD, the range is from £4.4k (Welsh) to £84.9k (Southern).

Excluding the outlier of HDD increases the average and median costs to £16.7k and £13.3k. Using this revised median cost increases our allowance by £580k.

Using the median, rather than the industry average cost has removed £1.02m from our Plan.

We note Ofwat's query ANH_35 and have included updated data in our response for our costs excluding the EA permit fees which are on average £6500 based on EA list of fees from 2018.

Impact on investment

The assessment results in a significant difference between our Plan and Ofwat's view of required expenditure. The scale of difference (45%) fundamentally inhibits our ability to comply with legal obligations under WINEP for monitoring.

Further Information

We provide further information on how we have selected the preferred options in this investment in our Addressing Flow at Water Recycling Centres Enhancement Business Case in WWS2 table commentary.

5.5.24 Wastewater resilience

Ofwat's IAP Approach

"Due to the company specific nature of resilience we undertake a deep dive of all company plans. We allow investment that addresses low probability / high consequence risk and that is supported by customers. This includes those related to the National Flood Resilience Review. We reallocate investment where we consider it relates to expected operational activities (for example managing sewer flooding). In this way, we ensure that our assessment is equitable across the industry."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 58.

Table 30 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	1.341	1.207	0.134	10
Opex	15.817	0	15.817	100
Totex	17.158	1.207	15.951	92.97

Analysis of Ofwat's IAP approach

Ofwat reallocate the capital expenditure in our Pluvial and Fluvial Flooding line WWS2 Line A33 to this wastewater resilience model.

It is our view that Ofwat should not reallocate any of our operational enhancement expenditure within WWS2 Line B80, which is the expenditure proposed as contributions to partnership funding for agencies such as the Environment Agency, Local Councils and Drainage Board schemes which protect communities and our assets from flooding.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of confirmation that these costs are sufficiently reflected in other modelling approaches results in a 93% efficiency challenge for this area of enhancement. This fundamentally restricts our ability to carry out this investment.

5.5.25 Odour

Ofwat's IAP Approach

"All company proposals are below the materiality threshold and therefore we assess the investment for this line by following the shallow dive process. We set allowances by applying a company-level enhancement efficiency challenge to the amount requested by companies."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 57.

Table 31 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	12.298	11.068	1.23	10
Opex	1.706	0	1.706	100
Totex	14.004	11.068	2.936	20.97

Analysis of Ofwat's IAP approach

Ofwat has applied the 10% company specific efficiency challenge.

We do not agree with the application of company specific efficiency challenges to enhancement expenditure which have been derived from the assessment of botex requirements. Our rationale is set out earlier in the chapter.

Given the materiality of this adjustment, a more robust approach would be to review companies' evidence on the basis of a deeper dive using the evidence set out in the enhancement business case in the WWS2 table commentary.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

We know from our customer engagement work that odour is an important issue to those choosing to live near our assets. As the Enhancement case states – 8.2% of all our written complaints in the year ending March 2017 related to odour. Our strategy to resolve this issue is a totex strategy comprising enhancement opex to employ a Strategic Odour Manager and a Tactical Odour Manager to lead engagement on odour resolution and focus the development on holistic catchment investigations that identify the root cause of odour. Ofwat's IAP approach disincentivises such approaches in favour of capex solutions.

Ofwat's IAP treatment of enhancement opex essentially acts as an additional efficiency challenge for companies proposing totex solutions for enhancement drivers. This treatment, in absence of being sufficiently reflected in botex modelling approaches results in an additional £1.7m efficiency challenge for this area of enhancement.

5.5.26 WINEP/NEP Chemicals removal

Ofwat's IAP Approach

"We base our capex allowance for the investment in this line on the lesser of two figures: (i) triangulation of outputs of four cost models or (ii) the costs requested by the company. We use population equivalent served by the wastewater treatment works needing chemicals removal as the cost driver in the models which we source from the EA's WINEP3. We do not use the data from two companies because they are outliers, one on costs and the other on population equivalent."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 55.

Table 32 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	11.867	10.089	1.778	14.98
Opex	0.484	0	0.484	100
Totex	12.351	10.089	1.8	18.31

Consistency of models with underlying engineering and economic principles

The WINEP lists all the substances under improvement drivers the various companies will need to treat as:

- Aluminium (total)
- Cadmium (total)
- Copper (dissolved)
- DEHP
- Diazinon
- Iron (total)
- Mercury (total)
- Tributyltin
- Triclosan
- Zinc (dissolved)

Dissolved copper and DEHP are the substances we need to address our obligations.

Chemical removal limits are substance specific and will require different treatment processes. Seeking to compare companies across a range of parameters, using a range of technologies is unlikely to produce a realistic model. We would expect the expenditure to vary widely across obligations and companies, and any model to be very weak at predicting expenditure.

Treatment of costs

We believe the population equivalent figures Ofwat use in the model are incorrect.

We think Ofwat has used a driver figure for the 2 improvements at Rayleigh East and Tuddenham WRCs and 1 No deterioration driver at Tuddenham WRC. We have a single investment and therefore expenditure is only allocated once in our tables for the improvements at Tuddenham WRC regardless of driver.

Ofwat correctly capture we have 13 lines for improvements or no deterioration schemes within WINEP at 8 sites. However, we have not planned to build schemes or included expenditure for the 'No Deterioration limit standstill' obligations in the WINEP as the EA has advised not to invest in processes to meet these limits.

Further analysis of Ofwat's model

We have reviewed the detail of Ofwat's modelling approach through the work commissioned with Vivid Economics. This highlighted model performance is very weak, with low statistical fit across specifications, and a number of insignificant coefficients.

The challenge of model fit is consistent with our view that it is unlikely find an appropriate model because of the extremely varied nature of the drivers captured by this expenditure.

This area is better placed to be addressed by a deep dive rather than modelling given the variety of chemical drivers and associated costs.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of being sufficiently reflected in botex modelling approaches results in an additional £0.5m efficiency challenge.

5.5.27 WINEP Storage schemes in the network to reduce spill frequency at CSOs

Ofwat's IAP Approach

"We assess the investment for this line by using a model which estimates expected capex based on the company requested capex and volume of storage each company is planning to construct. We use the model to estimate our expected costs and apply an efficiency challenge to these estimates. The efficiency challenge is informed by the potential level of efficiency indicated in our model. Where the company's requested investment is below our allowance, we reduce the allowance to the company's requested investment"

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 55.

Table 33 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	8.366	6.098	2.268	27.10
Opex	0	0	0	0
Totex	8.366	6.098	2.268	27.10

Analysis of Ofwat's IAP approach

We commissioned Vivid Economics to review Ofwat's enhancement models. In the case of spill frequency at CSOs, Vivid concluded that the 10% efficiency applied to this model was arbitrary compared to other models of similar quality. We also note that although the correct volume data was used in the analysis tab, the 'data' and 'data tables' tabs contain the storage volumes relating to U_IMP6 in error.

We do not agree with the application of company specific efficiency challenges to enhancement expenditure which have been derived from the assessment of botex requirements. Our rationale is set out earlier in the chapter.

Given the materiality of this adjustment, a more robust approach would be to review companies' evidence on the basis of a deeper dive using the evidence set out in the Addressing Flow in the Sewerage System enhancement business case in the WWS2 table commentary.

Treatment of costs

Ofwat's analysis re-allocates £3.283m from line 35 'WINEP / NEP Schemes at Water Recycling Centres to reduce impact of spills at CSOs' onto other lines. This freeform line was used to capture three investments which are U_INV/U_IMP4 drivers (as per investments on line 11 WINEP / NEP ~ Storage schemes in the network to reduce spill frequency at CSOs, etc), and was split out since these three investments are not in the network, they are on treatment sites.

We believe the investments on line 35 should be assessed in the spill frequency feeder model as they have the same driver as those on line 11. In order to assess these three investments, Ofwat would also need to bring the storage volume created by these investments which is currently excluded from line 11 in WWS4. The total storage volume created by these three investments is 1,041m3.

Consistency of models with underlying engineering and economic principles

Ofwat's model uses a driver of storage volume created. As we explain in our table commentary for line 11 in WWS4 "*As part of our drive to reduce carbon and reduce cost we have agreed with the Environment Agency that one of the investments does not require storage and the issue can instead be resolved with upgrades to the screen.*" At this location the modelled volume that would have been required if we had not agreed on a screen upgrade would have been 392m3. In this case we are therefore penalised for keeping costs down by selecting capex options which do not include new storage.

5.5.28 Company specific freeform wastewater enhancements

Ofwat's IAP Approach

"Where we consider it appropriate, we reallocate forecast expenditure entered by a company in a freeform enhancement line to a standard enhancement line or base maintenance. In other freeform lines where the expenditure relates to activity that is the subject of a cost adjustment claim (CAC), it is reviewed as part of the assessment of the CAC. For any remaining expenditure, our review subjects each claim to either a shallow or a deep dive assessment depending on the complexity of the claim and the issues raised by it."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, pages 58-59.

Table 34 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	1.949	0	1.949	100
Opex	0	0	0	0
Totex	1.949	0	1.949	100

Analysis of Ofwat's IAP approach

Ofwat has reallocated some capital expenditure proposed in the Freeform lines in WWS2 into other models.

The remaining expenditure relates to that associated with investment to achieve compliance with the Medium Combustion Plant Directive (MCPD): This expenditure has been subject to deep dive.

Ofwat rely on a statement from another water company, Thames Water, as part of their assessment to reject our proposed investment. However, the statement from Thames Water does make it clear obligations come into effect in 2025, but they fail to state that it is in fact 1 January 2025. Therefore our expenditure is required in AMP7 to meet the obligations. We also note that Yorkshire Water have also put forward investment to comply within AMP7.

Further information

In responding to the IAP Assessment we have provided additional information in our Medium Combustion Plant Directive Enhancement Business case in the WWS2 table commentary which reaffirms our view that investment in MCPD compliance remains an enhancement activity.

5.5.29 Wastewater Security & Emergency Measures Directive (SEMD) and non-SEMD

Ofwat's IAP Approach

"We combine investment on SEMD and non-SEMD costs into one security assessment. We welcome the proposals for companies to invest in this area and do not apply the company specific efficiency challenge to companies where wastewater security costs are not deemed material.

Where costs are material we carry out a deep dive assessment. We make allowances based on the proportion of base totex spent on security for the period from 2011-12 to 2024-25. We reduce the company allowance to ensure the total costs for this period do not exceed the average of both the median and the average proportion of base costs spent on security for all wastewater companies."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 58.

Table 35 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	1.019	1.019	0	0
Opex	0.174	0	0.174	100
Totex	1.193	1.019	0.174	14.59

Analysis of Ofwat's IAP approach

Only four companies propose expenditure in this area. Only one company has material expenditure, the remaining three companies, including Anglian are allowed capex costs in full due to low materiality.

Enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out earlier in this chapter and in the report we commissioned from Reckon LLP.

This treatment, in absence of being sufficiently reflected in botex modelling approaches results in a further efficiency challenge equivalent to over 14.6% for this area of enhancement.

5.5.30 WINEP/NEP Investigations (wastewater)

Ofwat's IAP Approach

"We assess the investment for this line using shallow and deep dives depending on the materiality of the investment. We apply a company-specific efficiency challenge for lines classed as not material. For companies whose costs are material, we carry out a deep dive using the information the companies provide in their business plan submissions."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, pages 55-56.

Table 36 Difference between our Plan and the IAP

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	0.108	0.0972	0.0108	10
Opex	0.190	0	0.190	100
Totex	0.298	0.0972	0.2008	67.38

Analysis of Ofwat's IAP approach

The investment associated with the investigations for this area of enhancement have significant impacts on potential future investment requirements for drivers of Marine Conservation Zones and Water Framework Directive.

We do not agree with the application of company specific efficiency challenges to enhancement expenditure which have been derived from the assessment of botex requirements. Our rationale is set out earlier in the chapter.

Given the materiality of this adjustment, a more robust approach would be to review companies' evidence on the basis of a deeper dive using the evidence set out in the enhancement business case in the WWS2 table commentary

Treatment of costs

There is a re-allocation of £1.094m into this line from line 35 'WINEP / NEP Schemes at Water Recycling Centres to reduce impact of spills at CSOs'. This freeform line was used to capture three investments which are U_INV/U_IMP4 drivers (as per investments on line 11 WINEP / NEP ~ Storage schemes in the network to reduce spill frequency at CSOs, etc), and was split out since these three investments are not in the network, they are on treatment sites. This is Ofwat's initial re-allocation.

Ofwat's rationale contained in the deep dive tab of the Storm Tank model confirmed a lack of clarity how to assess this spend for IAP. We challenge this reallocation as these investments (captured in line 35 of WWS2) should be assessed in the spill frequency feeder model as they have the same driver as those on line 11.

The approach to applying a shallow dive for enhancement capex in this area is inconsistent with other areas of enhancement expenditure with equivalent materiality. Other areas, such as Wastewater Security and Emergency Measures Directive (SEMD) and non-SEMD, have been allowed in full.

Treatment of enhancement opex

Our full views on Ofwat's treatment of enhancement opex in the IAP assessment are set out both earlier in this chapter and in the full report we commissioned from Reckon LLP.

This treatment, in absence of being sufficiently reflected in botex modelling approaches, results in a significant efficiency challenge for this area of enhancement under the statutory WINEP programme.

5.5.31 WINEP/NEP National phosphorus removal technology investigations

Ofwat's IAP Approach

"We do not expect AMP7 costs in these expenditure lines as there is no AMP7 driver for them. If companies put costs against these areas we either reject or reallocate the costs."

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 57.

Table 37 Difference between our Plan and IAP Assessment

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference (%)
Capex	0.16	0	0.16	100
Opex	0	0	0	0
Totex	0.16	0	0.16	100

Analysis of Ofwat's IAP approach

Our analysis suggests we are the only company to allocate costs to this prescribed line.

Whilst an order of magnitude lower relative to other WINEP drivers we still require investment in this area and are surprised by Ofwat prescribing an investment line in data tables and then setting out a view at IAP that their expectation was that companies should not to use it.

The guidance for line 14 in table WWS2 states the line should include "*Capital / operating expenditure on monitoring, investigations, feasibility studies and improvements listed in the NEP as part of the national AMP6 Phosphorus removal technology investigations programme.*"

The description within the WINEP is:

> *Investigation and/or options appraisal to determine impacts of Water Company activities, or permits or licence standards on the Natura 2000 or RAMSAR site or to determine the costs and technical feasibility of new targets.*

We are undertaking investigation into improving compliance with CSMG Phosphorus targets at various locations. To carry out feasibility and options appraisal and costs of meeting water company obligation for P and N, in order to achieve CSMG targets. This will incorporate outcomes from DWPP review work ongoing in area, due to complete in 2019.

The specific obligation references (WINEP unique IDs) for the expenditure we report in line 14 of WWS2 are:

- 7AW200220
- 7AW200221
- 7AW200222
- 7AW200223

Investments in this line relate specifically to phosphorus investigations. We therefore allocated the following driver code to these lines in our WWS2 table line A14 and B61: HD_INV.

This driver code is not available in any line definitions for table WWS2. We therefore mapped it to the line we believed was the closest allocation. During the query process, we have received no clarification on this, rather Ofwat has dismissed the expenditure. Consistent with other areas of low materiality Ofwat should allow these costs in full.

5.5.32 WINEP/NEP Conservation drivers

Ofwat's IAP Approach

We assess the investment for this line using shallow and deep dives based on the materiality of the capex requested and an assessment of the unit cost of each scheme. We also reconcile information from the companies' submissions with the list of schemes in the EAs' WINEP3, March 2018.

For claims below our materiality threshold, we apply the company-specific efficiency challenge. Where companies provide evidence, we use an indicative unit cost (number of schemes declared in the companies' business plans) to support the need for a deep dive. For example, where one scheme dominates a company's programme and the scheme is considered a cost outlier, we deep dive the costs. We consider the availability and quality of evidence for the deep dives.

Source: Technical appendix 2: Securing cost efficiency, Annex 5, page 53.

Table 38

	Our Plan (£m)	IAP Assessment (£m)	Difference (£m)	Difference %
Capex	0	0	0	0
Opex	0.130	0	0.130	100
Totex	0.130	0	0.130	100

Analysis of Ofwat's approach

This investment is for a project Market Harborough (WINEP ID 7AW202231) to achieve a conservation driver. Our selected solution agreed with the Environment Agency for this investment is a natural capital approach. We own land alongside the river Welland behind Market Harborough WRC. This investment is to undertake river restoration on our side of the river on our land. Because the investment does not create an asset it is opex. Ofwat's assessment therefore states our requested amount is zero and effectively disallows the costs. Our more general review of Ofwat's treatment of enhancement opex is detailed in chapter 5.

6. FOCUS AREA: LEAKAGE

Overview of our IAP Response

Our customers view leakage as a totemic issue and repeatedly indicate it as their highest service priority. They have expressed a strong preference to continue to push the industry frontier and support the use of enhanced incentives within the ODI framework if we deliver against our stretching targets.

We have a series of concerns about Ofwat's IAP approach to leakage, whilst recognising the challenge of having to reconcile the impact of very different levels of performance across the sector within both the cost assessment and ODI framework. Given the complex relationship between these parts of the regulatory framework, we have sought to capture all our views on leakage in this chapter.

Overall, the approach set out in the IAP does not recognise the necessary expenditure requirements for a company already at the leakage frontier to continue to drive down leakage by more than 15% in AMP7. This would represent a shift in Anglian's performance from being sector-leading to world-leading. This unprecedented level of ambition is fully supported by our customers but, as we evidence below, it will require significant expenditure to be achieved.

In addition, we think that further work is needed to ensure that the incentive regime recognises that companies who are pushing the frontier face very different risks and challenges to those who are starting from a more modest level of performance, and are rewarded rather than penalised for their past good performance. This is important not just for the leading companies, but also for those who are trying to catch up and need to see that frontier performance is worth striving for.

We have considered all these issues very carefully, reflecting on Ofwat's IAP response and our customer engagement results. As a result we have proposed some changes to our Leakage ODI from our September Plan which we believe strikes the right balance.

Base expenditure

Ofwat has accepted that maintaining our current leakage performance requires an adjustment to our base cost allowance. We welcome this, but have identified a mathematical error in Ofwat's calculation, which causes the adjustment to be understated by £71m.

Even with this adjustment, the omission of necessary leakage cost drivers in Ofwat's Botex models means that they do not sufficiently estimate the costs required to enable AMP7 forecast Upper Quartile (UQ) performance.

Enhancement expenditure

Ofwat's IAP rightly seeks to allow costs for companies who are either operating beyond the UQ or proposing reductions greater than 15% in AMP7.

The mechanism for deriving the unit costs for delivering this level of leakage performance should be improved in two ways from the current IAP method:

- Firstly, the per Ml/d allowances for delivering leakage beyond the UQ should reflect the economic basis that the marginal costs of driving down leakage further from the frontier position are significantly higher than the "industry median unit cost" which has been used in IAP; and
- The use of ODI incentive rates within the calculation is an unnecessary step which doesn't reflect the costs of leakage reduction.

The impact of using an industry median cost rather than our unit cost for leakage causes an understatement of our required enhancement costs of £40m.

ODIs

We believe that the incentives proposed in our September plan are consistent with the expressed desire of our customers that we should continue to prioritise leakage reduction, and would provide appropriate incentives for the sector as a whole to aspire to reach frontier levels of performance.

We are concerned that Ofwat's proposal to use the stretching leakage profile described in our WRMP as the basis for the ODI framework dampens the incentives to continue to drive performance beyond the frontier. We engaged with our customers on this point specifically; they agreed that it was appropriate for us to be able to earn greater rewards if we deliver the stretching level of performance set out in our September Plan, based on our Performance Commitment rather than our WRMP ambition. Delivery of such a low level of leakage should not be seen as a given. The step change in innovation that has been needed, aligned with the need to continually trial new technology which has typified our achievements on leakage over recent years is testament to the scale of this challenge and the uncertainty of outcomes. For us to deliver the PCL we have set will require further innovations in currently unproven technologies to deliver this world leading leakage target. Operating at the cutting edge in this way is inherently more costly, with results less certain, than if moving forward from a "middle of the pack" position with the benefits of learning from those that have gone before. The ability of the frontier performer to show the way for others is another reason why the incentive regime needs to reward such performance, as all customers in England and Wales will benefit in such a situation.

Recognising all of this, but also taking into account Ofwat's views in the IAP, we have reflected further on our leakage incentive mechanism and have proposed some changes compared to our September plan.

6.0.1 Botex cost adjustment

Ofwat has accepted that maintaining our current leakage performance requires an adjustment to our base cost allowance.

We welcome this, but have identified a mathematical error in Ofwat's calculation, which causes the adjustment to be understated by £71m.

As discussed at our meeting with Ofwat on 19 February and confirmed through the query process, we expect the error made in the calculation of this adjustment to be rectified for Draft Determination but would welcome early confirmation of this.

6.0.2 Wider botex approach

The sums allowed by Ofwat's Botex models only fund companies to deliver the average leakage position over the period considered by Ofwat's models (2011/12 to 2017/18). They do not fund the level of stretch that Ofwat requires of companies.

Ofwat has stated that it believes companies are funded to deliver stretching performance in AMP7 within the base allowances derived from the econometric approach to setting base costs. Stretching is defined as being the forecast 2024-25 upper quartile performance.

Both our own work, and that undertaken by Nera, suggests that Ofwat's approach to setting base allowances does not allow reasonable funding of leakage reductions consistent with the definition of "stretch" required by Ofwat. They do not fund the current costs for those companies already operating below industry average, nor the required AMP7 enhancements. Therefore, companies cannot achieve the stretching performance Ofwat aspires to if the funding is based on historical expenditure when performance requirements were much lower.

6.0.3 Enhancement: recommendation

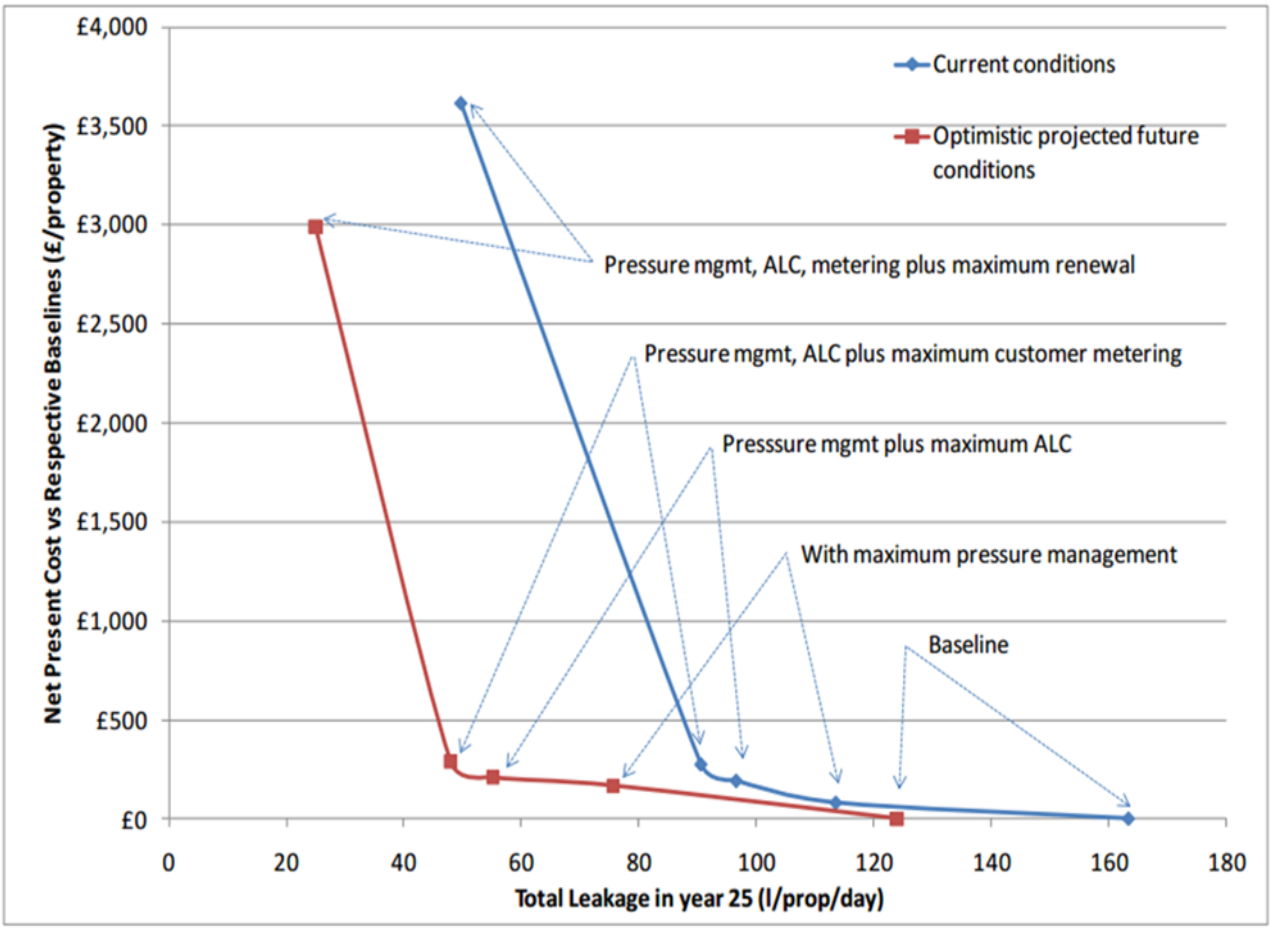
Allowances should be made to fund the leakage improvements companies will make between 2020 and 2025. These allowances should recognise the rising marginal cost of leakage improvement and be set in a way which reflects companies' current relative leakage positions. Cost curves exist which could be used to set these allowances.

Ofwat's IAP rightly seeks to allow costs for companies who are either beyond the UQ or proposing reductions greater than 15% in AMP7.

Both our views and those expressed in work conducted by Nera and Vivid Economics suggest that the current IAP mechanism for deriving the unit costs for delivering this level of leakage performance should be improved.

It is evident from a consideration of the practical and technical aspects of leakage control and reduction that the marginal cost of leakage reduction will increase as companies reduce leakage. This is certainly the case when operating at, and seeking to shift even further, the leakage frontier. By operating at the frontier, the activities to further drive down leakage are by their nature more innovative, their outcomes more uncertain, and their costs higher. Such investment may also provide the potential to help all customers across the country by showing and sharing what can be achieved.

Figure 15 UKWIR figure on leakage unit cost as baseline leakage levels are driven down



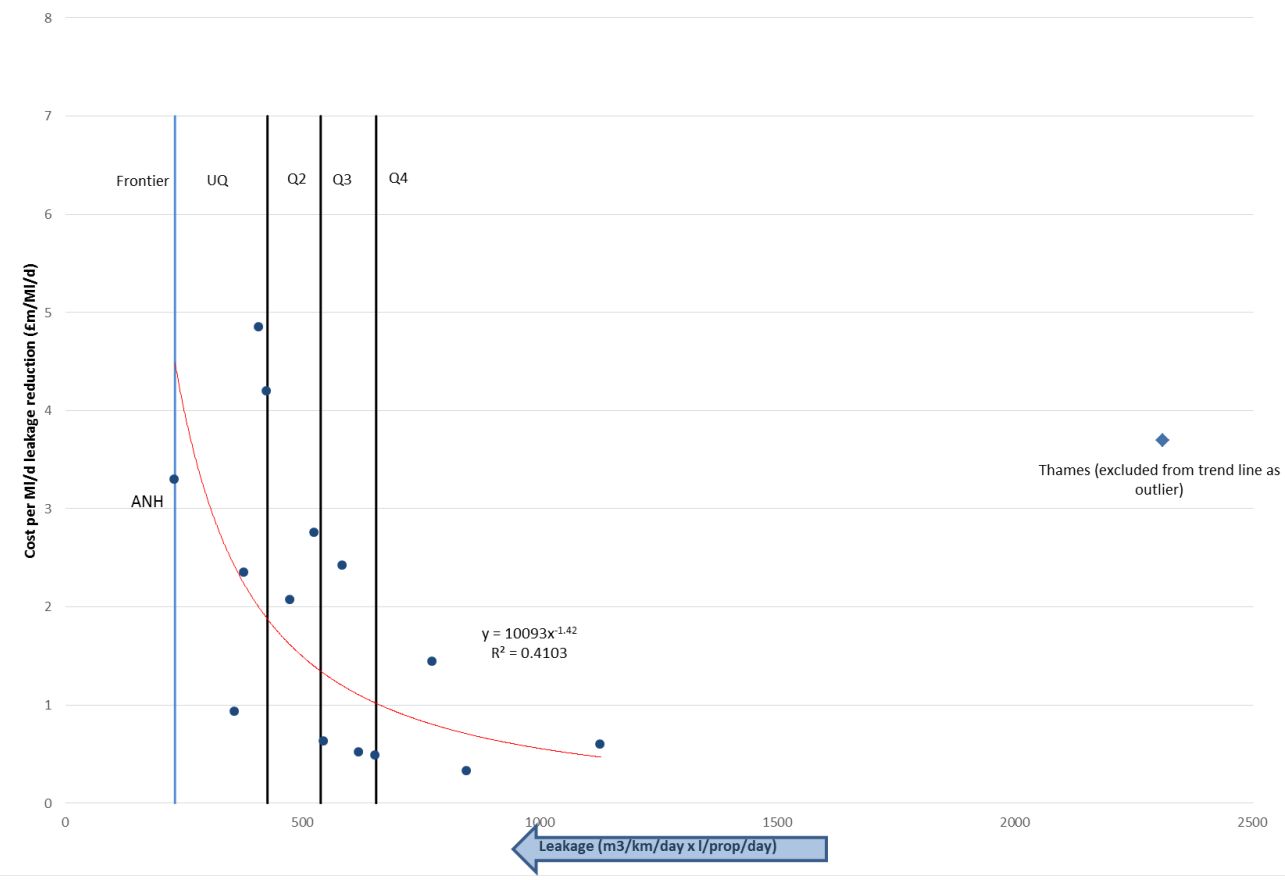
Nera explicitly derives statistical evidence that the marginal cost for leakage reduction tends to rise as companies reduce leakage to lower levels.

Under Ofwat's IAP, companies which plan to achieve leakage reductions greater than 15% from their 2020 position are assessed as needing additional funding, equivalent to a fixed sum per unit of leakage beyond this threshold. This sum does not reflect the well-established relationship between the existing leakage level and the marginal cost of leakage reduction shown above.

Our own evidence, the NERA report, and independent research all shows that more demanding leakage reduction targets are associated with higher marginal costs. This is because of the more expensive leakage reduction solutions companies must deploy. This is shown in the graph below:

Using data from companies' September business plans we have plotted the relationship between performance and cost:

Figure 16 Company AMP7 leakage costs mapped to forecast 2024/25 performance



This plot maps companies' performance against unit costs for leakage. There are two main findings. Firstly this accords with the economic logic that marginal costs of incremental units of leakage delivered increase towards the leakage frontier. Secondly, the data demonstrates that, compared to a combined leakage frontier cost curve, our unit rate is efficient.

6.0.4 Use of under and outperformance rates

The current derivation of the industry median unit cost uses both out- and underperformance rates for leakage within the calculation to determine the rate of £1.6m/Ml/d. This value is materially lower than the efficient cost of our leakage delivered and does not reflect our marginal costs for our leakage activities. Conversely for other companies this is likely to overstate their costs.

The use of ODI rates to set allowances is inappropriate. ODI out- and underperformance rates for leakage are driven by the social benefits of leakage reduction (i.e. customer willingness to pay for leakage reductions) and are not a reasonable basis to set costs.

This has a material impact on unit cost derived. The median 'reported unit cost' is £2.07m/Ml/d, whereas the ODI out- and underperformance rates are £1.64m/Ml/d and £1.10m/Ml/d respectively.

6.0.5 Calculating upper quartile: recommendation

All cost allowance methods depend on being able to assess companies' relative leakage positions. Two methods currently exist for measuring normalised leakage – one based on property, the other on mains length. Using two separate measures risks two companies with equivalent leakage performance being considered differently depending which measure is used, this is clearly undesirable.

Therefore a single 'unit' of comparative leakage is required to ensure fairness and consistency when comparing across companies. We suggest that the product of the two standard normalised measures provides this in a way which respects the range of differences between the regions served by companies.

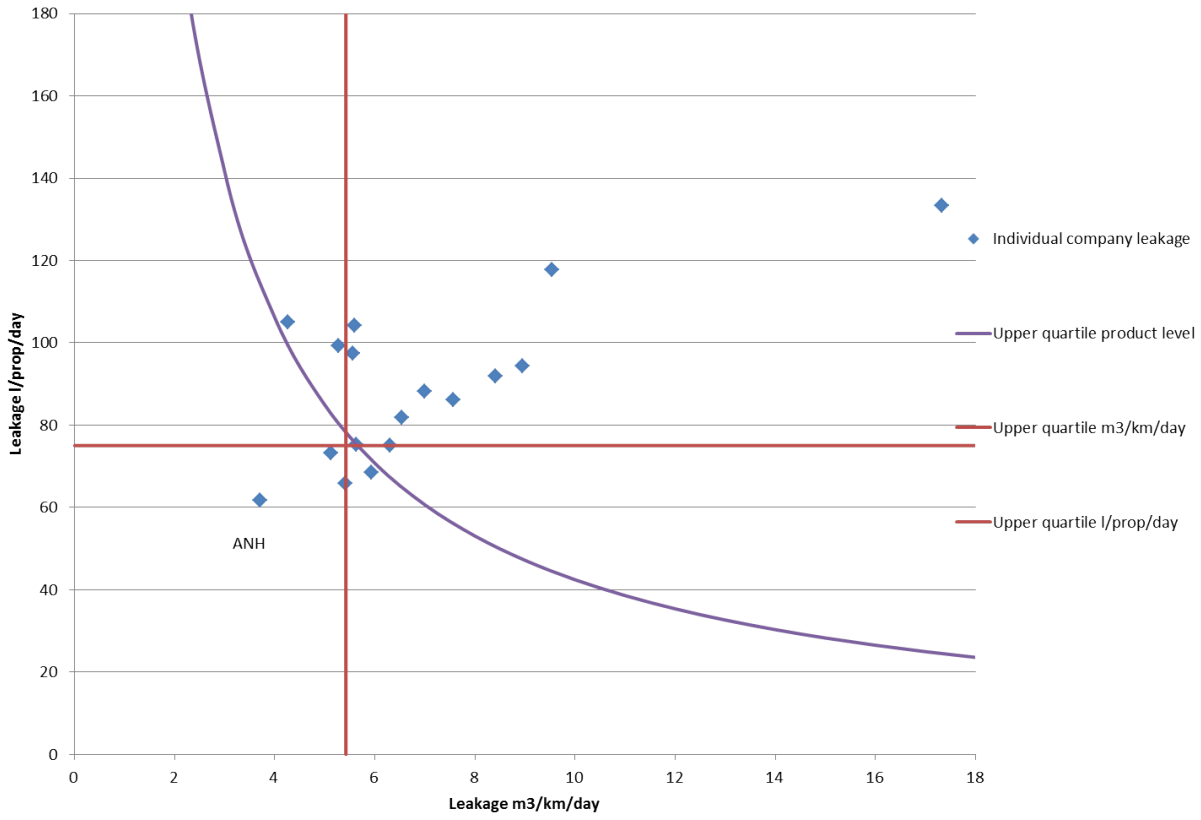
The nature of a company's network will determine how well it performs in relative terms on the two metrics (l/property/day and m3/km/day). The length of main and number of and density of properties in a company area are beyond companies' control.

Companies with high length of main compared to properties (companies with large rural areas) tend to perform better on the m3/km/day metric, whereas companies with high numbers of properties and short lengths of main (companies with large urban areas) tend to perform better on the l/prop/day metric.

On this basis, we believe that Ofwat's methodology of averaging the two values can be improved to allow for a better comparison of companies with higher property counts and density compared to companies with long mains length and low property density. The method we propose is to consider the product of Leakage in l/prop/day and Leakage in m3/Km/day.

If the two metrics are multiplied together this gives a way of assessing relative performance for companies with different mixes of rural and urban areas. For example, this means that a company with leakage of 5 m3/km/day and 100 l/prop/day could be said to have the same leakage performance as a company with 10 m3/km/day and 50 l/prop/day. The resulting boundary of UQ will be an arc on the graph shown by the purple line below rather than a square in the lower quarter:

Figure 17 Combining upper quartile metrics



Combining these two leakage metrics provides a single robust basis for calculating leakage volumes beyond the UQ. This also then simplifies the approach to derivation of enhancement allowances.

6.0.6 Robustness and efficiency of Costs: further evidence

WRMP

In this section we provide further company-specific evidence to demonstrate the efficiency of our leakage unit costs. As set out above, we expect these to differ from industry averages on the basis of our frontier leakage position. We assessed leakage costs and benefits as part of three strategic demand management options developed for our WRMP (extended, extended plus and aspirational).

The selection of the final demand management strategy within the WRMP was derived on the basis of the Cost Benefit Analysis models we developed to support the choice of the most appropriate demand management strategy.

These models included a comprehensive list of quantitative costs and benefits building blocks. In order to monetise these, we developed assumptions about the costs, take-up and water savings, using the best information available. This includes our own experiences of costs and benefits from our extensive demand management activity to date, including for example, learning from our trials of smart metering, behavioural change and leakage innovations such as use of drones, advanced noise logging techniques and deployment of hydrophones.

A description of the three leakage options considered is presented below:

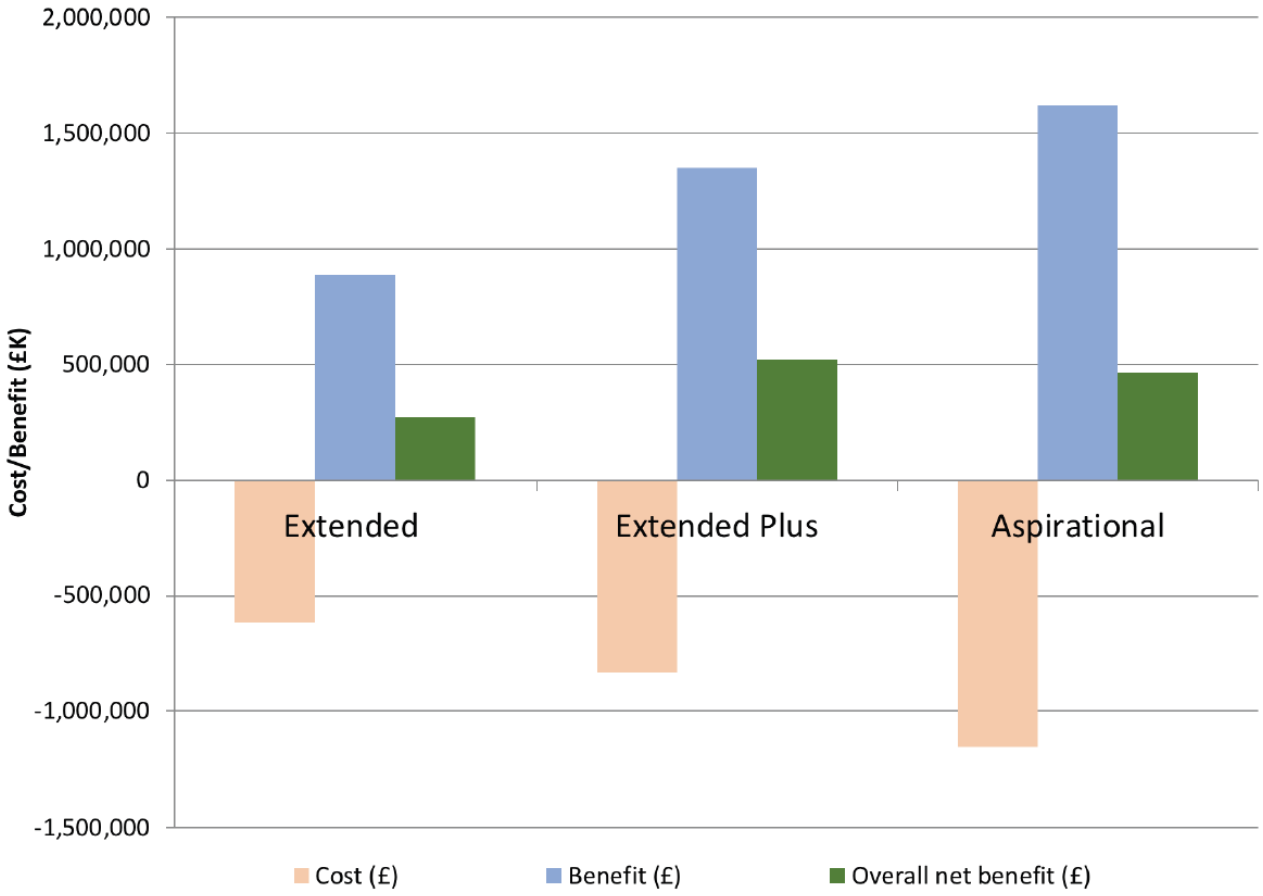
Table 39 WRMP leakage options

	Baseline	Extended	Extended plus	Aspirational
Leakage reduction	Leakage held at 172 Ml/d (the AMP6 company commitment) (177 Ml/d three year rolling average)	10 Ml/d reduction by 2045 (excludes 28 Ml/d cspl and distribution loss reductions from smart metering programme - see above) Reduction of leakage by 38 Ml/d to 134 Ml/d by 2045, by a combination of leakage and smart metering strategies. This does not meet our 15% reduction target.	42 Ml/d reduction by 2045 (excludes 28 Ml/d cspl and distribution loss reductions from smart metering programme - see above) Reduction of leakage by 70 Ml/d to 106 Ml/d by 2045, by a combination of leakage and smart metering strategies Leakage reducing by 21% to 142 Ml/d by 2025 and by 42% to 106 Ml/d from the current value (182.66 Ml/d) Note: Leakage currently represents 16% of DI and will represent 9.5% of DI in 2045.	77 Ml/d reduction by 2045 (excludes 28 Ml/d cspl and distribution loss reductions from smart metering programme - see above) Reduction of leakage by 105 Ml/d to 72 Ml/d by 2045, by a combination of leakage and smart metering strategies.

The Extended Plus option has the strongest business case of the three strategic options. It is the most cost beneficial option of the three strategic options as shown in the figure below. The Extended Plus option remains also cost beneficial when subjected to sensitivity testing. In a sensitivity testing

scenario which combined a higher cost of capital and operational expenditure, with lower consumption reduction scenarios (15 per cent), and a lower estimate of societal valuation, Extended Plus was the only strategic option to remain cost beneficial.

Figure 18 Total costs and benefits (25 year NPV)



6.0.7 Our Plan

Operating at the frontier for leakage and seeking to push this even further in AMP7 will require significant innovation. Previously deployed tried and tested approaches such as traditional "find and fix" processes and basic pressure management processes have delivered leakage benefits historically, but the marginal leakage benefits of such techniques diminish at lower levels of leakage performance.

Historically, we drove significant leakage reductions by targeting District Metered Areas (DMAs) with persistently high leakage. As we address these, and the low- hanging fruit diminishes we are required to resolve the residual leakage using more complex and expensive interventions.

To achieve further reductions in leakage, we have built a business plan which includes investment in new innovative methods which are yet to be fully proven.

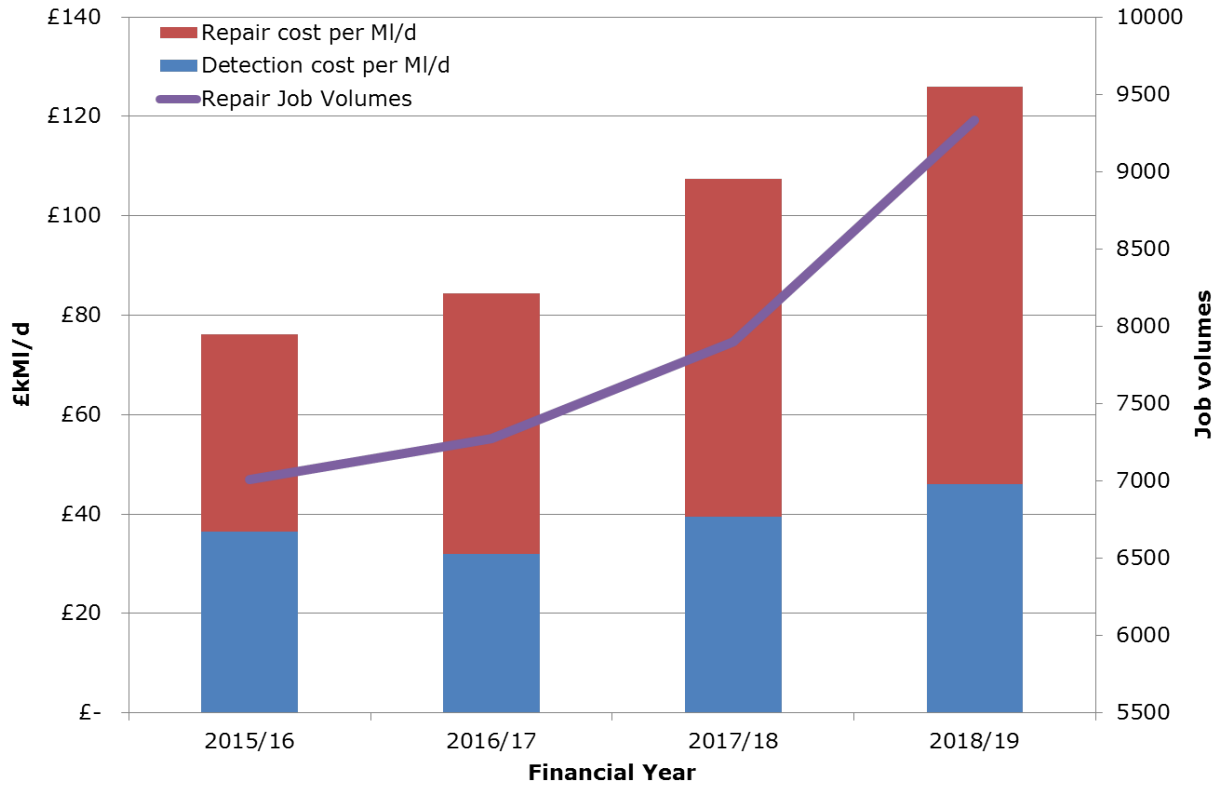
To go beyond the current frontier, we will have to deploy different techniques with higher marginal costs in DMAs where leakage remains stubbornly high and traditional targeting with find and fix and with simple pressure management schemes have not reduced leakage to minimum achievable levels.

These methods include:

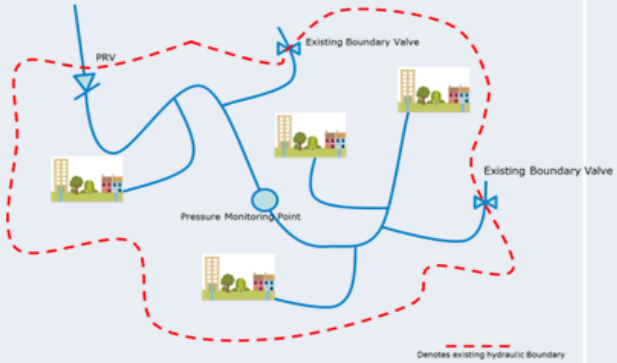
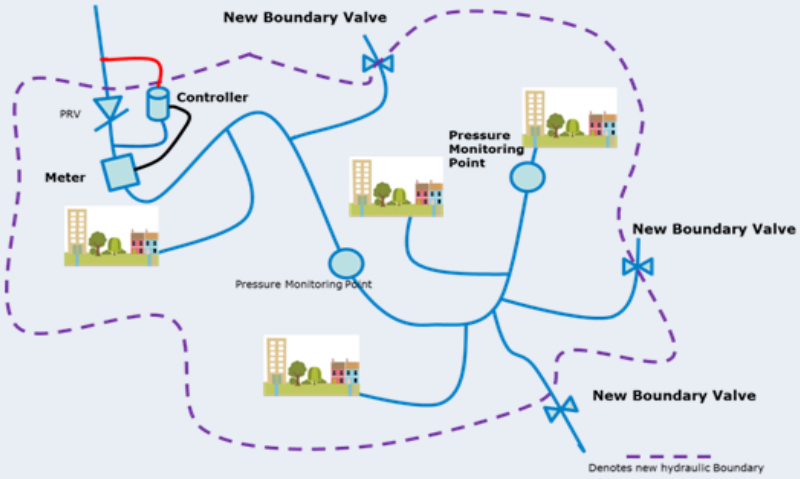
- The combination of intensive leakage and pressure management. These involve using data analytics and different technology working at increasingly marginal levels of leakage reduction

- Increasing targeted mains replacement in particularly rural DMAs where the water mains are towards the end of their asset lives
- We have a programme of reducing DMA size, especially in urban areas. In this way, the teams are able to focus their efforts on the worst affected areas and develop more targeted solutions more quickly
- Extensive trials of new technology are carried out in targeted high leakage areas to determine the potential benefits. For example investment in fixed correlating hydrophone noise loggers over a significant part of our network in AMP7
- We have improved the level and competency of our leakage resources. Equipping them with the latest advanced leakage detection/pinpointing technology to improve productivity. A key metric of the effectiveness of leakage detection teams is the number of investigations that successfully result in a leak being repaired. Our rate for this metric has increased over the course of AMP6 from around 95% to >98%. In our highest performing area our Technicians are achieving a rate of between 98.5 and 99%.
- The costs of maintaining performance at lower levels of leakage is higher (note this does not include the additional costs associated with driving the frontier forwards). The new technology enables us to identify previously undetectable leaks. These leaks by their nature are smaller and couldn't be detected with traditional techniques. Therefore when repaired they result in a lower volume of leakage saved per job. The overall volume of leakage repair work increases but the average volume of leakage saved per job decreases. The graph below illustrates one element of this:

Figure 19 Anglian Water AMP6 Leakage Detection and Repair volumes and Cost per Ml/d



The case study on the following page shows the evolution of pressure management over the past 5-10 years.

Then – Simple Pressure Management	Now – Advanced Pressure Management	Looking forward – Intelligent and Smart Water Systems
Historically we used simple pressure reduction by installation of Pressure Reducing Valves (PRVs). These valves would be installed on, or close to, the inlet of an existing District Metered area (DMA). The process used an existing hydraulic boundary, normally closed zone valves, and allowed the pressure to be reduced across the area. Pressure will fluctuate within the DMA throughout the day. A pressure monitoring point would be installed in the DMA to ensure adequate pressure is maintained.	During AMP6 we developed our Optimised Water Networks strategy. Using expert analysis of hydraulic performance, greater understanding of network losses was achieved. We no longer saw pressure variation in pressure-reduced areas as acceptable; we knew that further optimisation of pressure to control leakage should be achievable. We led collaboration on innovative projects with suppliers and academia to develop and implement interventions that further optimise DMAs with PRVs, and to identify new areas to pressure manage. The key change was controller device technology that provides automation to the PRVs making their output dynamically changeable (not static), so allowing the PRV to vary the pressure delivered to the DMA based on demand. Therefore only the pressure required to maintain service to the highest point is provided through the PRV. Overall the average pressure is reduced and leakage and burst mains reduce proportionally. It also became necessary to create new hydraulic boundaries to achieve pressure management. In addition to the PRV this usually requires further valves, hydrants, new controller devices and the monitoring points. To exploit this technology fully, a meter is also required at the PRV location so that demand can be measured and the pressure set accordingly. Our traditionally "dumb" assets are now smarter and substantial leakage reduction has been achieved.	As success has been delivered utilising smart controllers, continually identifying areas to optimise pressures becomes harder. At this point we evolved our strategy to consider the overall configuration of the network. For pressure management to be successful it requires discrete hydraulic boundaries. The downside to this is that the resilience of the network can be reduced and, as more closed boundaries occur, the risk of a supply interruption when an event happens increases. Similarly, these boundaries require flushing activities to maintain water quality should they be needed. We will now be investing in automating more of our network to ensure resilience and quality is maintained. Our plan to optimise our network will create hydraulically discrete areas whilst ensuring boundaries are automated and self maintaining. Further sensors are required to ensure performance is maintained and provide an early warning of any potential issues. Our network will become proactively monitored and maintained, so reducing leakage even further. Previously optimised areas will be reviewed to ensure the full potential is achieved. New areas will also be identified; they will require the full suite of additional assets but are likely to yield a greater leakage reduction.
Potential Assets Required: 1 PRV 1 bypass pipework 2 valves 1 hydrant 1 boundary box 1 pressure logger	**Potential Assets Required - New DMA installation** 1 PRV 1 bypass pipework 1-5 hydrant(s) 2 boundary boxes 1 flow meter 3-5 valves 1 smart controller 2 pressure logging points	**Potential Assets Required:** 2 PRVs 2 bypass pipework 1 automated valve 2 smart controllers 4-8 pressure loggers 3 flow meters 4-8 valves 2 hydrants 6-10 boundary boxes
		
Indicative modelled costs: £19,098	Indicative modelled costs: £53,863	Indicative modelled costs: £124,690

Benefit Assessment

Our approach is always to target the areas where the greatest benefit can be achieved. Each new area we visit (or previously 'optimised' system we return to) therefore offers a lower benefit return for a more complex intervention.

This requires a pioneering focus on innovation, seeking and/or developing potential new technologies, processes and ways of working within companies and with third parties such as external companies and universities.

We recognise that part of our role is sharing what we have done to get to the frontier and what we are trying to do to move it forward in AMP7. We have an open door policy and have hosted teams from various other companies to share our best practice in AMP6. We are also actively involved with a number of UK Water Industry Research leakage projects. As set out in our Plan we will develop a best practice guide for reducing leakage. We will update this guide regularly and report on the outcomes of innovative leakage trials. We will also hold a leakage symposium for sharing best practice. Those companies who follow us benefit from our innovation; not only can they and their customers avoid the cost and risk of trials that may or may not prove effective and scalable; they also benefit from simple supply and demand economics as proven technologies become more sought after, which enables them to be produced on a much larger scale, which in turn drives down the unit price.

6.0.8 ODI: recommendations

Ofwat set out some basic PR19 guidelines for setting stretching Performance Commitment Levels (PCL) for leakage:

- Exceeding forecast upper quartile performance, and
- At least 15% reduction, and
- The largest percentage reduction achieved since PR14 plus 1%.

Companies were asked to adopt this, or demonstrate why this is not appropriate.

Considering our leading performance on leakage, our customers were clear that they wanted us to continue to push the frontier for leakage and were willing to pay for the costs of this. In doing so, customers were also explicit in their support for us to earn enhanced rewards if we delivered against the stretching targets we consulted them on.

This evidence informed us as we set our PCL. Recognising our existing frontier position, we proposed a PCL that exceeded our forecast of the industry 2019/20 upper quartile performance by 15%. Our methodology in setting our PCL recognised:

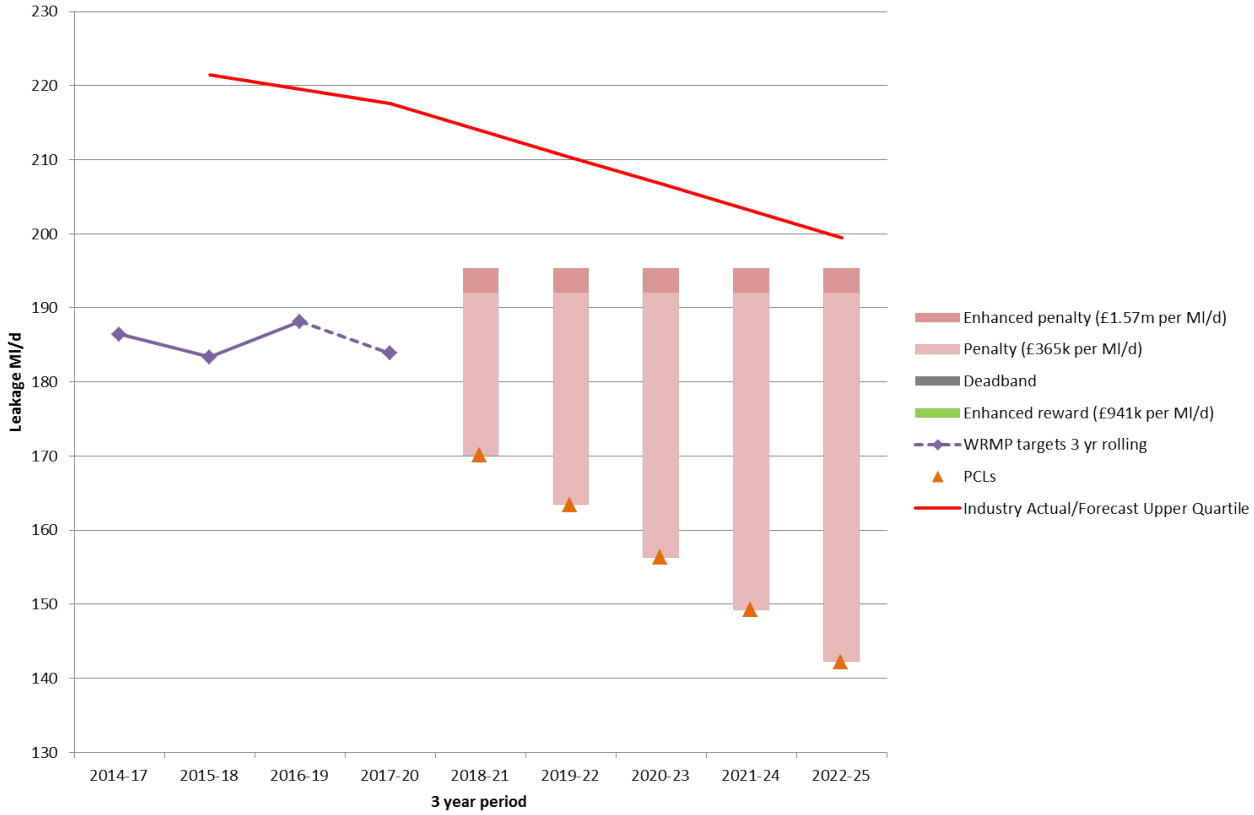
- That our 2025 leakage target, if met, would represent the best ever achieved by some distance in the UK water industry
- The value of this outturn as a benchmark for nationwide leakage performance
- The technological advances which had been developed to achieve this; and
- The need for the company to retain flexibility over the options it employs to meet its WRMP objectives.

6.0.9 Ofwat's IAP view of our leakage ODI

Ofwat's IAP proposes to set our PCL at our WRMP stretch target (142 Ml/d single year value). Combined with a challenge to deadbands, this equates to penalties for any shortfall in delivering frontier shifting leakage performance even if this performance remains sector leading.

The graph below shows the challenge Ofwat proposes for Anglian based on the IAP:

Figure 20 Challenge Ofwat proposes for Anglian



This proposal does not fit with the intentions for incentives set out in Ofwat's Final Methodology, nor does it pass a very basic sense check. It would create a situation where a company at the frontier, seeking to push the frontier further, could be financially penalised even whilst still improving its performance. This approach would also run counter to the views of our customers who supported rewards for continuing to improve leakage performance.

A further important implication of this approach is that, throughout AMP7 we would have a high chance of still being the frontier company but also deemed to be "failing" on leakage as we would be in penalty. The wider legitimacy of the sector would be damaged if the leading company is seen as "failing" on the basis of an ODI calculation, even if absolute performance is still leading.

6.0.10 ODI Principles: proposals

Ofwat's proposals for our leakage ODI would, contrary to our customers' views, materially weaken the incentives to continue to move the frontier on leakage – for us and for the sector as a whole.

Intuitively, we do not consider that the proposed levels are suitable for performance commitments for a number of reasons and we propose some key principles that Ofwat could use as a sense check when setting leakage PCLs for Draft Determination. We believe these accord with the long term goals on leakage reduction, which are shared across Ofwat, Government and its agencies, customers and companies.

We think a reasonable set of principles would be:

- Companies who are performing ahead of the upper quartile and continue to improve should not find themselves in penalty
- Companies who are ahead of upper quartile should be rewarded for improving performance from this position.

- In line with Ofwat's Final Methodology, companies who are delivering a major improvement to leakage that drives the frontier of industry performance should be allowed to earn enhanced rewards.
- Performance and reporting in AMP6 should not unduly affect performance under the AMP7 incentive regime.

When we test Ofwat's IAP approach against these principles we find significant problems. We have tried to devise a way forward, making some changes to our September ODI proposals. We believe the approach we now propose would give confidence that we are sharply focussed on leakage reduction, would provide appropriate incentives for us and for the sector as a whole, and would meet the principles above.

6.0.11 Aligning the principles to a PC and ODI mechanism

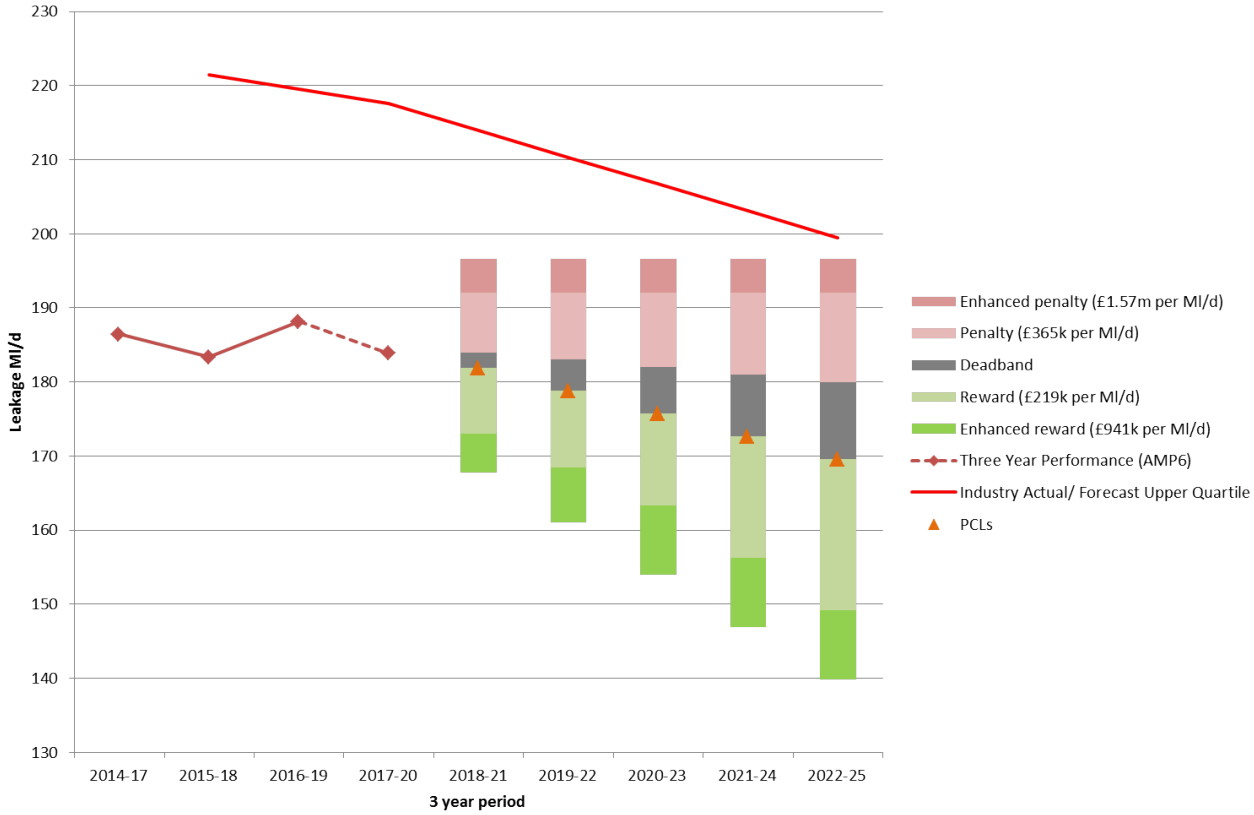
We have adjusted the ODI proposal that we put forward in our Plan to reflect these principles and to take into account more up to date information both on sector 2018-19 performance and industry forecasts of upper quartile to 2024-25. We have also addressed some of the detailed points that Ofwat has made in its IAP feedback.

We have made the following adjustments to our Plan ODI proposal:

- We have re-profiled our deadband to ensure that we are incentivised to improve year-on-year from the forecast end of AMP6 3-year average baseline (184 Ml/d). This provides a clear incentive for the company to improve each year and offers proportionate protection to customers in line with the principles set out above;
- We have re-profiled our PCL to reflect 15% below the industry forecast average UQ performance (average of per km main and per connected property using companies submitted business plans) for each year of AMP7 based on companies' plans. This reflects more up to date information than was available when we submitted our plan in September;
- We have removed the enhanced incentive between our PCL and our WRMP target to reflect Ofwat's concern at the level at which we could earn potential enhanced reward for our leakage performance. This has been replaced with a standard incentive to ensure that there is some reward for improving performance well beyond upper quartile and shifting the industry frontier.
- We have also ensured that the total incentive scope for leakage performance in AMP7 remains consistent with the views expressed by our customers.

The sum effect of these changes is reflected in the figure below:

Figure 21 Anglian modified proposal



Full details of the revision to the ODI and the responses to the IAP actions relating to ODIs are set out in our ODI chapter. We have also updated our ODI data table to reflect these adjustments.

We would like to continue to work with Ofwat through the remainder of this determination process to ensure the development and calibration of these incentives appropriately balance the interests of customers, companies and wider stakeholders.

7. DELIVERING OUTCOMES FOR CUSTOMERS

Ofwat's test area assessment: Delivering outcomes for customers

Overall test area grade	Overall test area summary assessment and rationale
B	Overall, across the delivering outcomes for customers test area, a generally high quality plan, with evidence that is generally sufficient and convincing, but not sufficiently ambitious and innovative to be exceptional. Anglian Water's plan provides evidence of a balanced package of PCs that overall reflects customer views and a high quality approach to its PCs and appropriately stretching levels, particularly that its forecast performance levels are upper quartile for leakage and internal sewer flooding by 2025. The company's plan provides evidence of a high quality package of standard ODIs that follows the PR19 methodology principles. In particular, it uses the Ofwat formula to calculate standard ODI rates as a default approach and appropriate triangulation based on customer valuations. The plan demonstrates clear consideration of how it will protect customers from ODI payments being higher than expected. However, the business plan was not deemed high quality in the following areas: • The company proposed a large number of caps, collars and deadbands, but it has not convincingly explained why its specific proposals are appropriate and in customers' interests.. • The company provides insufficient explanation how its ODI package incentivises it through better aligning the interests of management and shareholders with customers. The balance of incentives is skewed towards areas where the company already does well (for example leakage) rather than areas where service improvement is required. The company's overall ODI package is outside our indicative RoRE range of ±1% to 3% on the upside. • The company provides insufficient details of the plans it has to be able to report all common PCs in line with the guidance, particularly for unplanned outages .

Overview of our IAP Response

Ofwat has recognised our performance commitment (PCs) and outcome delivery incentives (ODIs) as being well evidenced and of high quality. We are one of only two companies to receive a 'B' rating on all assessment questions in this area. This rating acknowledges the robustness of our ODI suite and that these measures reflect customer priorities.

In responding to the actions on Delivering Outcomes for Customers we have:

- Adopted Ofwat's proposals for supporting vulnerable customers and addressing affordability,
- Provided further evidence to support the level of stretch in our performance commitment levels,
- Provided additional detail to support the ODI rates that we included in our Final Business Plan,
- Provided further evidence to support our overall approach to incentivisation and in doing so provided further detail to justify our use of caps, collars and deadbands, and
- Explain our proposals to protect customers from higher than expected outperformance payments and non-delivery of schemes.

We have carried out further customer engagement through our online community to understand:

- Customer views on adopting the two new ODIs on affordability and providing an inclusive service. We tested the acceptability of of these measures with customers and participants were positive about the introduction of the new ODIs,
- Customer views on whether the bathing waters ODI should be reflected in bills annually or at the end of five years – 71% supported this being end of period,
- Customer views on deadbands around the performance commitments for leakage, sewer collapses, external sewer flooding and bathing waters – the majority of customers considered supported their use for all measures,
- Customer views on the WINEP incentive mechanism, where we would be incentivised to challenge unconfirmed (i.e. amber) obligations – a majority think our proposal of 10% of scheme costs is acceptable, and most of those who don't support this think we should at least be able to cover the costs incurred.

Our concerns

We have concerns in a number of areas where Ofwat has suggested interventions:

- On leakage, we are concerned that Ofwat's proposed interventions do not account for our leading position within the industry and the additional effort and investment that is required to move forward frontier performance. The incentive regime that has been put forward could put Anglian in a position of moving forward the industry frontier yet incurring large underperformance penalties at an absolute level of performance where all other companies would receive rewards.
- On our overall package, which has been assessed as one of the best in the industry by Ofwat, we are conerned at the number of challenges that have been made in isolation to specific elements of our ODIs. The package that we have proposed has been supported by our customers in the round and this includes all elements of the ODIs when considered together. Interventions that are made at a micro level risk losing sight of the bigger picture.
- On Compliance Risk Index, we are concerned that Ofwat has proposed an incentive package that is likely to see 75% of the industry penalised during AMP7. If companies are failing Ofwat's deadband for drinking water quality confidence in the best quality water Europe will be undermined and could cause unnecessary public health concerns. The proposed deadband for CRI (1.5) is at a level that only 3 companies forecast being able to meet at the start of AMP7. This does not appear to be consistent with DWI guidance that companies should "aspire to continuous improvement and results of at least at a level that is equal to or below the national average". National average for 2018 is 3.56. Any difference between the assessment of performance between regulators would reduce confidence in the industry and could swing public opinion against the current structure.

- On the level of stretch proposed for PCs where Upper Quartile PCLs are required (Interruptions to Supply, Pollution Incidents and Internal Flooding), we are following the methodology that was supported by our customer engagement work and we therefore maintain the PCLs proposed in our Plan. We are confident that our approach to setting PCLs is rigorous and the most suitable for our customers. We question how Ofwat's common PCLs, which have been set using companies' forecasts of upper quartile performance. Ofwat treats these forecasts as if they are forecasting actual performance and due to this, Ofwat's method does not generate a true forecast of upper quartile performance. In addition to this we cannot see that the approaches companies have taken to setting PCLs proposed by companies have been critically evaluated.
- On standard ranges for incentive rates, we are concerned that these limit customer choice and influence over incentive rates. The use of 0.5 standard deviations either side of an average assumes that the incentive rates provided by companies follow a normal distribution. The low number of data points and the inclusion of outliers in this process suggests that the results of this process are not statistically valid. The approach taken also does not account for different levels of performance (e.g. customers who experience high levels of service would be expected to be willing to pay less for improvements than those experiencing lower service levels).

The Economics and Valuation Sub-Group of our Customer Engagement Forum (CEF) has scrutinised over our Outcomes package and challenged thoroughly our approach to customer valuation.

"With regard to quantification of ODIs, in general the sub-group saw strong evidence that the body of customer engagement and research had been well used, first to define which additional company-specific performance commitments AW would propose in its business plan, and then to calibrate the level to be achieved and the over- and under-performance financial incentives."

Anglian Water Customer Engagement Forum, Economics and Valuation Sub-Group, Response to Anglian Water's Business Plan 2020-25 (August 2018)

Introduction

In this section we respond to Ofwat's feedback relating to Delivering Outcomes for Customers.

Firstly, we respond to the company wide concerns that have been raised, focusing first on the areas that relate to the overall ODI package and then on the areas that relate to specific ODIs.

Secondly, we respond to the PC specific actions. These responses are mostly ordered in numerical order, however for some, where the actions are closely related, such as CRI and the actions for the sub-measures, we have responded to these actions together.

Finally, we present our proposals for new performance commitments for helping customers who are struggling to pay and for inclusive service provision. These are in response to Ofwat actions ANH.AV.A1 and ANH.AV.A2.

7.1 Company wide actions (ANH.OC.A1-A6)

We have structured our response to the associated actions to address the areas that relate to the overall ODI package first before moving on to dealing with actions related to specific ODIs.

Where our response to these covers multiple ODIs, for example setting standard ODI rates, we clearly signpost which ODI related action this responds to. Generally we order our response to maximise the flow of our evidence.

7.1.1 Overall ODI package

Action reference: ANH.OC.A4

Ofwat Concern: The company provides insufficient explanation of how its ODI package incentivises it, through better aligning the interests of management and shareholders with customers, to deliver on its PCs to customers.

In particular there are concerns regarding the balance of incentives, with the leakage PC having a large outperformance payment proposed.

Required Action: The company should provide further explanation of how its ODI package incentivises it, through better aligning the interests of management and shareholders with customers, to deliver on its PCs to customers.

Our response

Our package of performance commitments and outcome delivery incentives (ODIs) strongly aligns with the interests of customers, management and shareholders. It does this through:

- placing the strongest financial incentives in the areas that our customers have told us matter most to them and strengthening reputational incentives and;
- protecting customers from bill volatility and excessive incentives by appropriate use of deadbands, caps and collars.

Our proposals were recognised by Ofwat as appropriate, well-evidenced and stretching.

Our proposed incentives are driven by our customers. Our bottom up incentive rates are based on customer valuation of service improvements. The scale of total incentives (i.e. caps and collars) on each performance commitment are driven by customer views on the appropriate and acceptable level of bill impacts and the relative importance of each. This means that the strongest financial incentives are focused in the areas that our customers have told us matter most to them. Our approach to developing our ODIs and the application of customer views was reviewed and challenged by a specific sub-group of our CEF - the Valuation sub-group.

We have strong reputational incentives in AMP6 and these will increase in strength in AMP7. This is through increased use of industry league tables and reporting on important issues such as services for vulnerable customers. We have developed sector leading proposals to support customers in vulnerable circumstances, and our approach was challenged and informed by the Affordability and Vulnerability sub-panel of our CEF. Our reputation is vital for the legitimacy of our business. Our social capital and natural capital performance commitments provide a significant contribution to our reputational incentives, as it partly reflects our reputation and standing with our customers and our role in shaping the environment.

The scale of incentives proposed is limited by our caps and collars. This is an integral part of our customer protection. This limits the incentives to a level that appears modest compared to the scope for outperformance on measures less important to customers in other companies' AMP7 ODI packages.

The design of our suite of reputational and financial incentives means that shareholders can earn financial returns and demonstrate social responsibility if the company performs well in the areas that matter most to customers. The opposite applies if we fall short.

In our September 2018 submission, we explained that the Remuneration Committee was reviewing the outcomes of the Customer Consultation that was carried out to construct the Business Plan, and considering how to align Executive Remuneration even more closely with the priorities expressed by our customers. Following the review, the Remuneration Committee has made the decision to align all variable reward to the outcomes that customers have indicated are their top priorities, and to fundamentally restructure executive packages to reflect these priorities. To achieve maximum rewards in our bonus scheme, executives therefore need to achieve extremely stretching outcomes that are all 100% linked to delivery to customers as set out in our business plan.

These incentives work alongside our proposed mechanism for sharing financing outperformance and our commitment to reduce gearing. As confirmed in our response to action ANH.CA.A8 the Board and the Remuneration Committee are committed to implementing the recommendations included in the "Back in Balance" paper and Ofwat's Board Leadership Transparency and Governance principles which were published in January 2019.

Leakage incentives

Our customers do not agree with the Ofwat view that there are concerns with the scale of *potential* leakage incentive. They support our continued focus on leakage and the scale of incentives proposed.

Customers understood that our leakage performance is industry leading, and that reducing leakage further costs more. It remains an emblematic issue and for them a priority for investment. For example:

- In our Water Resources Second Stage Research stated preference survey, leakage reduction was the highest ranked option by both household and non-household customers.
- Our industry leading performance is considered something to be proud of (see page 192 of our customer engagement synthesis report).
- In the consultation on our Outline Plan whether we should continue to drive leakage down, or remain at current levels. 78% voted to continue to reduce leakage, even with the knowledge that the incremental costs are increasing. Customers were willing to pay for an enhanced reward at the level we set out in Our Plan in order to see that happen.
- The online community consultation on our outline plan found that this ambition "delights" customers and taps into their expectations in this area.

Our proposed leakage incentives reflect Ofwat's enhanced incentives framework for companies that deliver frontier shifting performance. Our customers qualitatively and quantitatively support this level of incentives. Results from our 'Be the boss' digital engagement tool suggest that 78% of customers support our ambition to deliver frontier shifting reductions in leakage with an associated enhanced outperformance incentive (represented as a £4 annual bill impact). This scale of bill impact reflects our capped incentive figure.

7.1.2 Board Assurance Customer Protection

Action Reference: ANH.OC.A6

Ofwat Concern: The company has not sufficiently explained how the Board assurance process would work to protect customers from higher than expected outperformance payments, whether this is binding or what measures would be implemented.

Additionally, there is concern that the proposed the 2020 - 2025 period cap on payments could lead to a situation where incentives to outperform and deliver improved service for customers diminish towards the end of the 2020-25 period.

Required Action: The company should amend its £292m 2020-25 period RoRE cap so that it is set to apply as an annual cap. The company should pro-rate the cap across the 2020-25 period and ensure that it states the annual cap in both £m and RoRE percentage points. With regards to bill smoothing and the maximum payments that can be rolled-over between years, the company should clarify the board assurance process in cases where bill movements exceed 5% and specify what strategies the company would consider.

Further evidence should be provided to demonstrate that this measure would provide equivalent customer protection as those measures outlined in 'Technical appendix 1: Delivering outcomes for customers'

Our response

We explain our protection mechanisms and approach to caps and collars.

Protection for customers

The measures we proposed in our Plan provide a greater level of customer protection than those measures outlined by Ofwat in 'Technical appendix 1: Delivering outcomes for customers'. Ofwat requires companies to include caps on rewards for only those ODIs where the P90 value is forecast to be at least 10% of the total P90s. Our approach is to apply caps to all our outperformance payments. We have also applied collars to all our underperformance penalties as this protects customers from large bill increases in the year following a penalty being applied.

This approach reflects the preferences of our customers, as shown by this excerpt from our independent customer engagement synthesis report (Our Plan - Annex 12c Anglian Water Customer Research & Engagement Synthesis page 111).

Several pieces of research suggest that customers generally prefer to avoid sudden increases in their bill. For example, participants at two of the future customer workshops emphasised that careful phasing and planning of new initiatives and investments was important, to avoid bill increases that were too large, or too sudden. In the consultation on the draft PR19 plan with members of the online community, some participants also expressed concerns about rapid bill increases, especially on the vulnerable, and those on low-incomes.

Incentive Caps and Collars

We have not proposed an aggregate cap or collar on our incentives. Our proposed caps and collars apply in year, performance commitment by performance commitment. The levels of these caps and collars are driven by customer evidence for each performance commitment. This is shown in the tables below (which is a summary of table App1). This excludes C-MeX and D-MeX.

Table 40 Annual Underperformance Penalty Collars

£m	2020-21	2021-22	2022-23	2023-24	2024-25	AMP7
Compliance Risk Index (CRI)	-4.7	-4.7	-4.7	-4.7	-4.7	-23.4
Water supply interruptions	-2.5	-2.5	-2.5	-2.5	-2.5	-12.5
Leakage	-10.8	-10.8	-10.8	-10.8	-10.8	-54.0
Per capita consumption	0.0	0.0	0.0	-7.0	-7.0	-13.9

Internal sewer flooding	-3.6	-3.6	-3.6	-3.6	-3.6	-18.0
Pollution incidents	-4.8	-4.8	-4.8	-4.8	-4.8	-24.0
Unplanned outages	-3.8	-3.8	-3.8	-3.8	-3.8	-19.1
Sewer collapses	-5.2	-5.2	-5.2	-5.2	-5.2	-26.0
Treatment works compliance	-4.9	-4.9	-4.9	-4.9	-4.9	-24.3
% Population supplied by a single system	-2.8	-2.8	-2.8	-2.8	-2.8	-13.8
Properties at risk of persistent low pressure	-4.2	-4.2	-4.2	-4.2	-4.2	-20.8
External Sewer Flooding	-5.5	-5.5	-5.5	-5.5	-5.5	-27.7
Reactive Mains Bursts	-5.2	-5.2	-5.2	-5.2	-5.2	-26.0
Bathing Waters Attaining Excellent Status	0.0	0.0	0.0	0.0	-18.0	-18.0
Abstraction Incentive Mechanism	-2.8	-2.8	-2.8	-2.8	-2.8	-13.9
Supporting customers in vulnerable circumstances (qualitative)	0.0	0.0	0.0	0.0	0.0	0.0
Supporting customers in vulnerable circumstances (quantitative)	0.0	0.0	0.0	0.0	0.0	0.0
Non-household Retailer Satisfaction	0.0	0.0	-1.7	-1.7	-1.7	-5.0
Water Industry National Environment Programme	0.0	0.0	0.0	0.0	0.0	0.0
Water quality contacts	-1.6	-1.6	-1.6	-1.6	-1.6	-7.8
TOTAL	**-62.2**	**-62.3**	**-63.9**	**-70.9**	**-88.9**	**-348.1**

Table 41 Annual Outperformance Payment Caps

£m	2020-21	2021-22	2022-23	2023-24	2024-25	AMP7
Compliance Risk Index (CRI)	0.0	0.0	0.0	0.0	0.0	0.0
Water supply interruptions	2.5	2.5	2.5	2.5	2.5	12.5
Leakage	4.5	6.7	9.5	14.0	18.6	53.4
Per capita consumption	0.0	0.0	0.0	7.0	7.0	13.9
Internal sewer flooding	3.6	3.6	3.6	3.6	3.6	18.1
Pollution incidents	4.4	4.4	4.4	4.4	4.4	22.1
Unplanned outages	0.0	0.0	0.0	0.0	0.0	0.0
Sewer collapses	0.0	0.0	0.0	0.0	0.0	0.0
Treatment works compliance	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of population supplied by a single supply system	2.8	2.8	2.8	2.8	2.8	13.9
Properties at risk of persistent low pressure	1.0	1.0	1.0	1.0	0.7	4.5

External sewer flooding	5.5	5.5	5.5	5.5	5.5	27.7
Reactive mains burst	0.0	0.0	0.0	0.0	0.0	0.0
Bathing waters attaining excellent status	0.0	0.0	0.0	0.0	16.2	16.2
Abstraction incentive mechanism	2.8	2.8	2.8	2.8	2.8	13.9
Supporting customers in vulnerable circumstances (qualitative)	1.7	1.7	1.3	1.3	1.3	7.3
Supporting customers in vulnerable circumstances (quantitative)	1.5	1.5	1.5	1.5	1.5	7.3
CRI: Water treatment works	0.0	0.0	0.0	0.0	0.0	0.0
CRI: Service reservoirs	0.0	0.0	0.0	0.0	0.0	0.0
CRI: Water supply zones	0.0	0.0	0.0	0.0	0.0	0.0
Non-household retailer satisfaction	0.0	0.0	1.7	1.7	1.7	5.0
Water Industry National Environment Programme	3.1	3.1	3.1	3.1	0.0	12.5
Water quality contacts	1.6	1.6	1.6	1.6	1.6	7.8
TOTAL	**34.9**	**37.1**	**41.2**	**52.7**	**70.1**	**236.1**

In our Plan we said that, where any in-period ODIs and other factors result in a year-on-year bill change over 5% (up or down), we would adopt the same approach to customer protection that we take with our current in-period leakage ODI.

This approach involves Board assurance that the impact on customers has been considered and the details of any mitigation strategies (such as deferral) adopted.

The Board assurance process in these cases will involve following a process similar to that set out in the Charges scheme rules issued in December 2018 (or any successors of these rules). These rules require companies to inform Ofwat as part of its assurance statement of the handling strategies it has developed in instances where bill increases for particular customer types exceed 5%.

Our handling strategies relating to ODIs for managing bill increases greater than 5% might include:

- consultation with our CEF about the appropriate levels of performance payments that are appropriate,
- develop glide paths to maintain bill volatility by partial or full deferral of performance payments into following years (as has been allowed by Ofwat in AMP6),
- deferring performance payments in order ensure bill affordability for customers where aggregate adjustments are significantly above 5% .

7.1.3 ODI deadbands, caps and collars

Action Reference: ANH.OC.A3

Ofwat concern: The company proposes an extensive usage of deadbands, which cover a significant proportion of its financial PCs. We have particular concerns about the PC-specific justifications offered by the company for some of these deadbands, but we additionally have broader concerns about the quantity of deadbands that is proposed. We judge that extensive usage of deadbands could materially weaken the company's overall incentives to achieve its PC targets, and for this reason the PR19 Methodology sets out that deadbands should only be used when they are demonstrably in customers' interests.

The company proposes a widespread application of outperformance caps and underperformance collars across its ODI package. Although the company provides some general evidence of customer support for caps and collars, the company does not provide sufficient evidence to justify these for each individual ODI.

Required action: The company should review our PC-specific concerns about the justification for certain deadbands, and in each case the company should decide whether to remove the deadband or provide further justification for why the deadband is appropriate and in customers' interests.

Additionally, the company should consider on the overall quantity of deadbands it proposes to apply and consider whether to reduce the number of deadbands in its ODI package. The company should provide a convincing and well-evidenced justification for its proposal.

The company should provide further ODI-specific evidence to support its individual use of both caps and collars, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company should reconsider its widespread application of collars to financial PCs and it should consider applying these features more selectively.

The company's evidence for its individual caps and collars should include justification for the levels at which the cap and/or collar are set, and the company should explain why these levels are appropriate and in its customers' interests.

Our response

We provide further justification for our proposed deadbands and caps and collars. Our response to this action should be considered alongside our response to action ANH.OC.A4, which explains our overall PC and OCI package and action ANH.OC.A6, which explains our approach to customer protection.

We address the PC-specific actions on deadbands and caps and collars on a measure by measure basis in our response to those specific actions.

Deadbands protect customers and companies from variances in performance that might result in an outperformance or underperformance payment that may have been influenced by events outside of management control. For example for sewer flooding, several years of reduced rainfall could result in reduced incidences of flooding, it would not be appropriate for companies to earn large rewards for outperformance. Deadbands form part of a package to mitigate against this risk. Even for the most resilient and best performing company there is no immunity to volatile performance introduced by factors outside of management control. Our customers support deadbands in principle and they form an important part of our package to protect customers from bill volatility.

The level of caps and collars and deadbands for each performance commitment is based on customer views for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The strength and depth of our customer engagement and valuation work was regonised by the Valuation sub-group of our CEF and in Ofwat's IAP assessment.

We have reviewed the plans submitted by other companies and are confident that the evidence produced in our plan offers the most comprehensive evidence that customers value the reduction in bill volatility that these mechanisms provide. It was as a result of this research with our customers that Ofwat rated our customer engagement and its application in our plan as sector leading. It is clear that customers are open to a holistic view that reduces bill volatility.

We have split the remainder of the response to this action into sections on deadbands and another on caps and collars.

Deadbands

We do not agree that our use of deadbands is extensive. We have been selective when choosing where to apply deadbands in our Plan. Of our 35 Performance Commitments, we applied deadbands to 11 of them. We have engaged customers on their views as part of the development of our ODI package. This number reduces to 9 as a result of revision our ODI approach to CRI set out in response to actions ANH.OC.A23, ANH.OC.A24, ANH.OC.A25, ANH.OC.A47, ANH.OC.A48 and ANH.OC.A49.

We consider that the level of deadbands that we have included in our proposals is appropriate. We have been selective about their application, which is based on our wider engagement with customers and in context of the whole outcomes package. Each deadband should be assessed in context of the wider incentive (e.g. level of stretch, incentive rate, frontier shifting performance) and whether it is supported by customers.

Ofwat's Final Methodology stated that it discouraged deadbands that remove the incentive for companies to improve performance. Where we have applied deadbands we have ensured that incentives to improve performance remain and also that we retain incentives to avoid deteriorating service. We have calibrated deadbands to ensure that there are strong incentives to improve performance.

Ofwat does not challenge the need for deadbands on five performance commitments. This is where Ofwat considers that the PCLs are very stretching or where there is a new measure:

- CRI (three sub-components)
- Treatment Works Compliance
- Unplanned Outages

For the remaining six (Leakage, Sewer Collapses, External Flooding, Reactive Mains Bursts, Bathing Waters, Retailer Satisfaction) we respond to Ofwat's IAP action and present the range of customer evidence in support of both the overall Outcomes approach and that specific to each ODI. This includes:

- Customer support – this is the most important reason for including these deadbands. As part of the overall PC and ODI package that we developed, our customers supported the use of deadbands for a limited set of ODIs.
- Protection against unnecessary bill volatility - one of the key themes that came out of our customer research was that our customers do not like bill volatility, rather they would prefer a smooth bill profile to allow them to better plan their household budgets. Customers were concerned about budgeting for instances where a large bill reduction followed by a return to a normal level following a large penalty. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance (e.g. External Sewer Flooding and Reactive Mains Bursts), to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

"I'd rather pay more and know what I'm paying, rather than you know, have it move about. Yes, you can save money, but you can also be out of pocket as well."

"You wouldn't want it to be that volatile I don't think, it might be worse to see it go up one it has been really low, and to have to keep checking it as well."

Customer views on bill volatility caused by ODIs from our Outcome Delivery Incentive Research, June 2018.

- Stretching the frontier– our leakage reduction will see us deliver even lower leakage in the interests of our customers and to move the frontier of performance from its current level. Our proposals for AMP7 are more than 20% lower on a per km basis than any other large water and wastewater company. Part of the proposal is a deadband that ensures the leading company for leakage reduction is not penalised for slightly missing its target but still delivering excellent performance, leading the industry. We would not have proposed such a stretching ambition without this deadband.
- To provide a non-financial incentive to make stretching improvements to asset health, while setting penalties for a decline from the current historic levels of performance.

We expand on these points when we address the individual ODI actions relating to deadbands.

Caps and collars

We are confident that our use of caps and collars is supported by customers. It has been extensively reviewed by the CEF and its Valuation sub-group.

The level of caps and collars for each performance commitment are based on a suite of customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs. The caps and collars represent the maximum incentives that customers consider appropriate for each measure. We have set the underperformance collars each year in line with these maximum incentives.

Ofwat notes there is strong evidence that our customers support the principle of using caps and collars. A recurring theme from our engagement with customers is that we can help them with the challenge of affordability through providing regular and consistent bills (see Annex 12c Anglian Water Customer Research & Engagement Synthesis page 100 of our business plan).

This was supported by specific engagement on our ODIs. In quantitative engagement with 995 household customers and 500 non-household customers 74% of customers showed that they support caps and collars on individual performance commitments (see business plan Annex 13f, Acceptability testing: PCs/ODIs, page 27). This theme was supported by further detailed engagement with customers on our proposed ODIs (see business plan Annex 13d, Outcome Delivery Incentive Research, page 34) – our customers selected the maximum ranges of bill impact that could result from our ODI outperformance and under performance payments.

Feedback from our CEF and CCWater informed our use of caps and collars. We were challenged that without caps and collars, the application of societal valuations and ODI rates could lead to bill volatility for customers and unconstrained outperformance payments for companies (as has occurred for some uncapped incentives in AMP6).

We have heard our customers loud and clear. We agree with them and conclude that caps and collars help appropriately balance risk and reward for us and our customers. Our general approach to customer protection from excessive incentives and bill volatility is based on caps and collars on individual performance commitments. The figures quoted in section 13.8 of our business plan are the sum of our total caps and collars (-£348.1m underperformance and £236.1m outperformance excluding C-MeX and D-MeX). The following section and steps show how we arrived at these figures, using multiple sources of customer evidence.

Setting caps and collars for individual measures

The levels of caps and collars for each performance commitment are based on customer views for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives.

For example, this means that for Per Capita Consumption (PCC), customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment).

We describe our approach in further detail below. It is based on the evidence gathered through our Outcome Delivery Incentive Research. This was conducted by ICS Consultants and included quantitative surveys with customers and a number of follow up focus groups. ICS's report was made available as Annex 13d, Outcome Delivery Incentive Research, to our Plan.

Step 1 - customers define the maximum incentives with customers

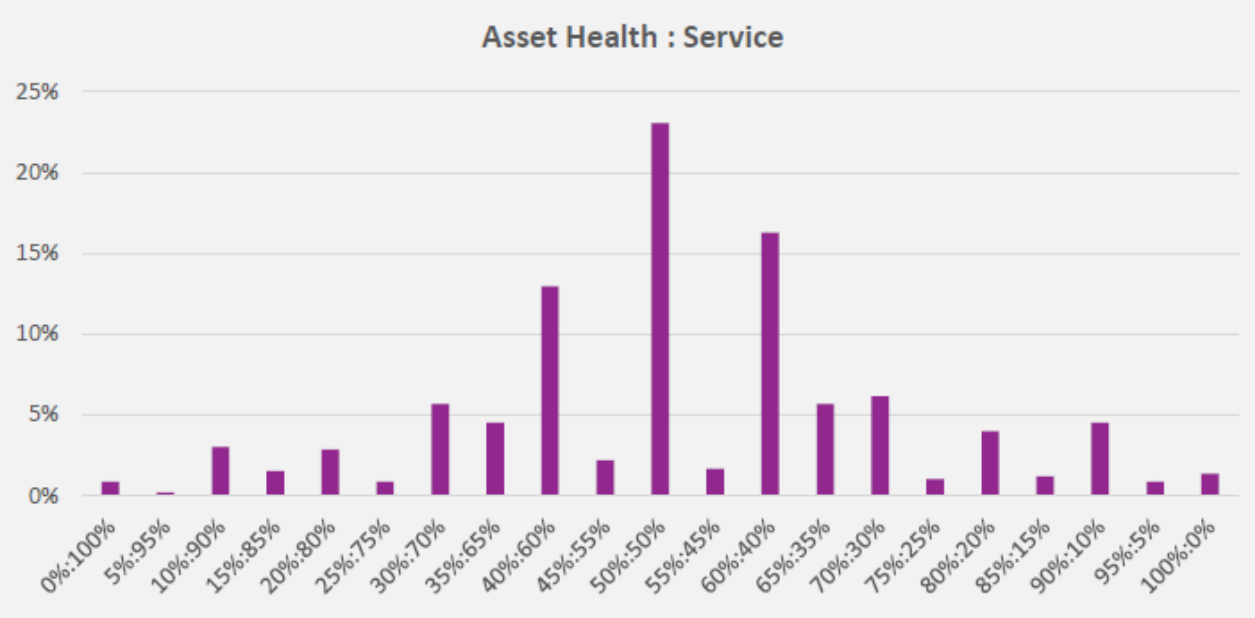
We engaged with customers on the potential scale of incentives, presented as monthly and annual bill impacts.

Based on our engagement, a range of evidence shows customers support for a RoRE range of around 2% for outcome delivery incentives (including the customer experience measures, C-MeX and D-MeX). This range translates to roughly +/- £350 million of incentives over the period 2020-2025 (based on our estimate of RoRE in Spring 2018). This RoRE range (again presented as a bill impact) was also tested with customers through acceptability research on the outline Plan.

Step 2 - customers allocate the scale of incentives between asset health and service

We asked customers how incentives should be allocated between asset health and service. Customers viewed service and asset health as equally important to incentivise and with complete discretion allocated approximately 50% of incentives to services measures and 50% to asset health. Customer's preferences on the allocation are shown in the figure below.

Figure 22 Customers' views on weighting incentives between asset health and service



This means that we have allocated approximately £175 million of incentives to service and £175 million to asset health.

Step 3 – customer views derive incentives for individual performance commitments

For each performance commitment, we asked customers how important they thought it was to be financially incentivised in that area.

For each service measure we have calculated a weighting based on their value to customers. Using this weighting we have allocated the incentives between each of the financial PCs (£175m for asset health and £175m for service).

This establishes the maximum incentives that customers consider appropriate for each measure. We have set the caps and collars each year in line with these maximum incentives - i.e. the cap or collar is set at the point at which the incentive unit rate (based on customer valuations) hit the value of the maximum incentives. For example if customers suggested the maximum incentives for water supply interruptions should be £2.5m each year and the outperformance incentive rate is £1m, then the cap is set two and a half minutes beyond the PCL. We have cross checked the outputs of this to ensure strong incentives across a range of performance.

Step 4 - triangulate the results with other sources of customer evidence

In order to finalise our proposed incentive ranges we triangulated the results with others sources of customer evidence. This resulted in adjustments to four PCs (leakage, supporting vulnerable customers and non-household retailer satisfaction).

1. Leakage - we propose that up to £54m of incentives (outperformance incentive and underperformance penalty) are applicable during AMP7. We explicitly sought customer views on our proposed enhanced incentives and bill impact for leakage. The range is based on scale of enhanced incentives supported by customers through our 'Be the boss' engagement, presented as a potential £4 bill impact.
2. Supporting customers in vulnerable circumstances (qualitative and quantitative) - we proposed a lower incentive range than the output of step 3. We propose that £7.25m of incentives are applicable to each PC (£14.5m total) in AMP7. The incentive range proposed is based on that considered acceptable by vulnerable customers in a series of focus groups, presented as a potential £1 bill impact. We propose any outperformance in this area is ring-fenced and reinvested in services to support customers in vulnerable circumstances. Further details are provided in response to action ANH.OC.A56.
3. Non-household retailer satisfaction - to account for developments in the market and to allow the net promoter score sample size to increase, we are proposing that incentives apply from 2022/23. We are proposing that £5m of incentives (outperformance incentive and underperformance penalty) are applicable during AMP7. This means we are forgoing the incentives allocated in the first two years of AMP7.

Our approach to determining caps and collars is driven by evidence from our customers. This is an area where customers have directly shaped our business plan. Our development of this package was robustly challenged by our CEF, its valuation sub-group and is reflected in our IAP gradings from Ofwat.

7.1.4 ODI rates

Action Reference: ANH.OC.A2

Ofwat concern: In cases of rejection or revisions to enhancement expenditure or a cost adjustment claim, the company should consider the implications, if any, for the associated level of the PC and ODI incentive rates proposed, and provide evidence to justify any changes to its business plan submission.

In cases where a scheme will no longer be undertaken, the company should consider the removal of the associated scheme-specific.

Required action: The company should provide further evidence to detail the estimation of forecast efficient marginal costs within its ODI rate calculations, in line with our Final Methodology. In particular, the company should provide evidence to demonstrate how these marginal cost estimates relate to the cost adjustment claims or enhancement expenditure proposed by the company.

Our response

We have not revised any cost adjustment claims that impact our ODIs. Ofwat's IAP states we sufficiently evidenced our approach to marginal costs. In response to this and other actions, we provide additional information and explain the links to enhancement expenditure for each ODI.

Our incentive rates reflect our customers' underlying preferences and priorities for service improvements and asset health. They are based on our efficient costs. As recognised by Ofwat we undertook an industry leading, innovative and robust programme of willingness to pay research which was subject to external third party assurance. This is important as it forms the basis of our incentive rates.

Cost inputs

In our Business Plan, Section 13.7.1 we explained our approach to determining marginal costs. Our approach to estimating marginal costs has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves and Frontier Economics concluded that "We believe that Anglian's approach performs well against Ofwat's guidance". They noted our approach was based on forecast efficient costs.

We have not adjusted our costs materially in response to Ofwat's IAP. This is explained further in the Securing Cost Efficiency chapter. In response to the EA's revised guidance on storm tank sizing, we have re-costed our investments in this area. This has impacted our incentive rate for pollution incidents which we have updated. Our removal of some expenditure due to the metaldehyde ban does not affect any of the costs used to determine marginal costs for ODIs. Other than for pollution incidents, we have not adjusted our marginal cost inputs or incentive rates.

We provide additional information for our marginal cost estimation for each performance commitment later in this chapter. This demonstrates how we have accounted for efficient enhancement expenditure for each performance commitment and any interactions with cost adjustment claims.

Approach to calculating marginal costs

Our PR19 investments are managed within our investment optimisation and delivery planning tool, C55. This allows us to optimise our Plan to deliver the greatest benefits to customers. We have used our full range of candidate investments to derive our marginal costs. These candidate investments have been robustly scoped and costed as part the development of this Plan. This has been subjected to independent, third party assurance. This means our cost curves draw on the greatest range of efficient sources from our modelling framework, not just investments selected as part of our final plan.

The investment costs used in the curves were the whole life cost over a 40 year planning horizon. The whole life cost includes the AMP7 totex, plus ongoing OPEX for the 40 years and future renewal capital throughout the 40 year horizon. This was discounted at the WACC assumption rate to give a Net Present Value (NPV) of the 40 year whole life cost, and annualised to give the Equivalent Annualised Cost (EAC).

For each relevant performance commitment, we have collated cost data from C55 to determine individual programmes of investments and the associated incremental improvement in performance.

Investments were prioritised on a cost to benefit basis creating curves with the most beneficial investments at the start. For all of the costs used to derive our marginal cost we have used our efficient costs, i.e. accounting for continuing productivity and efficiency assumptions.

Ofwat's approach to standardising rates

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. This approach is set out in Ofwat's Technical Appendix 1. This approach oversimplifies:

- The varying robustness of willingness to pay research across the industry,
- The varying approaches to calculating marginal cost information adopted by companies,
- The relative performance of each company and that customers are asked to value improvement from their own companies' current performance,

- That some companies may have used only household customer valuation, while others (such as ourselves) have used combined household and non-household valuations,
- The variety of approaches to calculating rates themselves, as some will be more closely linked to valuations and the default approach than others.

The level of standard deviation around the mean chosen by Ofwat is not well evidenced. The consequences of Ofwat mandating companies to adopt standardised incentives would be to significantly undermine the contribution of customer views to the PR19 process.

We note that for some of our incentives, our rates are lower than the Ofwat range. For others they are higher. This suggests that our approach has neither over nor under estimated valuations in the round and that our rates reflect the preferences of our customers. Given the quality of our work on societal valuation and calculation of rates it would be inappropriate for us to change our rates.

7.1.5 Asset Health ODI Package

Action Reference: ANH.OC.A5

Ofwat concern: No material company-wide issues.

Required action: The company should provide a clear list of what it considers to be its asset health PCs, and state its P10 underperformance payments and P90 outperformance payments for each of its asset health ODIs in £m and as a percentage of RoRE.

Our response

Our proposed suite of PCs includes 13 asset health measures. These are:

- the four common asset health measures,
- eight performance commitments from the Ofwat long list, and
- an additional bespoke performance commitment on reactive mains bursts.

None of our asset health measures are aggregated in baskets of measures.

We have undertaken extensive engagement with customers on our asset health performance commitments. This including:

- testing the clarity of our descriptions with customers,
- the level of stretch in our performance commitment levels, and
- our research on the scale of ODIs.

Our research included cognitive interviews with customers ahead of launch to ensure understanding of the materials and revisions and clarifications were made ahead of the full launch.

The full report from this research is available as Annex 13d of our Business Plan - Outcome Delivery Incentive Research.

We have summarised the Performance Commitments that we consider to be our asset health PCs along with the P10 underperformance payments and P90 outperformance payments for each of them in £m and as a percentage of RoRE.

Table 42 Asset health performance commitments

Performance Commitment	P10 Payment (£m)	P10 Payment (% RoRE)	P90 Payment (£m)	P90 Payment (% RoRE)
Common Asset Health Performance Commitments				
Total Mains Bursts	0	0	0	0
Unplanned Outages	-19.070	-0.12	0	0
Sewer Collapses	-25.761	-0.16	0	0

Treatment Works Compliance	-24.271	-0.15	0	0
Asset Health Performance Commitments from Ofwat's Long List				
Low Pressure	-20.813	-0.13	0.957	0.01
External Sewer Flooding	-27.733	-0.17	24.563	0.15
CRI	0	0	0	0
CRI: WTWs	-7.801	-0.05	0	0
CRI: Supply Points	0	0	0	0
CRI: Service Reservoirs	-7.801	-0.05	0	0
CRI: Water Supply Zones	-7.801	-0.05	0	0
ERI	0	0	0	0
Water quality contacts	-7.760	-0.05	1.873	0.01
Anglian specific bespoke Asset Health Performance Commitment				
Reactive Mains Bursts	-9.016	-0.05	0	0
TOTAL[1]	**-157.828**	**-0.95**	**27.393**	**0.16**

1 Totals may not sum due to rounding

Allocation of the scale of incentives between asset health and service

Of the £175m allocated to asset health, approximately £17m of this is outside of the P10 ranges of performance. This explains the difference to the table above.

7.1.6 Performance commitment (PC) definition - value for money PCs

Action Reference: ANH.OC.A1

Ofwat Concern: The company is proposing to discontinue its Value for Money PCs from PR14. The company has met the target for these PCs to date. The company justifies dropping them on the basis that PCs on C-Mex, Social Capital and Managing Void properties are included. However, we do not consider that this constitutes a valid reason to drop PR14 PCs on Value for Money.

Required Action: The company should provide further justification for discontinuing its PR14 Value for Money PCs (W-B1: Value for money perception - variation from baseline against WaSCs (water); S-B1: Value for money perception variation from baseline against WaSCs (wastewater); R-B1: Fairness of bills perception - variation from baseline against WaSCs; and R-B2: Affordability perception - variation from baseline against WaSCs). If sufficient justification for dropping the PCs cannot be provided, the company should propose a Value for Money PC by combining its PR14 Value for Money PCs and removing the outperformance element.

Our response

When selecting the package of performance commitments for PR19 we considered Ofwat's guidance on Bespoke ODIs (Appendix 2 of the PR19 Price Review Methodology). When considering removing these ODIs, we assessed the following factors from the PR19 Methodology:

- Are they required to meet one of the five areas that bespoke ODIs should cover (price controls, vulnerability, environment, resilience and abstraction)? - *No, these PCs do not meet the description for any of these five areas.*
- Are we performing badly on these PCs in the current period? - *No, we have hit our targets for every one of these PCs in every year of AMP6.*
- Do these PCs add to the overall strength of the financial incentive package? - *No, by having additional PCs with lower customer valuation and incentive rates, management focus is being drawn away from areas that most matter to customers.*

Our customers approved the whole PR19 package of PCs and to add these ODIs back into the package would undermine our customer consultation work. The introduction of a common ODI on affordability further reduces the need to include PCs based on these CCWater surveys.

There are a number of drawbacks to using the CCWater survey that make the incentive considerably weaker than the incentives that will be provided through the C-MeX Customer Experience Survey. The C-MeX Customer Experience Survey is a more wide ranging survey than the CCW water surveys and has several advantages.

Table 43 C-MeX vs CCW survey

CCW Survey Element	C-MeX Element	C-MeX advantage over CCW Survey
Annual Survey	Quarterly Surveys	An annual CCW survey only provides feedback at a single point in the year. The quarterly C-MeX surveys allow us to respond to changes in performance within the year to improve customer experience. The annual CCW survey is spread out across 5 months of the year, which introduces a high chance of external factors influencing the survey due to the timing.
Low sample size (200 customers for WaSCs and 150 for WoCs)	Higher sample size (800 customers per company)	The higher sample size in the C-MeX surveys increases the significance of the results and will give stakeholders more confidence in the conclusions drawn from them. This will also give us more opportunity to respond to what our customers want.

Weak financial incentives (+/-£2.5m)	Strong financial incentives (+/- £50m)	The incentives against the C-MeX Customer Experience survey are much higher than those in place for the CCWater surveys and will therefore drive the company to deliver great all round service for customers (including in the areas of Affordability, Fairness of Bills and Value for Money).

Customer Support and CEF Engagement

We engaged thoroughly with our Customer Engagement Forum (CEF) and received robust and constructive challenge from them on our suite of PCs and on our PR19 plan. The CEF noted that the process to identify and select performance commitments was grounded on strong evidence of customer preferences and priorities (see page 39 of our independent CEF's report of August 2018). CCWater are strongly represented on our CEF and no concerns regarding the absence of the value for money metrics were raised, nor on the evolution of our suite of PCs.

As part of our PR19 customer research we explicitly sought customers' views on our proposed performance commitments through acceptability research. This was conducted by Accent on our behalf. The results of this research show that customers strongly support the package of measures that we are proposing.

This research was conducted with a representative sample of 995 household customers and 500 non-household customers. This included customers across both the Anglian and Hartlepool areas. Quotas weighted to latest census data were used to ensure appropriate coverage and representative samples across age groups, genders and our customer segments.

There was a high level of support from customers on our proposed performance commitments. Evidence from our qualitative customer research found that 58% of our customers consider that we should be focusing specifically on providing support for the most vulnerable customers, rather than focusing on the value for money provided for customers as a whole.

7.2 Performance commitment specific actions

We respond to these actions in the numerical order of Ofwat's 'delivering outcomes for customers detailed actions' document. Where applicable we refer back to company wide actions rather than repeat text in response to performance commitment specific actions.

7.3 Water supply interruptions

7.3.1 Stretch

Action reference: ANH.OC.A7

Ofwat concern: The PR19 methodology expectation for the water Supply Interruptions PC is upper quartile performance in each year of the 2020-2025 period. Based on the forecast data provided by companies in the September 2018 business plan submission the upper quartile values are 2020/21 = 00:04:17; 2021/22 = 00:03:58; 2022/23 = 00:03:40; 2023/24 =00:03:22; and 2024/25 = 00:03:00.

The company proposed performance that was beyond these values by 2024-25, so there is no concern, but there is a required action so that all companies have consistent service levels.

Required action: We expect all companies' service levels to reflect the values we have calculated for each year of the 2020 to 2025 period.

Our response

We explain and justify why we have not accepted Ofwat's proposed PCL.

We do not consider that the service levels that Ofwat has calculated are appropriate for our customers. There are a number of reasons for this:

- Our customer engagement showed that our customers support the PCLs that we proposed.
- The proposed common service levels assume that companies have proposed PCLs that they can achieve, which is not what the PR19 methodology required. The methodology asked for companies to propose PCLs based on upper quartile performance.
- The ability to minimise supply interruptions is strongly influenced by factors outside of management control.

Customer engagement support

The acceptability testing for our outline business plan showed that 77% of household customers and 93% of non-household customers thought that our proposed PCLs were sufficiently stretching. This was backed up by qualitative engagement with our customers through our online community, where customers also supported the proposed PCLs. Indeed some even questioned whether the target was too ambitious. A more stretching PCL for water supply interruptions could divert focus and resources from issues more important to customers.

"Seems an enormous improvement - hope it is achievable." Customer comment in relation to our Interruptions to Supply PCLs proposed in our business plan.

Incorrect assumptions for common service levels

Ofwat has based the common service levels that it has asked companies to adopt on the PCLs that companies put forward in their plans. Ofwat now refers to this as "forecast data provided by companies", making the incorrect assumption that these are companies forecasts of the performance that they will achieve in AMP7. We know that this assumption is incorrect, because the guidance

that Ofwat provide in the PR19 Methodology (Appendix 2 page 61) states "we expect... that companies should propose their commitment levels to be at least the forecast upper quartile for each year of the price control".

Reflecting logically on the above, Ofwat would expect that, based on what companies propose being accurate forecasts of upper quartile, 75% of companies could be expected to miss the targets set. However, Ofwat has assumed that the PCLs proposed can be used as an accurate means of calculating upper quartile performance. There are several reasons why this is incorrect:

- A number of companies have put forward PCLs that they do not appear to be able to achieve, for example Affinity, Bristol, South East and Wessex all proposed PCLs below 4 minutes and affect Ofwat's upper quartile. None of these companies has achieved a score of less than 12 minutes in AMP6. The PCLs put forward are obviously not forecasts of the companies' future performance, but attempts to set stretching upper quartile PCLs. The performance of these companies is very likely to be worse than the levels submitted in table App1.
- Ofwat has used Yorkshire Water's PCLs, which are based on what it considers as frontier performance, as if they were forecasts of upper quartile performance. Ofwat has made no account for this in its calculations, despite Yorkshire providing forecasts of upper quartile in its Business Plan. This also affects the upper quartile assumption that Ofwat has proposed as the common PCLs.
- Ofwat has not made an assessment of the different methods that companies have used to forecast upper quartile performance, they have assumed that all are equally valid. This lack of scrutiny undermines the faith that customers can have in the process of setting common PCLs.

In addition to the above, historic performance across the industry has not reached an upper quartile of 3 minutes and company forecasts for AMP6 do not suggest that improvements will begin to approach these levels in the next few years.

Factors outside of management control

The biggest challenge to delivering a low score for Water Supply Interruptions lies in responding to complex and large scale incidents – something that impacts all companies. These are commonly caused by factors outside of management control, such as third party damage to a trunk main or loss of bulk supply imports from neighbouring companies.

While these incidents affect all companies at some point, the ability to respond to these events is also influenced by factors outside management control, which include things such as location and accessibility. It is apparent that the best performing companies are those such as city based companies that can easily re-route supplies and weaker performers are those with large areas and rural regions that are harder to access. This is due to not only the accessibility of a company's assets, but also reflects the length and vulnerability of the long water mains required to serve these areas.

This means that companies with large rural areas require much higher levels of investment to deliver the same performance as smaller city based companies as they will need to replicate large parts of their networks to increase resilience or to buy enough tankers to maintain water supplies in all areas. These approaches do not result in efficient solutions.

7.3.2 ODI rate

Action reference: ANH.OC.A8

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain why its proposed rates differ from our assessment of the reasonable range around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers') and demonstrate that this variation is consistent with customers' underlying preferences and priorities for service improvements in per capita consumption.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for per capita consumption and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our water supply interruptions ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 44 Water supply interruptions - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	Valuations were gathered over performance increments and decrements. The measure of service was the number of properties experiencing interruptions to supply of between 6 and 12 hours each year. The ranges of performance were based on our view of reasonable performance. The range was from 26,000 properties affected to 10,000 properties affected.	Valuation completion report, Section 5.1

Basis of willingness to pay values	The unscaled and scaled values for a 6 to 12 hours interruption have been mapped to the other durations using preference weights from the PR09 water services stated preference study. The validity of the preference weights used to map the values has been re-tested in the PR19 relative preference focus groups who generally support weightings between categories. The value of the average supply interruption greater than three hours in minutes per property has been linked to the individual values of unplanned interruption duration bands - from the shorter 0-3 hour duration band through to 3 weeks or more. We have used company data to assess the chance of any interruption being in any of those bands using company data; and have computed the average property minute based on the mid-point of the band. The values used for ODI rates represent only performance increments. This on the basis that the ODI incentivises improved and very stretching performance.	Valuation completion report, Section 5.1
Application of scaling	We have used scaled values for the calculation of our ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 45 Water supply interruptions - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
Unplanned interruptions	Number of properties affected by unplanned interruptions to water supply (6-12 hours each)	26,000	22,000	18,000	14,000	10,000
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves, from our September 2018 business plan. We provide more detail of our general approach in response to action ANH.OC.A2.

Specifically for water supply interruptions

For water suppy interruptions, we have collated cost data from C55 to determine individual programmes of investments and the associated incremental improvement in performance.

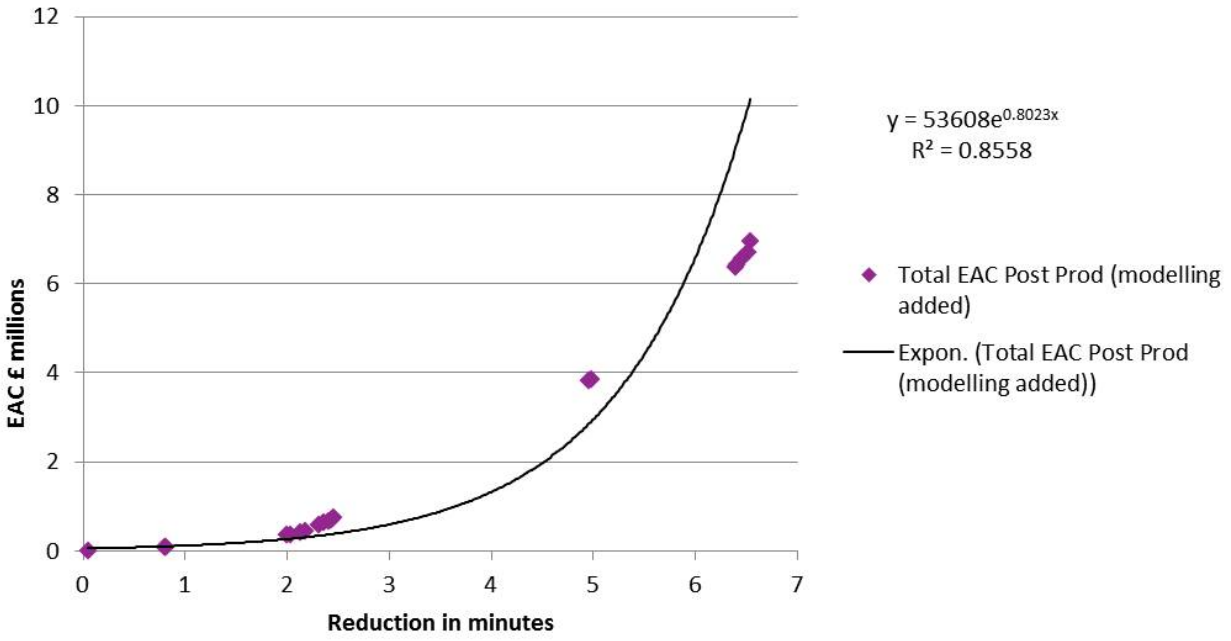
The enabling investment and enhancement expenditure for smart meters were included. This is a common cost shared with the leakage ODI. These common costs have been apportioned based on the societal value that these investments deliver to each performance commitment.

In line with Ofwat guidance, as we are not an upper quartile performer, and as our customer engagement shows this is a diminishing area of concern for customers as performance rises, all investment included in the interruptions to supply curve is included within base operating costs and capital maintenance within our plan, with the exception of 3 investments which share benefit with leakage. These all fall within WS1 Lines A9, B12 and B13.

The three shared investment areas are; intelligent networks including advanced sensors and automation of the network needed to achieve our extremely challenging and frontier shifting WRMP target for leakage reduction. These investments also provide some benefit to interruptions to supply. These investments fall within WS2 lines A10 and B49. These investments had their costs apportioned based on the ratio between the societal benefit value of the investments using their Equivalent Annualised Benefit (EAB).

This resulted in the below total cost curve. We used this cost curve and our expected 2019/20 performance to test performance commitment levels using CBA and set our incentive rate.

Figure 23 Water supply interruptions cost curve



Water supply interruption incentive rates

We are confident that our incentive rates reflect our customers preferences and priorities. They are based on robust valuations and efficient costs. We note our incentive rates for water supply interruptions are larger than Ofwat's identified range. We are comfortable with this as our incentive rates reflect our customers preferences and priorities and are specific to our proposed PCL and caps and collars.

7.3.3 Caps and Collars

Action reference: ANH.OC.A9

Ofwat concern: The company proposes to apply an outperformance cap and underperformance collar to this PC, and it provides evidence that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC.

Required action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and Collars For Water Supply Interruptions

For Water Supply Interruptions, customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars as well as the PCLs that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment).

Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3. The result of this valuation exercise was a maximum annual adjustment of £2.5m, which applies for both the outperformance and underperformance payments. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 46 Water supply interruptions - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	05:49	05:17	04:48	04:21	03:56
Underperformance Collar	08:24	07:52	07:23	06:56	06:31

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at approximately one minute above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

We consider that this PC is weighted in favour of customers - as evidenced by the P10 and P90 payments that we have submitted. We believe that it is unlikely that we will be able to achieve the caps on the out performance side early in AMP7, but have put them in place in order to ensure that customers are protected from bill swings that they are not willing to support.

The same is true of the underperformance collar and particularly for a weather sensitive measure such as interruptions to supply. Where a year of exceptional weather could cause a large penalty to be incurred in one year, performance in the range of the PCL the following year could generate a further bill swing that customers told us that they want to avoid.

7.4 Leakage

7.4.1 Stretch

Action reference: ANH.OC.A10

Ofwat concern: The company proposes that its PC should represent upper quartile performance, but expects to significantly outperform it and deliver the leakage reduction set out in its water resource management plan (WRMP). This follows its approach at PR14. It is important that water companies PC service levels align with the WRMP. We consider its service levels for leakage should reflect the required reduction. We have taken this into account in setting our cost threshold.

Required action: The company should restate its PC to reflect table Wn2 line 25 "total leakage" derived from the WRMP, this shows a 17% reduction between 2019-20 and 2024-25 on an annual average basis.

Our response

Ofwat set out some basic guidelines for setting stretching Performance Commitment Levels (PCLs) for leakage:

- Exceeding forecast upper quartile performance, and
- At least 15% reduction, and
- The largest percentage reduction achieved since PR14 plus 1%.

Companies were asked to adopt this, or demonstrate why this is not appropriate.

Considering our leading performance on leakage, our customers were clear that they wanted us to continue to push the frontier for leakage and were willing to pay for the costs of this. In doing so, customers were also explicit in their support for us to earn enhanced rewards if we delivered against the stretching targets we consulted them on.

This evidence informed us as we set our PCL. Recognising our existing frontier position, we proposed a PCL that exceeded our forecast of the industry 2019/20 upper quartile performance by 15%. Our methodology in setting our PCL recognised:

- That our 2025 leakage target, if met, would represent the best ever achieved by some distance in the UK water industry
- The value of this outturn as a benchmark for nationwide leakage performance
- The technological advances which had been developed to achieve this; and
- The need for the company to retain flexibility over the options it employs to meet its WRMP objectives.

Ofwat's IAP view of our leakage ODI

Ofwat has proposed that we should set our PR19 PCLs based on the single year leakage performance reported in table Wn2 line 25 "total leakage" derived from the WRMP. This reflects our ambitious proposals for meeting our Supply Demand balance in AMP7, which would see us reduce leakage further than any company in the UK. However, we do not consider that these levels are suitable for performance commitments for the following reasons:

- Driving Innovation was set out as one of the key pillars of the Ofwat approach to the PR19 process. Frontier companies, who bear the initial cost of innovation, would then share the learning from these innovative approaches/technologies with the rest of the industry and in so doing improve the service to customers. In relation to leakage Ofwat said 'Companies should consider how to innovate to reduce leakage. For example, they could include an enhanced outperformance payment in their ODI to incentivise a major improvement in leakage performance'. Under the scenario that Ofwat has proposed we would be unlikely to get any enhanced reward unless we exceed the P90 range of performance.

- The WRMP profile, presented in table Wn2, is based on single year targets and the PC measure reflects three year average performance. This means that we could hit these very ambitious WRMP targets and miss the PCLs that Ofwat proposes.
- The proposal that Ofwat has put forward is not consistent with expectations of other companies and for other PCs. We note that in the Outcomes Required Actions for United Utilities they have been allowed a PCL that is significantly behind upper quartile.
- We also note that for the other PCs where common targets are being set, companies who exceed upper quartile performance are being advised to set this as their PCL even if they are already exceeding this performance.
- Other companies that exceed upper quartile performance have not had the stretch of their PCLs questioned by Ofwat (e.g. Welsh and South East).
- This removes flexibility from our WRMP. Flexibility in delivering the outcomes required by the WRMP targets will result in the best and most efficient result for customers. We could achieve the WRMP differently in a number of ways, for example, installing more smart meters, bringing forward work on the internal interconnection schemes or by developing other water sources.

ODI Principles: proposals

Ofwat's proposals for our leakage ODI would, contrary to our customers' views, materially weaken the incentive framework to continuing to move the frontier on leakage – for us and for the sector as a whole.

Intuitively, we do not consider that the proposed levels are suitable for performance commitments for a number of reasons and we propose some key principles that Ofwat could use as a sense check when setting leakage PCLs for Draft Determination. We believe these accord with the long term goals on leakage reduction, which we believe are shared across Ofwat, Government and its agencies, customers and companies.

We think a reasonable set of principles would be:

- Companies who are performing ahead of the upper quartile and continue to improve should not find themselves in penalty
- Companies who are ahead of upper quartile should be rewarded for improving performance from this position.
- In line with Ofwat's Final Methodology, companies who are delivering a major improvement to leakage that drives the frontier of industry performance should be allowed to earn enhanced rewards.
- Performance and reporting in AMP6 should not unduly affect performance under the AMP7 incentive regime.

When we test Ofwat's IAP approach against these principles we find significant problems. We have tried to devise a way forward, making some changes to our September ODI proposals. We believe the approach we now propose would give confidence that we are sharply focussed on leakage reduction, would provide appropriate incentives for us and for the sector as a whole, and would meet the principles above.

Aligning the principles to a PC and ODI mechanism

We have adjusted the ODI proposal that we put forward in our Plan to reflect these principles and to take into account more up to date information both on sector 2018-19 performance and industry forecasts of upper quartile to 2024-25. We have also addressed some of the detailed points that Ofwat has made in its IAP feedback.

We have made the following adjustments to our Plan ODI proposal:

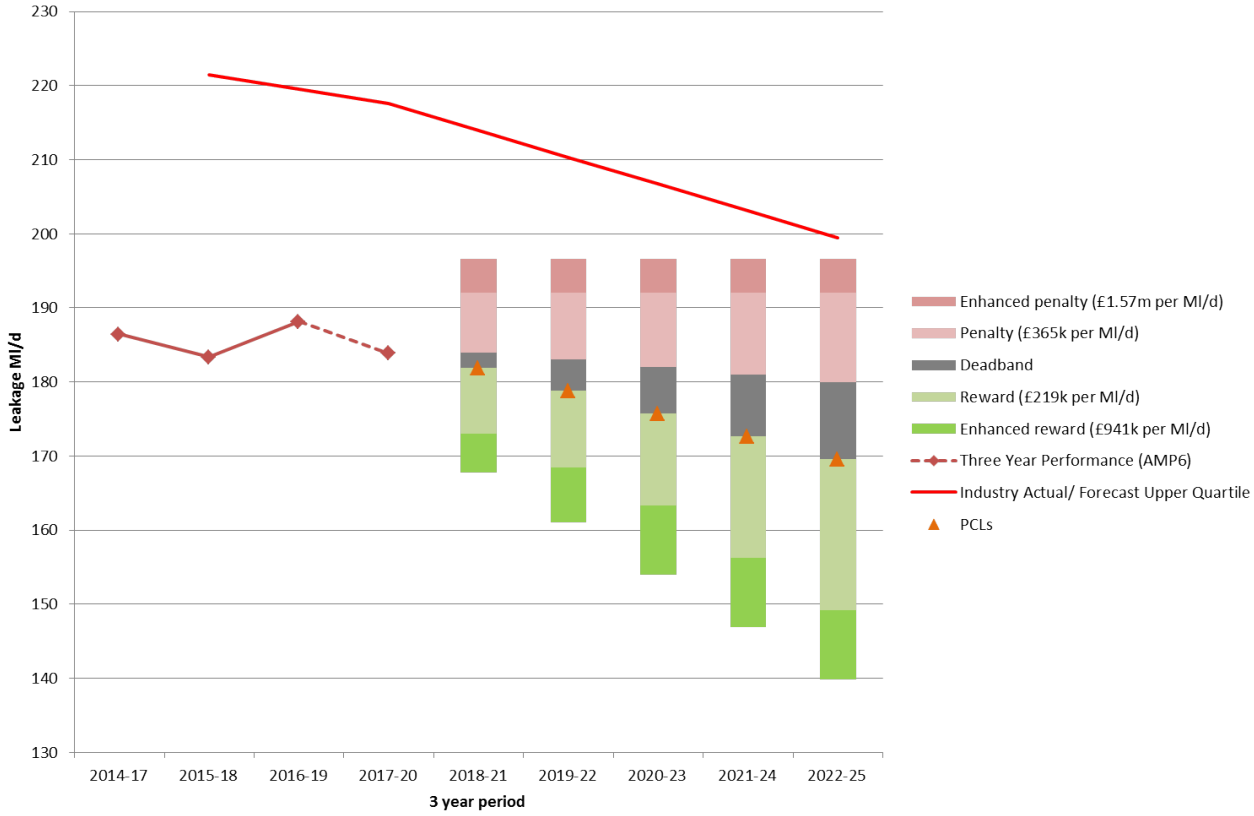
- We have re-profiled our deadband to ensure that we are incentivised to improve year-on-year from the forecast end of AMP6 3-year average baseline (184 Ml/d). This provides a clear incentive for the company to improve each year and offers proportionate protection to customers in line with the principles set out above;
- We have re-profiled our PCL to reflect 15% below the industry forecast average UQ performance (average of per km main and per connected property using companies submitted business plans)

for each year of AMP7 based on companies' plans. This reflects more up to date information than was available when we submitted our plan in September;

- We have removed the enhanced incentive between our PCL and our WRMP target to reflect Ofwat's concern about the level at which we could earn potential enhanced reward for our leakage performance. This has been replaced with a standard incentive to ensure that there is some reward for improving performance well beyond upper quartile and shifting the industry frontier.
- We have also ensured that the total incentive scope for leakage performance in AMP7 remains consistent with the views expressed by our customers.

The sum effect of these changes is reflected in the figure below:

Figure 24 Anglian modified proposal



The Performance Commitment Levels for our modified leakage performance commitment level are presented in the following table:

Table 47 Anglian modified Performance Commitment Levels

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Ml/d	184	181.8	178.8	175.7	172.6	169.6

We have also updated our App1 data table to reflect these adjustments. Further details on our approach to leakage for PR19 are included in the Focus area: Leakage chapter of our IAP response.

We would like to continue to work with Ofwat through the remainder of this determination process to ensure the development and calibration of these incentives appropriately balance the interests of customers, companies and wider stakeholders.

7.4.2 ODI rate

Action reference: ANH.OC.A11

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain why its proposed rate differs from our assessment of the reasonable range around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers') and demonstrate that this variation is consistent with customers' underlying preferences and priorities for service improvements in Leakage.

The company should provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for leakage and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our leakage ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 48 Leakage - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	The valuation is based on the anchor value for leakage. This is a combined value for both household and non-household customers. The ranges of performance were based on our view of reasonable performance. The performance increments/decrements tested with customers were reductions in the % of water lost through leaks compared to a baseline (15%). The increments were improvement to 8% of water lost through leaks and a second increment of 6% of water lost through leaks.	Valuation completion report, Section 8
Basis of willingness to pay values	The basis of the values used is the valuation from the second stage water resources study, for the first 44 Ml/d reduction. The values used for ODI rates represent only performance increments. This is on the basis that the performance commitment incentivises stretching improvements.	Valuation completion report, Section 8

Application of scaling	We have used scaled values for the calculation of our leakage ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 49 Leakage - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
Leakage	Percentage of water supplied lost due to leakage each year	22%	19%	15%	8%	6%
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b of our Plan, Review of cost curves. We provide more detail of our general approach in response to action ANH.OC.A2.

Specifically for leakage

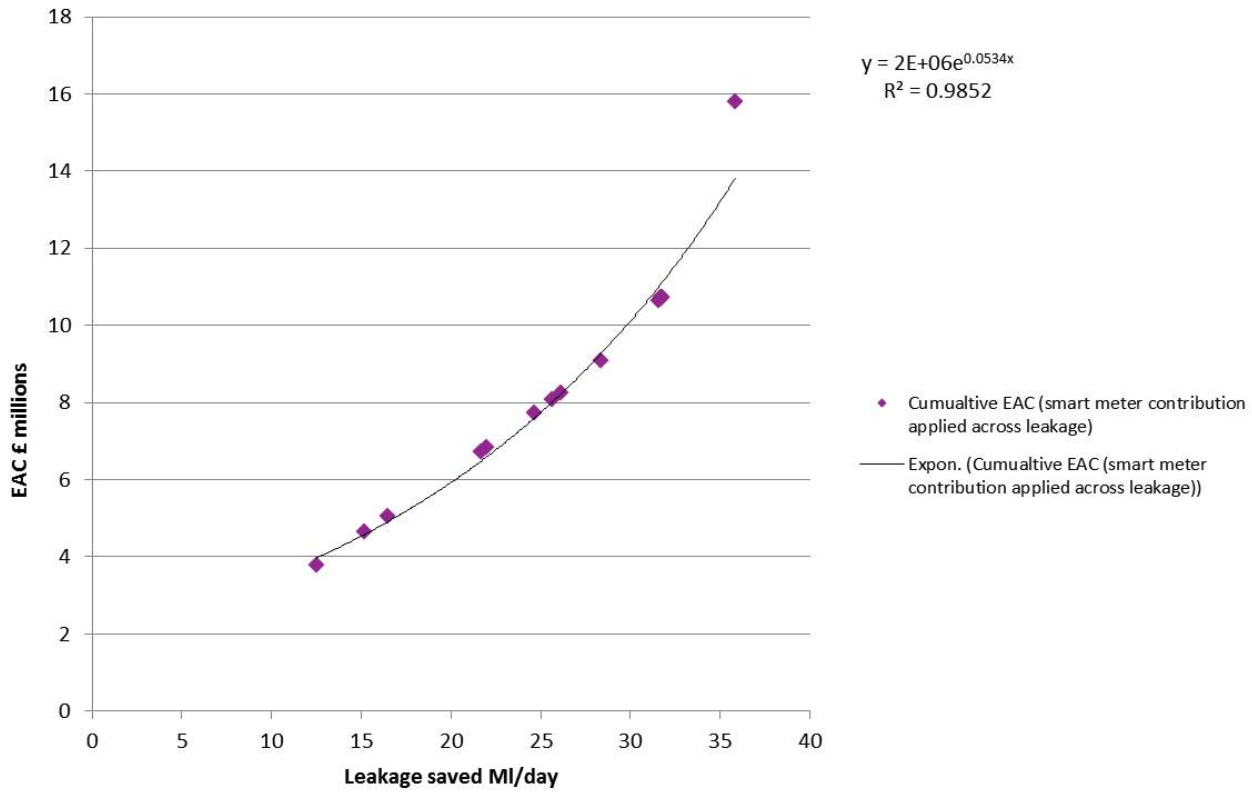
For leakage, we have collated cost data from our investment optimisation tool (C55) to determine individual programs of investments and the associated incremental improvement in performance. All leakage investment used for the ODI calculation is within the enhancement expenditure. These investments fall within WS2 lines A10 and B49. This does not include expenditure associated with the cost adjustment claim for leakage. Our cost adjustment claim relates to maintaining performance whereas the ODI incentivises improvement in performance.

The enabling investment and enhancement expenditure for smart meters were included. This is a common cost shared with the leakage ODI. These common costs have been apportioned based on the societal value that these investments deliver to each performance commitment.

There were three areas of common cost with the water supply interruptions performance commitment. These are for investment in intelligent networks including advanced sensors and automation of the network needed to achieve our extremely challenging and frontier shifting WRMP target for leakage reduction. These investments also provide some benefit to water supply interruptions. These investments fall within WS2 lines A10 and B49. These investments had their EAC values apportioned based on the ratio between the societal value of the investments .

This resulted in the below total cost curve.

Figure 25 Leakage cost curve



Leakage incentive rates

We are confident that our incentive rates reflect our customers' preferences and priorities. They are based on robust valuations and efficient costs. We note our incentive rates are within Ofwat's identified range.

7.4.3 Enhanced ODI rate

Action reference: ANH.OC.A12

Ofwat concern: The company has set its enhanced rates as a multiple of 4.29 over its standard incentive rates, for both outperformance and underperformance. This may exceed customer willingness to pay for leakage reduction.

Required action: The company should provide further evidence to justify the enhanced rates proposed, which are a multiple of 4.29 over its standard rates, or consider downwardly adjusting the enhanced incentive rates proposed.

Our response

We provide further explanation of evidence submitted as part of our September 2018 business plan.

As part of our business plan, we submitted robust evidence and strong customer support for our enhanced leakage incentives. This has not changed and we are concerned with the potential policy shift at Ofwat in this area since the PR19 Final Methodology.

Customers support us continuing to push the frontier for leakage and our proposed rates do not exceed customer willingness to pay for leakage reduction.

We have calculated the incentive rate in line with Ofwat's guidance and in line with advice received from Frontier Economics. Our approach to incentives for leakage is grounded in strong customer evidence.

To determine the enhanced incentive rate we have considered a number of sources of information and received specific advice and support from Frontier Economics (see Annex 13a of our Plan). Enhanced incentives seek to capture the benefits to the wider customer base from frontier shifting performance. This could be through raising PCLs at future price controls and the dissemination of new techniques allowing other companies to improve performance.

The level of the payment per unit of outperformance should reflect both the customer valuation of that metric and the value of the wider benefits. We consider that the main value of outperformance relates to the positive externality. That is, customers of other water companies benefit in the future if those water companies improved their performance as a result of our shifting the frontier. By shifting the frontier, future industry targets may be more stretching but also knowledge of how to improve performance is generated and shared.

We are proposing an enhanced incentive based on a top-down approach under which a multiplier is applied to the standard rate. This multiplier needs to reflect two factors. First, the size of the water company relative to the industry size. The smaller the company relative to the industry, the greater the ratio between the customers in other companies who benefit from improvements in sector performance and our own customer base that sets the standard incentive rate.

The second factor is our customers' valuation of the measure relative to the valuation of customers of other companies. The more customers of other companies value this metric compared to our own customers, the more they will benefit from improvements in sector performance.

We have calculated a multiplier of 4.29 to apply to our standard incentive rate. This is based on the relationship between the largest company's customer base and the wider customer base. We considered using the relationship between our own customer base and the national customer base - this would result in a multiplier of over 11. We believe the scaling factor should be consistent across companies and there is limited justification for applying larger scaling factors to smaller companies. As such we have opted for a conservative approach, and are proposing the multiplier that would apply to the largest company.

The majority of our customers supported the bill impact associated with our proposed enhanced incentives for shifting the industry frontier for leakage. Over 5,000 customers responded to our 'Be the boss' engagement and 78% of those supported the proposal with a £4 per year bill impact. This bill impact is based on our proposed incentive rate and maximum outperformance up to the incentive cap.

Our proposed incentive rate does not exceed the willingness of customers to pay for improvements. Our proposed enhanced rate is £941,035 Ml/d. This is based on the scaled value for our second stage water resources study. The enhanced rate itself remains lower than the triangulated but unscaled upper bound of our customer's willingness to pay for improvements in leakage. As shown in table 8.6 of A*ppendix 12h Valuation Completion Report* to our business plan.

Table 50 Leakage - proposed incentive rate

Area of performance	Unit	Lower	Central	Upper
Leakage	£ per Ml/d	320,120	717,232	1,114,339

On the basis that our customers supported the bill impact associated with enhanced leakage incentives and it is within the range of our triangulated valuations we conclude that our rates do not exceed our customer's willingness to pay and are appropriate for the level of ambition we are proposing.

7.4.4 Caps, collars and deadbands

Action reference: ANH.OC.A13

Ofwat concern: The company does not provide sufficient evidence to justify the application of an underperformance deadband to this PC.

The company proposes to apply an outperformance cap and underperformance collar to this PC, and it provides evidence that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC.

Required action: The company should either remove the proposed underperformance deadband from this PC or provide convincing evidence to explain why this deadband is appropriate and in customers' interests.

The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

In accordance with the amendments to the stretch levels for this PC, the company may revise its enhanced outperformance payment cap such that the more stretching targets do not remove the possibility of earning enhanced outperformance payments. The company should provide its evidence and rationale for any amendments proposed.

Our response

Our response to this action should be considered alongside our response to action ANH.OC.03, which explains our overall approach to caps collars and deadbands, action ANH.OC.A04, which explains our overall PC and ODI package and in conjunction with action ANH.OC.06, which explains our approach to customer protection.

In general, our overall approach to setting ODI deadbands, caps and collars is to promote the framework that was supported following detailed consultation with our customers. This should not be looked at in isolation from the other components of the outcomes package (i.e. stretching PCLs, rewards and penalties). This approach has been recognised as industry leading by Ofwat and is also supported by our Customer Engagement Forum.

The level of caps and collars and deadbands for each performance commitment is based on customer views for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives.

We have reviewed the plans submitted by other companies and are confident that the evidence produced in our plan offers the most comprehensive evidence that customers value the reduction in bill volatility that these mechanisms provide. It was as a result of this research with customers that Ofwat rated us so highly on customer engagement. It is clear that customers do not view these mechanisms in the same way that has been assumed and that they are more open to a holistic view that reduces bill volatility.

We have split the remainder of the response to this action into a section on deadbands and another section on caps and collars.

Deadbands

We have been selective when choosing where to apply deadbands in our PR19 business plan. In the case of leakage, we are protecting against the peverse incentive that would arise from penalising the leading company in the industry, while that company is improving its performance. Customer trust would be undetermined if some companies are rewarded for performance significantly worse than the leading company, who was being penalised.

Ofwat said in its Final Methodology that it would discourage deadbands that remove the incentive for companies to improve performance. As described in our response to action ANH.OC.A10 above, we have proposed deadbands that ensure that there is an incentive to improve performance and also an incentive not just to maintain current performance.

For Leakage we have the following evidence to support the inclusion of deadbands.

- Customer support – this is the most important reason for including these deadbands. As part of the overall PC and ODI package that we developed, our customers approved of deadbands being used for a limited set of ODIs. We were robustly challenged by our Customer Engagement Forum for our approach to ODIs, including on the use of specific deadbands which were considered by the Valuation Sub-Panel.
- Stretching the frontier– our leakage reduction will see us continue to deliver reducing leakage levels in the interests of our customers and to move the frontier of performance from its current level. Our proposals for AMP7 are more than 20% lower on a per km basis than all but one of the other water companies. Part of the proposal is a deadband that ensures the leading company for leakage reduction is not penalised were it to slightly miss its target but still delivering excellent performance, leading the industry. We have proposed such a stretching ambition in conjunction with this deadband as a package to deliver improvement for our customers.
- Protection against unnecessary bill volatility - one of the key themes that came out of our customer research was that our customers do not like bill volatility, rather they would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance (e.g. External Sewer Flooding and Reactive Mains Bursts), to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers could see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

"I'd rather pay more and know what I'm paying, rather than you know, have it move about. Yes, you can save money, but you can also be out of pocket as well."

"You wouldn't want it to be that volatile I don't think, it might be worse to see it go up when it has been really low, and to have to keep checking it as well."

Customer views on bill volatility caused by ODIs from our Outcome Delivery Incentive Research, June 2018.

Further customer research into deadband acceptability

As part of our ongoing customer research, we asked a sample of our customers their opinion about our use of deadbands for this ODI. Of those who took part 65% indicated support for the use of the deadbands (with 16% neutral or don't know). We consider that this support justifies our inclusion of a deadband for our leakage PC.

"If AW are the best in the industry, then I agree you should not be penalised and the buffer zone appears to be a good compromise." Customer taking part in 2019 online community research.

Caps and collars

The level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure. We have set the underperformance collars each year in line with these maximum incentives.

Caps and Collars for Leakage

Our caps and collars for the leakage ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £54m, which applies for both the outperformance and underperformance payments. We are proposing a higher incentive range that reflects enhanced incentives for frontier shifting performance. We proposed that up to £54m of incentives (outperformance incentive and underperformance penalty) should be applicable during AMP7. The range is based on scale of enhanced incentives supported by customers through our 'Be the boss' engagement, presented as a £4 bill impact. In the event of strong outperformance across all performance commitments, we would still be within the overall RoRE range selected by customers.

Based on the new ODI mechanism proposed above the range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 51 Leakage - cap and collar profiles

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	173.0	168.5	163.3	156.3	149.2
Enhanced outperformance Cap	167.8	161.1	154.0	146.9	139.9
Underperformance Collar	192	192	192	192	192
Enhanced Underperformance Collar	196.6	196.6	196.6	196.6	196.6

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to ensure improving service at the level of leakage set by Ofwat as a PCL on AMP6 .

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and protect them from bill volatility. The wider approach to customer protection is built on individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

These caps and collars fall within Ofwat's guidance on applying caps and collars for PCs where the maximum impact is financially significant. This aligns with feedback we have received from customers that suggests that we should reduce bill volatility.

7.5 Per capita consumption

7.5.1 Definition

Action reference: ANH.OC.A14

Ofwat concern: We identified in the APR18 submission evidence, that there are sub-components of this measure assessed as 'Amber' and 'Red'. We have not found any plans or a timetable by the company to achieve compliance with this measure.

Required action: For sub-components rated 'Amber' or 'Red' in table 3S of the 2018 APR submission, the company should provide details on the actions needed to comply with the standard definitions of common performance metrics and its timetable for completing them.

Our response

In our APR submission for 2018-19 for the new PCC definition, we recorded five out of 24 sub-components as being 'Amber'. No components were classified as being 'Red'. We have been working hard to ensure compliance with the new definitions since before they were finalised. The table below shows our planned actions and timetable for ensuring full compliance with this definition.

Table 52 Per capita consumption - planned actions

Item	Detail	2018 RAG	Commentary
3d	Company own estimate of MUR (meter under-registration) for revenue meters which is updated annually	Amber	Our estimation of MUR is based on an old model which has not been updated for a number of years. We plan to update the model by the end of AMP6.
4g	Meters are selected to provide sufficient granularity to detect low continuous flows indicative of plumbing losses or leakage short duration flow variations. The value of meter under registration is less than the company's average meter stock	Amber	Our IHM property meters are the same as our standard billing meters. They are included in our domestic meter replacement programme based on age. We therefore apply the same MUR as for domestic meters. During the next AMP 50% of our properties will have smart meters installed. This will substantially change the water balance and per household calculation methodology allowing us to move to daily water balances in many areas. This should improve accuracy. We therefore currently have no plans to replace these meters with higher spec versions.
4h	Estimate of plumbing losses is based on own data	Amber	We are participating in the current UKWIR research project relating to understanding plumbing losses and plan to use the outputs, in addition to our data from our smart meter trials to update our plumbing loss figures by the end of AMP6.
4i	Where unmeasured non-household reported volume is less than 2% of total non-household demand, data from a per property consumption study is refreshed every five years	Amber	Unmeasured non-household consumption is not part of the household consumption calculation. We do not believe it is relevant for reporting PCC. We have scored it Amber as our estimation of unmeasured household demand is based on a study older than 5 years. Volume of water used

			by these customers is reported as less than 1 Ml/d so is insignificant in the water balance calculation.
4k	Company own estimate of MUR (meter under-registration) for monitor meters which is updated annually	Amber	Our estimation of MUR is based on an old model which has not been updated for a number of years. We plan to update the model by the end of the AMP6.

7.5.2 ODI rate

Action reference: ANH.OC.A15

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain why its proposed rates differ from our assessment of the reasonable range around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers') and demonstrate that this variation is consistent with customers' underlying preferences and priorities for service improvements in per capita consumption.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for per capita consumption and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our PCC ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 53 Per capita consumption - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	The valuation is based on the anchor value for leakage. This is a combined value for both household and non-household customers. The leakage value is mapped to other options using weights from the PR19 water resources stated preference study. This includes PCC.	Valuation completion report, Section 8.2 VCR, Annex 1, page 16

	The ranges of performance were based on our view of reasonable performance. The performance increments/decrements tested with customers were reductions in the % of water lost through leaks compared to a baseline (15%). The increments were improvement to 8% of water lost through leaks and a second increment of 6% of water lost through leaks.	
Basis of willingness to pay values	The unscaled and scaled values for leakage have been mapped to the wider service measures for water resource options. The leakage value is mapped to other options using weights from the PR19 water resources stated preference study. This includes PCC. The value assigned to reducing demand (and ultimately PCC) is based on customer weightings towards incentives & education to save water and retrofitting water saving devices. The weighting of the anchor value to reducing demand was 0.8 (this varied for non-household customers). The application of this weighting gives a value in £/Ml of water saved for reducing demand. The value was divided by 1,000,000 to give a value per litre. This was then multiplied by the population in our water supply region to give a value in £ per person per litre. This value was used in our calculation of ODI rates. The values used for ODI rates represent only performance increments.	Valuation completion report, Section 8.2
Application of scaling	We have used scaled values for the calculation of our PCC ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 54 Per capita consumption - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
Leakage	Percentage of water supplied lost due to leakage each year	22%	19%	15%	8%	6%
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves, of our September 2018 business plan. We provide more detail of our general approach in response to action ANH.OC.A2.

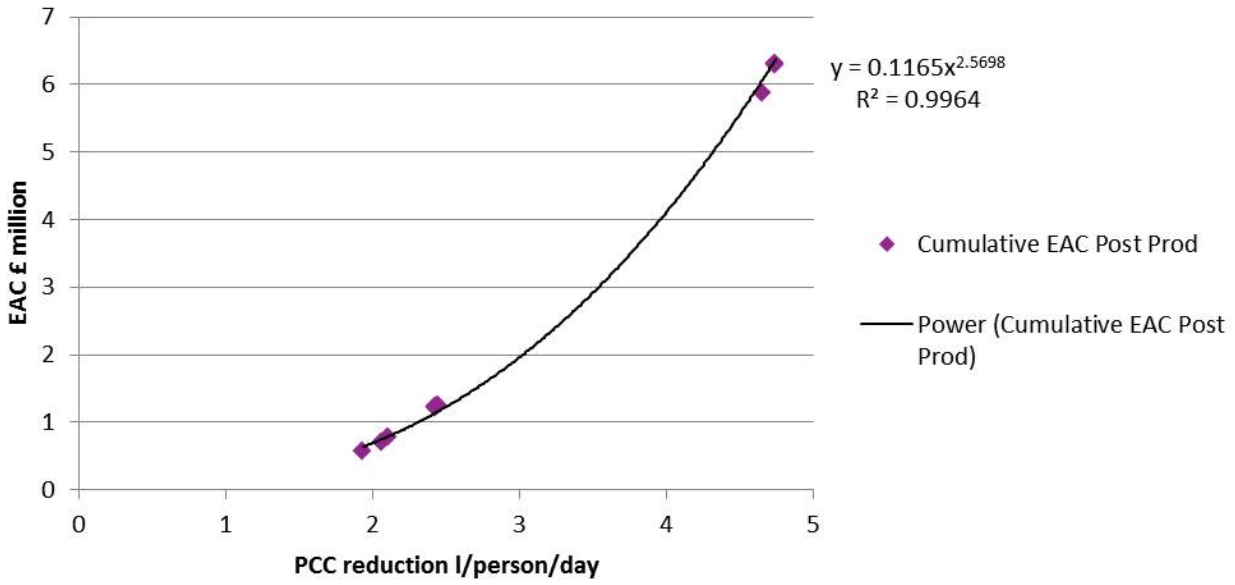
Specifically for PCC

For PCC, we have collated cost data from C55 to determine individual programs of investments and the associated incremental improvement in performance.

The enabling investment and enhancement expenditure for smart meters were included. This is a common cost shared with the leakage ODI. These common costs have been apportioned based on the societal value that these investments deliver to each performance commitment.This resulted in around 1/3 of the cost being allocated to PCC.

This resulted in the below total cost curve. We used this cost curve and our expected 2019/20 performance to test performance commitment levels using CBA and set our incentive rate.

Figure 26 PCC cost curve



PCC incentive rates

For PCC our proposed performance commitment level is beyond the level suggested by cost-benefit analysis (there is a distinction between this narrow analysis and the wider analysis undertaken for demand management in our WRMP). This means that the marginal cost of improvement at the PCL outweighs the marginal benefit of service improvements. This results in the standard formula implying an underperformance penalty rate of zero.

Following advice from Frontier Economics, we have set the underperformance penalty rate to match the outperformance incentive rate. The approach is pragmatic and delivers significant underperformance penalty rates. It implicitly captures an adjustment to the marginal cost and mechanistically this approach implies that the incremental cost has been set equal to the incremental benefit at the performance commitment level.

This means that both our out and underperformance rates are based purely on our customer valuations. This means they truly reflect our customer priorities.

7.5.3 Caps and collars

Action reference: ANH.OC.A16

Ofwat concern: The company proposes to apply an outperformance cap and underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC.

Required action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for PCC

For PCC, customer valuation of improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment). Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3.

We have proposed that the financial incentive applies in the final two years of AMP7. To set the cap and collar we have taken the maximum incentive that customers wish to apply to PCC (+/- £13.9m over AMP7) between the two final years. This gives the maximum incentives in an individual year. We have then divided the maximum incentives by the underperformance penalty rate to set the collar and the outperformance incentive rate to set the cap.

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at over 16 litres per person per day above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.6 Internal Sewer Flooding

7.6.1 Stretch

Action reference: ANH.OC.A17

Ofwat concern: Our PR19 methodology expectation for the Internal sewer flooding PC is the upper quartile performance in each year of the 2020 – 2025 period. Based on the forecast data provided by companies in the September 2018 business plan submission, the values are: 2020/21 = 1.68; 2021/22 = 1.63; 2022/23 =1.58; 2023/24 = 1.44; 2024/25 =1.34. The company proposed performance that was beyond these values by 2024/25, so there is no concern, but there is a required action so that all companies have consistent service levels.

Required action: We expect the company's service levels to reflect the values we have calculated for each year of the 2020 to 2025 period.

Our response

We explain and justify why we have not accepted Ofwat's proposed PCL.

We do not consider that the service levels that Ofwat has calculated are appropriate for our customers. There are a number of reasons for this:

- Our customer engagement showed that our customers support the PCLs that we proposed.
- The proposed common service levels assume that companies have proposed PCLs that they can achieve, which is not what the PR19 methodology required. The methodology asked for companies to propose PCLs based on upper quartile performance.
- Ofwat does not appear to have taken into account the accuracy of company forecasts for upper quartile performance or have carried out any assessment of whether the methodologies used are reasonable.

There are many factors that could influence levels of performance proposed, one of the major ones being that companies are currently not reporting this measure in a consistent manner. Ofwat has made no attempt in setting common PCLs to address this.

We therefore believe that the most appropriate PCLs for our customers that were agreed in consultation with them and proposed in our plan and which in any case are more stretching than those proposed by Ofwat.

7.6.2 ODI Rate

Action reference: ANH.OC.A18

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income.

Required action: The company should provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for internal sewer flooding and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

The company should explain and evidence how its proposed ODI rate for external sewer flooding is coherent with the rates proposed for all other sewerage performance commitments (including External sewer flooding, Sewer collapses and Pollution incidents) and demonstrate how the package of ODIs across the relevant group of performance commitments appropriately incentivises performance in the long and short term.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our internal sewer flooding ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 55 Internal sewer flooding - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	Valuations were gathered over performance increments and decrements. The measure of service was the number of properties affected by internal sewage flooding each years . The ranges of performance were based on our view of reasonable performance. The range was from 460 properties affected to 60 properties affected. Note that this is using the AMP6 definition.	Valuation completion report, Section 10
Basis of willingness to pay values	The number of incidents per year has been linked to societal valuations for domestic and non-domestic properties subject to internal flooding. We have used historical data on the number of incidents affecting households and non-households to estimate the weighted average per incident. The values used for ODI rates represent only performance increments. This on the basis that the ODI incentivises improved and vevry stretching performance.	Valuation completion report, Section 10
Application of scaling	We have used scaled values for the calculation of our ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1

Table 56 Internal sewer flooding - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
Internal sewer flooding	Number of properties affected by internal sewage flooding each year[1]	460	360	260	160	60
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

1 Performance based on the AMP6 definition

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves of our business plan. We provide more detail of our general approach in response to action ANH.OC.A2.

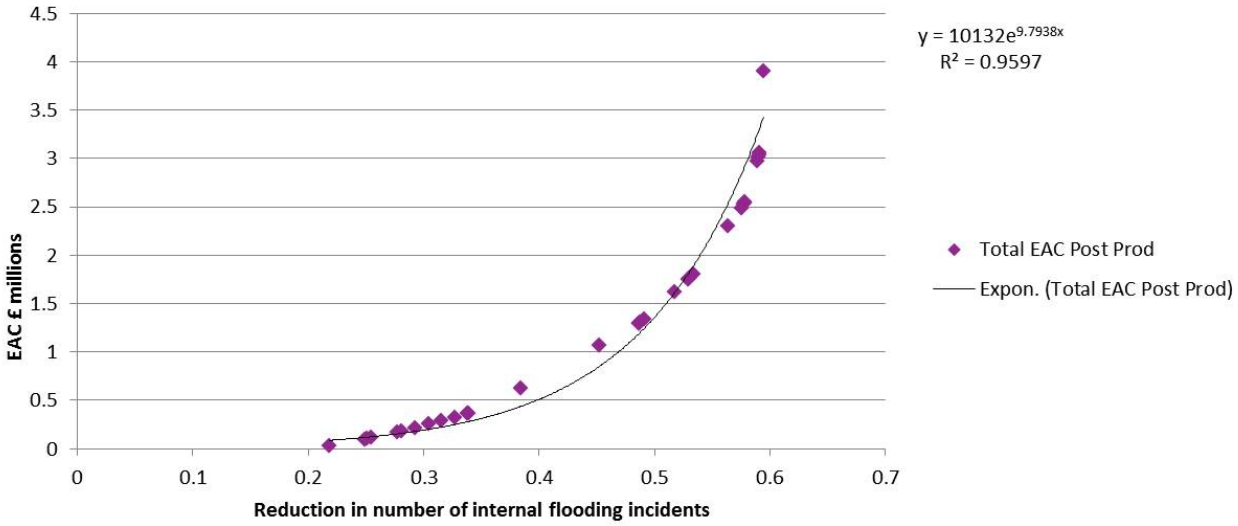
Specifically for internal sewer flooding

We have collated cost data from C55 to determine individual programs of investments and the associated incremental improvement in performance. This includes a mixture of botex and enhancement expenditure. The investment to improve internal sewer flooding is included in enhancement and is in Table WWS2 Lines A30 and B77.

Botex investments to increase sewer flushing (planned preventative maintenance) and sewage pumping station wet well cleans were also included in the curve as these improve performance. The totex for this investment falls within WWS1 Line A9. These costs were apportioned for the subset of investments that also deliver benefits for internal sewer flooding and pollution incidents.

This resulted in the below total cost curve. We used this cost curve and our expected 2019/20 performance to test performance commitment levels using CBA and set our incentive rate.

Figure 27 Internal sewer flooding cost curve



Internal sewer flooding incentive rates

Our underperformance incentive rate is slightly higher than Ofwat's range and our outperformance rate is within Ofwat's range. We are confident that our incentive rates reflect our customers preferences and priorities. They are based on robust valuations, efficient costs and reflect our customer priorities.

The rates are coherent with our rates for external sewer flooding, pollution incidents and sewer collapses. There are separate customer valuations for internal sewer flooding, external sewer flooding and pollution incident, which were scaled together as part of the package exercise described above. The sewer collapses rate is derived from our ODI research with customers. This informed the caps and collars for all sewer performance commitments. and how incentives are split between asset health and service. We conclude that the rates and scale of our sewer ODIs strongly incentivise both short and long term performance in line with the views of our customers.

We note our underperformance incentive rate is are larger than Ofwat's identified range. We are comfortable with this as our incentive rates reflect our customers preferences and priorities and are specific to our proposed PCL and caps and collars.

7.6.3 Caps and Collars

Action reference: ANH.OC.A19

The company proposes to apply an outperformance cap and underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC.

The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for internal sewer flooding

For Internal Sewer Flooding , customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars as well as then PCLs that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment).

Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3. The result of this valuation exercise was a maximum annual adjustment of £3.6m, which applies for both the outperformance and underperformance payments. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 57 Internal sewer flooding - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	1.29	1.20	1.11	1.03	0.96
Underperformance Collar	1.82	1.73	1.64	1.56	1.49

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at over 0.17 properties flooded per 10,000 sewer connections above the PCL . The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is perfect alignment between our approach to caps and collars and customer protection.

We consider that this PC is weighted in favour of customers - as evidenced by the P10 and P90 payments that we have submitted. We believe that it is unlikely that we will be able to achieve the caps on the out performance side, but have put them in place in order to ensure that customers are protected from bill swings that they are not willing to support.

The same is true of the underperformance collar and particularly for a weather sensitive measure such as flooding. Where a year of exceptional weather could cause a large penalty to be incurred in one year, performance in the range of the PCL the following year could generate a further bill swing that customers told us that they want to avoid.

7.7 Pollution Incidents

7.7.1 Stretch

Action reference: ANH.OC.A20

Ofwat concern: The PR19 methodology expectation for the pollution Incidents PC is upper quartile performance in each year of the 2020 - 2025 period. Based on the forecast data provided by companies in the September 2018 business plan submission the upper quartile values are 2020/21 = 24.5; 2021/22 = 23.7; 2022/23 = 23.0; 2023/24 = 22.4; and 2024/25 = 19.5.

Required action: The company proposes service levels which are less stretching than these.

For this common PC we expect all companies' service levels to reflect the values we have calculated for each year of the 2020 to 2025 period.

Our response

We explain and justify why we have not accepted Ofwat's proposed PCL.

We do not agree with Ofwat's broad brush approach to setting PCLs for AMP7. We consider that simplistic method of forecasting upper quartiles is not appropriate for our customers. Ofwat does not appear to have taken into account the accuracy of company forecasts for upper quartile performance or have carried out any assessment of whether the methodologies used are reasonable. Rather it has assumed that the range of PCLs proposed represents a probability field wherein the target that it considers is appropriate for customers is exactly on the first quartile of performance from the most ambitious company.

There are many factors that could influence levels of performance proposed, one of the major ones being that companies are currently not reporting this measure in a consistent manner. Ofwat has made no attempt in setting common PCLs to address this.

We therefore believe that the most appropriate PCLs for our customers that were agreed in consultation with them and proposed in our plan and which in any case are similar to those proposed by Ofwat.

7.7.2 ODI rate

Action reference: ANH.OC.A21

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain why its proposed rates differ from our assessment of the reasonable range around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers') and demonstrate that this variation is consistent with customers' underlying preferences and priorities for service improvements in pollution incidents.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for pollution incidents and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our Pollution Incidents ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 58 Pollution incidents - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	The valuation is based on values for category 2 and 3 incidents from a number of studies. This is a combined value for both household and non-household customers. Performance increments and decrements were tested with customers. The range of performance used in the package exercise was from 300 to 100 incidents (category 3).	Valuation completion report, Section 13
Basis of willingness to pay values	The category 2 pollution incident values have been mapped to category 1 and 3 pollution incidents using weights from Anglian Water PR14 Environment Stated Preference Study. These weights were tested in the recent PR19 relative preference focus groups and found to be highly valid. We have linked the value of 1-3 category pollution incidents per 10,000km wastewater network to each of the individual categories of wastewater pollution incidents using data on the proportions experienced historically. This has been normalised using the length of sewers. The values used for ODI rates represent only performance increments. This is on the basis that ODIs are to incentivise stretching improvements in performance.	Valuation completion report, Section 13
Application of scaling	We have used scaled values for the calculation of our Pollution Incident ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 59 Pollution incidents - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
Pollution incidents	Number of minor pollution incidents (category 3) that affect rivers and coastal areas each year	300	260	210	160	100
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves to our September 2018 business plan. We provide more detail of our general approach in response to action ANH.OC.A2.

Specifically for pollution incidents

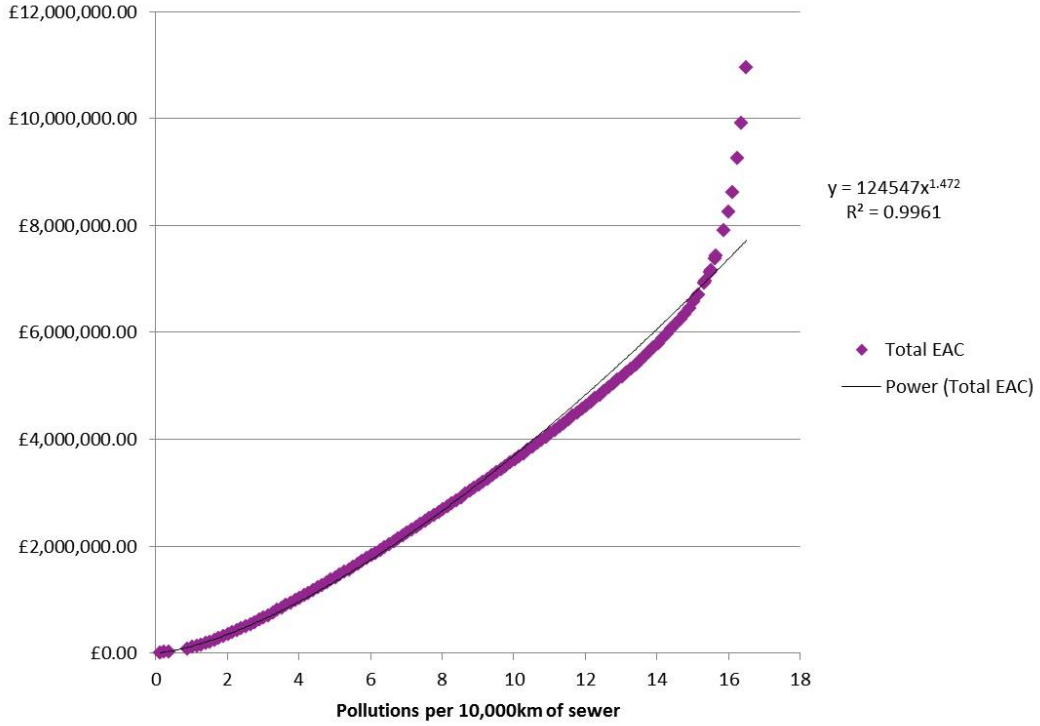
For Pollution Incidents, we have collated cost data from C55 to determine individual programs of investments and the associated incremental improvement in performance.

We first identified investments that resulted in a reduction to the numbers of pollution incidents. The EAC for each investment was calculated as well as the benefit it delivers. The investments chosen were from the combined sewer overflow programme of work and three investments that link to our sewer flooding programme. These common costs were apportioned between Pollution Incidents, External Sewer Flooding and Internal Sewer Flooding on the basis of the associated societal valuation.

This curve includes candidate investments considered but not selected in the AMP7 plan. These candidates remain valid and become investments we would consider for future AMP investment. The enhancement investment which forms a portion of this curve are included in WWS2 Lines A10, A30, B57 and B77. The remainder and the majority of totex (built up in the investment with candidate investments) is assumed to be within Botex.

In light of the EA's revised guidance for storm tank sizing, we have re-costed our U_IMP6 investments. This impacts our marginal cost at our proposed performance commitment level. This increases the cost per site but also the efficiency, this alters the shape of our cost curve for the ODI which includes candidate investments. We have reflected in this in our underperformance incentive rate which has increased. This takes our proposed rate into Ofwat's identified range. This resulted in the below total cost curve. We used this cost curve to set our incentive rate.

Figure 28 Pollution incidents cost curve



Pollution incidents incentive rates

We have followed Ofwat's guidance and default formulae to calculate the out and underperformance incentive rates. These are built from our customers valuations of improving service and efficient costs. Our September plan incentive rates are lower than Ofwat's range, albeit slightly. Our updated underperformance rate is within Ofwat's rate (see above). We are confident that our incentive rates reflect our customers preferences and priorities. They are based on robust valuations and efficient costs.

The rates are coherent with our rates for external sewer flooding, internal sewer flooding and sewer collapses. There are separate customer valuations for internal sewer flooding, external sewer flooding and pollution incident, which were scaled together as part of the package exercise described above. The sewer collapses rate is derived from our ODI research with customers. This informed the caps and collars for all sewer performance commitments and how incentives are split between asset health and service. We conclude that the rates and scale of our sewer ODIs strongly incentivise both short and long term performance in line with the views of our customers.

7.7.3 Caps, collars, deadbands

Action reference: ANH.OC.A22

Ofwat concern: The company proposes to apply an outperformance cap and underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to the ODI associated with this PC.

Required action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and Collars For Pollution Incidents

For pollution incidents, customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars as well as then PCLs that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment). Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3. The result of this valuation exercise was a maximum annual adjustment of £4.8m, which applies for both the outperformance and underperformance payments.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 60 Pollution incidents - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	10	9	8	7	6
Underperformance Collar	36	35	34	33	32

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at 11 pollution incidents per 10,000 km sewer above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

We consider that this PC is weighted in favour of customers - as evidenced by the P10 and P90 payments that we have submitted. We believe that it is unlikely that we will be able to achieve the caps on the out performance side, but have put them in place in order to ensure that customers are protected from bill swings that they are not willing to support.

The same is true of the underperformance collar and particularly for a weather sensitive measure such as pollution incidents. Where a year of exceptional weather could cause a large penalty to be incurred in one year, performance in the range of the PCL the following year could generate a further bill swing that customers told us that they want to avoid.

7.8 Compliance risk index

7.8.1 ODI type

Action reference: ANH.OC.A23, ANH.OC.A47, ANH.OC.A48, ANH.OC.A49

Ofwat Concern: *On 19 December 2018 the Environment Secretary announced that a ban is being put in place on the outdoor use of metaldehyde. Consequently, there is now insufficient justification to have a financial incentive attached to the CRI sub-measures instead of the CRI common PC.*

Required Action: *The company should propose an underperformance payment for this PC and provide evidence to justify the rate that it selects. This should include evidence to support the marginal cost and marginal benefit inputs used to calculate the ODI rate proposed.*

The company should remove its ODI under performance payment [for the sub-measures].

Our response

We agree that as a result of the metaldehyde ban it is now appropriate to attach a financial incentive to the total CRI measure and to remove the PCs associated with the sub-measures. We have removed the CRI sub-measures from our revised App1 submission and have added a penalty incentive to the ODI calculated in the same manner as the sub-measures were.

Details of how we have calculated the ODI rate are shown in our response to action ANH.OC.A24.

7.8.2 ODI rate

Action reference: ANH.OC.A24

Ofwat concern: The company should add an ODI underperformance payment to this PC in line with our assessment of the reasonable range of ODI rates around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers'). If the proposed rate does not sit within this range the company should explain why and demonstrate that the difference is consistent with customers' underlying preferences and priorities for service improvements in CRI.

Required action: The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation CRI and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We did not directly capture societal valuations for CRI. CRI is a new metric and the definition is still evolving. However we did seek societal valuations for certain aspects of drinking water quality.

From our societal valuations of service, we have calculated customer willingness to pay for improvements in CRI. We have very few CRI exceedances that link directly to societal valuations of service. We have translated the impact of CRI exceedences which resulted in boil water notices in 2017 and the number of customers impacted. We had a very small number of boil water notices that related to regulatory exceedances which impacted on a very small number of customers in 2017 (three boil water notices which affected a single property each).

This suggested a relatively low marginal benefit. We have used customer views on the scale of appropriate ODIs and relative priority of PCs to determine the appropriate maximum penalty for this measure. To ensure a robust incentive we have divided the maximum incentives by the range of possible performance to calculate the incentive rate.We have apportioned the incentives allocated by customers from the deadband to the P10. The calculation of the underperformance penalty payment incentive rates is shown in the following table.

Table 61 CRI - performance profile

Performance commitment	Performance range	Incentive allocated (£m)	Incentive rate (£m)
Compliance Risk Index	Deadband = 3.56 Penalty Collar =9.50 Range = 29.7 (over AMP7)	23.4 (over AMP7)	0.788

We believe our rates are appropriate as they are based on the views and priorities of our customers. This approach provides higher incentive rates for asset health performance commitments than relying on extrapolating societal valuations and is in line with Ofwat's guidance on using a wide range of customer evidence to set incentive rates for asset health. This approach results in rates that fall within Ofwat's range.

We are comfortable that this incentive rate is based on our customers views and priorities. This is part of our robust package of asset health incentives. The underperformance incentives on our asset health performance commitments represent roughly 1% of RoRE. We believe this, alongside independent ODIs for service (e.g. water supply interruptions), provides strong incentives on performance in the short and long term.

7.8.3 Deadband

Action reference: ANH.OC.A25

Ofwat concern: We propose to intervene to ensure companies perform to the regulatory requirement of 100% compliance against drinking water standards. As set out in the methodology we noted a deadband may be appropriate. It is important that the range of underperformance to the collar is adequate to provide clear incentives for companies to deliver statutory requirements.

Required action: The company should set a deadband at 1.50 and collar at 9.5 for 2020-25.

Our response

We have proposed an alternative deadband for CRI that is in line with DWI guidance for meeting national average CRI rates. We accept the collar that Ofwat has proposed.

We remain supportive of the inclusion of CRI in the suite of common PCs. The measure is a strong indicator of risk, however it is not a direct proxy for drinking water quality. CRI has been developed to identify risks that companies can address to maintain the safety of their customers' drinking water supplies. DWI guidance is for companies to aspire for continuous improvement and to levels that are at or below the national average.

Consequences of metaldehyde ban

Since we submitted our Plan Defra announced a ban on the outdoor use of the pesticide metaldehyde on the 19th December 2018. In our September Plan we had split the CRI into individual components and added financial underperformance to three of the four sub components because of the effect of metaldehyde on the Supply Points sub component which is largely outside our control.

Metaldehyde manufacturing ceased as of December but sales remain legal until June 2019. Outdoor application remains legal until June 2020. We believe metaldehyde may still have an impact on drinking water quality into early AMP7 due to the risk of legacy metaldehyde from within our catchments and will continue to pose a potential risk to raw water compliance. Dependent on our historic understanding of agricultural practises and taking into account application rates over the transitional period, our data suggests that we may observe legacy levels for a period of at least 3 years. Additionally we are aware that the Metaldehyde Stewardship Group and the National Farmers Union are lobbying for an extension meaning that metaldehyde could be used into the 2021 season.

However, as a metaldehyde ban has been announced we no longer feel it is necessary to split the CRI components and instead propose a deadband and financial underperformance only incentive against the overall CRI measure.

DWI expectation

We continue to strive for 100% compliance as evidenced by the 0 PCL we put forward in our Business Plan in line with Ofwat and DWI expectation.

In setting our PCL for AMP7 we have looked to the advice from the water quality regulator DWI, particularly from their response to Ofwat's draft PR19 methodology - http://www.dwi.gov.uk/stakeholders/price-review-process/PR19_DWI_response.pdf

'As the drinking water quality regulator, our interest in this paper concerns the statutory provisions necessary to enable water companies to protect the health of their consumers, and to maintain consumer confidence in the supplies and services provided.'

'As such, in terms of a target, companies should aim for CRI (and ERI) scores of zero and thus aspire to continuous improvement and results of at least at a level that is equal to or below the national average.'

National average

In order to calculate our proposed deadbands for submission of our business plan we used the DWI's national average rates for 2016. DWI methodology hasn't been made available to the industry, however, from our calculations we believe that when DWI talk about 'national average' this isn't a traditional average. DWI have not taken all the CRI scores from each individual company and then divided them by the number of companies. In order to generate their national average for England and Wales we believe DWI have weighted the CRI scores for each company (by the appropriate function for each part of CRI *), these weighted national indices for each sub component are added together to give the Compliance Risk Index for England and Wales or national average.

**The zonal element is the summed CRI scores for all companies divided by the population of England and Wales, the Storage Point element is the summed scores for all companies divided by the total capacity of storage points for England and Wales, the Supply Point and Water Treatment Works CRI elements would be the summed scores for all companies divided by the total output flow of Supply Points or Water Treatment Works for England and Wales).*

Proposals updated to reflect new data

At the time of generating our business plan submission we didn't have access to the industry figures for CRI for 2017. These are now available and we believe it is appropriate to update our proposed deadbands for the three sub components of CRI where we had previously used 2016 data. We have also used this information to propose a deadband for the Supply Point sub component which we had not previously included. If we had simply updated our proposal to include the Supply Point sub component using 2016 national average this would have given an overall deadband of 4.78. However we feel that it would be appropriate, and in our customers interests to propose our revised deadband using 2017 CRI at 3.56. This is consistent with the DWI guidance that companies should "aspire to continuous improvement and results of at least at a level that is equal to or below the national average".

Maintaining consumer confidence

If companies are failing to achieve Ofwat's deadband for drinking water quality set at 1.5 for CRI, we could potentially see 75% of the industry in penalty for the headline water quality measure. We believe this to be out of line with DWI expectation and has the potential to drive the wrong message and reduce consumer confidence in the safety of drinking water that is the best quality water in Europe.

The deadband must account for volatility in CRI performance. In the last year there was a standard deviation in performance of nearly 3. This is significantly greater than the deadband proposed by Ofwat. This volatility in part reflects the fact that it is impacted by a range of factors, some of which are outside management control. This includes bad hygiene control at a customer tap, consequential discolouration from bursts associated with new developments or illegal hydrant use.

If a large number of companies are failing Ofwat's deadband for drinking water quality target, confidence in companies who are delivering the best quality water outcomes in Europe will be undermined. This could drive the wrong behaviours in companies and be misleading for customers.

Proposals for a penalty collar

We consider the penalty collar proposed by Ofwat as reasonable as it reflects the level of the current worst industry performer for 2017 (Severn Trent Water), who has a performance of 9.44. We have chosen to adopt this penalty collar as this was one of the options we also considered for setting our P10 performance.

7.9 Total Mains Bursts

7.9.1 ODI Type

Action reference: ANH.OC.A26

Ofwat concern: The company does not propose a financial incentive for total mains bursts on the grounds that it could disincentivise the use of active leakage control solutions to improve leakage performance. The company instead proposes to attach a financial incentive to its bespoke Reactive Mains Bursts PC.

Required action: The company should provide further evidence to justify the selection of a non-financial incentive for total mains bursts (including evidence demonstrating the link between leakage control and mains repairs).

Alternatively, the company should propose a financial ODI, supported by evidence to justify the customer valuations and forecast efficient marginal cost inputs selected.

Our response

We provide further information to justify our selection of a non-financial incentive.

In addition to a common asset health measure on Total Mains Bursts per 1,000km water main, we have proposed a performance commitment on Reactively Identified Mains Bursts. This measure will differ from the common measure in that only reactive bursts will be reported. Reactive bursts will be defined as those that have been identified and reported by a customer or another third party before they have been fixed.

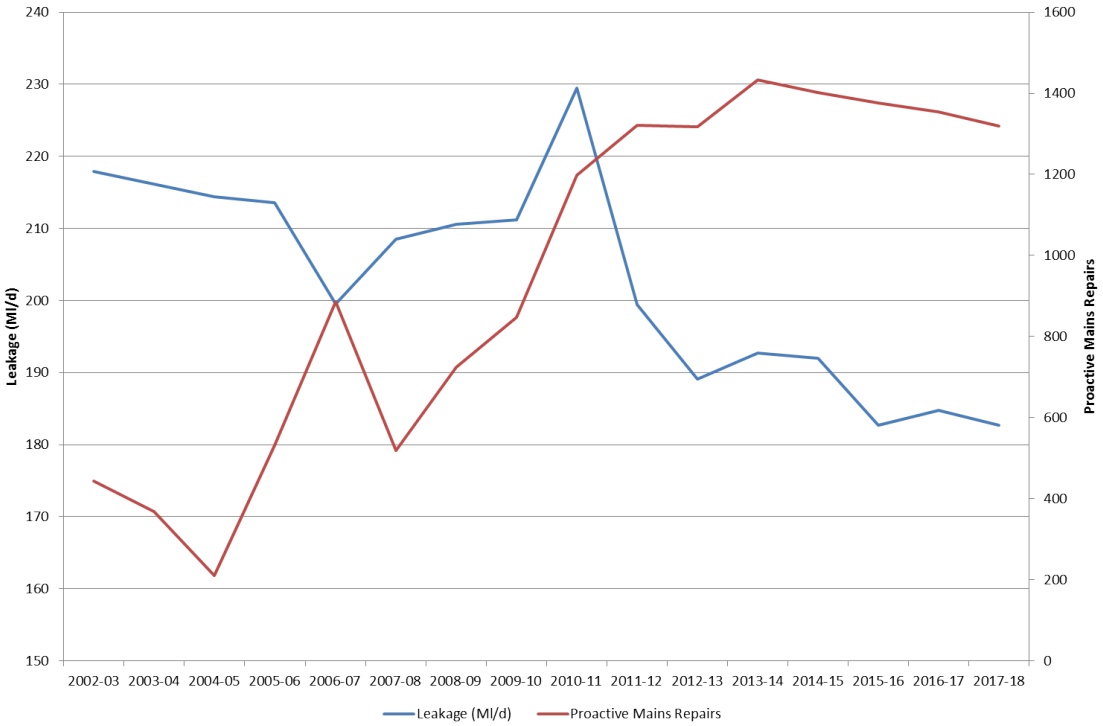
Our justification for this approach demonstrates that the performance commitment is designed to incentivise the company to improve asset health and reduce leakage by finding and fixing bursts and leaks earlier and before they come to the attention of customers. Where we identify a burst quickly using remote sensing or other means of leakage detection and reduces leakage as a result the burst will not be counted against this measure.

We are proposing that this measure should have financial incentives placed against it and that the common performance commitment should be reputational only.

Why are we proposing another measure for mains bursts?

The common measure as it is currently designed does not incentivise companies to find and fix more leaks, or to fix them earlier. Proactively identified bursts mains as part of leakage detection efforts will be counted against the common measure and this measure will penalise companies who report more bursts, and thus it penalises companies that carry out more leakage detection.

Figure 29 Leakage and proactive mains repairs



The graph above illustrates how proactively detected bursts relates to reduced leakage levels.

Ofwat set out clear expectations in the methodology consultation that reducing leakage over AMP7 is extremely important. This aligns with our continued focus and customer priorities. For example, Ofwat stated that "Reducing leakage continues to remain a top priority for customers and the UK and Welsh governments" and the incentive will be subject to stretching leakage targets.

As the company that is at the frontier of leakage performance, we feel that this perverse incentive will affect us more than other companies, particularly as we have invested in the staff and technology to enable us to target bursts that may not be visually identified by the public for years. By stopping these leaks a lot earlier, we are able to reduce our overall leakage, which is the key area of customer concern in the industry.

Being judged on the number of mains bursts also disincentivises beneficial activities which enhance network intelligence. After the drought of 2010-2012 and subsequent harsh winter of 2012-13 which caused a big rise in our leakage, we significantly increased our leak detection effort. A consequence of this was a big increase in the number of bursts we found and reported. In this way a company could risk being penalised for pursuing a strategy with widespread customer support and significant benefits for the environment.

We are not alone in this opinion. In the recent joint KPMG and Jacobs "Targeted review of common performance commitments", which was carried out on behalf of Ofwat and Water UK, it was suggested that companies study in more detail the effect of pro-active leakage detection on mains burst numbers.

We understand Ofwat's desire to limit exclusions within metrics. However, we firmly believe the measure proposed could be made more progressive by focusing only on those bursts where companies are unable to detect asset failures themselves.

7.9.2 ODI Rate

Action reference: ANH.OC.A27

Ofwat concern: The company does not propose a financial incentive for total mains bursts on the grounds that it could disincentivise the use of active leakage control solutions to improve leakage performance. The company instead proposes to attach a financial incentive to its bespoke Reactive Mains Bursts PC.

Required action: Should the company propose a financial ODI, the company should explain and evidence how its proposed ODI rates for mains bursts are coherent with the rates proposed for PCs relating to the associated customer facing-impacts of the asset failure (including leakage and supply interruptions) and demonstrate how the package of ODIs across the relevant group of PCs appropriately incentivises performance in the long and short-term.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rates for mains bursts and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We do not propose to implement a financial ODI for this measure, therefore a response to this action is not applicable.

7.10 Unplanned Outages

7.10.1 Definitions

Action reference: ANH.OC.A28

Ofwat concern: We identified in the Annual Performance Report 2018 (APR18) submission evidence (shadow reporting table 3S) that there are sub-components assessed as 'Amber' or 'Red'. The company has not provided sufficient evidence to demonstrate that plans and timetables are in place to achieve compliance with these measures by 2019-20.

Required action: The company should provide details on the actions needed to comply with the standard definition of this common performance metric and its timetable for completing them (where there is a sub-component rated Amber or Red in table 3S of the 2018 APR submission).

Our response

We provide details of how our planned actions to ensure compliance with the definition.

In our commentary to our 2018 Annual Performance Report we reported the sub-components of the unplanned outages definition that we assessed as 'Amber' or 'Red' in relation to our ability to comply with the definitions that Ofwat had published. As this is a very new measure and as reporting guidance was not published until March 2018, we had not established a robust reporting system to report against this measure in time for the 2018 APR.

There is only one limitation on reporting against the Ofwat definition for this measure, however it affects most of the components of the definition. The components affected are summarised in the table below and the detail of the action to comply follows below the table.

Table 62 Unplanned outages - affected components

	Component	Compliant (R/A/G)	Actions to comply with standard definition
1	PWPC		Not applicable
1a	Annual review		Not applicable
1b	PWPC by production site		Not applicable
1c	Water Resource Zone PWPC		Not applicable
2	Asset failure / unplanned outage		New reporting system to be developed by March 2020 (see detail below)
2a	Source data		New reporting system to be developed by March 2020 (see detail below)
3	Planned outages		New reporting system to be developed by March 2020 (see detail below)
3a	Source data - programme of works		New reporting system to be developed by March 2020 (see detail below)
4	Duration		New reporting system to be developed by March 2020 (see detail below)
4a	Start time		New reporting system to be developed by March 2020 (see detail below)

4b	End time		New reporting system to be developed by March 2020 (see detail below)
4c	Rounding		New reporting system to be developed by March 2020 (see detail below)
5	Reduction in capacity		New reporting system to be developed by March 2020 (see detail below)
5a	Reduced capacity		New reporting system to be developed by March 2020 (see detail below)
5b	Total outage		New reporting system to be developed by March 2020 (see detail below)
6	Exclusions		Not applicable
6a	Normal water quality operating bands		Not applicable
6b	Evidence of WQ events		Not applicable

Our current telemetry system cannot extract the large volumes of data that we require to report against this measure for all WTWs (over 1 billion lines) quickly or simply. By March 2020 we will have a new system which will allow data to be extracted and utilised more easily and could be utilised for this measure moving forward.

We do not currently have a robust system in place for capturing the data required to obtain the current status of our assets that can cause an unplanned outage greater than 24 hours. We are currently setting up a corporate data system that will report the equipment off-line that are relevant to this measure. This is in development and, when installed, will be able to capture, record and report assets out of service and will provide the data required to be compliant with components 2, 3, 4 and 5 and their sub-components. This report is under development and testing will be completed during 2019-20, with a view to reporting accurately by March 2020.

7.10.2 Stretch

Action reference: ANH.OC.A29

Ofwat Concern: We have some concerns that the company's forecast performance level is not determined using data consistent with the common definition.

Require Action: The company is required to provide fully audited 2018-19 performance data by 15 May 2019. This should take the form of an early APR submission, but only for Unplanned Outages. Board assured data can be provided with the main APR in July 2019, any changes will be taken into account for the Final Determination. Based on the latest performance and updated methodologies, the company should resubmit 2019-20 to 2024-25 forecast data in the 15 May 2019 submission. The company should also report its current and forecast company level peak week production capacity (PWPC) (Ml/d), the unplanned outage (Ml/d) and planned outage (Ml/d) in its commentary for the May submission.

Our response

We will provide fully audited 2018-19 performance data by 15 May 2019, as requested.

7.10.3 ODI rate

Action reference: ANH.OC.A30

Ofwat Concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required Action: The company should explain and evidence how its proposed ODI rate for unplanned outages is coherent with the rates proposed for PCs relating to the associated customer facing-impacts of the asset failure and demonstrate how the package of ODIs across the relevant group of PCs appropriately incentivises performance in the long and short-term.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODIs rate for unplanned outages and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide additional explanation of the calculation of our incentive rate.

We did not directly capture societal valuations for Unplanned Outages. The definition of this measure was still under development during our societal valuation programme.

We have used customer views on the scale of appropriate ODIs and relative priority of PCs to determine the appropriate maximum penalty for this measure. To ensure a robust incentive we have divided the maximum incentives by the range of possible performance to calculate the incentive rate. This avoids any double counting with other ODIs, such as Water Supply Interruptions. The calculation of the underperformance penalty payment incentive rates is shown in the following table.

Table 63 Unplanned outages - underperformance penalty payment incentive rates

Performance commitment	Performance range	Incentive allocated (£m)	Incentive rate (£m)
Unplanned outages	Deadband: 6.06 P10: 12.1 Range = 6.04	3.81 per year	0.63 per %

This approach provides higher incentive rates for asset health performance commitments than relying on extrapolating societal valuations and is in line with Ofwat's guidance on using a wide range of customer evidence to set incentive rates for asset health.

Ofwat's incentive range for this measure should be regarded with caution. We have reservations about the readiness of this metric to act as a financial incentive. This is a view that is clearly widely held in the industry with a number of company's proposing reputational only incentives. This means that there is a limited number of data points to draw robust conclusions. We also note that levels of performance are dramatically different between companies.

We are comfortable that this incentive rate is based on our customers views and priorities. This is part of our robust package of asset health incentives. The underperformance incentives on our asset health performance commitments represent roughly 1% of RoRE. We believe this, alongside independent ODIs for service (e.g. Water supply interruptions), provides strong incentives on performance in the short and long term.

7.10.4 Caps and collars

Action reference: ANH.OC.A31

Ofwat Concern: The company proposes to apply an underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of a collar to this specific PC.

Required Action: The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide a convincing ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this justification it should remove the underperformance collar.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Collars For Unplanned Outages

Our collars for the unplanned outages ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £3.8m, which applies for the underperformance payments.

This gives the following profile:

Table 64 Unplanned outages - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Underperformance Collar	12.1	12.1	12.1	12.1	12.1

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at over 10% of population experiencing severe restrictions above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.11 Sewer collapses

7.11.1 ODI rate

Action reference: ANH.OC.A32

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income.

Required action: The company should explain and evidence how its proposed ODI rate for external sewer flooding is coherent with the rates proposed for all other sewerage performance commitments (including External sewer flooding, Internal sewer flooding and Pollution incidents) and demonstrate how the package of ODIs across the relevant group of performance commitments appropriately incentivises performance in the long and short-term.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODIs rate for sewer collapses and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide additional explanation of the calculation of our incentive rate.

We did not directly capture societal valuations for Sewer Collapses. We have calculated customer willingness to pay for improvements in the number of sewer collapses using our societal valuation work. This is based on the valuation of sewer flooding and pollution incidents, overlaid with the number of flooding and pollution incidents caused by sewer collapses in 2016/17. This suggested a relatively low marginal benefit and incentive rate. This is shown in data table App1a.

For asset health performance commitments with low marginal benefits, we have triangulated with additional sources of customer evidence to set incentive rates. In the customer research we conducted on ODIs, we gathered data on the overall range of incentives supported by customers and their relative weighting of individual measures for financial incentives. We have proposed caps and collars on incentives based on this customer evidence. Our approach to this engagement is described in detail in response to action ANH.OC.A3. For measures where we do not have societal valuations, we have used this additional source of customer evidence to set incentive rates. To determine the rates, we have apportioned the incentives allocated by customers from the deadband to the P10. The calculation of the underperformance penalty payment incentive rates is shown in the following table.

Table 65 Sewer collapses - underperformance penalty payment incentive rates

Performance commitment	Performance range	Incentive allocated (£m)	Incentive rate (£m)
Sewer collapses	Deadband: 6.87 reducing to 6.74 over AMP7 P10: 9.1 Range = 11.3 over AMP7	26.0 over AMP7	2.298m per 1,000km of sewer

This approach provides higher incentive rates for asset health performance commitments than relying on extrapolating societal valuations and is in line with Ofwat's guidance on using a wide range of customer evidence to set incentive rates for asset health. It also avoids any double counting with our service performance commitments on sewer flooding and pollution incidents.

We are comfortable that this incentive rate is based on our customers views and priorities. This is part of our robust package of asset health incentives. The underperformance incentives on our asset health performance commitments represent roughly 1% of RoRE. We believe this, alongside independent ODIs for service (e.g. sewer flooding and pollution incidents), provides strong incentives on performance in the short and long term.

7.11.2 Caps, collars, deadbands

Action reference: ANH.OC.A33

Ofwat concern: The company proposes an underperformance payment deadband and collar without providing sufficient justification. The company includes a deadband for this PC based on previous deadbands set by Ofwat for the 2015-20 period and states that this will ensure performance is incentivised in line with long term trends rather than due to volatility in reporting. The company states that this measure is a customer priority and therefore it should not limit the power of the ODI with a deadband and collar.

Our response: The company should either remove the proposed underperformance deadband from this PC or provide convincing evidence to explain why this deadband is appropriate and in customers' interests.

The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide a convincing ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this it should remove the underperformance collar.

Our response

We provide additional justification for our proposals and summarise additional customer engagement on the deadband.

Our response to this action should be considered along side our response to action ANH.OC.03, which explains our overall approach to caps collars and deadbands, action ANH.OC.A04, which explains our overall PC and ODI package and in conjunction with action ANH.OC.06, which explains our approach to customer protection.

In general, our overall approach to setting ODI deadbands, caps and collars is to promote the framework that was supported following detailed consultation with our customers. This should not be looked at in isolation from the other components of the outcomes package (i.e. stretching PCLs, rewards and penalties).

The level of caps and collars and deadbands for each performance commitment are based on customer views for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives.

We have reviewed the plans submitted by other companies and are confident that the evidence produced in our plan offers the most comprehensive evidence that customers value the reduction in bill volatility that these mechanisms provide. It was as a result of this research with out customers that Ofwat rated us so highly on the customer engagement within our plan. It is clear that customers do not view these mechanisms in the same way that has been assumed in recent regulatory precedent and that they are more open to a holistic view that reduces bill volatility.

Collars For Sewer Collapses

Our collars for the sewer collapses ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum adjustment of £26m, which applies for the underperformance payments. Our standard approach would have taken the incentive rate that resulted from our societal valuation work applied to this range to set

the collar for sewer collapses. However, when we calculated customer willingness to pay for improvements to the number of sewer collapses using our societal valuation work this resulted in a relatively low marginal benefit.

We therefore took the P10 performance to equal the collar for this performance commitment to ensure that customers are protected against the most likely range of performance up to the maximum value that they see as appropriate for the total ODI impact. Based on the ODI mechanism proposed and the range gives the following profile:

Table 66 Sewer collapses - performance profile

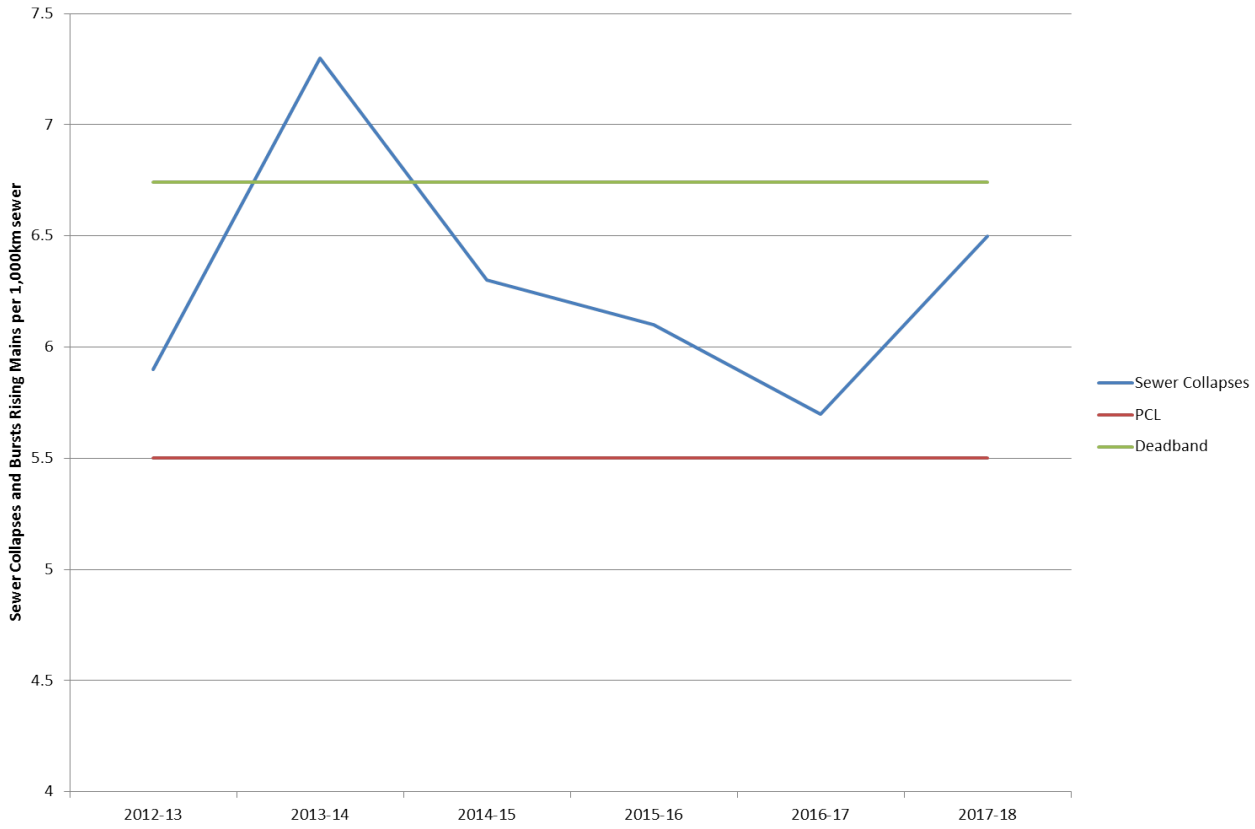
	2020-21	2021-22	2022-23	2023-24	2024-25
Underperformance Collar	9.1	9.1	9.1	9.1	9.1

Deadbands

We have been selective when choosing where to apply deadbands in our PR19 business plan. In the case of sewer collapses, we are protecting customers from unnecessary bill volatility and setting stretching PCLs where there is volatility within the measure performance.

We consider that the overall package of deadbands and performance commitment levels that we have set are sufficiently stretching. This can be justified by looking at out historic performance against this measure.

Figure 30 Historic sewer collapses performance



The graph demonstates that the PCL is set at a level that we have not achieved before and the deadband would mean that a penalty would have applied if in operation during AMP6. For context, during AMP6 we have performed 40% below the level that would trigger a penalty in every year. As a package, this performance commitment is much more stretching than the asset health measure currently in place.

Ofwat said in its Final Methodology that it would discourage deadbands that remove the incentive for companies to improve performance.

The PCLs incentivise improved performance beyond the levels currently achieved and the deadbands show improvement across AMP7 is in spite of no additional botex allowance and no change from the historic funding arrangements that required companies to maintain stable performance levels.

For Sewer Collapses we have the following evidence to support the inclusion of deadbands.

- Customer support – this is the most important reason for including these deadbands. As part of the overall PC and ODI package that we developed, our customers approved of deadbands being used for a limited set of ODIs. We were robustly challenged by our Customer Engagement Forum for our approach to ODIs, including on the use of specific deadbands which were considered by the Valuation Sub-Panel.
- To provide a non-financial incentive to make stretching improvements to asset health, while allowing penalties for a decline from the current historic levels of performance.
- Protection against unnecessary bill volatility - one of the key themes that came out of our customer research was that our customers do not like bill volatility, rather they would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance, to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

"I'd rather pay more and know what I'm paying, rather than you know, have it more about. Yes, you can save money, but you can also be out of pocket as well."

"You wouldn't want it to be that volatile I don't think, it might be worse to see it go up one it has been really low, and to have to keep checking it as well."

Customer views on bill volatility caused by ODIs from our Outcome Delivery Incentive Research, June 2018.

Further customer research into deadband acceptability

As part of our ongoing customer research, we asked a sample of our customers their opinion about our use of deadbands for this ODI. Of those who took part 53% indicated support for the use of the deadbands (with 12% neutral or don't know). We consider that this support justifies our inclusion of a deadband for our sewer collapses PC. The results of this engagement can be seen in Annex 3a of this IAP response.

*"I agree particularly as a lot of these occurrences are beyond the company's control."***Customer taking part in 2019 online community research**

7.12 Treatment Works Compliance

7.12.1 Stretch

Action reference: ANH.OC.A34

Ofwat concern: The company provided insufficient evidence that its proposed service levels for 2020 to 2025 are stretching. Additionally its forecast for 2024-25 does not meet the expected compliance level of 100%.

Required action: The company should set performance to the expected target of 100% for the period 2020-25 or provide convincing evidence why it cannot.

Our response

While our customers supported a PCL of 99%, we are proposing a PCL at 100%. In App1, we have not set our future forecasts at 100% in AMP8 as we do not feel that this level would be achievable in that timescale.

7.12.2 ODI Rate

Action reference: ANH.OC.A35

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain and evidence how its proposed ODI rate for treatment works compliance is coherent with the rates proposed for any PCs relating to the associated customer facing-impacts of the asset failure (such as river water quality) and demonstrate how the package of ODIs across the relevant group of PCs appropriately incentivises performance in the long and short-term.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODIs rate for treatment works compliance and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how we calculated our incentive rate.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 67 Treatment works compliance - information requested

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	Valuations were gathered over performance increments and decrements. The measure of service was river water quality. The units of valuation were 'Percentage of river length at good status or better each year'. The ranges of performance were based on our view of reasonable performance. The range was from 8% to 28 % of river length at good or better status.	Valuation completion report, Section 14
Basis of willingness to pay values	The unscaled and scaled values for river water quality have been mapped to the wider service measures for wastewater compliance, priority substances, growth and litter. The links between the type of compliance failure and the river quality values are based on customer research and analysis completed for PR14. At PR19 we reviewed the assumptions and updated where better information is available. Treatment works compliance has been linked to societal valuations for Nutrients (P) compliance and Sanitary consents. We have used historical data on the number of these failures and their impact on treatment works compliance to calculate a value per %. Valuations were gathered over performance increments and decrements. The resulting values were relatively low, and we concluded they were too low to yield appropriate incentives.	Valuation completion report, Section 14
Application of scaling	We have used scaled values for the initial calculation of the ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 68 Treatment works compliance - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
River water quality	Number of properties affected by unplanned interruptions to water supply (6-12 hours each)	8%	12%	18%	24%	28%
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Triangulating with other sources of customer evidence

From our societal valuations of service, we have calculated customer willingness to pay for improvements in performance. This suggested a relatively low marginal benefit. This is shown in table App1a.

For asset health performance commitments with low marginal benefits, we have triangulated with additional sources of customer evidence to set incentive rates. In the customer research we conducted on ODIs, we gathered data on the overall range of incentives supported by customers and their relative weighting of individual measures for financial incentives. We have proposed caps and collars on incentives based on this customer evidence. Our approach to this engagement is described in detail in response to action ANH.OC.A3. For measures where we do not have societal valuations, we have used this additional source of customer evidence to set incentive rates. To determine the rates, we have apportioned the incentives allocated by customers from the deadband to the P10. The calculation of the underperformance penalty payment incentive rates is shown in the following table.

Table 69 Treatment works compliance - underperformance penalty payment incentive rate

Performance commitment	Performance range	Incentive allocated (£m)	Incentive rate (£m)
Treatment works compliance	Deadband: 98.6% P10: 95% Range = 18% over AMP7	24.27 over AMP7	1.348 per %

This approach provides higher incentive rates for asset health performance commitments than relying on extrapolating societal valuations and is in line with Ofwat's guidance on using a wide range of customer evidence to set incentive rates for asset health. It also avoids any double counting with our service performance commitments.

We are comfortable that this incentive rate is based on our customers views and priorities. This is part of our robust package of asset health incentives. The underperformance incentives on our asset health performance commitments represent roughly 1% of RoRE. We believe this, alongside independent ODIs for service (e.g. sewer flooding and pollution incidents), provides strong incentives on performance in the short and long term.

7.12.3 Caps, collars and deadbands

Action reference: ANH.OC.A36

Ofwat concern: The company proposes to apply an underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of a collar to this specific PC.

The company does not provide sufficient evidence that its proposed level of deadband is sufficiently challenging and protects customers from poor service delivery.

Required action: The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide a convincing ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this it should remove the underperformance collar.

The company should revise the deadband level to 99% or provide justification why this is not appropriate.

Our response

We provide additional explanation and justification for our proposed deadband and collar.

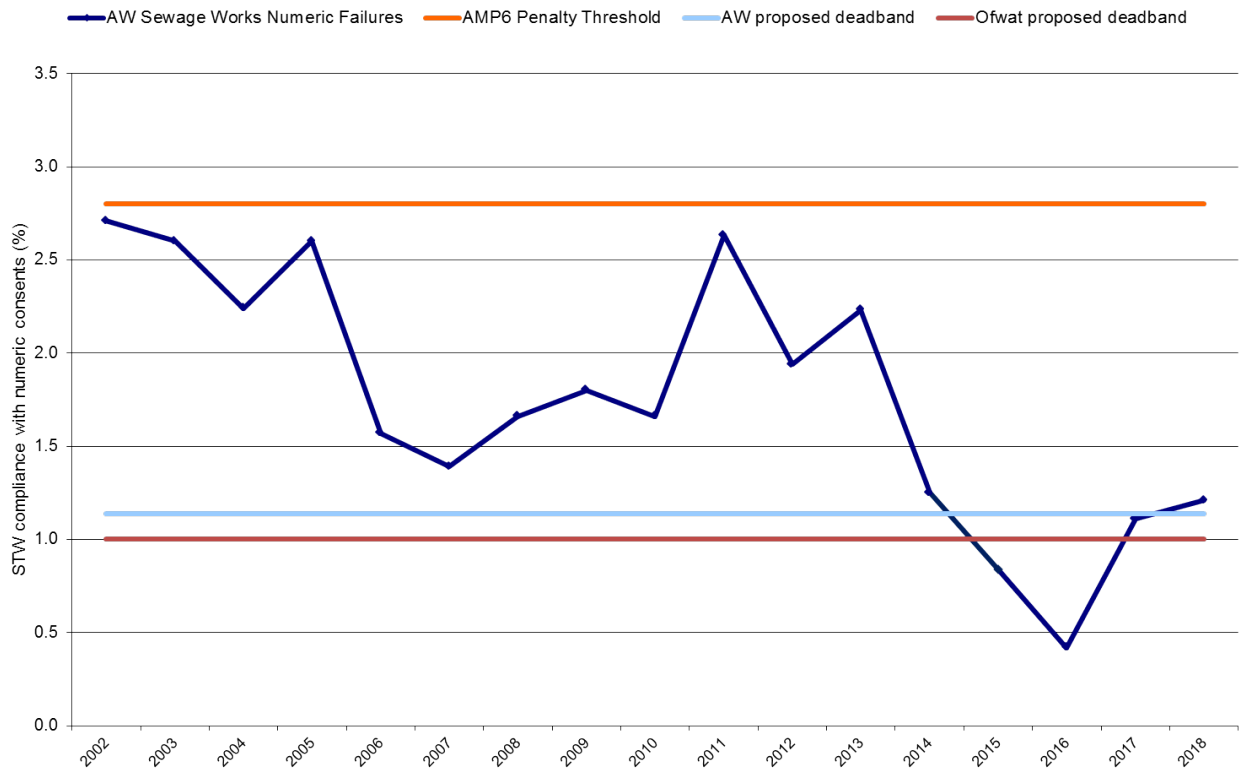
Deadband for treatment works compliance

As part of the overall PC and ODI package that we developed our customers approved of deadbands being used for a limited set of ODIs. Our acceptability research as part of our outline plan asked specifically about Treatment Works Compliance, where 77% of household and 88% of non-household customers agreed that both the deadband and the associated PCL that we proposed are sufficiently

stretching. We also have customer support for the use of specific deadbands. We propose that the support of our customers is sufficient evidence to retain the deadband that was in our Final Business Plan.

The below graph demonstrates the challenge we currently have to meet the deadband that we have proposed. In AMP7 the Treatment Works Compliance measure will include Water Treatment Works, which makes the target more challenging as we have over 130 of them and they currently make up 39% of our non-compliant discharges.

Figure 31 Treatment Works compliance



The deadband we have proposed is half of the penalty threshold for Sewage Treatment Works Compliance in AMP6 and we have only achieved this level of performance 3 times in our history. The deadband that we have proposed is appropriate for our customers and our region.

Collar for treatment works compliance

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Our collars for Treatment Works Compliance are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum adjustment of £24.3m, which applies for the underperformance payments. Our standard approach would have

taken the incentive rate that resulted from our societal valuation work applied to this range to set the collar for sewer collapses. However, when we calculated customer willingness to pay for improvements to the number of sewer collapses using our societal valuation work this resulted in a relatively low marginal benefit.

We therefore took the P10 performance to equal the collar for this performance commitment to ensure that customers are protected against the most likely range of performance up to the maximum value that they see as appropriate for the total ODI impact. Based on the ODI mechanism proposed the collar is set at 95% each year in AMP7.

7.13 Low pressure

7.13.1 Stretch

Action reference: ANH.OC.A37

Ofwat concern: The company provides projected performance levels which are not sufficiently stretching. As a result the company may be able to benefit early in the 2020 - 2025 period following no discernible improvement in performance. In addition to this the company proposes a flat long term performance level without sufficient explanation why further reductions are not in customers interests.

Required action: The company should revise its performance forecast to reflect more stretching performance in each year of the 2020-25 period. The company should also revise the flat performance in its longer term forecast or provide convincing evidence why this is not in customers interests.

Our response

We provide additional justification for our performance commitment level and long term forecast. This rationale is supported by our customers.

Our proposed performance commitment level is predicated on two factors. The first being achieving significant outperformance in the final year of AMP6. The second is the delivery of a large scheme in late AMP7.

Achieving our AMP6 ambition

We in 2018-19 we expect to outturn around 250 properties. We have had more work to do in AMP6 in order to reduce the number of properties experiencing low pressure to 150. This has been exacerbated by increased demand for water during the warm summer of 2018, putting a larger number of properties at risk. It also reflects significant ongoing action to prevent properties coming onto the register. There is a real possibility that we outperform out AMP6 performance commitment level but not sufficiently to avoid penalty in the first year of AMP7.

Due to the flat nature of our region we have a large number of properties that are not currently reportable, but are borderline. We must continue to invest in AMP6 to keep properties from experiencing low pressure.

This means that the proposed PCL is stretching in AMP7.

Delivering more in AMP7

In AMP7, we plan to deliver a large scheme that aims to remove a group of customers that have been on the register for some time. There is no straightforward solution, hence the properties still being on the register. The scheme is planned for later AMP7 as it will take several years to evaluate and identify the optimal solution. This is likely to involve creating a new tank asset or a substantial length of main laying. Both of these solutions will take a number of years to deliver. Planning for delivery of this scheme will begin in earnest in AMP7.

Due to the flat nature of our region we have a large number of properties that are not currently reportable, but are borderline. Localised changes in demand can be sufficient to make them reportable, particularly when we experience extreme weather. We estimate that we will need to invest to keep around 720 properties from being added to the register in AMP7. This will be occuring while we identify the best solution for the larger scheme. Increased demand during periods of warm weather can also impact pressure on the network, which may increase the number of properties that could be added to the register without action being undertaken by us.

In acceptability research on our Outline Plan, we further tested whether our PCL was stretching. In response to this research 77% of household and 92% of non-household customers agreed the PCL was stretching.

Beyond AMP7

To achieve further reductions than those planned in AMP7 would require costly bespoke solutions for a number of individual or small groups of properties. This would include booster stations for individual properties. We do not think this is an efficient use of constrained resources. In the majority of cases these properties have their own solutions in place which they maintain, and we do not receive complaints on low pressure, we also have mechanisms in place to resolve issues should they arise.

Customers do not support investments to address issues at individual properties. Our wider customer base do not support us reducing low pressure any further.

Customer support

When presented with our investment proposals in this area, not all customers immediately bought-into the idea of the company investing to address all low pressure issues. Customers who took part in the online discussion on low pressure also felt the proposed investment to tackle this issue felt high, considering the relatively small number of properties affected. Customers found it easier to accept the investment when this was presented as benefitting a group of properties, or an entire area, as this felt more in line with other improvements designed to enhance the network as a whole.

In acceptability research on our Outline Plan, low pressure was considered to be the least important measure of asset health by both household and non-household customers.

7.13.2 Caps and collars

Action reference: ANH.OC.A38

Ofwat concern: The company proposes to apply an outperformance cap and underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC.

Responding to the action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for low pressure

For low pressure, customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars as well as then PCL that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment). Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3.

To set the cap and collar we have apportioned the maximum incentives that customers wish to apply to low pressure (+/- £20.8m over AMP7) between the five years of AMP7. This gives the maximum incentives in an individual year. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set to 0 as the maximum level attainable.

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at around 340 properties above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.14 External sewer flooding

7.14.1 Stretch

Action reference: ANH.OC.A39

Ofwat concern: The company provides insufficient evidence to demonstrate that the forecast performance level is sufficiently stretching, given a significant improvement in performance in the past year. The company provides insufficient evidence to set out the reasons for this improvement and why it cannot be sustained over the 2020-25 period.

Required action: The company should revise its forecast performance level in line with recent performance or provide further evidence of why the last year's performance cannot be sustained.

Our response

We provide further evidence outlining how recent strong performance cannot be sustained. We consider that the performance commitment levels that we have set are sufficiently stretching.

When setting PCLs for this ODI we calculated the most recent Upper Quartile level using the data provided to Ofwat by companies as part of their table 3S APR reporting. We chose this as it is the most consistent dataset available for the whole industry at the time plans were being produced. This produced the a figure of 15.85 areas flooded per 10,000 connections to sewers, which is the equivalent of 4,349 incidents on the Anglian sewer network. We also considered the performance commitment indicated by cost benefit analysis and this suggested a level of 4,220 incidents. For all years of AMP7 our PCLs go beyond the levels suggested by these methods.

This performance commitment is particularly stretching as in recent years our performance has been assisted by the low rainfall but in the future the weather is likely to have a negative impact on our performance. In its guidance for modelling future flood risk, the EA suggests there could be a 5-10% increased in peak rainfall intensity. Intense periods of rainfall can increase the risk of sewer flooding. We also expect significant growth, with over 200,000 new wastewater connections expected in AMP7. This growth will make even maintaining historic levels of performance more challenging.

The stretch in our performance commitment can also be justified by looking at our historic performance against this measure and the relationship with rainfall.

Figure 32 Rainfall and external sewer flooding

This measure is quite volatile and is affected by external factors such as weather. For these reasons it is difficult to forecast exact levels of performance into the future. The above graph shows the relationship between days of rainfall greater than 1mm in the East Anglia meteorological region and the number of external flooding incidents we reported by from (2010-2017). This demonstrates a close relationship between the two. The days of rainfall greater than 1mm are displayed in relation to the maximum and minimum for the 1961-2018 period, which demonstrates that performance experienced in recent years is typical and that lower performance is unlikely. This is because the rainfall experienced in this time period has covered the same range as that experienced over a much longer time period.

The presence of a symmetrical deadband for this performance commitment must also be accounted for. These allow a narrow range, where the impact of rainfall is buffered and the incentives kick in once customers can be more confident that they are being applied as a result of management action, rather than weather related impacts. Investment must continue in dry year to ensyre penalties are avoided in a wet year.

Our aim is to show improvement across AMP7, and to meet the challenge that maintaining the current botex allowance provides.

7.14.2 ODI rate

Action reference: ANH.OC.A40

Ofwat concern: There is substantial variation in proposed ODI rates across companies for common and comparable PCs. This finding implies large differences in underlying costs and customer preferences that cannot plausibly be explained by companies' comparative and historical performance, or exogenous factors such as household income or water stress.

Required action: The company should explain why its proposed rates differ from our assessment of the reasonable range around the industry average (as set out in 'Technical appendix 1: Delivering outcomes for customers') and demonstrate that this variation is consistent with customers' underlying preferences and priorities for service improvements in external sewer flooding.

The company should also provide the additional information set out in 'Technical appendix 1: Delivering outcomes for customers' to allow us to better understand the causes of variation in ODI rate for external sewer flooding and assess the appropriateness of the company's customer valuation evidence supporting its ODI.

Our response

Overall rates

We provide the additional information requested by Ofwat in Technical appendix 1 and provide further explanation for how our rates relate to enhancement expenditure.

We have significant concerns with Ofwat's approach to standardising incentive rates across the industry. Our concerns are detailed as part of our response to action ANH.OC.A2.

We are confident that our incentive rates reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Calculating benefits

We provide the information requested in 'Technical appendix 1: Delivering outcomes for customers' in the table below. This demonstrates that there is a clear, robust line of sight from our customer valuations and preferences to our external sewer flooding ODI rate. The approach to valuation and final report was peer reviewed by Professor Ken Willis of Newcastle University (see annexes 12i and 12j of our business plan) and our translation of these valuations for use in calculating ODI rates was reviewed by ICS consulting (see annex 13c of our business plan).

Table 70 External sewer flooding - requested information

Requested information	Our response	Notes on source
Performance increments / decrements tested with customers	Valuations were gathered over performance increments and decrements. The measure of service was the number of properties affected by external sewage flooding each years . The ranges of performance were based on our view of reasonable performance. The range was from 7,100 properties affected to 3,100 properties affected.	Valuation completion report, Section 11
Basis of willingness to pay values	The number of incidents is linked to societal evaluations for external sewer flooding of domestic curtilages and commercial industrial buildings. We	Valuation completion report, Section 11

	exclude any non-private land from this calculation. They used historic data to work out a weighted average of a typical external flooding event given historical data. The values used for ODI rates represent only performance increments. This on the basis that the ODI incentivises improved and vevry stretching performance.	Valuation completion report, detailed spreadsheets, 180129 Water resources options V1.0
Application of scaling	We have used scaled values for the calculation of our ODI rates. We have scaled values on the basis of a package exercise. This gave customers a series of performance and bill 'options'. The packages presented to customers are shown in the table below.	VCR, Annex 1, page 11

Table 71 External sewer flooding - package exercise

Attribute	Unit	Level -2	Level -1	Level 0	Level +1	Level +2
External sewer flooding	Number of properties affected by external sewage flooding each year	7,100	6,100	5,100	4,100	3,100
Water bill (households)	Change in annual water bill from 2020	£20 decrease	£10 decrease	No change	£5 increase	£15 increase
Water bill (non-households)	Change in annual water bill from 2020	5% decrease	3% decrease	No change	2% increase	4% increase

Calculating costs

In Section 13.7.1 of our business plan we explained our approach to determining marginal costs. Our approach has been peer reviewed by Frontier Economics. Their report can be seen as Annex 13b Review of cost curves. We provide more detail of our general approach in response to action ANH.OC.A2.

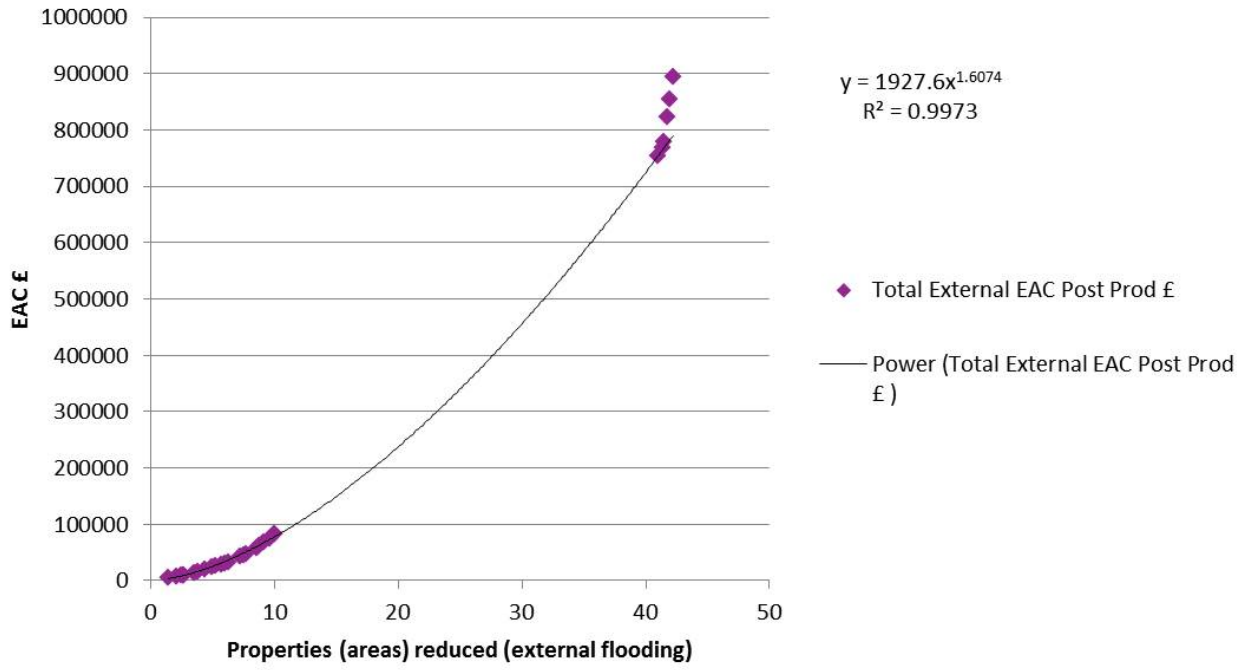
Specifically for external sewer flooding

We have collated cost data from C55 to determine individual programs of investments and the associated incremental improvement in performance. This includes a mixture of botex and enhancement expenditure. These enhancement totex for these investments is included in WWS2 Lines A30 and B77.

Botex investments to increase sewer flushing (planned preventative maintenance) and sewage pumping station wet well cleans were included in the curve as these deliver improvements in performance. The totex for this investment falls within WWS1 Line A9. In areas of common cost with internal sewer flooding and pollution incidents costs were apportioned on the basis of societal benefit.

This resulted in the below total cost curve.

Figure 33 External sewer flooding cost curve



External sewer flooding incentive rates

For External Sewer Flooding our proposed performance commitment level is beyond the level suggested by cost-benefit analysis. This means that the marginal cost of improvement at the PCL outweighs the marginal benefit of service improvements. This results in the standard formula implying an underperformance penalty rate of zero.

Following advice from Frontier Economics, we have set the underperformance penalty rate to match the outperformance incentive rate. The approach is pragmatic and delivers significant underperformance penalty rates. It implicitly captures an adjustment to the marginal cost and mechanically this approach implies that the incremental cost has been set equal to the incremental benefit at the performance commitment level.

The rates are coherent with our rates for internal sewer flooding, pollution incidents and sewer collapses. There is no double counting of benefits or incentives. There are separate customer valuations for internal sewer flooding, external sewer flooding and pollution incident, which were scaled together as part of the package exercise described above. The sewer collapses rate is derived from our ODI research with customers. This informed the caps and collars for all sewer performance commitments and how incentives are split between asset health and service. We conclude that the rates and scale of our sewer ODIs strongly incentivise both short and long term performance in line with the views of our customers.

We are confident that our incentive rates reflect our customers preferences and priorities. They are based on robust valuations and efficient costs. We note our incentive rates for lower than Ofwat's identified range. We are comfortable with this associated with our proposed PCL and caps and collars.

7.14.3 Caps, collars and deadbands

Action reference: ANH.OC.A41

Ofwat concern: The company provides insufficient evidence to justify its proposition to apply an outperformance deadband and underperformance deadband to this PC, as well as an underperformance collar and outperformance cap.

Required action: The company should either remove the proposed deadbands from this PC or provide convincing evidence to explain why these deadbands are appropriate and in customers' interests.

The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our 2018 Plan to support our use of a deadband, cap and collar for this PC. We also provide additional customer evidence in relation to the deadband.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

We have reviewed the plans submitted by other companies and are confident that the evidence produced in our plan offers the most comprehensive evidence that customers value the reduction in bill volatility that these mechanisms provide. It was as a result of this research with our customers that Ofwat rated us so highly on the customer engagement within our plan. It is clear that customers do not view these mechanisms in the same way are more open to mechanisms that reduce bill volatility.

Caps and collars for external sewer flooding

For external sewer flooding, customer valuation for improving service and customer views on its relative importance for financial incentives have combined to set the caps and collars as well as then PCLs that we proposed in our plan. The caps and collars are set at the level of performance each year that results in the maximum incentive being applied (either outperformance incentive payment or underperformance penalty payment). Determining maximum incentives based on customer views is described in our response to action ANH.OC.A3.

Our caps and collars for the external flooding ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £5.5m, which applies for both the outperformance and underperformance payments. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 72 External sewer flooding - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	2292	2242	2192	2142	2092
Underperformance Collar	5951	5901	5851	5801	5751

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at over 1,200 areas flooded above the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is perfect alignment between our approach to caps and collars and customer protection.

We consider that this PC is weighted in favour of customers - as evidenced by the P10 and P90 payments that we have submitted. We believe that it is unlikely that we will be able to achieve the caps on the out performance side, but have put them in place in order to ensure that customers are protected from bill swings that they are not willing to support.

The same is true of the underperformance collar and particularly for a weather sensitive measure such as flooding. Where a year of exceptional weather could cause a large penalty to be incurred in one year, performance in the range of the PCL the following year could generate a further bill swing that customers told us that they want to avoid.

Deadbands

We have been selective when choosing where to apply deadbands in our PR19 business plan. In the case of external sewer flooding we are protecting against the unnecessary bill volatility that would arise from weather variations throughout AMP7. This is in line with research that we have carried out with our customers, where they have told us that they would prefer their bills to remain stable where possible.

We consider that the overall package of deadbands and performance commitment levels that we have set are sufficiently stretching for external sewer flooding .

Deadbands protect customers and companies from variances in performance that might result in an outperformance or underperformance payment that may have been caused by events outside of management control. For external sewer flooding, several years of reduced rainfall could result in reduced incidences of flooding, it would not be appropriate for companies to earn large rewards for outperformance. Deadbands form part of a package to mitigate against this risk. Even for the most resilient and best performing company there is no immunity to volatile performance introduced by factors outside of management control.

Ofwat said in its Final Methodology that it would discourage deadbands that remove the incentive for companies to improve performance. The PCLs for external flooding incentivise improved performance beyond the levels currently achieved and the deadbands show improvement across AMP7 is in spite of no additional botex allowance and no change from the historic funding arrangements that required companies to maintain stable performance levels.

For External Sewer Flooding we have the following evidence to support the inclusion of deadbands.

- Customer support – this is the most important reason for including these deadbands. As part of the overall PC and ODI package that we developed, our customers approved of deadbands being used for a limited set of ODIs. We were robustly challenged by our Customer Engagement Forum for our approach to ODIs, including on the use of specific deadbands which were considered by the Valuation Sub-Panel.
- Protection against unnecessary bill volatility - one of the key themes that came out of our customer research was that our customers do not like bill volatility, rather they would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance, to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

"I'd rather pay more and know what I'm paying, rather than you know, have it more about. Yes, you can save money, but you can also be out of pocket as well."

"You wouldn't want it to be that volatile I don't think, it might be worse to see it go up one it has been really low, and to have to keep checking it as well."

Customer views on bill volatility caused by ODIs from our Outcome Delivery Incentive Research, June 2018.

Further customer research into deadband acceptability

As part of our ongoing customer research, we asked a sample of our customers their opinion about our use of deadbands for this ODI. Of those who took part 58% indicated support for the use of the deadbands (with 10% neutral or don't know). We consider that this support justifies our inclusion of a deadband for our external sewer flooding PC.

"A very difficult subject because of the unpredictability of weather, but looks like AW have thought about it and planned as well as they can". Customer taking part in 2019 online community research

7.15 Reactive Mains Bursts

7.15.1 Stretch

Action Reference: ANH.OC.A42

Ofwat concern: The company does not provide sufficient evidence to justify that the projected performance level over the 2020-25 period is sufficiently demanding, particularly given that active leakage control activity is likely to reduce the number of reactive mains bursts.

Required action: The company should consider revising its projected performance level to take into account expected active leakage control, to make this PC more stretching. The company should clearly set out its evidence and rationale for the revised targets.

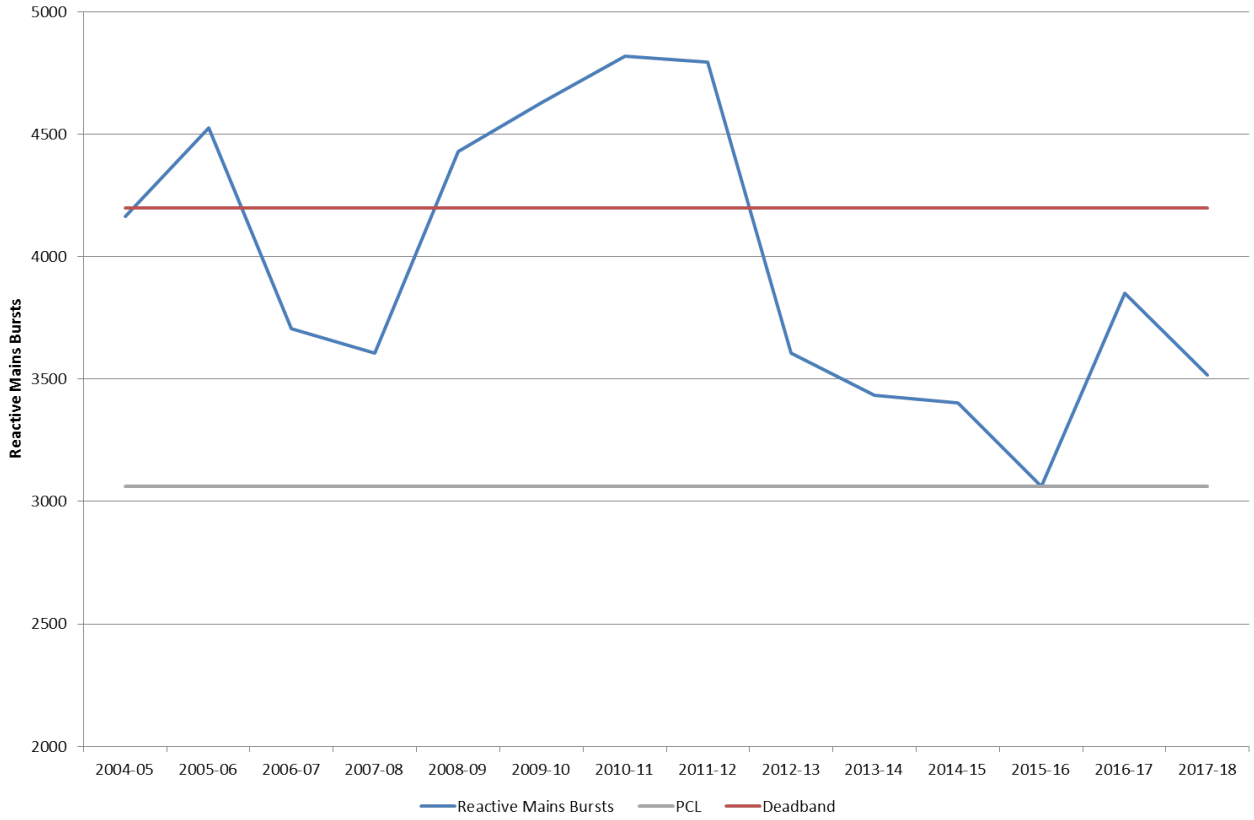
Our response

We provide additional justification that our proposed performance commitment level is stretching.

We believe we have adopted a reasonable approach for this performance commitment. We have not proposed outperformance incentives and our performance commitment level is stretching.

We consider that the performance commitment levels that we have set are sufficiently stretching. This can be justified by looking at our historic performance against this measure.

Figure 34 Historic reactive mains bursts



This measure is quite volatile and is affected by external factors such as weather. For these reasons it is difficult to forecast exact levels of performance into the future. To set a target that was less stretching, we could have used average performance over several years and set this as the PCL for each year. However, due to our desire to show improved performance, we consider that setting a target to hit our best level of historic performance in each year of AMP7 is very stretching.

This means that we have set ourselves a target that we have never bettered and one which is a 12% reduction on our most recently reported performance (3,441 repairs in 2017-18). We believe that, although this means that we could miss this target in the early years of AMP7, this will provide an incentive to beat our best historic performance in years that have favourable external conditions and to aim to reduce reactive mains repairs by as much as possible in those years that do not.

This aim, to show improvement across AMP7, is in spite of no additional botex allowance and no change from the historic funding arrangements that required companies to maintain performance levels.

We have already seen a change in reactive and proactive bursts driven from increased leakage detection. The proactive bursts we target now are those 'hidden' bursts that wouldn't ever be identified by customers or traditional detection.

7.15.2 ODI type

Action Reference: ANH.OC.A43

Ofwat concern: For Total Mains Bursts we have asked the company to provide further evidence to justify its non-financial incentive or propose a financial ODI. If it proposes a financial ODI for Total Mains Bursts there may be double counting with this PC.

Required action: If the company chooses to apply a financial ODI to Total Mains Bursts it should also review its selection of a financial ODI for this PC and ensure there is no double counting.

Our response

We have not proposed a financial ODI for Total Mains Bursts, therefore this action is not applicable.

7.15.3 Deadband, caps and collars

Action Reference: ANH.OC.A44

Ofwat concern: The company proposes to apply an underperformance deadband and underperformance collar to this PC, but it does not provide sufficient justification.

Required action: The company should either remove the proposed underperformance deadband from this PC or provide convincing evidence to explain why this deadband is appropriate and in customers' interests.

The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide an ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this it should remove the underperformance collar.

Our response

We provide additional justification of our proposed deadband and caps and collars.

Our response to this action should be considered along side our response to action ANH.OC.03, which explains our overall approach to caps collars and deadbands, action ANH.OC.A04, which explains our overall PC and OCI package and in conjunction with action ANH.OC.06, which explains our approach to customer protection.

The level of caps and collars and deadbands for each performance commitment are based on customer views for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives.

We have reviewed the plans submitted by other companies and are confident that the evidence produced in our plan offers the most comprehensive evidence that customers value the reduction in bill volatility that these mechanisms provide. It was as a result of this research with our customers that Ofwat rated us so highly on the customer engagement within our plan. It is clear that customers do not view these mechanisms in the same way that has been assumed in recent regulatory precedent and that they are more open to a holistic view that reduces bill volatility.

Caps and collars for reactive mains bursts

Our collars for the reactive mains bursts ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £5.2m, which applies for the underperformance payments. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate. This gives the following profile:

Table 73 Reactive mains burst - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Underperformance Collar	7286	7286	7286	7286	7286

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at over 3000 mains bursts above the deadband. The benefits to customers from these collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers.

We consider that this PC is weighted in favour of customers - as it is penalty only and represents a substantially more difficult incentive to avoid penalty than our AMP6 PC.

The underperformance collar provides protection for customers on a particularly weather sensitive measure such as reactive mains bursts. Where a year of exceptional weather could cause a large penalty to be incurred in one year, performance in the range of the PCL the following year could generate a further bill swing that customers told us that they want to avoid.

Deadbands

We have been selective when choosing where to apply deadbands in our PR19 business plan. In the case of reactive mains bursts we are protecting against the unnecessary bill volatility that would arise from weather variations throughout AMP7. This is in line with research that we have carried out with our customers, where they have told us that they would prefer their bills to remain stable where possible.

We consider that the overall package of deadbands and performance commitment levels that we have set are sufficiently stretching for reactive mains bursts. This can be justified by looking at out historic performance against this measure.

The graph in our response to ANH.OC.A42 demonstrates that the PCL is set at a level that we have not achieved before and the deadband would mean that a penalty would have applied if in operation during AMP6. For context, during AMP6 we have performed 40% below the level that would trigger a penalty in every year. As a package, this performance commitment is much more stretching than the asset health measure currently in place.

Deadbands protect customers and companies from variances in performance that might result in an outperformance or underperformance payment that may have been caused by events outside of management control. For reactive mains bursts, years with prolonged cold winters could result in increased incidents of mains bursts, this could result in a significant decreases in bills during that year and then a large bills increase the following year when the effect of weather is removed.

Deadbands form part of a package to mitigate against this risk. Even for the most resilient and best performing company there is no immunity to volatile performance introduced by factors outside of management control.

Ofwat said in its Final Methodology that it would discourage deadbands that remove the incentive for companies to improve performance. The PCL for reactive mains bursts incentivise improved performance beyond the levels currently achieved and the deadbands ensure that performance does not deteriorate to levels worse than those acheived in the past. This will be achieved with a reduced botex allowance and no change from the historic funding arrangements that required companies to maintain stable performance levels.

For Reactive Mains Bursts we have the following evidence to support the inclusion of deadbands.

- Customer support – this is the most important reason for including these deadbands. As part of the overall PC and ODI package that we developed, our customers approved of deadbands being used for a limited set of ODIs. We also have support from our Customer Engagement Forum for our approach to ODIs, including the use of specific deadbands which were considered by the Valuation Sub-Panel.
- Protection against unnecessary bill volatility - one of the key themes that came out of our customer research was that our customers do not like bill volatility, rather they would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance, to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

"I'd rather pay more and know what I'm paying, rather than you know, have it more about. Yes, you can save money, but you can also be out of pocket as well."

"You wouldn't want it to be that volatile I don't think, it might be worse to see it go up one it has been really low, and to have to keep checking it as well."

Customer views on bill volatility caused by ODIs from our Outcome Delivery Incentive Research, June 2018.

7.16 Managing void properties

7.16.1 Stretch

Action reference: ANH.OC.A45

Ofwat concern: The company provides insufficient evidence that its proposed target for 2020/21 is stretching.

Required action: The company should reconsider its proposed percentage target for 2020/21. The company should improve the target or justify it clearly setting out the evidence and rationale.

Our response

We provide additional justification for our proposed performance commitment level.

We have ensured that our percentage target is relevant and challenging. Our performance commitment addresses what is within management control. Its focus is on limiting the avoidable extra cost to customers resulting from "occupied" void properties rather than being a metric of overall void property numbers. Measuring the performance commitment in this way is highly relevant for customers because it reflects the properties that are within our control to identify and which have an impact on their bill (i.e. where voids are correctly identified as void it is not possible to bring these properties into charge; but where they might otherwise be brought into charge, other customers end up paying more because those occupied-void properties aren't receiving a charge). It does not focus on the number of unoccupied properties correctly classified as void, as these are outside of management control, and determined by broader macro-economic factors.

This is a new performance commitment with no historic or comparative context; companies report the total number of voids rather than the number of occupied voids, and no other company has proposed an equivalent performance commitment.

We are reversing the recent increase in the proportion of properties classed as void in time for the start of AMP7 from 103,393 in 2018 to 93,021 in 2020. This is reflected in data table App30. We believe it is in the best interests of our customers to deliver this improvement now, rather than wait until AMP7 for the sole purpose of demonstrating an improving target. Our performance commitment level has been set to test that more than 90% of properties classed as void for more than 6 months are unoccupied.

If the level of voids increases over the AMP, then our target will become more challenging, because in order to limit the number of occupied-voids to 0.25% or less of all properties, a smaller proportion of the sample of 1000 void properties must be found to be occupied. For example, if 2.5% of properties are classified as void, we must find that more than 90% of the samples of properties void for more than 6 months are unoccupied. If the proportion of void properties increases to 5%, we must ensure that more than 95% of the samples of properties void for more than 6 months are unoccupied.

The table below highlights how this works under several scenarios where the proportion of voids is high or low. This provides a strong incentive and therefore promotes greater focus on this area, even where the proportion of properties classed as void were to increase beyond our control.

Table 74 Managing void properties - high / low scenarios

Description	Calculation	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
% of total properties which are classified as long term voids	A	1	2.5	5	10	20
% of total properties which are classified as long term voids and are occupied **(Performance Commitment Level)**	B	0.25	0.25	0.25	0.25	0.25
% of total properties which are classified as long term void and are not occupied (in order to meet PCL under each scenario)	A-B	0.75	2.25	4.75	9.75	19.75
% of properties in survey sample which must be unoccupied in order to meet PCL	1 -(B/A)	75.00	90.00	95.00	97.50	98.75
Number of properties in survey sample which must be unoccupied in order to meet PCL (sample size: 1,000)	1000 * (1-(B/A))	750	900	950	975	988

In acceptability research on our outline plan, 74% of household and 81% of non-household customers agreed our proposed PCL was stretching. See Annex 13g 'Acceptability testing: Outline business plan' of our September 2018 business plan.

7.16.2 ODI type

Action reference: ANH.OC.A46

Ofwat concern: The company does not provide sufficient evidence to justify the use of a non-financial incentive for this ODI.

Required action: The company should provide further evidence to justify the use of a non-financial incentive by demonstrating why a financial incentive would not be in the interests of customers.

Alternatively, the company should formulate a financial ODI reflecting the reduction in customer bills that would result from a reduction in the proportion of occupied void properties.

Our response

We provide additional justification for the type of incentive.

Our target has been set in order to focus effort on limiting bill volatility for customers resulting from the number of occupied-void properties which are avoidable given this is within management control to influence this figure.

We have not attached underperformance penalties to this performance commitment. As highlighted in our response to action ANH.OC.A45, whilst focussing on reducing the number of occupied voids as these are within management control, our performance commitment becomes more stretching as the proportion of void properties increases. Therefore, applying underperformance payments creates a disincentive to proactively identify void properties and add them to our records increase the likelihood of not meeting our performance commitment and being eligible for an uderperformance penalty (see table of scenarios in ANH.OC.145 response, which demonstrates how the stretch of the performance commitment changes as the number of void properties changes). We therefore do not believe an underperformance penalty would be in the the interests of customers.

We have not attached outperformance payments to this performance commitment. By minimising the proportion of long-term occupied void properties, we will reduce the cross subsidy provided by customers who receive a charge, reducing the level of customer bills. Applying an outperformance payment would limit the benefit that customers receive from lower bills. Therefore we do not believe an outperformance payment would be in the interests of customers.

In acceptability testing of our proposed PC, voids was seen as a lower priority for customers, ranking last from our bespoke performance commitments. A reputational incentive will allow us to explain our analysis as to why we have outperformed or underperformed against the performance commitment level including with reference to both the total level of voids and the proportion of voids which are identified as occupied.

This approach recognises that when the number of void properties is high, we will need to focus our efforts on ensuring the number of occupied voids is kept under control to ensure we can limit the impact on customer bills.

7.17 Water Quality Contacts

7.17.1 ODI Rate

Action reference: ANH.OC.A50

Ofwat concern: The company does not provide sufficient evidence that its ODI outperformance payment is appropriate relative to the level of stretch proposed for this PC.

Required action: The company should provide further evidence to justify the standard outperformance ODI rate assigned to this PC given the forecasted flat performance over the 2020 - 2025 period.

The company should provide its evidence and rationale of why this is in its customers interest.

Our response

We provide further justification to support our proposal.

The PCL and incentive rates that we have proposed for this performance commitment are part of the package of cost and service approved by our customers. Customers told us that they felt that while they think that drinking water quality is an important service attribute (the most important of our ten outcomes - 97% of customers taking part in our Acceptability research) they are also strongly supportive of our proposals to maintain performance at the current AMP6 levels.

"AW's maintenance programme of infrastructure and numbers of customers calling to complain shows that they're on the right track. If this is maintained in the future, there's no reason for an increase in customer complaints."

"It would be a waste of bill payers' money to take it any lower. If there's no benefit to take it to 1.17 and will cost money, why not leave it at 1.38? It's still better than others in the industry!"

Customer views from our Online Community

We have set our PCLs for this measure at a level that requires us to maintain the levels of performance we have achieved during AMP6. This has been achieved through investment in our network to target specific areas where contacts were high. Further improvement across our network will be more difficult as issues we now experience are less easy to target.

During AMP7, we expect that the influence of growth in our region will cause upward pressure the number of customer contacts as new areas of our network take time to settle.

Customers have accepted our proposed level of performance as part of the package of service they will receive at a price they are prepared to pay. However we also know customers are prepared to pay extra for additional improvements in service from our societal valuation work. This is the basis of the outperformance incentive rate.

We have calculated our incentive rate, using customer valuation for improving performance. We have included a marginal cost of 0 in the calculation of our underperformance incentive rate to reflect the flat PCL. This is because there is no investment in the plan for further improvement. However if we do invest to improve performance we should be able to earn a return. This means that the underperformance incentive rate is significantly stronger than the outperformance incentive rate. We conclude this appropriately balances risk and reward in favour of customers.

We are confident that our incentive rates for Water Quality Contacts reflect our customers' underlying preferences and priorities for service improvements. As recognised by Ofwat we undertook an innovative, robust, programme of willingness to pay research which was subject to external third party assurance.

Our performance commitment captures, taste, odour and discolouration. We note that a range of definitions have been adopted by companies as part of their PR19 submissions.

7.17.2 Caps and collars

Action reference: ANH.OC.A51

Ofwat concern: The company proposes to apply an underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent sufficient justification for the application of a collar to this specific PC.

Required action: The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide a convincing ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this it should remove the underperformance collar.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and Collars For water quality contacts

Our caps and collars for the Water Quality Contacts ODI are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £1.6m, which applies for both the outperformance and underperformance payments. We have then divided the maximum incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 75 Water quality contacts - performance profile

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	0	0	0	0	0
Underperformance Collar	1.75	1.75	1.75	1.75	1.75

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at 0.58 customer contacts per 1,000 population above the PCL . The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is perfect alignment between our approach to caps and collars and customer protection.

We consider that this PC is weighted in favour of customers - as evidenced by the P10 and P90 payments that we have submitted. We believe that it is unlikely that we will be able to achieve the caps on the out performance side. The calculated outperformance payment cap for this PC is 0.004 to three decimal places, however due to rounding to the number of decimal places used for this PC this means that the calculated cap coincides with the natural cap at zero.

7.18 Percentage of population supplied by a single supply system

7.18.1 Caps and collars

Action reference: ANH.OC.A52

Ofwat concern: The company proposes to apply an outperformance cap and underperformance collar to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent a sufficient justification for the application of caps and collars to this specific PC as the company does not consider the costs and benefits of applying these features to this specific PC, nor does it justify the levels at which the cap and collar are set.

Required action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for percentage population supplied by a single supply system

Our caps and collars for the single supply system performance are based on a maximum incentive that was determined through our customer engagement. The result of this valuation exercise was a maximum annual adjustment of £2.7m, which applies for both the outperformance and underperformance payments. We have then divided these incentives by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

The range of performance covered by the maximum adjustments varies between outperformance and underperformance depending on the incentive rates (which we have calculated using Ofwat's standard formula). This gives the following profile:

Table 76

	2020-21	2021-22	2022-23	2023-24	2024-25
Outperformance Cap	17.6	15.3	15.3	13.5	7.67
Underperformance Collar	28.7	26.4	26.4	24.6	18.7

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at 4.6% above the PCL.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.19 Bathing waters attaining excellent status

7.19.1 Deadband

Action reference: ANH.OC.A53

Ofwat concern: The company proposes to apply an underperformance deadband and underperformance collar to this PC. The company does not provide sufficient evidence to justify the use of either of these features. The argument that an underperformance deadband is necessary because many third parties can influence bathing water excellence is not sufficient justification. We expect the company to compensate customers for any failure to reach its PC target unless it can convincingly demonstrate that a deadband is in customers' interests. We additionally note that the deadband allows the company to avoid underperformance payments without improving on 2019/20 performance, which we consider to be inappropriate.

Required action: The company should either remove the proposed underperformance deadband or provide convincing evidence to explain why it is appropriate and in customers' interests. If the company chooses to retain the deadband, it should either increase the level at which it applies or provide a compelling justification for the level at which it is currently set.

Our response

We provide additional justification of our proposed deadband.

We have been selective when choosing where to apply deadbands in our PR19 business plan, as explained in our response to action ANH.OC.3. For Bathing Waters the deadband protects customers against unnecessary bill volatility.

A key theme from our customer engagement was bill volatility. We have taken steps to protect customers from bill volatilty through the use of deadbands and caps and collars. Customers say they would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where weather can cause variation in performance (e.g. External Sewer Flooding and Reactive Mains Bursts), to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of extreme weather and again the following year when the bill adjustment was removed.

We are not the only party that can influence bathing water quality. Other parties such as those with private discharges farmers, boating, algal growth and even dog fouling and bird reserves can also have an significant impact on water quality, as well as extreme weather conditions. To reflect the impact of factors outside of our control we are proposing a deadband to be set at 33, the baseline number of beaches predicted to attain excellent classification in 2019/20. In principle, 69% of customers support the use of deadbands on the basis that some flexibility to account for extreme weather or a small allowance if things 'go wrong' will ultimately lead to better performance. See Annex 13f 'Acceptability testing: PCs/ODIs' of our September 2018 business plan.

We tested our rationale and the level of the deadband with customers as part of the development of our business plan. In acceptability research on our outline plan, we tested whether our PCL and associated deadband was stretching. In response to that research 72% of household and 67% of non-household customers agreed the PCL and associated deadband was stretching. See Annex 13g 'Acceptability testing: Outline business plan' of our September 2018 business plan.

We conclude that the deadband is appropriate as it protects customers from bill volatility, deadbands are supported by customers in principle and at the specific level for this performance commitment.

We note Ofwat's point around the deadband meaning we would not be penalised for no improvement during AMP7. This is based on the assumption that we can deliver our proposals in AMP6 on what is a volatile measure, influenced by third parties. This is far from assured.

Further customer research into deadband acceptability

As part of our ongoing customer research, we asked a sample of our customers their opinion about our use of deadbands for this ODI. Of those who took part 67% indicated support for the use of the deadband (with 10% neutral or don't know). We consider that this support justifies our inclusion of a deadband for our bathing waters at excellent status PC.

*"33/49 is pretty good already; to achieve 36 would be fantastic but I understand this isn't a very easy goal because it isn't totally in AW's control. Keeping with the 33 for the buffer zone is a smart choice."***Customer taking part in 2019 online community research**

7.19.2 Caps and collars

Action reference: ANH.OC.A53

Ofwat concern: The company proposes to apply an underperformance deadband and underperformance collar to this PC. The company does not provide sufficient evidence to justify the use of either of these features. The company provides only a package level justification for caps and collars, and it does not consider the costs and benefits of applying a collar to this specific PC.

Required action: The company should reconsider whether to apply an underperformance collar to this PC, taking account of its broader approach to customer protection. If the company decides to retain the collar, it should provide a convincing ODI-specific justification for this decision. This should include justification for the level at which the collar is set, with the company explaining how this compensates customers adequately for poor service performance. If the company cannot provide this it should remove the underperformance collar.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for bathing waters

As an end of period incentive all of the incentives will apply in the final year of AMP7. The evidence from our customers supports this. We have then divided the maximum incentives of £18m by the underperformance penalty rate to set the collar above the PCL. The outperformance cap is set on the same basis using the outperformance rate.

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service at 4 bathing waters below the deadband. This is similar in scale to our AMP6 ODI for bathing waters which has delivered strong incentives to reach the PCL. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.19.3 Timing

Action reference: ANH.OC.A54

Ofwat concern: The company proposes to apply this ODI at the end of the 2020-25 period to revenue; this is not sufficiently justified based upon customer support.

Required action: The company should apply this ODI in-period, or alternatively provide convincing evidence on why it chooses to not do so. This should include evidence of customer support.

Our response

We provide additional evidence to support the proposed end of period incentive. This includes the outcome of additional engagement with our customers.

Our default position is that incentives should be in-period. This applies to most of our ODIs. We are proposing that this PC operates based on performance at the end of AMP7, as an exception to our default approach. We believe there is a strong case for an end of period incentive for bathing waters. This is supported by customers and recognised by our CEF.

The EU Bathing Water Directive produces classifications for water quality each year. However each classification is based on a 4 year rolling average of sample results and therefore requires four years of sampling to be undertaken in order to calculate a result. This means that even if improvements are made at the start of AMP7, it will take time for them to be reflected in the bathing water classification performance. We therefore do not anticipate a step change in improvements to classification until the end of the AMP, even though the investment will have been delivered.

To seek customer views on the appropriate type of incentive for this specific performance commitment, we interviews with a sub-set of customers. In these interviewed further detail regarding the time period over which the data is gathered and analysed were provided. The provision of this information led to customers changing their preference for this measure being an in-period measure to having a preference for an end of period measure. Preferences also changed on understanding that there are some external factors that can impact on our performance and it was felt unfair to penalise us immediately for this. It was felt that we should be provided with an opportunity to address these external factors. But customers do not want us to use external parties as an excuse for not hitting targets on an on-going basis. This is shown Annex 13f of our 2018 business plan.

Additional customer support

Following Ofwat's IAP, we have sought to engage further with our customers on this topic. 71% of customers involved in that exercise support the end of period incentives proposed. The results of this engagement can be seen in Annex 3a of this IAP response.

We believe there is a strong case for an end of period incentive for bathing waters as investment performance effectiveness cannot be seen until 4 years worth of data has been collected. This is supported by customers and we believe it is an appropriate exception to in-period incentives.

7.20 Supporting customers in vulnerable circumstances (qualitative)

7.20.1 Definition

Action reference: ANH.OC.A55

Ofwat concern: The company provides no evidence on survey methodology.

Required action: The company should provide additional evidence on the sample size used in the monthly survey to determine the PC target. In addition, the company should provide external assurance that the survey will be conducted in line with social research best practice.

As this performance commitment does not involve a survey, we sought clarification from Ofwat as to the nature of this action. This was clarified at a meeting with Ofwat on 19 February. Following this, we are responding to the revised action below.

Ofwat confirmed that rather than information of a survey, Ofwat would like would like more details on how the independent panel would work, data analysis and disclosure. They are also interested in who would be on the panel.

Our response

We provide the additional detail requested.

Our qualitative performance commitment measures this overall support provision through an independent assessment of our support for customers in vulnerable circumstances.

We are proposing an annual assessment by consultants and an independent panel. The independent consultant and panel will judge our performance against five criteria:

- Understanding and commitment to supporting customers in vulnerable circumstances
- Quality and use of data and information
- Management and use of the priority services register
- Developing and utilising partnerships
- Embedding a strategy for addressing vulnerability in systems, processes and customer interactions.

Detailed sub-criteria against which we will be assessed were published in Annex 13l of our business plan (Final AMP7 Performance Commitment definitions). These are based upon the same criteria as used to assess distribution network operators as part of Ofgem's Stakeholder Engagement and Consumer Vulnerability (SECV) incentive. This will allow us to externally benchmark our performance with other sectors.

We will receive a score out of 10 for each of the five criteria listed above, giving a total score out of 50. Our performance commitment will be based on this total score out of 50.

An independent consultant will undertake the assessment and present this to an independent panel. This Panel will determine whether there are any reasonable grounds upon which to adjust the consultant's suggested score (for example, to build in additional evidence from customer engagement).

Details of how the qualitative performance commitment would be run

Three elements will be used to assess Anglian Water's performance through the qualitative performance commitment:

- Pre-determined criteria;
- Independent panel and;
- Independent consultant.

Pre-determined criteria

The criteria determine the overall parameters of the assessment. The individual statements within these criteria provide the basis upon which the Panel will set specific expectations required for Anglian Water to reach each assessment level (poor, fair, good, excellent). The criteria have been designed to be detailed enough to indicate the expected performance at each level (i.e. excellent, good etc.), whilst not prescribing the detailed requirements in within these criteria. This will allow the flexibility for the assessment to reflect best current practice.

For example, the pre-determined criterion for "good" and "excellent" performance in 'Developing partnerships' is:

"Extensive range of partnerships, with a wide variety of organisation types. Partnerships provide full and effective support for all groups of customers in vulnerable circumstances."

The Panel will use its own expertise and evidence available at the time to determine what an "extensive range" of partnerships and a "wide variety" of organisation types is for each year of the AMP.

The Independent Panel

We are proposing that we will appoint the Independent Panel with the agreement of the Customer Engagement Forum. The CEF will provide challenge that the Panel will be making an assessment which is informed by our customer engagement work and that this is reflected in the specific assessment criteria for each year. The Panel will provide challenge on the findings and if it sees fit, will have the power to alter the assessment score if it disagrees with the independent consultant's recommendations. The panel will consist of members from third-party organisations, particularly those that have close interactions with customers in vulnerable circumstances.

The Independent Consultants

The expectations set by the pre-determined criteria and the independent panel will inform the consultant's assessment of our performance. The consultant will undertake the detailed assessment of our performance against the criteria. The independent consultant will be paid for by Anglian Water and appointed with the agreement of the Panel. The independent consultant will provide a report on the findings of its review against the assessment criteria and present this to the Panel.

Timeline

The review will take place on an annual basis and the Panel will meet at least two times per year. One to inform the independent consultant's assessment with a specific view of the requirements to be met by Anglian Water as part of its assessment, and another to consider the consultant assessment and confirm the final scores to be assigned to Anglian Water as part of the assessment.

The figures below show how we propose to appoint the Panel and Consultant and the proposed assessment process for the qualitative performance commitment.

Figure 35 Customers in vulnerable circumstances - panel appointment process

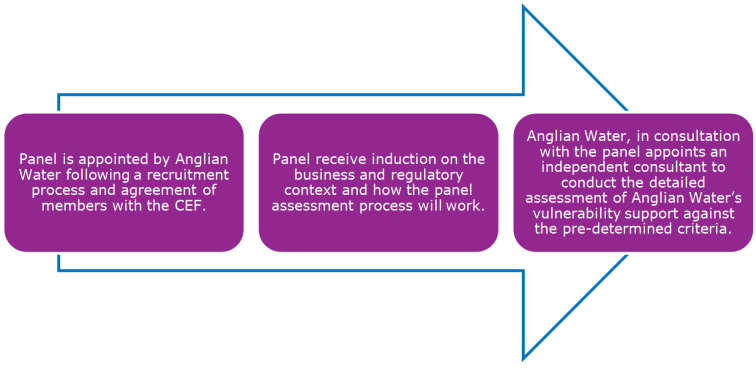


Figure 36 Customers in vulnerable circumstances - panel assessment process

7.20.2 ODI type

Action reference: ANH.OC.A56

Ofwat concern: The company proposes an outperformance only payment for this PC and states that any outperformance payments associated with it will be reinvested into vulnerable customer services. However, the company has not provided sufficient evidence on how this will occur.

Required action: The company should provide further evidence to demonstrate how the outperformance payments from this PC will be reinvested into vulnerable customer services. In this instance, the company should propose an outperformance and underperformance incentive rate.

Our response

We provide further evidence for how outperformance would be reinvested.

The way in which outperformance payments for this performance commitment will be reinvested will be informed by our panel assessment and the priorities of customers in vulnerable circumstances, elicited though business as usual customer engagement. This will help us to identify where we are demonstrating best practice and where we have more room for improvement. By helping us to understand what is working well for customers on a qualitative level and conducting a lessons learned approach, we will consider how our best practice approaches can be applied to other areas of our vulnerability strategy. For example, we may receive an 'excellent' score for delivering positive outcomes for a particular group of customers in vulnerable circumstances. We would reflect on

what made this partnership a success, and reinvest outperformance payments to expand on the positive learning experiences. This will to improve support for customers in vulnerable circumstances by encouraging innovative approaches to be taken and using evidence-based approaches to reinvesting in those areas that work well.

Some examples of where we may look to reinvest are provided below. It should be noted that new priority areas of funding will emerge during the AMP as we learn from the Panel's assessment.

Strategic understanding and commitment to the role that Anglian Water can play in tackling social issues relevant to customers in vulnerable circumstances

- Funding research – i.e. funding University of East Anglia to undertake research that could help inform and enhance the industries understanding of vulnerability.
- Funding additional learning and staff training into specific vulnerabilities i.e. development of virtual reality training to enhance understanding of challenges faced by specific vulnerabilities or health conditions
- Investment into systems enhancement that's directly improve services and the management of customers in vulnerable circumstances
- Funding initiatives and campaigns to help tackle social issues i.e. access to water for homeless, particularly during summer months, tackling dehydration amongst the older population
- Funding of outreach programmes - i.e. Support for carers, programmes to help asylum seekers, programmes to support those with hidden disabilities e.g. mental health issues, dementia, and learning disabilities
- Investing in educational programmes – i.e. school programmes, children in particular are heavily influenced by what others are doing around them and can modify the behaviour of their parents.
- Funding of community events and bill management/debt surgeries to support those who may be struggling to afford their bill, recognising the impact debt can have on mental health
- Increased development of partnerships i.e. additional investment into work with charities and other third party organisations that support customers in vulnerable circumstances.

Engagement with stakeholders to improve the data and information that they hold on customers in vulnerable circumstances and what they do with it

- Funding of development of vulnerable customer data management and acquisition – i.e. development of software to support data share with external agencies
- Funding of stakeholder engagement forums and community events to facilitate and build cross sector working relationships across our region
- Investment in specialist resource and technology i.e. data architects dedicated to enhancing the incorporation of vulnerability data within our systems and processes, to offer tailored solutions and flexibility
- Enhance existing system capability i.e. software such as speech analytics. It would enable us to be able to invest more in software capability and extending functionality so data is managed and analysed in real time
- Expanding avenues for engagement i.e. shop window, pop up shops,
- Investment in community spaces

Approach taken to management and use of PSR and associated services

- Investment in wide ranging advertising campaigns and opportunities, capitalising on touch points identified through research and customer engagement
- Investment in dedicate resource to increase our reach across those that might be considered hard to reach i.e. we may choose to fund a dedicate CAB advisor, we may choose to fund an additional partnership co-ordinator (dependant on demand)
- Development of additional partnerships over and above our current ambitions i.e. national and regional charities
- Funding initiatives to tackle current social issues such as loneliness amongst the older population or access to services in rural locations
- Investment in additional services to support those who might be vulnerable i.e. development of a field based app that can identify local support services to enable effective signposting

- Investment in referral programmes - building technologies and relationships that can enhance service offerings beyond signposting of available support
- Investment in creating innovative products to support customers in vulnerable circumstances i.e. funding development in dementia friendly taps
- Funding the free provision of help aids to customers i.e. droplet, auto stop tap

Encouraging innovative approaches to supporting customers in vulnerable circumstances in this way is central to this performance commitment. We therefore do not believe that it would be in the interests of customers to introduce an underperformance penalty to this performance commitment as there is a risk that this would introduce a fear of failure and hinder innovation.

7.20.3 ODI rate

Action reference: ANH.OC.A57

Ofwat concern: The company provides insufficient evidence to demonstrate and justify the methodology used to calculate the standard ODI outperformance payment for this PC.

Required action: The company should provide further evidence to demonstrate and justify the calculation of the ODI incentive rates and the methodology employed, in particular why the standard incentive rate formulae cannot be applied.

Our response

We provide further explanation of evidence we submitted as part of our Plan.

We have undertaken an extensive and robust programme of societal valuations. This provides information on the value that customers place on improving service. We have triangulated some of our incentive rates with an additional source of customer evidence.

In areas, such as non-household retailer satisfaction and supporting vulnerable customers, there was limited information from which to derive a valuation. For these performance commitments, we have triangulated with additional sources of customer evidence to set incentive rates. In the customer research we conducted on ODIs, we gathered data on the overall range of incentives supported by customers and their relative weighting of individual measures for financial incentives (our approach is described in greater detail in response to Action ANH.OC.A3). We have proposed financial caps and collars on incentives based on this customer evidence. For measures where societal valuations are not readily available, we have used this additional source of customer evidence to set incentive rates. To determine the rates, we have apportioned the incentives allocated by customers over the range of likely performance from the PCL to the P90.

Table 77 Customers in vulnerable circumstances - incentive rate

Performance commitment	Performance range	Incentive allocated (£m)	Incentive rate (£m)
Supporting customers in vulnerable circumstances (qualitative)	PCL: 38 increasing to 40 over AMP7 P90: 47 Range = 39 over AMP7	7.25 over AMP7	0.186 per panel score

7.20.4 Caps and collars

Action reference: ANH.OC.A58

Ofwat concern: The company proposes to apply an outperformance cap to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent sufficient justification for the application of a cap to this specific PC.

Required action: The company should provide further ODI-specific evidence to support its use of a cap, whilst also considering how its use of this feature aligns with its broader approach to customer protection. The company's evidence should include justification for the level at which the cap is set, with the company explaining why its level is appropriate and in customers' interests.

Our response

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

The score we could receive in the panel assessment is limited to a maximum score of 50. However, the observed maximum score achieved in the closest equivalent of this metric in other sectors (SECV – vulnerability element) is 47. Whilst removing the cap and maintaining the incentive rate would allow us to reach up to the £10m incentive, recognising the affordability challenge, our cap limits the rewards to £7.25 million over the AMP, keeping the maximum bill impact on customers to below £1 per year, whilst also being high enough to encourage our attainment of the highest level of performance observed so far in the energy sector.

Our approach to managing bill volatility and customer protection across all of our ODIs is built up of caps and collars on individual performance commitments.

Figure 37 Customers in vulnerable circumstances - outperformance profile (years 1-2)

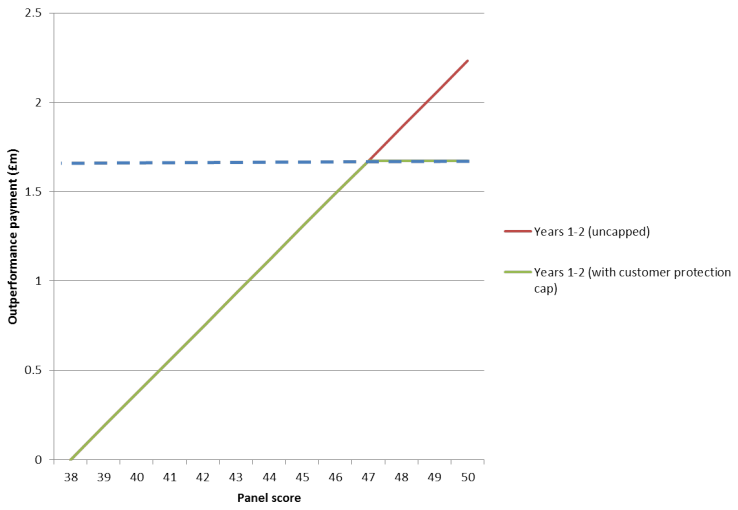
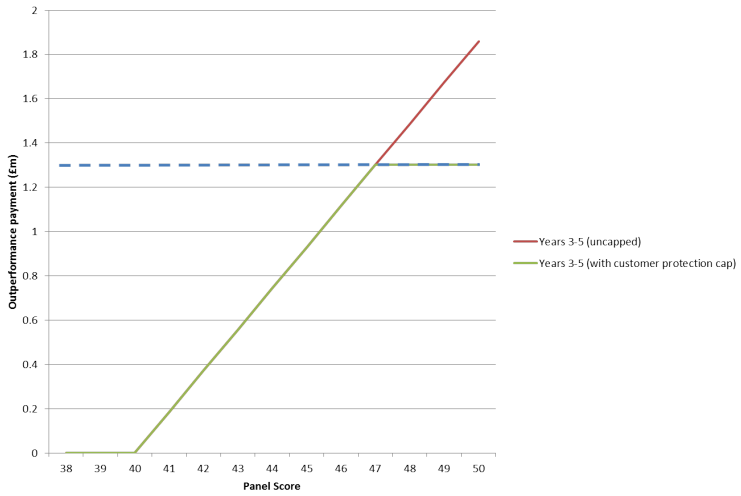


Figure 38 Customers in vulnerable circumstances - outperformance profile (years 3-5)



7.21 Supporting customers in vulnerable circumstances (quantitative)

Action reference: ANH.AV.A3

Anglian Water has proposed a reputational performance commitment on Priority Services Register (PSR) growth (PR19ANH_22). It is proposing to increase its PSR reach from 1.5% in 2019/20 to 15% of households in 2024/25. This is a sector leading target. However, it has only checked 5% of PSR data over the past two years.

We propose to introduce a Common Performance Commitment on the PSR: Anglian Water should adapt its performance commitment on Priority Service Register (PSR) growth (PR19ANH_22) to align with this proposed PSR Common Performance Commitment. This would involve making the performance commitment reputational and committing to checking at least 90% of PSR data every 2 years.

For further information on the performance commitment definition, and reporting guidelines, please refer to 'Common performance commitment outline for the Priority Service Register ("PSR")', published on the initial assessment of plans webpage.

Our response

We have proposed a financial performance commitment linked to the priority services register (PSR).

We have adjusted our performance commitment, in order to commit to checking at least 90% of PSR data every two years, and and will report against this element of the performance commitment. However we have not reflected this in table App1 as our proposed performance commitment is financial and reporting a composite figure invalidates the calculations within App1.

We developed our performance commitment in consultation with our customers who expressed their support for reinvesting outperformance payments for high performance back to supporting customers in vulnerable circumstances.

Therefore, on the basis that:

a Our performance commitment level is sector leading;
b We will provide assurance on the quality of the register by committing to check at least 90% of data every two years;
c We will only achieve outperformance by meeting both of the above criteria (90% of the register checked every two years and our industry leading number of customers on the PSR);
d We have committed to reinvest 100% of any outperformance payment to supporting customers in vulnerable circumstances and;
e Our customers are supportive of our existing proposal

We do not believe that it would be in our customers' interests to remove the outperformance reinvestment mechanism and replace this with a reputational incentive. Our aim is to stretch the frontier for the industry in supporting customers in vulnerable circumstances. Having a sector-leading performance commitment level and the opportunity to further invest in support, coupled with our qualitative performance commitment will help us to achieve this.

On the basis set out above, we have not proposed to make this Outcome Delivery Incentive reputational.

In our original submission, our performance commitment was to have 382,000 customers on the PSR by 2025. To align with the common performance commitment, we have updated the performance commitment to report a percentage of customers on the PSR, rather than the number. This gives a performance commitment level of 12.8% of customers by 2025. This is has changed from the 15% level reported in App 4 of our original submission which did not account for growth and customers supplied by a Water Only Company. Following additional guidance from Ofwat on reporting the common PSR performance commitment, we have now included growth and WOC

customers in the percentage, whilst maintaining our performance commitment level of 382,000 customers being on the PSR by 2025. It also remains our long-term target for 15% of customers to be on the PSR.

7.22 Non-household Retailer Satisfaction

7.22.1 Deadband

Action reference: ANH.OC.A59

Ofwat concern: The company does not sufficiently justify its proposal to apply an outperformance deadband and underperformance deadband to this PC

Required action: The company should either remove the proposed deadbands from this PC or provide convincing evidence to explain why these features are appropriate and in customers' interests.

Our response

We provide additional justification in support of our proposed deadband.

A key theme from our customer engagement was bill volatility. We have taken steps to protect customers from bill volatilty through the use of deadbands and caps and collars. Customers say would prefer a smooth bill profile to allow them to better plan their household budgets. Therefore as we developed our ODI package we focussed on areas where small variation in performance can impact incentives, to ensure that we are only rewarded or penalised when performance falls outside of a reasonable range. If we did not do this customers would see changes in their bill every year as a result of this variation and again the following year when the bill adjustment was removed.

Net promoter score (NPS) is an important part of this performance commitment. This qualitatively captures overall customer satisfaction with a service they receive. However this is a notoriously volatile measure and we expect the sample size of retailers to remain relatively small numerically.

To reflect the small sample size for NPS, and the inherent volatility in that metric, we are proposing a deadband of +/-15 for NPS. We have selected this level as a reasonable range, where performance outside of this range reflects improvement or degradation of performance.

This translates to a deadband of three in the overall score out of 100. In principle, 69% of customers support the use of deadbands on the basis that some flexibility to account for extreme weather or a small allowance if things 'go wrong' will ultimately lead to better performance (See annex 13f Acceptability testing: PCs/ODIs of our September 2018 business plan). The proposed deadband moves with the PCL meaning performance must improve during AMP7 to avoid penalty.

We conclude that the deadband is appropriate as it protects customers from bill volatility, deadbands are supported by customers in principle.

7.22.2 Caps and collars

Action reference: ANH.OC.A59

Ofwat concern: The company does not sufficiently justify its usage of an underperformance collar and outperformance cap.

Required action: The company should provide further ODI-specific evidence to support its use of a cap and a collar, whilst also considering how its use of these features aligns with its broader approach to customer protection. The company's evidence should include justification for the levels at which the cap and collar are set, with the company explaining why these levels are appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer

views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for Non-household retailer satisfaction

We are proposing that £5m of incentives (outperformance incentive and underperformance penalty) are applicable during AMP7. Our proposed cap and collar for this performance commitment is based on evidence from our customers on the scale of incentives and our estimate of the likely range of performance (the P10 and P90). By the end of AMP7 our expected P90 is 100% performance on OPS and MPS and 35 on NPS. Our expected P10 is -27.5 for NPS (the worst water company in the UK) and maintain 2017-18 performance for OPS and MPS.

We have considered the costs and benefits of applying these caps and collars. We conclude that the penalty collar is at an appropriate level to provide incentives to avoid degradation of service. The cap acts to ensure that significant outperformance on NPS does not impact customer adversely. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward. The caps and collars on individual performance commitments are the main mechanism that protects customers.

7.23 Natural capital

7.23.1 Definition, Stretch

Action reference: ANH.OC.A60, ANH.OC.A61

Ofwat concern: The company states it will measure the PC against "key metrics identified within the strategy". However it does not detail further what these are and how the final performance figures will be derived. The company does not provide sufficient evidence to set out the key metrics and target scores for this PC.

Required action: The company should clearly define what the key metrics are and how it will measure performance against them. The company should clearly define what the key metrics are for this PC and what the target performance will be.

Our response

We provide an update on our progress and explain why we are not yet ready to finalise the metrics or set a baseline for improvement during AMP7.

We have made significant progress in the development of our natural capital and social capital performance commitments. This is part of our wider work integrating the six capitals into our decision making processes. We have established a six capitals project board which meets on a monthly basis with a mandate to oversee the development of our six capitals framework.

We are developing our framework collaboratively. This includes experts around our business and external organisations. The benefit of our approach is that it will result in robust mechanisms that not only capture our contribution to the six capitals in our region but also inform our decision making processes. We have been working with the Sustainability and Resilience sub-panel of our CEF on the development of these metrics. This panel includes representation from a range of stakeholders, including Natural England, the Environment Agency, the RSPB and Friends of the Earth.

We have made significant progress defining our metrics but we are not yet ready to finalise all of these. Some metrics, such as carbon and bathing waters are well defined and are stand alone performance commitments. Others need further development. During March and April 2019 we are continuing to work on:

- Agreeing less developed metrics
- The assessment process, including how we combine metrics, weightings, sensitivity, materiality etc
- Agree process (align to existing process, system requirements, gateway criteria to shortlist, who, what will we use it on e.g. every project, bundles of projects etc)
- Understanding likely timings and resources required
- Agree assurance requirements

In April and May 2019 we will pilot our metrics and processes on historic AMP6 projects. We will seek assurance on this excercise and use the findings to further refine the metrics. Later in 2019 we will test our refined metrics to assess live projects. Following this stage we will finalise the metrics for April 2020. This iterative process is vital to developing robust metrics that will not only record performance but influence decisions.

Our work on the biodiversity metric illustrates the work we are doing more generally on natural capital. We have developed our metric on Biodiversity Units, in consultation with our stakeholders and we are currently gathering and analysing data in order to create a trusted baseline which we can use to measure performance. We will not be able to set a target for biodiversity until this work is complete. Furthermore, government has recently stated that it will mandate Biodiversity Net Gain through its forthcoming Environment Bill. It is necessary to fully understand government expectations before finalising our approach.

Once the metrics are finalised we will establish our current baselines of performance. In our business plan, we committed to maintaining or improving performance against these baselines.

7.24 Water industry national environment programme

7.24.1 ODI type

Action reference: ANH.OC.A62

Ofwat concern: The proposed PC provides a financial incentive for the company to accelerate the delivery of uncertain schemes (ie Amber schemes) within WINEP. This may result in investment that later turns out to be abortive for example if a ministerial decision results in these uncertain schemes no longer being needed. The plan includes proposals to return some of this expenditure to customers in this event but it will only return 90% of the value for uncertain Amber schemes. Additionally the company does not clarify the benefit to customers of expediting these schemes.

The company provides insufficient evidence to justify the outperformance only structure of this ODI. In particular, the lack of an underperformance incentive rate.

Required action: The company should clarify why it will not return 100% of the value to customers if amber schemes it has already started are no longer needed. In addition to this the company should clarify what the benefit is to customers of expediting work, and that this will not be the result of normal reprofiling of the investment programme.

The company should provide further evidence to justify how the structure of this ODI will stimulate scheme delivery and is supported by customers, or alternatively remove the outperformance payment.

Our response

We provide further explanation of how the performance commitment will operate and justification for the type of incentive.

Our proposed WINEP performance commitment does not provide an incentive to accelerate delivery of uncertain schemes. Our proposed definition is clear that any obligations removed from the WINEP will not be counted in the PCL or performance.

"The performance commitment level is related to the obligations contained within the WINEP. As these are developed by the EA they may change between now and 2025 and the performance commitment level will adapt accordingly.

There is an agreed alterations process whereby companies and the EA can agree modifications to the WINEP obligations. Any agreed changes would be reflected in the performance commitment level."

The PC is designed to incentivise faster delivery of the WINEP, to unlock benefits for customers and the environment early. We believe this is appropriate as there are existing incentives to ensure delivery on time. Under these arrangements we have delivered every one of our previous obligations on time.

Our WINEP programme for the period 2020-25 is more than double the size it has been in the past. The scale of the programme for AMP7 represents a significant delivery challenge.

The profile of the programme is relatively flat during AMP7. This coupled with outperformance being measured based on delivery in the preceding reporting years means there is very limited scope to outperform on the basis of reprofiling the programme alone. Any outperformance represents stretching early delivery to the benefit of customers and the environment. This early delivery will improve the river water quality in our region which is valued by customers. The value customers place on river water quality is the basis of our incentive rate - this is an annual value. This also improves the resilience of water resources, which is critical to facilitating growth and enable the UK to meet the requirements of quality directives such as the WFD early reducing the likelihood of infraction proceedings being bought by the EU.

We are confident that customers support outperformance payments for this incentives. There are two strong sources of customer evidence that show this support.

In our statistically robust research with customers on our ODIs, customers on average gave a 6.9 out of 10 importance to this PC having financial outperformance incentives to encourage good performance. This support included willingness to accept bill impacts associated with ODIs. Further detail of this research can be seen in Annex 13d of our September 2018 business plan.

We know that customers are willing to pay for environmental improvements. Our incentive rate is based on our customers willingness to pay for river quality improvements. This valuation is not used in calculating any of our other ODIs so there is no double counting. Our societal valuation programme has been recognised as one of the best in the industry and subject to robust peer review and assurance.

We respond to Ofwat's comments on the return of funding to customers under action ANH.CE.A4.

7.24.2 Caps and collars

Action reference: ANH.OC.A63

Ofwat concern: The company proposes to apply an outperformance cap to this PC, and it highlights that its customers support the use of caps and collars at a general level. This does not represent sufficient justification for the level of a cap to this specific PC.

Required action: The company should provide further ODI-specific evidence to support its use of an outperformance cap, whilst also considering how its use of this feature aligns with its broader approach to customer protection. The company's evidence should include justification for the level at which the cap is set, with the company explaining why its level is appropriate and in customers' interests.

Our response

We provide additional explanation of evidence that formed part of our Plan to support our use of a cap and collar for this PC.

As explained in response to action ANH.OC.A3, the level of caps and collars for each performance commitment are based on a suite customer evidence for each measure. They are the result of a triangulation of bottom up customer views (willingness to pay information) and top down customer views on the level of bill volatility that should be associated with ODIs and those which should receive the greatest weightings of financial incentives. The caps and collars represent the maximum incentives that customers consider appropriate for each measure.

Caps and collars for individual performance commitments are the basis of our approach to protecting customers from bill volatility and excessive incentives, as explained in response to action ANH.OC.A6.

Caps and collars for WINEP

We have proposed that the financial incentive applies in the first four years of AMP7. This reflects that in the final year, all remaining obligations should be delivered so there is no outperformance for obligations delivered in that year. To set the cap and collar we have taken the maximum incentive that customers wish to apply to WINEP (+/- £12.5m over AMP7) between the first four years of AMP7. This gives the maximum incentives in an individual year. We have then divided the maximum incentives in each year by outperformance incentive rate to set the cap.

We have considered the costs and benefits of applying these caps and collars. The benefits to customers from caps and collars are protection from undue bill volatility and the balancing of risk and reward.

Our justification for the level of the cap and collar is that it is based on multiple sources of evidence from our customers. These caps and collars are based on customer evidence and in their interests by protecting them from bill volatility. The wider approach to customer protection is built of individual performance commitment caps and collars, so there is alignment between our approach to caps and collars and customer protection.

7.25 Social capital

7.25.1 Definition, Stretch

Action reference: ANH.OC.A64, ANH.OC.A65

Ofwat concern: This PC is still under development to be finalised for 2020. This PC is still under development therefore the level of stretch cannot be assessed.

Required action: The company should ensure that the full definition is in place before 2020 and that all the actions and the timetable for these actions are demonstrated within the plan. The company should provide the levels for this PC.

Our response

We provide an update on our progress and explain why we are not yet ready to finalise the metrics or set a baseline for improvement during AMP7.

We have made significant progress in the development of our natural capital and social capital performance commitments. This is part of our wider work integrating the six capitals into our decision making processes. We have established a six capitals project board which meets on a monthly basis with a mandate to oversee the development of our six capitals framework.

We are developing our framework collaboratively. This includes experts around our business and external organisations. The benefit of our approach is that it will result in robust mechanisms that not only capture our contribution to the six capitals in our region but also inform our decision making processes.

We have made significant progress defining our metrics but we are not yet ready to finalise all of these. Some metrics, such as carbon and bathing waters are well defined and are stand alone performance commitments. Others need further development. During March and April 2019 we are continuing to work on:

- Agreeing less developed metrics
- The assessment process, including how we combine metrics, weightings, sensitivity, materiality etc
- Agree process (align to existing process, system requirements, gateway criteria to shortlist, who, what will we use it on e.g. every project, bundles of projects etc)
- Understanding likely timings and resources required
- Agree assurance requirements

In April and May 2019 we will pilot our metrics and processes on historic AMP6 projects. We will seek assurance on this excercise and use the findings to further refine the metrics. Later in 2019 we will test our refined metrics to assess live projects. Following this stage we will finalise the metrics for April 2020. This iterative process is vital to developing robust metrics that will not only record performance but influence decisions.

Once the metrics are finalised we will establish our current baselines of performance. In our business plan, we committed to maintaining or improving performance against these baselines. Our latest thinking on metrics for social capital include:

- Community Investment
- Community Engagement
- Supplier Relationships
- Mitigating negative impacts.

7.26 New performance commitments

In this section we outline new performance commitments that we are proposing in response to Ofwat's IAP feedback.

7.26.1 Affordability

Action reference: ANH.AV.A1

Ofwat feedback: *All companies apart from Anglian Water have proposed a performance commitment for those who are struggling to pay or are at risk of struggling to pay. Anglian Water should propose a performance commitment relating to supporting customers that struggle to pay or who may be at risk of struggling to pay to help provide additional confidence that it will achieve its proposals.*

Our response

Background

Our plan highlights our ambition to look beyond water poverty at the drivers of affordability more broadly for those struggling or at risk of struggling to pay. We highlighted our increased capacity to support customers in such circumstances in AMP7 through signposting to available third party support and the potential of unclaimed income related benefits, as well as the measures we have in place to support customers in paying their water bill.

In developing our performance commitment definition, we considered measuring the take-up of individual elements of our affordability support - such as the number of customer on concessionary tariffs. However, we felt that this would risk driving perverse behaviours such as focussing on targeting the number of customers receiving a certain type of support, rather than ensuring they receive the right support. Our performance commitment is therefore focussed on the overall support offered by our Extra Care and Collections teams.

Our affordability assistance

Several pieces of evidence highlighted in our plan have set out that approximately 20% of customers in our region struggle or are at risk of struggling to pay their water bill (e.g. Experian credit data, customers whose bill is >3% of income). We are therefore increasing our capacity to support customers in this situation through the creation of an Extra Care team, dedicated to supporting customers who are identified as being at risk of struggling to pay, together with an enhanced service from our Collections team. Non-operational calls from customers will be routed to the Extra Care and Collections teams when they are identified as having an affordability risk, for example through a low credit score or being in arrears.

Customers served by these teams will be offered an Extra Care assessment when appropriate, such as when they pass a series of gateway questions designed to establish customers struggling to pay. These assessments will help us to understand the customer's needs and help us to identify the most appropriate affordability support for them. This could include a benefits-maximisation test, eligibility for concessionary tariffs, the suitability of affordable payment plans (including forgiveness schemes where appropriate) and signposting to any relevant third parties and potential state benefits.

Routing of calls in this way will allow us to channel customers who might be eligible for support; it is not a guarantee of support. This performance commitment is aimed at delivering our proactive strategy to intervene before affordability has manifested in arrears.

Definition

Recognising the range of different affordability challenges faced by our customers and the bespoke nature of support required, we have developed a performance commitment linked to our enhanced affordability assistance which will be on hand to support all customers struggling, or at risk of struggling to pay their bill. Our performance will be measured against the following:

The percentage of non-operational calls received that are handled by the Extra Care and Collections teams for an assessment of their circumstances and appropriate support.

Performance commitment level

The affordability challenge in our region shows that around 20% of customers are at risk of struggling to pay their bill. However, we believe that the calls we receive may include a higher proportion of customers who struggle to pay their bill than our overall population. Therefore, we are setting our performance commitment level at 30% for the end of the AMP, from 20% at the start of the AMP. On current volumes of 1.2 million non-operational calls per year, this would equate to 240,000 non-operational calls handled by the Extra Care and Collections teams in 2020/21, rising to 360,000 by 2024/25.

To ensure that our performance commitment reflects outcomes for customers, we will undertake an annual review with the Consumer Council for Water to understand what assistance has been offered through this performance commitment. This supports our policy of going beyond water poverty to help tackle poverty in our region overall, as the review will assess the extent to which our performance commitment is helping us to deliver on this policy of reducing poverty in our region. The annual review will act as a feedback loop to ensure we are providing our customers with the right help for them, and not simply supporting a high number of customers. The terms of reference for this annual review will be developed with the Consumer Council for Water.

Table 78 New performance commitments - non-operational calls

Year	2020/21	2021/22	2022/23	2023/24	2024/25
Performance commitment level (% of non-operational calls)	20 (and annual review)	22.5 (and annual review)	25 (and annual review)	27.5 (and annual review)	30 (and annual review)

Outcome Delivery Incentive

We have carefully considered the appropriate nature of the outcome delivery incentive associated with this performance commitment.

We are proposing a reputational incentive for this performance commitment, as we consider that delivering on our strategy is a highly visible measure of the service we provide to our customers. Further, any financial incentive associated with this performance commitment will itself have an impact on affordability, which this performance commitment aims to address. Any outperformance payment applied due to exceeding the performance commitment level will increase customer bills, potentially offsetting the extra support provided. Any underperformance payment applied would be for the generality of customers, and so not targeted at those who struggle, or are at risk of struggling to pay.

Our affordability strategy aims to work in partnership with others to tackle poverty in our region as a whole. Where greater poverty in our region leads to more customers experiencing affordability challenges, this could lead to an increase in customers seeking support and an outperformance payment being applied due to more than 30% of customer calls being handled through the Extra Care and Collections teams, despite what might be poorer outcomes for customers overall. Conversely, improvements in poverty reduction in our region could result in our performance commitment level being missed, or that in order to meet the performance commitment level the threshold for reference through to affordability assistance would need to be reduced and so support would be less well targeted.

Customer engagement

We presented this performance commitment to our online community who had an overall positive response to our proposal. Most customers felt that the approach encouraged sustainable methods to identify affordability issues before they become severe, and that it demonstrates our commitment

to supporting customers who may struggle to pay their bill. Our Affordability and Vulnerability CEF sub-group highlighted the role that customer views should play in feeding in to the annual review. We will ensure our business as usual engagement with customers feeds in to this review.

The results of this engagement can be seen in Annex 3a of this IAP response.

Table 79 New performance commitments - summary

Item	Summary
Performance Commitment measure	The percentage of non-operation calls received which are handled by the Extra Care and Collections teams
Performance Commitment Level	2020/21 – 20.0 and annual review 2021/22 – 22.5 and annual review 2022/23 – 25.0 and annual review 2023/24 – 27.5 and annual review 2024/25 – 30.0 and annual review
Outcome Delivery Incentive	Reputational

7.26.2 Inclusive service provision

Action reference: ANH.AV.A2

Ofwat feedback: *Anglian Water has stated that it will achieve the British Standards Institution (BSI) standard for inclusive services but has not provided a performance commitment or plan on how it will do so. Anglian Water should propose a performance commitment on achieving the BSI standard for fair, flexible and inclusive services for all and maintaining it throughout the 2020 to 2025 period.*

Our response

In our business plan, we highlighted that we will achieve the BSI standard. We are therefore proposing a new reputational incentive for the achievement of the BSI standard. Each year we will be measured based on whether we comply or do not comply with the standard.

Table 80 New performance commitments - inclusive service provision

Year	2020/21	2021/22	2022/23	2023/24	2024/25
Performance commitment level	Compliance	Compliance	Compliance	Compliance	Compliance

We garnered the views of customer in our online community on this performance commitment who showed support for our commitment to achieve the BSI standard. The results of this engagement can be seen in Annex 3a of this IAP response.

8. ALIGNING RISK AND RETURN

Ofwat's test area assessment: Aligning risk and return

Overall test area grade	Overall test area summary assessment and rationale
C	Despite some aspects of Anglian Water's plan which are high quality, shortcomings in two aspects mean that it overall falls short of providing convincing and high quality evidence to support its approach in the area of aligning risk and return. The following areas of the plan are high quality: • It is based on our Final Methodology 'early view' cost of capital and retail margins. • There is convincing evidence to support the board's statement that the company is financeable on the notional structure. • There is convincing evidence to support the company's choice of PAYG and RCV run-off rates. There are two main areas where the plan falls short of high quality. It does not provide sufficient and convincing evidence in the following respects: • Further assurance is required that the company is financeable on its actual structure given the FFO/Net debt financial ratio and the stated investment requirement. • While the plan contains some high quality elements in its RoRE analysis, there is insufficient evidence presented on its risk management and risk mitigation measures in its RoRE analysis.

Overview of our IAP Response

We have prepared our business plan on the basis of Ofwat's indicative WACC and targeted a Baa1 credit rating both for the notional and the actual company credit rating. The Board considers the plan to be financeable on an appointee WACC of 2.4%, but with very limited headroom at unchanged credit metrics for debt.

The long-term financial resilience of the business is tested on a regular basis and further scrutinised at various levels by stakeholders, including investors. We maintain a 25 year financial model that is audited annually and is aligned with our Strategic Direction Statement. The Board considers long-term financial scenarios as it signs its long-term viability statement.

We are also mindful of the importance of assessing the position of the notional company. This sets the base level of financial headroom in the Plan and is comparable across the sector on a notional gearing level. We recently submitted a paper entitled "An exploration of the relationship between the allowed cost of equity and notional financeability". This highlights key issues that have been raised been by stakeholders, and stresses the importance of focusing on the approach that credit rating agencies take on certain key issues and metrics. We hope that Ofwat will take this into account as it considers the WACC for the Draft Determination.

We have accepted all key components from Ofwat's "Putting the sector back in balance" document published in 2018, and have committed to continue to de-gear through AMP7. Our base plan includes no dividends to shareholders until post 2025.

8.1 Financeability

8.1.1 Introduction

We have prepared our PR19 Business Plan on the basis of the cost of capital and retail margin guidance provided by Ofwat in the PR19 Final Methodology. The Board considers the Plan to be financeable on both Ofwat's notional company structure and the company's actual capital structure. Specifically, the Plan achieves the credit metrics for Baa1 rating under both the notional and actual capital structure, albeit with very limited headroom for the notional company.

However, more generally, we do not believe that Ofwat's financeability methodology for the notional company is appropriate, for the reasons outlined below.

The PR19 guidance for the cost of equity proposed puts the notional company into the Baa2 category based on the Annual Interest Cover Ratio (AICR). This is set out in more detail in our recent paper, "PR19 – Notional Company Financeability: An exploration of the relationship between the allowed cost of equity and notional financeability" (see appendix 8a).

This categorisation is based on rating agency guidance for the 1.5x Baa1 threshold. There is a significant risk that companies will be down-graded to Baa2, which is only one notch above the minimum investment grade rating. This would be expected to increase the cost of, and decrease access to, debt finance on efficient terms, particularly at times of capital market stress.

Moreover, this is inconsistent with, and more expensive than, the regulatory allowance for the cost of new debt being set on the basis of an average of A3 and Baa1. This would leave companies having to place more weight on making undesirable operational adjustments if other external financial shocks materialised.

In the IAP, there are areas where the interpretation of the financeability duty (under section 2 of the Water Industry Act as amended) indicates that Ofwat proposes to adopt a different approach to that followed by credit rating agencies. We disagree with this approach, for the reasons set out in this chapter.

8.1.2 Target credit rating

We agree that companies should target a Baa1 rating under the notional and actual capital structures as this provides headroom to accommodate shocks. The capital structure of Anglian Water contains credit enhancing features that enable the company to maintain a Baa1 rating at lower levels of credit metrics. These credit enhancements represent a transfer of risk from debt to equity.

8.1.3 Financial ratios

Companies have used thresholds for financial ratios based on updated guidance from the credit rating agencies.

Ofwat has indicated that this updated guidance will not be taken into consideration when it is assessing the financeability of plans:

> "We do not propose to adjust or tighten our financeability requirements such as target credit rating or target ratios, following the putting the sector in balance position statement. We understand that rating agencies take a view on regulatory risk as part of reaching their view on company credit ratings and may adjust this view from time to time. Consistent with our wider approach to financeability, we leave companies to manage implications of the rating agencies approaches in terms of the financeability of their actual structures, including their view of regulatory risk." [1].

This statement appears to suggest that the management of the regulatory risk perceived by rating agencies is the sole responsibility of the companies. Moreover, it seems to suggest that companies should operate with sufficient equity to absorb a development in the regulatory regime that has negative implications for cash flows.

There are two problems with this position.

1 IAP technical appendix 3, p. 24

First, the regulator cannot absolve itself of responsibility for maintaining a stable and predictable regime. The introduction of the 'sharing of gearing out-performance' mechanism in the 'Putting the sector back in balance' document was not predicted by the market. The introduction of the mechanism had the effect of retrospectively discriminating between companies depending on which capital structure decisions had been made in the past and was viewed by Moody's as destabilising the regulatory environment for water.

Secondly, the impact of the negative revision to the assessment of the stability and predictability of the regulatory regime following the 'Putting the sector back in balance' position statement affects all companies, regardless of capital structure. Although companies that are unable to reduce gearing below the 70% threshold will face additional financeability pressures from the penalty mechanism, even those with gearing close to the notional 60% will have to achieve higher interest cover ratios to maintain their credit ratings. The tightening of ratios is therefore being driven by regulatory changes, not by the capital structure choices of individual companies.

We therefore request that Ofwat should consider looking again at whether elements of its proposals fully protect the stability of the regulatory regime. This would also be in line with the principles of better regulation regarding transparency, proportionality and consistency.

In particular, as the Competition Commission [2] previously observed, it is particularly important that any regulatory changes arising due to 'changes in approach' should be particularly well justified given the 'benefits to a stable and well understood regulatory framework' which are potentially compromised by any unjustified and/or unduly rapid regulatory change.

8.1.4 Addressing financeability constraints

With regard to the use of pay-as-you-go (PAYG) and RCV run-off rates under the notional capital structure, Ofwat states:

> "As financeability constraints are driven by the cash flow effect of a real return on an inflating regulatory capital value it may be reasonable for companies to make some use of PAYG or RCV run-off to address issues around notional financeability" [3].

We have based our Plan on the natural PAYG and RCV run-off rates, for two main reasons:

- our customers support this approach as it meets the principle of intergenerational equity;
- credit rating agencies have consistently stated that they will reverse the effects of advancing revenue from future controls when calculating credit metrics for the assessment of ratings.

Ofwat continues:

> "Four companies have used PAYG or RCV run-off to address a notional financeability constraint. A number of companies note that this may not necessarily be effective due to certain credit rating agencies reversing the effects of advancing revenue in calculating the financial ratios. However, as we do not target a specific credit rating agency or specific financial ratios for the notional company, we maintain that the use of PAYG or RCV run-off may be an appropriate mechanism where it does not have a material impact on financial resilience over the longer term and there is sufficient evidence of customer support" [4].

Rating agencies reverse the impact on financial ratios of advancing revenue precisely because this would have an impact on financial resilience over the long-term [5]. Moody's has now included a formula in its ratios to adjust for changes in PAYG relative to the natural rate. Other rating agencies have also indicated they do not consider that increases to PAYG or RCV run-off rates improve financial resilience.

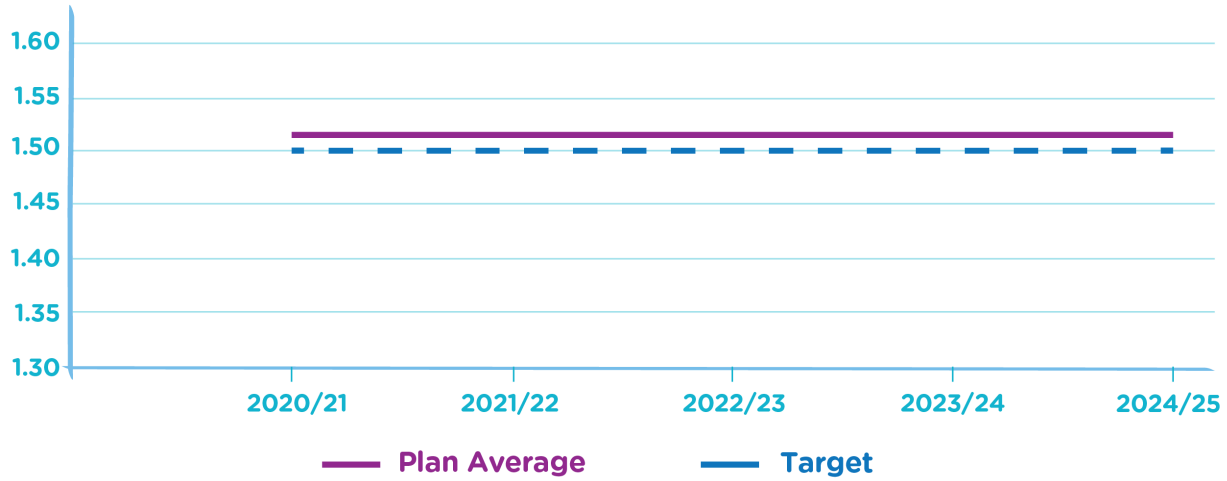
Advancing revenue improves current interest cover ratios at the expense of worsening future interest cover ratios. Future gearing will also be higher as a result of using higher PAYG and RCV run-off rates because the value of the future RCV will be reduced.

2 Competition Commission Bristol Water Redetermination 2010, para 9.21
3 IAP technical appendix 3, p. 25
4 IAP technical appendix 3, p. 25
5 Moody's Special Comment: Speed of Money Cannot Address Potential Financeability Concerns, 16 May 2013'

Notional Company Analysis

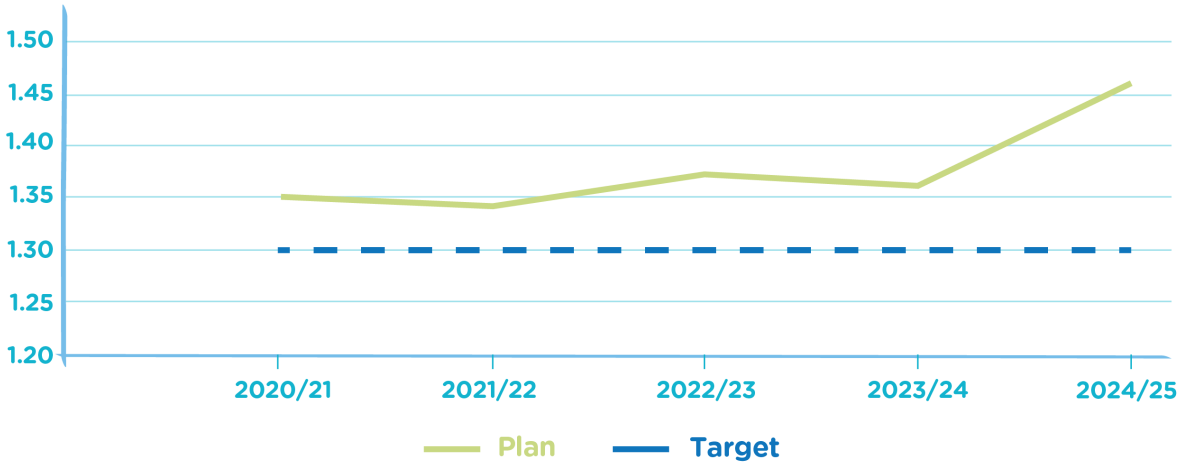
In response to the IAP and reflecting on additional information, we have revised our plan ratios, but the story remains similar. Our notional company ratios for AICR achieve 1.51x when legacy rewards are included. This is just above the 1.50x level required to achieve the Baa1 credit rating, both by Moody's and the Fitch. The profile of our legacy rewards remains unchanged from our September Plan; this reflects our view that macroeconomic risks are expected to be high in the early phase of AMP7.

Figure 39 Adjusted Interest Cover Ratio - Notional (average over the AMP)



On the actual capital structure, our credit rating target of baa1 requires us to achieve AICR ratios above 1.30x; this is in line with the guidance both by Moody's and the Fitch. Our AICR ratios achieve that target in every year of the AMP.

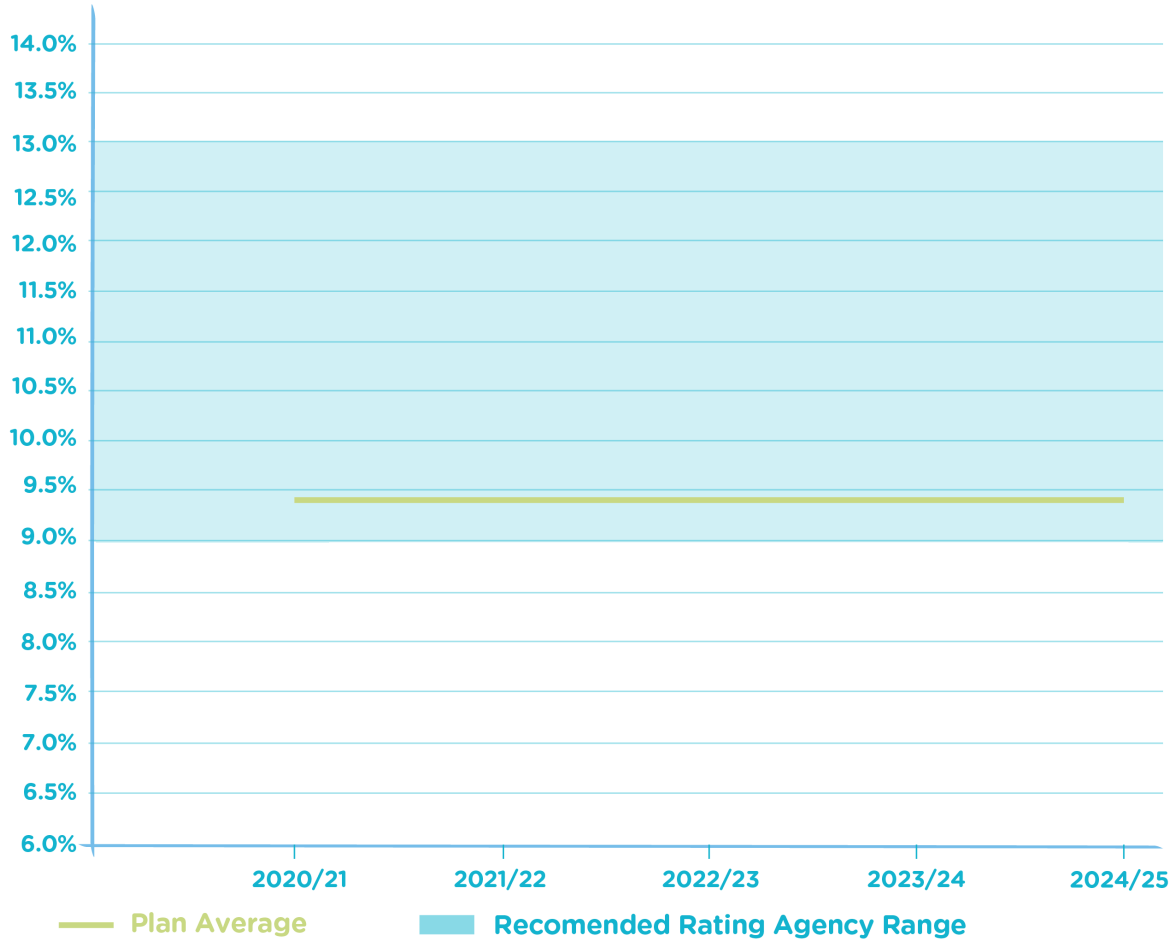
Figure 40 Adjusted Interest Cover Ratio - Actual company



FFO to net debt (notional)

For the notional company, the FFO to net debt ratio achieves 9.4% (average of the AMP). This is at the lower end of the recommended range by the rating agencies of 9% to 13%.

Figure 41 FFO - Notional

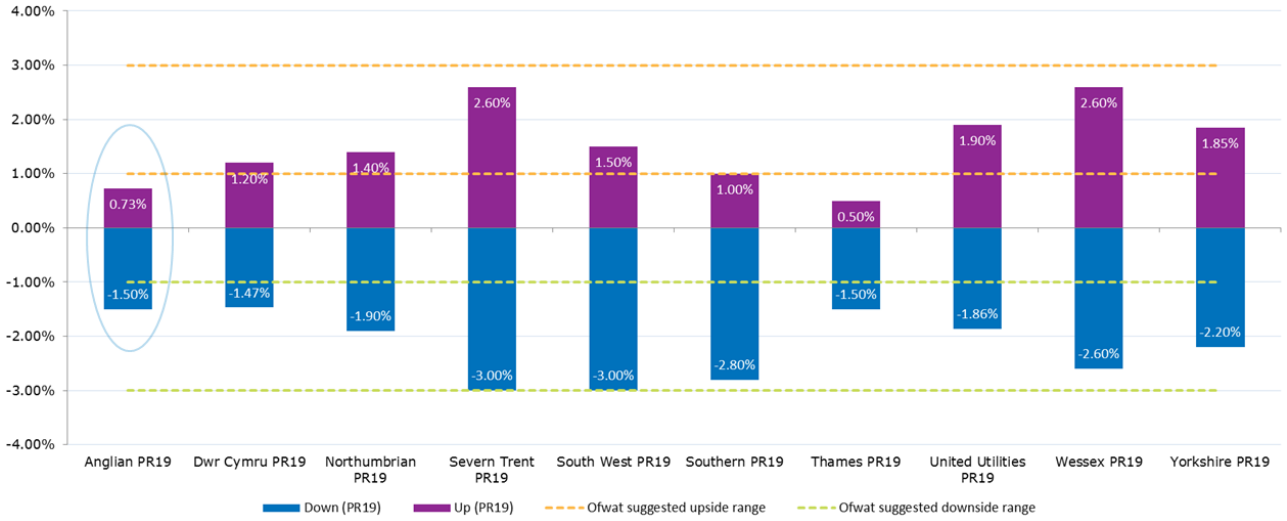


FFO to net debt (Actual)

Our actual ratios for S&P's FFO/net debt are slightly better than our base plan in AMP6.

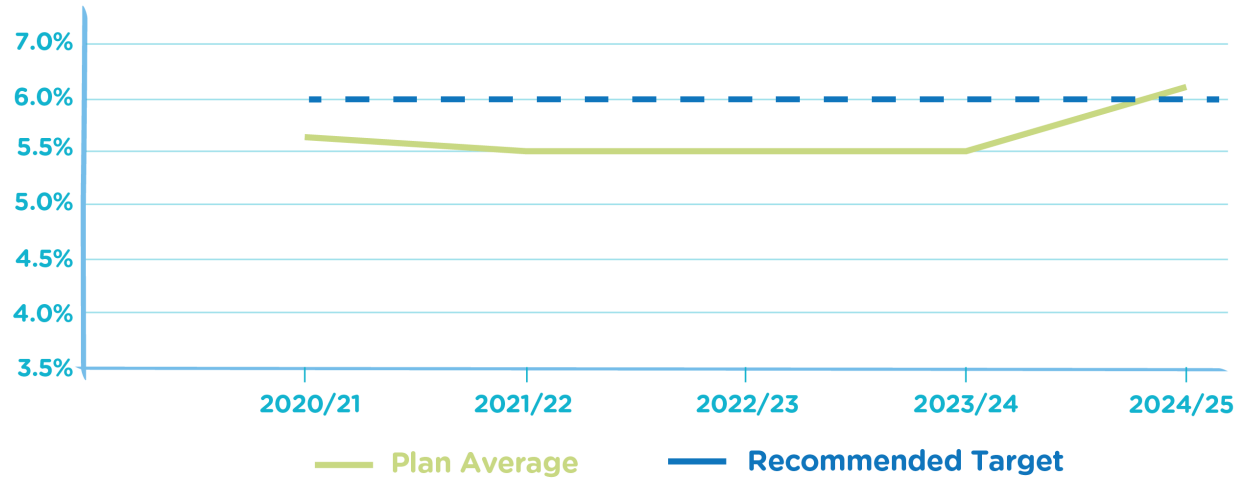
In our meetings, S&P has highlighted that one of their key concerns is the potential for more volatile revenues in AMP7 as a result of higher powered ODIs. To address that concern, we have been careful in planning our ODIs and managing that risk, as is clear from the graph below.

Figure 42 September 2018 ODI RoRE ranges



Our base plan ratios show an improving trend that achieves S&P's target by year five. They are higher than our September submission due to further mitigating action we have undertaken on our debt portfolio - without any increase in cost to customers. More importantly, our FFO/net debt ratios at the PR14 Final Determination were at a similar level to our PR19 plan. With our commitment to de-gear the business, a narrow range of ODIs in the plan, an improving trend of FFO/net debt and rating agency discussions, we are confident that we will maintain our current credit rating level with the S&P.

Figure 43 S&P FFO / net debt - Actual company



Long-term resilience scenarios

Given our Plan ratios remain at a similar level or slightly better than in our September submission, we need to make no changes to the financial resilience scenarios already submitted (as discussed on our call with Andy Chesworth of 1 March 2019).

Commitment to extend our financial resilience analysis beyond 2025

We maintain a financial model that extends 25 years forward. This model is underpinned by our Strategic Direction Statement (SDS) and forms part of our long-term view strategic review. A key component of the model is financial resilience. This is checked and tested across the life of the

financial model. This model is also audited annually. Our long term viability statement 'met expectations' in Ofwat's 2018 company monitoring framework. For future viability statements we aim to improve this to "exceed expectations" by incorporating the suggested areas for improvement.

As agreed in the call with Andy Chesworth, we commit to demonstrate financial resilience beyond 2025 in our next long term viability statement.

[redacted]

[redacted]

Table 81

	AMP7	AMP8
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

8.3 Ofwat Action: RoRE

Action Reference: ANH.RR.A2

The company should provide further evidence to explain why there are positive values for both upside and downside values for Totex (including uncertainty mechanism) or restate its RoRE downside

Our response

As part of our updated data tables we have recalculated RoRe in App26. The sign of the values accord with Ofwat's expectations.

8.4 Ofwat Action: RoRE Assessment and resilience

Action Reference: ANH.RR.B1

The company should provide further evidence to explain how the RoRE assessment takes account of Anglian Water's systems approach to resilience.

Our response

The outcomes which we have set out in our Plan were designed and agreed with our customers so as to meet our obligations and improve our resilience both in the coming AMP and beyond. As such, the RoRE assessment encapsulates the results of our systems approach to resilience.

9. SECURING LONG-TERM RESILIENCE

Ofwat's test area assessment: Securing long-term resilience

Overall test area grade	Overall test area summary assessment and rationale
C	Overall, the plan falls short of high quality and the company does not provide sufficient and convincing evidence of securing long term resilience in certain areas. Anglian Water provides a high quality plan in some areas of operational, corporate and financial resilience. The plan presents a comprehensive and well-structured baseline resilience assessment, providing a maturity profile of corporate and operational resilience. The company presents how the maturity of resilience evolves in the future. The rationale behind the maturity scores is well evidenced. The company provides sufficient evidence that it has an effective approach to asset health and incident management, with some links to resilience. The company demonstrates collaboration and initiatives to identify risks to resilience in its plan, such as the publication of a Water Recycling Long Term Plan which supports the company's long-term strategy parallel to that of the Water Resources Management Plan. The company considers a wide range of options to ensure resilience in the delivery of water and wastewater services, including nature-based solutions (e.g. SuDS and catchment management schemes) as well as initiatives to change customer behaviours (e.g. reduce sewer blockages, SuDS awareness). The plan also provides evidence of ambition to deliver efficient options through: collaborative approaches to develop nature-based partnerships, adaptable solutions that account for uncertainty and consideration of integrated water resource planning. However, we consider that the plan does not provide sufficient and convincing evidence of a commitment to resilience in the round in the following areas: • There is limited evidence that the company has undertaken a systems-based approach to resilience that considers system interdependencies and prioritises risks appropriately. • The company provides limited evidence of the quantitative methods used in the assessment of risks as well as limited evidence that the company has employed environmental valuation techniques to assess risks to resilience. • The plan is not sufficiently convincing in linking the proposed options to the identification of risks and mitigations within the resilience framework. However, the company outlines a number of mitigation approaches in respect of financial risks that build on the long term viability statement in its annual performance report. • Whilst Anglian Water shows impacts from financial risk scenario modelling on its adjusted interest cover, there is insufficient evidence to explain why impacts on its FFO/net debt ratio have not been considered, particularly in the context of its highly geared structure. In addition, there is insufficient evidence that risks associated with a possible reduction to its credit rating are considered in the context of requirements to refinance subordinated debt. The company has not considered possible impacts on financial resilience of the mechanism for sharing financing outperformance for companies with actual gearing levels of 70% and above.

Overview of our IAP Response

In response to our actions we have:

- Provided a commitment to work with the sector to develop robust, forward looking asset health metrics and provided greater transparency of how our asset health indicators influence our operational decision making. To take this commitment forward, we and United Utilities have put forward a proposal to develop a suite of measures that can be used by the industry against a standard method measurement.
- Confirmed that our financial stress test scenarios cover both AMP7 and AMP8 and that financial resilience is tested over a 25 year horizon in our financial model.
- In response to Ofwat's queries on financial risk, we have highlighted:
  - our resilience to increases in the cost of debt in the unlikely event of a downgrade to our credit rating; that we have reduced the proportion of subordinated debt which finances our business plan;
  - our assessment of the impact of the gearing outperformance mechanism and;
  - the steps we would consider taking to mitigate financial risk including dividend reductions, potential equity injections and reviewing debt arrangements.

We note that some of our actions in this area are required for completion after 1 April 2019. Our response focusses on those areas for which action has been required by 1 April 2019.

9.1 Ofwat Action: Operational resilience performance commitments

Action Reference: ANH.LR.A1

The company should ensure that its common and bespoke performance commitments associated with operational resilience are clearly defined, sufficiently demanding for AMP7 and the long term, and supported by the right incentives. We expect the company to satisfy the relevant actions set out in relation in the outcomes areas ensuring a line of sight between risks to resilience and package of outcomes.

Our response

In our test question summary assessment Ofwat told us that we provided "sufficient and convincing evidence that [we] have developed a resilience framework that includes elements of, operational... resilience."

In our Plan and in responding to the actions in Delivering Outcomes for Customers we have met the criteria set out in this action for Performance Commitments being clearly defined, sufficiently demanding and containing the right incentives. We set out in our 7. Delivering Outcomes for Customers chapter our responses to each of the Outcomes based actions.

9.2 Ofwat Action: Action plan for systems based approach to resilience in the round

Action Reference: ANH.LR.A2

The company should provide a commitment that it will, by 22 August 2019, prepare and provide to us an action plan to develop and implement a systems based approach to resilience in the round and ensure that the company can demonstrate in the future an integrated resilience framework that underpins the company's operations and future plans showing a line of sight between risks to resilience, planned mitigations, package of outcomes and corporate governance framework.

Our response

We confirm our commitment to provide the required action plan as set out in the action above by 22 August 2019.

Our leading work on resilience over the past few years, the publication of our updated Strategic Direction Statement, Water Resources Management Plan and other strategic documents, including our work with Arup (this work is described in response to action ANH.LR.A4), demonstrates how important Resilience in the Round is to us and our customers. Our plan has considered the relationships between risk and resilience and is already part of our business decision making. However we will create a clearer demonstration of the linkages and relationships between risks and our plans, actions and outcomes, as well as how this is integrated into the business and our governance processes.

9.3 Ofwat Action: Asset Health Metrics

Action Reference ANH.LR.A3

The company should also provide a commitment to work with the sector to develop robust forward looking asset health metrics and provide greater transparency of how its asset health indicators influence its operational decision making.

Our response

We commit to working with the sector to develop robust forward looking asset health metrics and provide greater transparency of how our asset health indicators influence our operational decision making.

We have worked with United Utilities to raise an UKWIR Proposal which will be considered this spring. The primary objective of this proposal is to develop a suite of measures that can be used by the industry against a standard method measurement. A suite of lead measures shall be developed and builds on the work completed on lead and lag measures project. Using lead and lag measures will enable companies to improve their operational decision making.

The approach needs to ensure the linkage between assets and customers is maintained. The report needs to address the linkage to outcomes and the impact on future targets.

The report will be used by companies to both develop their approaches to the collection and assessment of data but also to support a wider understanding of underlying asset health trends across their businesses and across the overall industry.

This proposal supports UKWIR's Big Question "What is the true cost of maintaining assets and how do we get this better reflected in the regulatory decision making process'

9.4 Ofwat Action: Financial resilience

Action Reference: ANH.LR.A4

The company's assessment of financial stress scenarios extends only to 2025. The company should commit to demonstrating that its assessment of financial resilience extends beyond 2025 in its next Long-Term Viability Statement.

Our response

Financial stress scenarios

Our September Plan set out that, with Arup, we co-created a framework to apply the proposals contained in Ofwat's "Resilience in the round" document. One of the three central resilience themes related to financial resilience, defined as an organisation's ability to avoid, cope with, and recover from, disruption to its finances. Arup assessed our current maturity against this framework and found in terms of financial resilience we had a robust and actioned approach to each of the five sub-components of financial resilience. These included long-term financial viability.

Our assessment of financial stress scenarios extended beyond 2025. Our September Plan set out the long-term stress scenarios that supported our submission these included testing scenarios which cover both AMP7 and AMP8 periods (see section 15.6.3 of our Plan).

In addition, under the Arup assessment of financial resilience we assessed a number of scenarios, including testing our resilience to a £500m financial cost shock. Arup concluded that we were resilient to such an unlikely event.

Given our Plan ratios remain at a similar level or slightly better than in our September submission, we need to make no changes to the financial resilience scenarios already submitted (as discussed on our call with Andy Chesworth of 1 March 2019).

Long-term viability statement

We maintain a financial model that extends 25 years forwards. This model is underpinned by our Strategic Direction Statement (SDS) and forms part of our long-term view. A key component of the model is financial resilience. This is checked and tested across the life of the financial model. This model is also audited annually. Our long term viability statement 'met expectations' in Ofwat's 2018 company monitoring framework. For future viability statements we aim to improve this to "exceeds expectations" by incorporating the suggested areas for improvement.

As agreed in the call with Andy Chesworth, we commit to demonstrate financial resilience beyond 2025 in our next long term viability statement.

9.5 Ofwat Action: Financial risks

Action reference: ANH.LR.A5

Please explain how the company has taken account of the risks associated with:

- *long term financial resilience associated with possible downgrade to its credit rating given the negative outlook;*
- *requirements to refinance subordinated debt;*
- *any application of the gearing outperformance mechanism for PR19; and*
- *outline associated risk management/mitigation approaches identified by the company to provide assurance on long term financial resilience*

Our response

Anglian Water is currently on a negative outlook, along with the rest of the water sector by the rating agency Moody's. As discussed above, Moody's has explained this change is due to their re-assessment of regulatory stability and predictability.

We have taken the following steps to ensure we maintain our current credit rating:

- maintained a regular dialogue with the rating agencies to fully understand their recent concerns;
- publically committed to reduce shareholder dividends in order to de-gear the regulated business to the mid-70's;
- our base business plan includes no dividends to shareholders, and;
- simplified our capital structure and improved transparency.

A key component of our plan is Ofwat's early view of the cost of equity which provides financial resilience to the notional company, as described in our paper "Notional Financeability – an exploration of the relationship between the cost of equity and notional financeability" (Appendix 8a). We hope Ofwat will consider the issues in the paper when setting the overall cost of capital.

In the unlikely event of a downgrade (or a sector downgrade) from Moody's

Our corporate family rating of Baa1 is two notches above minimum investment grade. The primary impact of a downgrade to our credit rating, would be an increase in the cost of new debt. We have carried out a comparison of our current financing cost with that of companies at a notch below us. There is a consistent wedge, and a downgrade is likely to increase our cost of debt. However, the impact may be worse if the water sector as a whole gets downgraded. In all these scenarios, customers ultimately will be affected as the financing costs are passed on to the customers in the following AMP.

As part of our annual Long-Term Viability Statement stress testing, we routinely stress-test for an increase in the cost of new debt, as well as increases in the cost of the limited amount of variable rate debt we have. We have also tested Ofwat's prescribed downside scenario of a 2% increase in the cost of new debt. In all of these scenarios we retain an investment grade credit rating.

Requirement to refinance subordinate debt

We have a small amount of Class B subordinated debt maturing in AMP7 which will be refinanced in the normal course of business. Our liquidity provisions ensure we retain sufficient facilities (just under £1 billion) to cover any downside risks from the credit market.

We have reduced the proportion of subordinated debt that finances our investment plan, recognising recent evidence from the rating agencies in their application of senior credit ratings.

Application of the gearing outperformance mechanism for PR19

We have accepted the mechanism as set out in the "putting the sector back in balance" document. The impact of this on financial resilience is:

- Based on our projected gearing over the AMP7 period, we estimate that our financing outperformance sharing quantum could be just over £40million (lower, if gearing falls below that in our base plan). This will be calculated each year and reported in our APRs.
- As any adjustment will apply in AMP8, there are no cash implications in AMP7. As part of our Long-Term Viability Statement, we will take into account the financial impact in AMP8 of the application of the gearing outperformance mechanism. Our modelling shows this will not impact our AMP8 credit ratings.

Outline associated risk management/mitigation approaches identified by the company to provide assurance on long term financial resilience

In our continued work with stakeholders, including the rating agencies, we identify further steps that we could take to mitigate exceptional risk. Some of these steps could include further dividend reductions, potential shareholder equity injections, reviewing the debt arrangements and financing costs (which, at the extreme, could involve fairly complex financial arrangements), with a potential restructure or liability management exercise as well as major actions to reduce the operational and administrative cost base of the Company.

10. SECURING CONFIDENCE AND ASSURANCE

Ofwat's test area assessment: Securing confidence and assurance

Overall test area grade	Overall test area summary assessment and rationale
D	Overall, Anglian Water's business plan falls significantly short of providing sufficient evidence to demonstrate high quality in the securing confidence and assurance test area. The company's business plan provides some evidence of high quality since it provides sufficient and convincing evidence that overall, the company's business plan tables are consistent, accurate and assured. However the company's plan falls short of high quality in the following areas: On demonstrating a fair balance between customers and investors: • The company is highly geared and accepts our gearing mechanism and proposes base dividend yield below 5%. • On dividend policy, there is insufficient evidence of the company's intention to meet the expectations set out in the "Putting the sector in balance" position statement. Whilst the dividend policy refers to all of the required elements, the company provides no detail on the customer measures that will be considered when it reviews performance, and there is no specific commitment to publish information on dividend policy annually or signal changes to stakeholders. • On executive pay, the company demonstrates insufficient evidence of its intention to meet the expectations set out in the 'Putting the sector in balance' position statement. There is little evidence of how the targets would be stretching and weighted towards the delivery of service for customers. Also there is no reference as to how the policy will be applied and monitored during the period, or a clear commitment to publish the policy when finalised and evidence of how changes would be signalled to customers. • The company's Board does not provide assurance that its plan will enable customers' trust and confidence through high levels of transparency and engagement and there is little or no evidence of transparency on its corporate and financial structures and how these relate to its financial resilience. • The company does not put forward proposals for a bespoke voluntary benefits sharing mechanism but proposes donations to social tariffs and hardship funds which we assess could have a value of £1.0m per year. The scale of the proposals for voluntary benefits sharing are very modest in the context of the company's size. However, voluntary sharing is not a requirement of the PR19 methodology, so the proposed sharing does not impact our assessment of this test area. In our assessment of the company in the 2018 Company Monitoring Framework (not including the elements related to the PR19 business plans) while the company exceeds expectations in 1 area and meets expectations in 5 areas, it has minor concerns in 4 areas. The company's plan falls significantly short of high quality in the following areas: • The company's Board provides a small minority of the Board assurance statements requested to demonstrate that all the elements of its business plan add up to a plan that is high quality and deliverable and that it has challenged management to ensure this is the case. The Board only signs a sub-set of assurance statements and there is insufficient evidence that the Board itself provides the other requested statements. This substantially reduces our overall confidence in the assurance in the plan and raises concerns over Board ownership.

- The company's Board provides a non-compliant statement of assurance within the signed Board statement to demonstrate that its governance and assurance processes will deliver operational, financial and corporate resilience over the next control period and the long term.
- The company's Board provides a non-compliant statement of assurance within the signed Board statement to demonstrate that the business plan will deliver – and that the Board will monitor delivery of – its outcomes.

Overview of our IAP Response

Our Board were disappointed by Ofwat's "D" rating in relation securing confidence and assurance. The Board made it clear that it did not believe this rating was reflective of the level of ownership, engagement and challenge they provided to Management in developing our Plan.

In response to the IAP assessment, we have provided an updated Board Assurance Statement (BAS) updating the one submitted in our September plan, to provide sufficient and convincing evidence and to include compliant statements. The Board signed the BAS on 27 March 2019.

We have provided additional assurance on our responses to Ofwat queries, our data tables, technical and financial models, customer engagement, and changes to performance commitments. We have also provided further assurance to support our IAP response.

In this response we highlight our commitment to publishing our dividend policy in the Annual Integrated Report and Annual Performance Report. This will set out how these reflect performance against business and regulatory targets and the resilience of the business.

We have also provided more detail on our approach to executive pay. All variable reward is aligned to customer outcomes, and we are increasing the degree of discretion and oversight provided by the Remuneration Committee. We have also consulted our customers on the principle we are planning to apply, gaining 82% support.

10.1 Board assurance

The Board was disappointed by Ofwat's "D" rating in relation to the Securing confidence and assurance IAP test area and the non-compliance finding in relation to aspects of the test relating to Board assurance. The Board does not believe that this rating is reflective of the level of ownership, engagement and challenge provided to Management in developing our Plan.

We received 11 Company actions relating to Securing confidence and assurance, which we have addressed in our IAP Response. In most cases, actions relate to the Board Assurance Statement ("BAS"), as Ofwat "found no evidence of an assurance statement within the signed component of the Board assurance statement".

The Board has provided a revised BAS by way of response to the even Company actions that relate to the BAS. This revised BAS updates the one it submitted in September 2018, and includes a compliant statement for each of the areas set out in Table 13.2 of Ofwat's final methodology. We have worked with KPMG to ensure that the BAS appropriately responds to the actions set out in the IAP. The whole Board signed the whole document at a meeting of the Board on 27 March 2019.

Assurance has continued to play an important role as we have developed our IAP Response. Additional assurance activity has included reviews by third parties of:

- Our responses to Ofwat's post-submission queries
- Changes to data tables
- Technical and financial models
- Further customer engagement activity
- Changes to performance commitments.

Assurance in a wider context has also been sought from a range of subject matter experts to provide evidence to support our IAP Response.

Since receiving the IAP feedback, the Board and Management have engaged on at least seven occasions, to discuss and shape our IAP Response. The table below provides details of this engagement and challenge:

Date of meeting	Area of discussion / challenge / decision
Thursday 31 January 2019	• Initial note circulated to the Board and Management, summarising the main points of Ofwat's IAP feedback in each of the nine test areas
Wednesday 6 February 2019	• Board call to discuss IAP feedback and initial thoughts on how to respond • The Board asked Management to respond to the challenges raised in the IAP feedback by providing additional evidence to support the Plan and by making some adjustments where appropriate
February 2019	• At the request of the Board, various communications (phone calls and letters) between Anglian Water and Ofwat regarding the "D" rating in relation to the Securing confidence and assurance test area • Meeting between Stephen Billingham (Chairman of Anglian Water) and Jonson Cox (Chairman of Ofwat) on 26 February
Thursday 14 February 2019	Board meeting to discuss IAP and agree strategy and further details for response in relation to: • Generic elements of PR19 - Real Price Effects, frontier productivity, specification of Botex models and treatment of enhancement opex • Company specific element of PR19 - 20% disallowance of costs, evidence on need for enhancement cases, Investments linked to WRMP, totex challenge • Engagement with wider stakeholders - Government departments and agencies, the Customer Engagement Forum
Tuesday 12 March 2019	• Workshop organised at the request of the Board, to discuss the proposed IAP Response, in particular for the following areas: ▪ Additional evidence on enhancement cases and models ▪ ODIs and customer protection ▪ Botex modelling ▪ Financeability and financial resilience ▪ Approach to maintenance spend, risk to asset health ▪ Treatment of enhancement opex • Members of the Board considered whether the proposed IAP Response: ▪ Fully addressed the challenges presented by Ofwat in relation to each topic ▪ The extent to which the evidence and arguments presented were convincing ▪ What other areas should be included • All AWS Board members attended the workshop which was facilitated by members of the PR19 Programme Board
Wednesday 27 March 2019	• Board meeting to approve our IAP Response ▪ Signing of revised Board Assurance Statement

10.2 IAP assurance

We re-engaged Deloitte for financial assurance activities and Jacobs for technical assurance activities to review certain elements of our IAP Response. This included the following activities:

Ofwat post-submission queries: Each query response was passed to either Deloitte or Jacobs so that they could consider whether the response was relevant, complete and supported by evidence.

PR14 reconciliation data tables: Deloitte reviewed financial tables where AMP6 forecasts have been updated to better reflect performance to date. The reviews considered whether forecasts were consistent with supporting information and whether suitable explanation has been provided where appropriate.

Other data tables: All data that we updated in the remaining data tables, including new or amended lines in the January 2019 data tables issued by Ofwat, were reviewed by either Deloitte or Jacobs.

Financial models: Deloitte re-reviewed our process for populating and completing the updated Ofwat PR19 financial models, including response to actions identified in the IAP. This included assessing the feeder models, assumptions used to populate the models and overall checks and reconciliations for inputs and outputs.

Sludge forecasting models: Jacobs undertook a review of the model and outputs used to provide sludge production volume forecasts. The focus was to review how data has been used in the models and how that data has been used to populate the business plan data tables Bio1 and Bio2.

Customer engagement: Jacobs reviewed the customer engagement activity undertaken since receiving the IAP, including the data included in the relevant lines of tables App4 and WS18.

Performance Commitments: Jacobs reviewed our response to the actions identified in the IAP, along with changes to data in App1, and the data included in the new tables App1a and App1b.

Investment portfolios: Jacobs reviewed the updates to investment portfolios relating to Metaldehyde and Storm tanks, as these were the two main areas of change.

10.3 IAP wider assurance

As part of the Board's challenge to Management, it requested additional evidence to support the Plan, that we submitted in September 2018. A number of additional activities have therefore been undertaken. Subject matter experts carried out work on our behalf and the evidence has been used to support our IAP Response.

The information below summarises the wider assurance activities undertaken.

Area of business plan	Scope / aim of work	Assurance provider
Econometric models	Critique of models	Professor David Saal, Centre for Productivity and Performance, Loughborough University with Peer review by Alan Horncastle, Oxera
Econometric models	Assessment of models from first principles, operational basis	Internal business leads
Econometric models	Review of cost driver values used in models	Internal regulation leads
Econometric models	Review of enhancement models	Vivid Economics
Treatment of enhancement opex	Understand the impact on efficiency of moving out enhancement opex into enhancement models	Internal regulation leads

Treatment of enhancement opex	Critique of approach	Reckon
Direct Procurement for Customers	Provide further evidence to support proposals	KPMG
Position on Real Price Effects	Critique of Europe Economics report	First Economics
Position on additional 0.5% pa for productivity improvement	Critique of KPMG report	First Economics
Totex revisions relating to WRMP and Catchment management	Update treatment requirements due to metaldehyde ban Removal of farmer incentives for metaldehyde substitutions	Internal business leads
Totex revisions relating to WINEP	Update costs and capacities of storm tanks to reflect revised EA guidance and phasing of schemes into AMP8	Internal business leads
Investment reviews	Deep dive enhancement cases Cost models	Arup
Board assurance	Review of revised Board Assurance Statement	KPMG

10.4 IAP actions relating to the Board Assurance Statement

Action reference: ANH.CA.A1

The business plan will enable the company to meet its statutory and licence obligations, now and in the future and take account of the UK and Welsh Government's strategic policy statements.

"Our Plan will enable us to meet statutory and licence obligations, now and in the future and take account of the UK Government's strategic policy statements" [This assurance statement is not within the signed section of the BAS]

Reasons: The company's query response did not provide sufficient and convincing evidence that the Board was also signing the statement in the 'Supporting information' in addition to its Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response

The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to meeting statutory and licence obligations. The compliant statement can be seen on Page 9 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A2

Assurance that large investment proposals are robust and deliverable, that a proper assessment of options has taken place, and that the option proposed is the best one for customers.

No statement within the signed component of Board Assurance Statement

Reasons: We found no evidence of an assurance statement within the signed component of the Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response

The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to large investment proposals. The compliant statement can be seen on Page 22 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A3

Assurance that the Board has identified the risks associated with delivering the plan.

No statement provided in the signed component of the company's Board Assurance Statement

Reasons: We found no evidence of an assurance statement within the signed component of the Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response

The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to risks associated with delivering the plan. The compliant statement can be seen on Page 23 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A4

Assurance that the risk mitigation and management plans the Board has in place are appropriate.

No statement provided within the signed component of the Board's assurance statement

Reasons: We found no evidence of an assurance statement within the signed component of the Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response

The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to risk mitigation and management plans. The compliant statement can be seen on Page 23 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A5

Assurance that the company's business plan is financeable on both the notional and actual capital structure and the the plan protects customer interests in both the short and long term. The statement should clearly set out the steps taken to provide this assurance.

Our Plan is financeable on both the notional and actual company structure.

Reasons: The Board's assurance statement does not confirm that the plan protects customer interests.

Actions: Provide a restated and compliant Board assurance statement.

Our response
The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to financeability of the plan on both notional and actual capital structures and protection of customer interests in both the short and long term. The compliant statement can be seen on Page 25 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A6

The company's business plan provided sufficient and convincing evidence covering all necessary areas, that the company's full Board had provided assurance that its governance and assurance processes will deliver operational, financial and corporate resilience over the next control period and the long term.

No statement provided in the signed component of the company's Board Assurance Statement

Reasons: We found no evidence of an assurance statement within the signed component of the Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response
The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to providing assurance that governance and assurance processes will deliver operational, financial and corporate resilience. The compliant statement can be seen on Page 10 of the revised BAS. The Board signed the BAS on 27 March 2019.

Action reference: ANH.CA.A9

The company's business plan provided sufficient and convincing evidence that the company's full Board has provided comprehensive assurance to confirm that it will monitor delivery of its outcomes to ensure they meet its relevant statutory and licence obligations and has explained how it will do this.

No statement of assurance within the signed board statement however evidence of assurance process provided within the supporting information for the board statement.

Reasons: We found no evidence of an assurance statement within the signed component of the Board assurance statement.

Actions: Provide a compliant statement that is clearly made by the company's full Board.

Our response
The Board has provided a revised BAS, which updates the one submitted in September 2018, to provide sufficient and convincing evidence and to include a compliant statement in relation to confirmation that it will monitor delivery of outcomes. The compliant statement can be seen on Page 17 of the revised BAS. The Board signed the BAS on 27 March 2019.

10.5 Ofwat Action: dividend policy

Action Reference: ANH.CA.A7

On dividend policy the company is required to confirm that it is committed to adopt the expectations on dividends for 2020-25 as set out in 'Putting the sector in balance' to include:

- *clear Board commitment to publish detail on dividend policies in the APR and to signal changes to stakeholders; and*
- *commitment to transparency about how the dividend policy in 2020-25 takes account of obligations and commitments to customers for the dividend policy that is applied in 2020-25 and when determining dividends.*

Please provide an update on the steps you are taking to fully meet the expectations as set out in our putting the sector in balance position statement.

Our response

We have considered Ofwat's final position statement and accept that the base plan nominal dividend yield should be 4.5%: this is reflected in our Plan both for the notional and **the actual** capital structure. This is however, less relevant for us as we have committed to de-gear. Accordingly our shareholders have already agreed to forego dividends in the base plan. The majority of dividends that flow out of the Company are required to satisfy various covenants and will be injected back as equity into AWS.

Prior to dividends being paid, the board will have due regard to:

i. The company's performance in respect of business and regulatory targets in meeting obligations to its customers. These targets and obligations include both statutory obligations to customers as well as consideration of performance commitments set in ODIs and customer service measures including CMEx and DMEx; and
ii. The resilience of the business including the financial resilience through the remainder of the AMP, reflected in our Long-Term Viability Statement which we publish each year in our Annual Integrated Report.

The Board publishes its dividend policy in the Annual Integrated Report and Annual Performance Report for the duration of AMP7. In these reports we will explain clearly how dividends declared or paid comply with our dividend policy and how commitments to customers have been considered. Any changes to dividend policy such as those envisaged in the 'Putting the Sector back in Balance document will be clearly signalled to stakeholders in both of these reports. The Board will keep the dividend policy under regular review in order to ensure that it remains transparent and takes account of the interests of customers, wider stakeholders and evolving policy.

10.6 Ofwat Action: Executive Pay

Action reference: ANH.CA.A8

"On executive pay the company is required to confirm that it is committed to adopt the expectations on performance related pay for 2020-25 as set out in 'Putting the sector in balance' to include:

- *visibility and evidence of substantial linkage or executive remuneration to delivery to customers;*
- *clear explanation of stretching targets and how they will be applied;*
- *clearer explanation of how the policy will be rigorously applied and monitored;*
- *commitment to report how changes, including the underlying reasons, are signalled to customers; and*
- *commitment to publish the executive pay policy for 2020-25 once it has been finalised.*

Please provide an update on the steps you are taking to fully meet the expectations as set out in our putting the sector in balance position statement."

Our response

Executive Remuneration Governance

The Board is committed to implementing the recommendations included in the "Back in Balance" paper and in Ofwat's Board Leadership Transparency and Governance ("BLT9") principles which were published in January 2019.

The AWS Board has gone further and has adopted a new corporate governance code (the "2019 AWS Code") which incorporates the provisions of the UK Corporate Governance Code – save where the UK Code cannot sensibly be applied to a company in private ownership – together with Ofwat's BLTG principles. The 2019 AWS Code will be published on the AWS website on 1 April 2019. The first report on compliance against the 2019 AWS Code will be published in the 2020 Annual Integrated Report ("AIR"), and we will continue to report against the 2019 AWS Code on an annual basis. In addition, the AWS Remuneration Committee will consider the provisions of the Companies (Miscellaneous Reporting) Regulations 2018 (the "2018 Regulations") which relate to remuneration arrangements when setting policy and will ensure that AWS reports in accordance with the relevant provisions in our 2020 AIR.

The Board of Anglian Water has published, and will continue to publish in detail our remuneration policies in our AIR each year. As required under the 2019 AWS Code, Executive Remuneration is determined by the Remuneration Committee of the Board. The Remuneration Committee comprises a majority of Independent Non Executive Directors and is chaired by an Independent Non- Executive Director. The Remuneration Committee is committed to hold itself to account in respect of our governance Code, and therefore commissions an independent advisor (in this case PWC) to report on the adherence to our Code and to advise on how transparency might be increased. These recommendations are acted on each year. In reviewing the 2018 report, PWC commented that we were as transparent, and in many cases more transparent, than any other Water company, on all of the 18 measures that they review.

The Remuneration Report, which forms part of our Annual Integrated Report sets out both the achievement of previous targets and changes to the elements that make up the future targets for the senior executives. The report details the structure and quantum of the executive's remuneration. The report will continue to outline Executive Remuneration and changes to the policies will be highlighted. Pay policy for 2020 to 2025 will be published in the Annual Report once it has been finalised following the Final Determination.

Our approach to executive pay

We take our responsibility as a monopoly supplier of water and water recycling in the Anglian Region very seriously. We therefore go far beyond the required disclosure to demonstrate that our executives are rewarded for achieving the outcomes that benefit our customers. We are very conscious of consumer and public concern about high pay, and particularly pay which seems

unjustified by the results achieved. So we are reflecting the importance of there being a clear, transparent link between the rewards for executives and the results delivered to customers. We have consistently been more transparent with our Remuneration Report than is required, and we are committed to continue to do so. We published the ratio of CEO pay to median company pay a year before such disclosure was mandated, and we will be publishing the ratios in line with the 2018 Regulations (although compliance with this aspect of the 2018 Regulations is only mandatory for listed companies) in our 2019 AIR.

We have revised our executive pay approach in line with "back in balance" to even more explicitly tie reward to customer outcomes, and to increase the level of scrutiny over executive remuneration. In our September 2018 submission, we explained that the Remuneration Committee was reviewing the outcomes of the Customer Consultation that was carried out to construct the Business Plan, and considering how to align Executive Remuneration even more closely with the priorities expressed by our customers. Following the review, the Remuneration Committee has made the decision to align **all** variable reward to the outcomes that customers have indicated are their top priorities, and to fundamentally restructure executive packages to reflect these priorities. To achieve maximum rewards in our bonus scheme, executives therefore need to achieve extremely stretching outcomes that are all 100% linked to delivery to customers as set out in our business plan. Our approach is illustrated below, in a table from our Remuneration Report in our 2017/18 Annual Integrated Report which details the ODI targets and our achievement against these targets. This table is then translated into a breakdown of each executive's bonus calculation, so that the components of each executive's bonus payment can be clearly seen.

Figure 44 Table taken from the 2017/18 Annual Integrated Report showing targets and achievement

	Threshold	Base	Stretch	Outcome
SIM position (position among WaSCs)	5th 🟢	4th 🟢	🟢	1st
Interruptions to supply (minutes)	–	12 🟢	🟢	7 mins 24 secs
Leakage (megalitres per day)	–	182 🔴	🔴	183
Pollution incidents (number of Category 3 incidents)	298 🟢	219 🟢	🔴	219
Bathing waters (number of bathing waters rated excellent)	–	33 🔴	🔴	31
Flooding internal (number or properties)	–	448 🟢	🟢	396
Water quality complaints (number of complaints per 1,000 customers)	–	1.23 🟢	🔴	1.23
Affordability (% improvement in CCWater tracker survey)	–	2% 🟢	–	10%
Fair bills (% improvement in CCWater tracker survey)	–	2% 🟢	–	9%
Flooding external (number of properties)	–	6,159 🟢	–	4,823
Low pressure (number of properties at risk of persistent low pressure)	–	366 🟢	🟢	297
Drinking water quality (% mean zonal compliance)	–	99.95 🟢	–	99.96
Per property consumption (litres per property/household per day)	–	308 🔴	–	316
Value for money (% improvement in CCWater tracker survey)	–	2% 🟢	–	8% (water) 5% (sewage)

We will continue to provide this level of openness in the next AMP, with the AMP7 ODIs used as the Performance Measures in the bonus scheme, and we will apply the same methodology to the other elements of the new scheme as set out below.

Implementation of policy 2020 to 2025

Executive Remuneration in AMP7 will therefore comprise two elements:

1. **Base Pay & Benefits**: These are fixed, and tested annually against the market. Our policy is to target median reward when judged against our sector and organisations of similar scope and

scale, this is in line with our policy for the wider workforce. In accordance with the provisions of the AWS 2019 Code, we will align the percentage of salary paid in pension contributions to new Executive Directors with those of the wider workforce, i.e. they will be no more than 12% of basic pay.

2. **Deferred Bonus Scheme**: Our previous annual bonus scheme and LTIP will be replaced by one scheme which **only** rewards measures that customers have indicated are important to them. There will be **no** reward directly linked to securing shareholder returns, as the Remuneration Committee believes that achieving these customer focused goals will be in everyone's long term interests – an efficient, sustainable organisation with customers' interests at its heart will deliver for everyone, including shareholders. We believe we are the only WASC to have taken such a customer centric approach.

The Deferred Bonus Scheme will have three sets of measures:

- Direct customer measures such as CMEX and the achievement of our ambitious support proposal for our most vulnerable customers
- Customer delivery measures – a small number of ODIs which represent the most important customer priorities as determined by our customers
- A customer centric measure of efficiency – customers want the company to provide services as efficiently as possible, and we will reward the achievement of efficiency which is shared with them.

Executives will earn an annual bonus based on achieving base, threshold, and stretch performance against these measures. The measures will be published in the AIR, and be directly linked to the 2020 to 2025 outcomes that are agreed following our Business Plan submission. In other words, Executives will be directly remunerated on achieving the Business Plan endorsed by our customers.

At the end of the year for which the bonus has been set, achievement will be calculated and half of the reward earned will be paid out.

The remaining half will be paid out in two tranches – two years and three years after the first payment – and therefore three and four years after the performance period begins. These payments will be dependent on the achievement of a number of serviceability measures during the deferral period, to ensure that performance is sustained in the long term.

Importantly, we are increasing the degree of discretion and oversight applied by the Remuneration Committee. It is critical to our customers, and to the future success of the company that short term decisions are not taken at the expense of the long term viability of water infrastructure in the region. The Remuneration Committee will therefore ensure that there are material deductions to awards in the event of a deterioration in Environmental or Health and Safety performance or as a result of reputational damage. The Remuneration Committee will also retain discretion to look at performance in the round, with the ability to stop any award in full in the event of short-term focus at the expense of long term customer needs. Comprehensive malus and clawback provisions will also be built into the scheme rules to ensure that Executives are held to the highest standards of behaviour.

The Remuneration Committee believes that this policy and the publication of measures and achievement will mean that:

- rewards reflect long term sustained performance for the benefit of customers
- any rewards are transparent and there is read across from achievement to the level of reward
- rewards are proportional to the challenge of the goals set, so that maximum rewards are only payable against outstanding delivery
- rewards reflect achievement of the goals and challenges set out in our final Business Plan
- rewards will reflect outperformance which has also benefited the customer, for example through ODI reward, re-investment or the sharing of outperformance.

The detail of the measures (once the targets are agreed in the Final Determination), will be published in the Annual Integrated Review and we will continue to publish the detail annually.

We have consulted with PWC on our proposals and they have commented that the new scheme has the following positive features:

- Retains ability to set targets for the performance period based on alignment with regulatory targets
- Increases focus on customer outcomes
- Reduces focus on measures over which executives have less control (e.g. shareholder return)
- A range of underpin measures attached to the deferred element of the award, both "hard" through the use of serviceability metrics and "soft" through the availability of discretion and operational/safety underpins
- A longer deferral term for a portion of the award to four years after the beginning of the performance period (currently the LTIP pays out after three years), recognising that the targets are being set over a shorter period

Ensuring customers, staff and stakeholders' voices are heard

Customer feedback is so important to us that we have gone further than other companies, and consulted our customers about the changes that we are planning to make, in order to assure ourselves that customers agree that these changes are significant improvements. We consulted our online community about the high level principles that we were planning to apply, and 82% agreed that this was an improvement. This gives us a high level of confidence that the policy has significant support, and as agreed with the Customer Engagement Forum, we will continue to feedback the details of the remuneration policy as it is developed in detail to seek their feedback and support. We will also publish a guide to executive remuneration in our AIR written in plain English, so that our policy is clear to our customers.

In line with the 2018 Regulations, the Board will also be implementing the recommendations with regard to Employee Voice, and we are currently working to ensure that there is an employee voice in all Remuneration decisions. As required by the 2018 Regulations, we will explain in our 2020 AIR how directors have engaged with employees, and how the directors have had regard to employee interests, and the effect of that regard, including on the principal decisions taken by the company during the financial year.

The elements of our variable pay strategy are therefore linked to stretching customer centred goals, whether that is through the achievement of ODIs and CMEX or as a result of efficiencies which flow through into financial outperformance which is shared with the customer. We have demonstrated in past Remuneration Reports an exceptional level of transparency, including publication of objectives, base and stretch targets and outcomes. We are committed to continuing this practice in the next AMP and beyond, increasing our transparency even further through explicit customer and employee engagement over remuneration policy.

Ofwat feedback

The company does not put forward proposals for a bespoke voluntary benefits sharing mechanism but proposes donations to social tariffs and hardship funds which we assess could have a value of £1.0m per year. The scale of the proposals for voluntary benefits sharing are very modest in the context of the company's size. However, voluntary sharing is not a requirement of the PR19 methodology, so the proposed sharing does not impact our assessment of this test area.

We note that this did not impact on our assessment but we are proud to work closely with, and invest in our communities, reflected in being named as BITC's Responsible Business of the Year in 2017. The attached 'Social Impact Assessment Report 2017/18' (Appendix 8b) outlines the impact of our work, and we will continue to develop our long term commitment and investment in our communities and in social capital more widely.

10.7 Ofwat Action: Financial model and data tables

Action reference: ANH.CA.A10

The company is required to provide a revised financial model and data tables on 1 April 2019. Please see 'Anglian Water: Securing confidence and assurance detailed actions.'

Provide a revised financial model (based on version 16z released on 31 January 2019) and data tables on 1 April 2019."

Our response

We have submitted a full suite of data tables using the template provided by Ofwat on 31 January 2019. The changes made to the data tables are listed in the table at the beginning of each Data Tables Commentary document. Table commentary has been updated where appropriate to explain changes at the individual line level.

We confirm that we have provide a revised financial model (based upon the latest version 17z released on 6th March 2019).

Action Reference: ANH.CA.B1 (advised)

The company has an advisory action regarding its financial model. Please see 'Anglian Water: Securing confidence and assurance detailed actions.'

Provide an updated financial model that does not overwrite our CPI(H) + RPI wedge calculation in 2020/21 and the TDS discount factor.

Our response

We confirm that the revised financial model provided does not overwrite the CPI(H) + RPI wedge calculation in 2020/21 and the TDS discount factor.

11. TARGETED CONTROLS, MARKETS AND INNOVATION

Ofwat's test area assessment: Targeted controls, markets and innovation

Overall test area grade	Overall test area summary assessment and rationale
B	Overall, Anglian Water provides sufficient and convincing evidence across most areas of Targeted Controls, Markets and Innovation. However, it is not sufficiently ambitious and innovative to be exceptional. The company convincingly demonstrates a commitment to using market led solutions for most aspects of its plan. The company provides an ambitious and innovative plan for the use of markets for both water and wastewater network-plus. For example, the Slug It Out scheme, which engages farmers to help reduce pollution, uses sector leading techniques when engaging with the market. On water resources, Anglian Water has a strong approach to using markets and engaging with third parties, with some evidence of an ambitious and innovative approach. For RCV Allocation, the evidence is complete. The company's plan includes strong evidence across most areas of innovation, with some ambitious ideas for some of the drivers. However, there is less convincing evidence about how its leadership and support help facilitate an innovation culture, specifically regarding internal interaction with employees at all levels. Information on bilateral markets is more limited, whilst on bioresources the company has evidenced engagement with third party providers for low-value services, like haulage, rather than considering more extensive third party options. The company considers the relevance of DPC for its investment programme. However, there is uncertainty related to the scheme proposed, which would be subject to consultation in the 2024 WRMP. The Value for Money assessment included in the plan for that scheme is insufficient as a clear strategic case has not been made for the scheme.

Overview of our IAP Response

We are pleased with our overall test assessment in this area. We respond to all actions in this test area including:

- providing further information about how we have used growth and WINEP data to devleop our forecast of sludge volume calculation;
- confirming our approach to splitting fixed and variable revenues for the bio-resources revenue control;
- confirm we are committed to providing a detailed work programme by the end of August 2019 to deliver appropriate drainage and wastewater management plans;
- confirm our commitment to address Ofwat's feedback on our Bid Assessment Framework by 15 July 2019.

We have provided a comprehensive response to each action identified for DPC. Each of the three schemes analysed were assessed as having an overall DPC suitability of "less suitable" on the basis of size, discreteness and value for money.

We explain that we are fully committed to work with our neighbouring companies via regional water resources planning groups as part of our preparations for WRMP24 to deliver the ambition set out in the joint regulator "Building Resilient Water Supplies" letter.

We are supportive of the developing market for Bioresource activities both in terms of inter WASC trading and use of third parties. We are excited by the opportunity it presents. We have been active in many areas both at a bilateral level and through encouraging the development of market-assisting tools like the Biosolids Assurance Scheme to encourage the development of bioresources markets.

Although not an action, we have provided information on our Transforming our Leadership Programme and other programmes for employees which demonstrate our commitment to an innovation culture.

11.1 Ofwat Action: Sludge volume calculation

Action Reference: ANH.CMI.A1

The company's plan does not provide sufficient explanation for the sludge production volume forecasts. The company should provide further evidence around how the sludge volume forecast was calculated, including any assumptions made or adjustments to model outputs.

Our response

For years up to 2019/20 the forecast raw sludge produced (ttds) has been calculated as follows. A raw sludge production rate of 0.02183 ttds per head of population equivalent (PE) per annum has been used. This is the average of the 2015/16 and 2016/17 taken from table 4 for the September 2017 RCV data submission. The production rate has been multiplied by the anticipated connected PE for the given year. This data takes local authority growth data by site by year.

From 2020 the sludge production data is taken directly from the Business Modelling Associates (BMA) Decision Support Tool (DST) model. The BMA DST model uses the same growth assumptions and also includes for the anticipated impact of new quality standards for wastewater treatment from the WINEP3 programme. The BMA DST model was built using historic sludge production numbers from 350 WRCs representing over 95% of the total indigenous sludge production. Growth projections for all WRCs have been captured and applied to the respective WRCs in the model. Site specific sludge yields were increased in-line with the population equivalent increase. The population (PE) increase (as modelled) from 2020 to 2025 is approximately 3.99%, the total sludge yield (PE related) for the same period is approximately 4.29%. This difference is because sludge production is dependent on the individual site conditions where population growth occurs as it is specific to the type of process and existing consent standards at these WRC's.

The percentage increase in sludge production following P removal and population growth for each year of the AMP is:

to 2021-22 - 0.08% (P-removal), 0.88% (growth)

to 2022-23 - 0.14% (P-removal), 0.76% (growth)

to 2023-24 - 0.16% (P-removal), 0.71% (growth)

to 2024-25 - 2.68% (P-removal), 0.70% (growth)

to 2025-26 - 0.45% (P-removal), 0.63% (growth)

This is based on forecast growth figures for our region and phosphorus consent levels in WINEP3.

11.2 Ofwat Action: Fixed and variable costs Bioresources

Action Reference ANH.CMI.A2

The proposed split of fixed and variable revenues for the bio-resources revenue control has not been sufficiently evidenced, particularly where cost lines are partly incremental and partly fixed. We are also intervening to ensure that the bioresources revenue adjustment is set on a broadly comparable basis to avoid setting revenue controls that may distort the development of trades. We will set out our view in the draft determinations based on the updated tables Bio1, Bio3 and Bio4. We will treat the funding of the 2020 RCV (run-off, returns and tax) as fixed for these purposes, along with revenues to recover local authority rates; some fees; and a proportion of direct and indirect costs of bioresources treatment and transport.

Our response

We believe that our proposed split of fixed and variable revenues for the bioresources revenue control has been sufficiently evidenced with the guidance available. We set out in the table commentary for Bio4 a detailed breakdown of expenditure areas and the rationale for how each was classified. The information in Bio4 confirms the information provided in our response to Ofwat's post submission query ANH-IAP-CMI4_001.

The allocation of revenue to recover fixed and variable costs has been calculated in accordance with the additional guidance provided by Ofwat and our historic bioresources cost data. In determining whether these costs were classified as being fixed or variable, we have assessed, by cost category, whether these costs would be likely to change driven by short term increases/reductions in sludge volumes.

Where costs were determined to vary in the short term with changes to sludge volumes, these were all categorised as variable (with all other expenditure items categorised as fixed). We have assumed that sludge volumes would only vary by relatively modest amounts and likely impact all sludge treatment centres.

11.3 Ofwat Action: Drainage and Wastewater management plans

Action Refernece: ANH.CMI.A3

The company should provide a commitment to provide a detailed work programme by end August 2019 to assure us that the company will deliver appropriate drainage and wastewater management plans. The programme should ensure that the company can prepare and consult on its first drainage and wastewater management plan no later than the summer of 2022 to enable revised plans to be prepared in early 2023 to inform PR24 business plans.

Our response

We confirm we are committed to providing a detailed work programme by the end of August 2019 to deliver appropriate drainage and wastewater management plans.

In advance of the Drainage and Wastewater Management Plan framework, in September 2018 we published our first Water Recycling Long-Term Plan (WRLTP). Our WRLTP:

- outlines investment strategies to support sustainable growth: £479M in AMP7 and £1.2billion to 2045.
- reviews risk at all of our 1,100+ Water Recycling Centres (WRCs) and catchments.
- is the first one to be published in the Industry.
- is framed by our Strategic Direction Statement, our 25 year forward vision for the region and supports our AMP7 Business Plan.
- complements our Water Resources Management Plan (WRMP).
- was prepared in collaboration with our partners and customers; requires working in partnership to deliver solutions effectively.

By summer 2022 we will publish our first Drainage and Wastewater Management Plan (DWMP) which will;

- encompass all drivers and investment that contribute to water recycling outcomes.
- be developed by the Water UK 21st Century Drainage Programme and involve all WaSCs, supported by key regulators.
- is expected to become statutory, like the WRMP.
- provide the opportunity to integrate external stakeholder needs and long-term aspirations into our intervention proposals from 2025 onwards.
- be driven by the same factors that led us to develop our WRLTP - it's a natural next step for us.

We have been active in supporting the development of the DWMP framework through involvement in the Project Steering Group, and continue to support delivery through the Water UK DWMP Implementation Group and the DWMP Project Steering Group. This enables us to use this wider insight to ensure we adopt best practice and helps to ensure consistent approach across companies. In September 2018 we established a DWMP Lead, an active internal DWMP Strategic Planning Group that meets quarterly, supported by a DWMP Task and Finish Group that meets monthly. We also meet quarterly to consider alignment of practices between the DWMP and WRMP, such as stakeholder engagement. This is supported by a Risk and Issues Log, and Action and Decisions Log. We have completed our first Risk Based Catchment Screening (RBCS) assessment with 2017 baseline data as a first test. We will feed into national data presentation of risk from the RBCS assessment and Baseline Risk and Vulnerability Assessment. We have started to engage our stakeholders with awareness presentations at key events, such as Regional Flood and Coastal Committees, Catchment Based Approaches (CaBA) workshops and the FloodEx conference.

The development of our WRLTP has established risk based decision making that provides a platform for DWMP implementation. We are fully committed to producing our first DWMP by summer 2022

11.4 Ofwat Action: Bid assessment framework

Action Reference: ANH.CMI.A4

The company has provided a bid assessment framework that has many elements of good practice but where we have identified specific concerns. These include, but is not limited to, areas where the process outlined for the assessment of third party bids appears to favour the assessment of in-house options without justification. The company should make a change to the bid assessment framework document in response to our feedback published in the associated information notice, including addressing the issue of potential discrimination.

Our response

This action is required by 15 July 2019 and we will respond in due course.

11.5 Direct procurement for customers

In response to the Direct Procurement for Customers (DPC) detailed actions from Ofwat, we have provided a comprehensive response to each action identified. We engaged KPMG to support our response, ensuring a consistent approach to the DPC analysis used within our original business plan submission. KPMG's detailed response is set out in the accompanying appendix 11a (Direct Procurement for Customers: IAP Response). We provide cross references to the relevant pages of this report as part of our responses to each action.

In summary, we have provided additional technical details and a breakdown of the estimated scheme costs for the Elsham, North Fenland to Ely, and Pyewipe schemes. In addition, we have completed a value for money (vfm) assessment for each of these schemes, adopting the new assumptions set out in Ofwat's IAP assessment Appendix A. We have also responded to Ofwat's query as to the rationale for separating Pyewipe treatment and transfer schemes in our original assessment.

Our analysis shows that for all three schemes, 'in-house' delivery is more beneficial for customers than DPC delivery. Therefore we have not altered our view on DPC as set out in our September 2018 Business Plan. The Elsham Treatment and Transfer Scheme, which has a relatively high initial capital spend, may provide marginally greater value for money for customers under the DPC delivery model in the Mid Case, but the results are highly sensitive to the assumptions and the discreteness test also suggests that the scheme is less suitable for DPC compared to in-house delivery.

The smaller schemes are more expensive under the DPC model and an in-house delivery could save customers between 4.5% and 5.3% of the total costs in NPV terms.

Table 82 Summary of key findings

Eligibility assessment	Elsham Treatment & Transfer	North Fenland	Pyewipe (integrated)
Size test [1]	Pass Whole life costs: £337m	Marginal Whole life costs: £100m	Pass Whole life costs: £140m
Discreteness test	Less suitable Critical supply asset, providing highly integrated system resilience, mitigating operational failure and uncertainty around scope	More suitable Limited number of interfaces, with no upgrades expected, however critical and required for day to day operation	Less suitable Combination of two elements requiring different capabilities and characterised by different risk profiles.

VFM analysis	Marginal Pass	Fail	Fail
Overall DPC suitability	Less suitable	Less suitable	Less suitable

1 in 2017/18 prices. The asset useful economic life calculated as the weighted average of infrastructure and non-infrastructure elements based on 25-year capex spend

11.6 Ofwat Action: Elsham Transfer and Treatment scheme

Action Reference: ANH.CMI.A5

Elsham Transfer and Treatment scheme

- *A summary of the key elements of the proposed Elsham Transfer and Treatment scheme. This should include all of the relevant scheme information including but not limited to the key deliverables.*
- *A summary of the projected scheme costs clearly identifying the costs for each phase of the scheme by year. These should clearly identify the incremental costs to Anglian Water.*
- *An economic analysis of the scheme including a Net Present Value analysis using the standardised assumptions provided in Table A. This analysis should clearly identify any additional benefit to customers of progressing this scheme outside of DPC.*

Our response

We have provided additional technical details relating to the Elsham Transfer and Treatment scheme in appendix 11a. This includes a summary of the key infrastructure and non-infrastructure asset components p.10, a high level schematic diagram to illustrate how the different elements of the scheme integrate together p.11 and a detailed process diagram of the proposed water treatment works p.12.

A timeline with the projected costs associated with the Elsham scheme has also been provided. This clearly shows the costs associated with each phase of the scheme by year and provides a breakdown to show the Capex, Capex Repeat, Opex (RICS) and Opex (RICS) Repeat costs associated with the scheme p.13-15.

We have completed a vfm assessment for the Elsham scheme adopting the new assumptions set out in Ofwat's IAP Response Appendix – Direct Procurement for Customers detailed actions. The analysis directly compares the value to customers for delivering this scheme under DPC against in-house delivery. The full results from the assessment can be found on pages 16-19.

Our analysis shows that the delivery of the Elsham transfer and treatment scheme under the DPC delivery model may provide marginally greater value for money for customers in the mid-case (£0.3 million or 0.3% of total costs in NPV terms) than in-house delivery. These results are highly sensitive to the new assumptions applied. If the assumed Capex efficiency benefits are not realised then the benefits offered by DPC would be offset by the additional procurement costs.

Bringing in the wider DPC eligibility tests set out in Ofwat's Guidance, specifically technical eligibility (i.e. discreteness) has highlighted that the Elsham scheme is unlikely to provide benefits to customers under the DPC delivery route. Based on our updated analysis, we are recommending that this scheme is not considered for delivery under the DPC delivery route.

11.7 Ofwat Action: North Fenland to Ely Transfer and Treatment scheme

Action Reference: ANH.CMI.A6

North Fenland to Ely Transfer and Treatment scheme

- *A summary of the key elements of the proposed North Fenland to Ely Transfer and Treatment scheme. This should include all of the relevant scheme information including but not limited to the key deliverables.*
- *A summary of the projected scheme costs clearly identifying the costs for each phase of the scheme by year. These should clearly identify the incremental costs to Anglian Water.*
- *A revised economic analysis of the scheme including a new Net Present Value analysis using the standardised assumptions provided in Table A. This analysis should clearly identify the any additional benefit to customers of progressing this scheme outside of DPC.*

Our response

We have provided additional technical details relating to North Fenland to Ely Transfer and Treatment scheme, see appendix 11a. This includes a summary of the key infrastructure and non-infrastructure asset components and a process diagram of the proposed water treatment works p.21.

A timeline with the projected costs associated with the Fenland scheme has also been provided. This clearly shows the costs associated with each phase of the scheme by year and provides a breakdown to show the Capex, Capex Repeat, Opex (RICS) and Opex (RICS) Repeat costs associated with the scheme p.22-23.

We have completed a revised vfm assessment for the Fenland scheme adopting the new assumptions set out in Ofwat's IAP Response Appendix – Direct Procurement for Customers detailed actions. The analysis directly compares the value to customers for delivering this scheme under DPC to outside of DPC. The results from the assessment can be found on p.24-27.

Our analysis has shown that the delivery of the North Fenland to Ely Transfer and Treatment scheme is more expensive under the DPC model and in-house delivery could save customers ~4.5% of the total costs in NPV terms (£1.7 million). It should also be noted that this scheme only marginally passed the size test for DPC eligibility (£100.2 million).

Based on our updated analysis, we are recommending that this scheme is not considered for delivery under the DPC delivery route.

11.8 Ofwat Action: Pyewipe Water Reuse of Non potable use

Action Reference: ANH.CMI.A7

Pyewipe Water Reuse for Non-potable use

- *A summary of the key elements of the proposed Pyewipe Water Reuse for Non-potable use scheme. This should include all of the relevant scheme information including but not limited to key deliverables.*
- *A summary of the projected scheme costs clearly identifying the costs for each phase of the scheme by year. These should clearly identify the incremental costs to Anglian Water.*
- *A summary of the timeline to increase the output from 6 Ml/d to 20Ml/d as per Anglian Water's plan (pg. 67).*

Our response

We have provided technical details relating to the Pyewipe Water reuse for non-potable use scheme, see appendix 11a. This includes a summary of the key non-infrastructure asset components p.29, a high level schematic diagram to illustrate how the different elements of the scheme integrate together p.30 and a detailed process diagram of the proposed non-potable water treatment works p.31.

A timeline with the projected costs associated with the Pyewipe Water reuse for non-potable use scheme has also been provided. This clearly shows the costs associated with each phase of the scheme by year and provides a breakdown to show the Capex, Capex Repeat, Opex (RICS) and Opex (RICS) Repeat costs associated with the scheme p.32.

We have also provided a timeline to outline the timescales associated with increasing the output at Pyewipe from 6 Ml/d to 20 Ml/d. This will be phased over AMP7 and AMP9 with full capacity being delivered at the start of AMP9.

Full capacity at Pyewipe is not required until a much later period, at the start of AMP9, therefore the non-infrastructure elements of the scheme will be constructed with an initially lower output requirement of 6 Ml/d and extended over AMP8 on a modular basis.

We are adopting an adaptive planning approach to this scheme and future solutions will be assessed as part of WRMP24 and included in our PR14 business plan.

11.9 Ofwat Action: Transfer from Pyewipe to non potable network scheme

Action reference: ANH.CMI.A8

Transfer from Pyewipe to non-potable network scheme

- *A summary of the key elements of the proposed Transfer from Pyewipe to non-potable network scheme. This should include all of the relevant scheme information including but not limited to the key deliverables.*
- *A summary of the projected scheme costs clearly identifying the costs for each phase of the scheme by year. These should clearly identify the incremental costs to Anglian Water.*

Our response

We have provided technical details relating to the Pyewipe Transfer from Pyewipe to non-potable network see appendix 11a. This includes a summary of the key infrastructure asset components p.35 and a high level schematic diagram to illustrate how the different elements of the scheme integrate together p.36.

A timeline with the projected costs associated with the Pyewipe Transfer from Pyewipe to non-potable network scheme has also been provided. This clearly shows the costs associated with each phase of the scheme by year and provides a breakdown to show the Capex, Capex Repeat, Opex (RICS) and Opex (RICS) Repeat costs associated with the scheme p.37.

11.10 Ofwat Action: Pyewipe other

Action reference: ANH.CMI.A9

Pyewipe – other

- *Please explain why linking the two Pyewipe schemes into a single DPC scheme was not contemplated.*
- *An economic analysis of a combined Pyewipe Water Reuse for Non-potable use scheme and Transfer from Pyewipe to non-potable network scheme including a new Net Present Value analysis using the standardised assumptions provided in Table A*
- *This analysis should clearly identify any additional benefit to customers of progressing these schemes outside of DPC.*

Our response

The Pyewipe Treatment and Transfer Schemes are inherently different in nature and cost profile raising concerns around the deliverability of the aggregated scheme under a DPC model.

Risk profile	• As a general rule, infrastructure elements are characterised by inherently different risk profile than non-infrastructure elements. • While the transfer scheme is considered to be a relatively simple asset from construction and operational perspectives, treatment works involve complex operational processes. • As a result, the average expected return for a transfer scheme ranges between 1% - 2%, versus 6% - 10% for treatment works.
Capabilities of the supply chain	• The delivery of the treatment work and transfer scheme requires different set of capabilities from the supply chain. • Combining that with the different risk profiles of these two elements, bringing them together into one aggregated DPC project is likely to reduce the scheme's attractiveness in the market. • Limited interest from market participants can act as a major constraint on competition achieved through tendering. A reduction in competitive tension will adversely affect the potential benefits of the DPC route. • The supply chain may, however, consolidate their capabilities and enter the tender in consortia allowing participants to share the risk and manage the aggregated project in an efficient way.
Uncertainty	• The increase in costs for professional indemnity cover by 150% from 2018/19 introduces significant contractor risk and raises concerns around insurability of the project. • While the Pyewipe Treatment and Transfer Schemes represent the preferred option in the WRMP, in light of the responses received as part of the consultation, there is some uncertainty around the scheme and alternative options are being considered.

We have responded to Ofwat's query as to the rationale for separating Pyewipe treatment and transfer schemes in our assessment, see appendix 11a, p.39.

We have completed a vfm assessment for the integrated Pyewipe scheme adopting the new assumptions set out in Ofwat's IAP Response Appendix – Direct Procurement for Customers detailed actions. The analysis directly compares the value to customers for delivering this scheme under DPC to outside of DPC. The results from the assessment can be found on p.40-44.

Our analysis has shown that the delivery of the Integrated Pyewipe scheme is more expensive under the DPC model and in-house delivery could save customers ~5.5% of the total costs in NPV terms (£3.0 million). Bringing in the wider DPC eligibility tests set out in Ofwat's Guidance, specifically the technical eligibility (i.e. discreteness), has highlighted that the integrated Pyewipe scheme is unlikely to provide benefits to customers under the DPC delivery route.

Based on our analysis, we are recommending that this scheme is not considered for under the DPC delivery route.

11.11 DPC conclusion

Each of the three schemes analysed as part of the IAP response have been assessed as having an overall DPC suitability of 'less suitable' on the basis of size, discreteness and value for money. The results show that all three schemes are unlikely to provide benefits to customers under the DPC delivery route. Whilst the Elsham Treatment and Transfer scheme may provide marginally greater value for money for customers under DPC delivery, the results are highly sensitive to the assumptions made and the scheme does not pass the discreteness test.

The proposed timeline assumes that a competitive process is not required. We assess this would add 12 months to the programme and would jeopardise meeting our obligation dates for restoring sustainable abstraction.

11.12 Ofwat Action: Strategic water resource options

Action reference: ANH.CMI.A10

The company should explain how it will work together with neighbouring companies to explore strategic water resource options and knowledge sharing on demand-side measures with regional planning groups.

Our response

The development of strategic water resource options and demand management measures is an integral part of the Water Resources Management Plan (WRMP) process. We are fully committed to working with our neighbouring companies through regional water resources planning groups as part of our preparations for WRMP24 to deliver the ambition set out in tripartite regulator "Building Resilient Water Supplies" letter.

We will continue to work together, both bi-laterally, and within regional groups to ensure the consistent development (including cost assessment and delivery of enabling works) of feasible strategic water resource options to address the future challenges of climate change, further environmental needs and resilience to extreme droughts. This will be a build on the extensive sector leading work we have delivered in AMP6, as part of the Water Resources East initiative.

We are involved in three regional planning groups; Water Resources East (which we led in AMP6, and is now being set up as an independent organisation), Water Resources South East and Water Resources North. The Environment Agency led National Planning Framework will co-ordinate the inputs from these groups and establish a consistency picture of the need for additional resources nationally.

We will work jointly with Affinity Water to deliver the work required to ensure the eastern regional transfer options and associated South Lincolnshire Reservoir is construction ready in AMP8. This work will be delivered via scheme working group, as part of the structure governance structure set out in to deliver strategic regional solutions for the south east (see response to ANH.CE.A3) and additional information in Appendix 4a.

We will also continue to work within the regional groups and across the sector to develop future demand management strategies, sharing the learning from implementation of AMP6 demand management programmes, such as our smart metering roll out. We are already working collaboratively across the industry with Water UK assessing long term pathways for achieving Per Capita Consumption (PCC) reductions. This work will feed into the development of demand management strategies in the regional plans, WRMP24 and PR24.

11.13 Ofwat Action: Bioresources trades and Collaboration with other companies

Action reference: ANH.CMI.B1-2

- *The company should provide further information on potential bioresources trades with other companies.*
- *The company should consider how it can collaborate with other companies to maximise the opportunities for research to address common challenges (eg leakage detection, water efficiency and wastewater treatment processes) rather than companies progressing research independently.*

Our response

Bioresources trades

We are supportive of the developing market for Bioresource activities both in terms of inter WASC trading and use of third parties. We are excited by the opportunity it presents. We have been active in many areas both at a bilateral level and through encouraging the development of market-assisting tools like the Biosolids Assurance Scheme to encourage the development of bioresources markets.

We have regularly engaged with our neighbouring WASCs over the past four years. These discussions have included bilateral talks over potential short term non-committal trades and long term fully committed trades.

The table summarises the meetings held and the key actions and activities that arose warranting further investigations.

Table 83

Water and sewerage company	Meeting date	Meeting date	Meeting date	Meeting date	Status
Thames	14 January 2016	8 June 2016	12 July 2016	6 June 2018	Initial meetings identified options for long term and short term trades. Long term trading out of raw cake with the transfer of cake from Tilbury to TMS Riverside sites has been discussed. This potential trade was highlighted as an example of 'good practice' in the Ofwat Wholesale Markets Guidance document issued in March 19. However, insufficient capacity and Thames Water's strategy changes mean this is not an option until 2023 at the earliest. Short term non-committal trades on liquid sludge along boundary areas have also been identified. This would be on a reciprocal basis to reduce transport movements and costs.
Severn Trent	11 January 2016	31 August 2016	30 January 2018		Spare capacity is unavailable in close proximity to the border areas. SVT does not have the ability to receive or export sludge as raw cake.

					Short term non-committal trades on liquid sludge along boundary areas have been identified. This would be on a reciprocal basis to reduce transport movements and costs.
Yorkshire	10 December 2015	10 April 2017			There is no opportunity at present for long term committed trades due to lack of capacity within the boundary areas. We have entered into a number of short term trades with YW over the period, receiving dewatered raw sludge cake into both Pyewipe and Gt Billing STC's. Liquid sludge trades are not feasible due to excessive transport distances between the respective STC's. In addition to these meetings we actively participated in the YW Bioresources market testing exercise during 2018.

We have produced and continue to develop a number of modelling tools to aid in the assessment of trading opportunities with our neighbouring WASCs.

- We used the 25 year strategic model to assess viability of trades at various gate fees to assess which sites would be viable for trading.
- We used our transport planning tool (Paragon) to assess the viability of short term trades with neighbouring WASCs. This assessed all sites where the distance travelled for moving sludge from water recycling centres to a STC for treatment was equal or greater in distance compared to a neighbouring WASC's facility.
- We have completed the rollout of a new weekly production planning model (PPM) that provides a complete view of the end to end Bioresources network including transport, treatment and recycling operations. The model provides a dynamic view of cost on both a system and site level together with capacity utilisation rates against a weekly sludge production profile which considers the seasonal nature of sludge production based on historic trends. The outputs of this model will provide a greater insight of capacity, headroom, unit cost and risk, thus enabling the management teams to make better informed decisions on trading opportunities.
- Based on 16/17 cost base for our STC assets modelling demonstrated that three would open to trading sludge.

To date we have exchanged details of the identified sites with the neighbouring WASCs in terms of volumes, sludge type and quality, we have also exchanged draft contract terms and anticipate that trading around these opportunities will commence by 2020/21.

Collaboration

Anglian Water Innovation Lab

We are creating the Anglian Water Innovation Lab in partnership with Allia Future Business Centre. It aims to achieve better internal engagement with innovation and also provide the facility as a support to small innovative businesses in our region. This will mean all AW employees and Alliance partners will have access to the lab for projects and team building days etc. to put a focus on enabling innovation and creating expansive opportunities outside of people's day to day roles. There are 4 main areas it will focus on developing people's skills:

- CAD design and VR
- Electronics & Computing
- Bespoke manufacturing & Rapid prototyping
- Digital Media

The lab also compliments the Water Innovation network by providing state of the art facilities to help entrepreneurs with product or service development. The lab will help to increase the talent pipeline into the industry by engaging with schools in the area around STEM topics relating to the water industry.

Anglian Centre for Water Studies

Over the last two years we have been partnering with the University of East Anglia to create the Anglian Centre for Water Studies. The Centre is focusing on environmental and social sciences. As the Centre develops during the next AMP we intend to work with other researchers, businesses, government and NGOs to provide the sector with the best research and innovation in these areas. In doing this we intend to work in collaboration with other water companies to lead in how we use environmental and social sciences to benefit customers and the environment.

11.14 Innovation culture

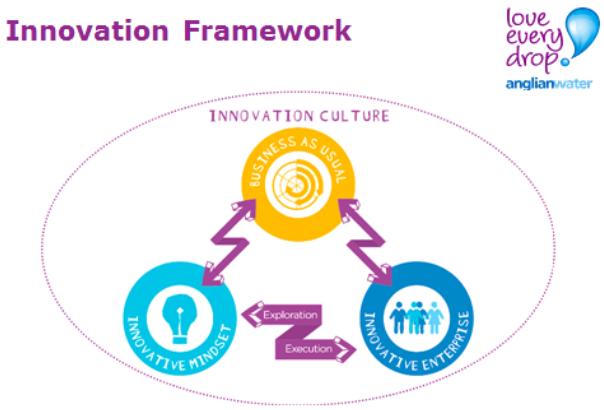
Ofwat feedback:
There is less convincing evidence about how its leadership and support help facilitation an innovation culture specifically regarding internal interaction with employees at all levels".

Our response

We have worked hard in AMP6 to encourage, develop and embed a culture of innovation within our workforce. We outlines some examples below of how this has been done.

Innovation Skills of our leadership

As part of our recent Transforming Our Leadership Programme which covered the top 260 leaders in AW (including the CEO and Management Board) two days of the programme was specifically looking at innovation and collaboration. Techniques to create innovation thinking were taught by Lane 4 and Loughborough University Business School and implemented via line project activity (the groups consulted on a live innovation project for the world governing body for hockey) and the use of 'Hackathons' – a technique to generate ideas.



Innovation skills of managers

The Transforming Our Leaders Programme was further developed and rolled out to over 500 First Line Managers over 2017. In this version one day was spent covering similar innovation material.

Both these programmes have created large scale interest and skills which are being applied right across the organisation.

Love Every Minute – Innovation and Lean Practice

A company wide initiative run between 2016 and 2018 trained 1200 people in the use of Lean techniques and the link to innovation via efficiency. There were four levels of training depending and what was offered depended on the work area and the ability to influence process innovation and efficiency. These were a. Supporter b. Enabler c. Practitioner, d. Optimiser. Courses ranged between 1 and 3 days. Some people went on to formal external qualifications post the courses.

12. ACCOUNTING FOR PAST DELIVERY

Ofwat's test area assessment: Accounting for past delivery

Overall test area grade	Overall test area summary assessment and rationale
B	Overall, Anglian Water's business plan demonstrates high quality accounting for past delivery, with sufficient and convincing evidence both in support of PR14 reconciliations and on deliverability of the 2020-25 plan given past performance. In the round we do not have concerns with the evidence for deliverability for the 2020-25 plan. The plan is high quality for deliverability in the following areas. • The company has delivered or is forecast to deliver 91% of its performance commitments with financial ODIs in 2015-20. The company provides sufficient evidence that it understands the drivers of its performance, and the plan includes appropriate measures to deliver the planned outcomes. We therefore have no concerns with the evidence for deliverability of outcomes. • The company is forecast to underspend against its cost allowance for 2015-20. We calculate that the company is proposing to increase base costs over the 2020-25 period. The company provides insufficient evidence that it understands the drivers of its performance and that it has learnt lessons from its performance. However, taking into account the level of stretch in the plan, we have no concerns with the evidence for deliverability of the planned costs. • The company is already meeting CCWater's 2020 household customer complaints target of resolving 95% of customer complaints at stage one and has falling total household customer complaints. We therefore have no concerns with the evidence for deliverability of customer complaints handling performance. The plan falls short of high quality for deliverability in the following areas. • The company had two major pollution incidents in 2015-18 and had a high number of category one and two pollution incidents per 10,000 kilometres of sewer. It provided insufficient evidence on measures to address this performance. We therefore have some concerns with the evidence for deliverability of improved performance for major incidents. There is sufficient and convincing evidence for seven out of eight PR14 reconciliation areas and insufficient evidence for residential retail. There is only a marginal difference (within 0.05% of 2019-20 revenue) between expected and proposed reconciliations. In the round we consider that this supports the accounting for past delivery test area score.

Overview of our response to IAP

We are pleased with our IAP assessment in this area. We note that some of our actions in this area are required for completion after 1 April 2019 and we confirm our commitment to responding to these. Our response focuses on those areas for which action has been required by 1 April 2019.

In response to our actions we have:

- updated our forecast land sales for 2018/19 to reflect our actual sales in the year to date;
- explained that the change in trend of customer numbers during AMP6 are driven by slower than expected house-building growth in the AMP so far and greater expected house building rates later in the AMP;
- updated our totex forecasts for 2018/19 and 2019/20 to reflect our latest view of capex and opex. There is no change in the net cumulative totex forecast over these two years;
- highlighted our revised revenue forecast for 2018/19 as £3.0 million over recovery for water recycling and £10.3 million for water.

12.1 Ofwat Action: Land Sales

Action reference: ANH.PD.A1

PR14 Land sales: Anglian Water is required to provide additional evidence to support the forecast trajectory in table App9.

Our response

For the years 2014/15 to 2017/18, total actual land sale proceeds net of all costs and net book values are reported. The split between water and waste water is based on the operational purpose of the sites being disposed.

For 2018/19 and 2019/20, forecast sales of £500,000 less anticipated associated costs of £50,000 have been entered, split 70:30 between water and wastewater.

We are not currently anticipating any significant land disposals during this period, with water tower disposals forming the majority of the forecast. This is consistent with our table App9 and associated commentary.

12.2 Ofwat Action: PR14 Outcome Delivery Incentives

Action reference: ANH.PD.A2

PR14 Outcome delivery incentives: Anglian Water is required to update its forecast for 2019-20 performance to take account of the actual 2018-19 performance for all its performance commitments. We expect the company to pay particular focus where we found the evidence provided in its business plan for the 2018-20 forecasts to be insufficient which was for:

- *W-D3: Per property consumption (PPC) (litres/household/day reduction)*
- *W-I1: Mean zonal compliance (MZC)*
- *W-A4: Water quality contacts*
- *W-A3: Properties at risk of persistent low pressure*
- *S-A3: Properties flooded externally from sewers - three-year average (reduction)*
- *W-E2: Environmental compliance (water)*
- *S-C1: Percentage of bathing waters attaining excellent status*
- *S-C4: Environmental compliance (wastewater)*
- *S-F2: Sewerage non-infrastructure*

Our Response
This action is required by 15 July 2019 and we will respond then.

12.3 Ofwat Action: PR14 Residential Retail

Action reference: ANH.PD.A3
PR14 Residential retail: Anglian Water is required to clarify what the correct number is in table R9 for metered wastewater only customers in 2017-2018; provide further evidence to explain its forecasts which depart from the trend in the first three years of the control period and provide further clarity on the reasons for the difference between reforecast customer numbers and actual customer numbers in 2018-2019.

Our response
We can confirm that the actual revenue collected net for metered wastewater only customers is £12.583 million.

Growth from new connections was initially lower than forecast at the start of AMP6. Growth in house-building is now strengthening (reflected in the over-recovery of allowed wholesale revenue driven by increased new connection charges); this is driving the increase in metered customer numbers. We also reflected higher growth in the later periods, consistent with our WRMP and the methodology to capture local authority planning targets. This results in the higher reforecast customer numbers (section B) for 2018/19 and 2019/20.

The reforecast customer numbers for 2018/19 set out in section B are based on the charge multipliers used to set charges for our Charges Scheme, as published in February 2018. These are based on forecasts developed during autumn 2017, and reflect a prudent approach to managing revenue recovery. The 'actual' customer numbers set out in section C for 2018/19 were a revised forecast consistent with the growth figures set out in our WRMP and elsewhere in our Plan and reflected the methodology to capture local authority planning targets. We now expect to report actual customer numbers for 2018/19 that differ from those submitted previously in R9. Whilst the number of new metered customers continues to strengthen compared to prior years, it is below the figures set out previously, appearing to reflect the current softening in the housing market resulting from short term economic uncertainty. The result is therefore likely to be close to our original reforecast.

Our full response is provided in IABP retail tables commentary: R9.

12.4 Ofwat Action: PR14 Totex

Action reference: ANH.PD.A4
Anglian Water is required to provide evidence to explain its forecast performance in tables WS15/WWS15.

Our response
We have updated our totex forecast for 2018/19 and 2019/20, reflecting our latest view of opex and capex. Whilst for 2018/19 we have a reasonable view of the split of our costs between price controls, we do not do the actual split until after year end when we prepare our financial statements for the Annual Performance Report.

For 2018/19 we forecast our Water Totex expenditure to have increased by £12.1 million, made up of an increase of £25.3 million in operating costs and a decrease of £13.2 million in capital expenditure. This largely reflects the ongoing impact on our water supply and distribution systems of the 'beast from the east' and the hot dry summer in 2018. For 2019/20 our forecast opex is unchanged and we have reduced our forecast capital expenditure by a further £12.0 million. We have also reflected higher Grants and Contributions receipts in 2018/19 of £4.1 million due to increased developer activity and assumed these result in higher capex in 2019/20. Overall there is no change to the cumulative net Totex forecast over the two years.

For 2018/19 we forecast our Wastewater Totex expenditure to have decreased by £43.4 million, made up of an increase of £1.8 million in operating costs and a decrease of £45.2 million in capital expenditure. This reflects a timing of expenditure issue which is effectively deferred to 2019/20. We have also reflected higher Grants and Contributions receipts in 2018/19 of £1.7 million due to increased developer activity and assumed these result in higher capex in 2019/20. Overall there is no change to the cumulative net Totex forecast over the two years.

12.5 Ofwat Action: PR14 Wholesale revenue forecasting inventive mechanism

Action reference: ANH.PD.A5

Anglian Water is required to provide evidence to explain its forecast performance in tables WS13/WWS13.

Our response

For report year 2018/19 in the table submitted the recovered revenue was forecast to be in line with allowed revenue, therefore no revenue adjustment and no penalty was forecast. The evidence was not available at the time to conclude that the outcome would be other than we recovered the level of allowed revenue.

We set charges for a Charging Year in the preceding December, using the latest forecast of charge multiplier data in order to calculate charges to recover the revenue allowed under the control. We were required to submit WWS13 and WS13 before 28 July 2018. Given the constraints of the assurance and board sign-off process we finalised our data table submission using data up to Period 2 (May) in the financial year. At that point in the year it was too soon to determine whether revenue recovery for the report year 2018/19 would vary materially from the allowed revenue used to calculate charges. The main elements that historically have been seen to affect variations in revenue are summer demand, optant metering, prior year accounting adjustments and the level of connection charges. Being only 1/6 of the way through the year after Period 2, whatever the early indications may have suggested, we have experience of those reversing before the end of the year (and in the case of summer demand, with a wet July/August quickly reversing any earlier increases in year to date demand), and so took a neutral position as the most reasonable for that point in time.

The PR19 Reconciliation Rulebook notes that for the report year 2018/19 Ofwat will have complete information on actual recovered revenues and RPI at the time of setting allowed revenues at PR19, therefore, it will make an adjustment to allowed revenues for the incentive calculated through the WRFIM formula for PR19. We therefore understood that the figure for report year 2018/19 was in any event indicative for the purposes of WWS13; and the indications at the time of submission were inconclusive as to the level of any variation in recovered revenue as compared to the level of allowed revenue.

Prior to the year end for 2018/19, we have updated our forecast for recovered revenue. This shows an over-recovery of £3.0 million for water recycling, representing 0.4% of allowed revenue (£709.8 million). This reflects an over-recovery of main charges against allowed revenue of £1.4 million. This resulted from prior year accounting adjustments. Actual recovery of grants and contributions revenue is £1.6 million higher than the revised forecast, reflecting increased levels of connection charges compared to the available forecast when setting charges.

There was an over-recovery of £10.3 million for water representing 2.2% of allowed revenue (£476.8 million). This reflects an over-recovery of main charges against allowed revenue of £5.4 million, resulting from prior year accounting adjustments (£3.2 million) and higher customer demand than forecast when setting tariffs. Actual recovery of grants and contributions revenue is £4.9 million higher than the revised forecast, reflecting increased levels of connection charges compared to the available forecast when setting main charges.

For report year 2019/20 we have not updated our forecast.

12.6 Ofwat Action: PR14 reconciliations

Action reference: ANH.PD.A6

Further to the actions we have set out to address our concerns over the evidence provided in its business plan for the individual reconciliations, we will require the company to refresh all of its PR14 reconciliations to replace its 2018-19 forecast performance with 2018-19 actual performance and update the evidence for its forecast 2019-20 performance taking into account of the actual 2018-19 performance.

Our response

This action is required by 15 July 2019 and we will comply as required. We have updated some 2018/19 forecasts now that we have more accurate data available. All changes are outlined in the relevant table commentaries.

12.7 Ofwat Action: Past performance

Action reference: ANH.PD.B1

Anglian Water should produce and provide additional evidence that it has identified:

- *the drivers of incidents performance and customer communication and support performance during and after major incidents, pollution incidents and where statutory and licence obligations enforced by the EA/NRW, DWI and Ofwat have not been met;*
- *lessons learnt from good and poor past and current performance;*
- *the performance gap between current performance and proposed performance in the 2020-25 business plan; and*
- *measures planned or already in place to ensure deliverability of the 2020-25 business plan.*

Our Response

We will provide this information for 24 May 2019.

Action reference: ANH.PD.B2

Anglian Water should produce and provide an action plan that sets out:

- *how Anglian Water will continuously monitor incidents performance and customer communication and support during and after major incidents and deliver targets set by the EA/NRW in the Environmental Performance Assessment (EPA), by DWI and by Ofwat's regulations , including what evidence it will look for beyond itself and the sector;*
- *how Anglian Water will identify drivers of performance and lessons learnt from both good and poor performance;*
- *how Anglian Water will identify measures to improve performance and integrate these into its business; and*
- *how Anglian Water will ensure that this is a continuous rather than one-off process.*

Our Response

We confirm we will provide an action plan for 24 May 2019.

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