December 2019

PR19 final determinations

Anglian Water – Cost efficiency additional information appendix

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PR19 final determinations: Anglian Water – Cost efficiency additional information appendix

1 Capital maintenance cost adjustment claim

1.1 Our draft determinations

In April 2019 Anglian Water submitted a revised business plan with forecast base costs that is 21% above our view of efficient costs in wholesale water and 19% higher than our view in wastewater. Anglian Water's proposals were also considerably higher than its historical base costs.

1.2 Stakeholder representations

In June 2019 Anglian Water submitted a cost adjustment claim for £197 million as a late response to the initial assessment of plans. It states the need for an adjustment to our modelled base allowance because "The evaluation of the sustainable level of Base Operating and Capital Expenditure (Botex) is complex, and requires consideration of the following:

- The historical levels of expenditure and what it has delivered
- The period the expenditure is reviewed over
- Any changes in accounting standards – UKGAAP to IFRS
- The move away from a perceived capital bias to totex
- New regulatory obligations and future predicted asset deterioration
- Impacts of innovation and efficiencies"

The company sets out its capital maintenance spending since 2010 which shows increasing spend until 2019-20 followed by a forecast of declining expenditure through 2020-25. It states that its "overall Botex plan recognises a number of factors, these will not be picked up by historical econometric modelling approach that include; the natural deterioration of the asset base, the impact of new obligations, continued innovation and the move to Totex approaches". It also presents additional arguments in a supporting academic paper.

In its draft determination representation the company identifies a 2.8% decrease in capital maintenance expenditure for the 2020-25 period in comparison with 2015-20. Despite the reduction in maintenance costs it considers base costs will increase due to additional opex requirements. It also increases the value of the cost adjustment

claim to £238 million. The representation provides further considerations of the reasons for the cost gap between its requested base costs and our allowed costs,

Anglian Water provides a paper to support its claim: “Providing Appropriate Regulatory Funding for Capital Maintenance Funding for Capital Maintenance Activity: Ensuring Capital Sustainability and Service Resilience” by Dr Harry Bush and John Earwaker, May 2019. The paper discusses the overall approach to funding capital maintenance rather than the reasons for the particular claim which Anglian Water submits or evidence to support a specific cost adjustment. The paper accepts benchmarking to be a starting point for assessment and recommends it is complemented by company specific analysis embracing engineering and financial factors.

The overarching points which the paper makes are:

- Asset health is key to sustainability and resilience of service. It can take several years before the impact of systematic underspending is apparent;
- There was criticism of Ofwat’s PR99 price review around the lack of forward-looking assessments of asset condition. PR19 is in danger of looking like PR99
- Drivers of capital maintenance vary between companies in any one period and over time. The past is not a good indication of future requirements
- Other regulators use forward-looking or age based models for replacement costs;

The paper makes the following observations on our PR19 approach:

- The upper quartile cost benchmark may lock in lower quartile volumes of maintenance activity rather than top quartile efficiency; and
- Setting stretching performance commitments and efficient cost allowances separately risks sub-standard performance over time.

It proposes that the solution is to triangulate model forecasts with evidence from forward looking bottom up analysis of capital maintenance needs. We assess Anglian Water’s claim in the following section and our detailed assessment of the individual elements of the cost adjustment claim in table 1.1 below.

1.3 Our assessment and reasons

We set out our methodology for assessing costs in our PR19 methodology (December 2017). We were clear that our approach to capital maintenance relies on econometric modelling of base costs complemented with an adjustment process where companies can raise cost adjustment claims. Anglian Water submitted its business plan to us in September 2018 and a revised plan in April 2019, without a cost adjustment claim for capital maintenance. In June 2019 it makes a £187 million claim for additional capital maintenance. Due to the late submission of this claim we were unable to fully assess the claim for our draft determination. We assess the claim for our final determinations.

Long term nature of maintenance investment

Anglian Water states that its management supports its approach to using a forward looking, risk based approach to assessing future maintenance needs. It states its customers do not support cutting back on investment today and storing up problems for future customers. The supporting paper critiques the approach to capital maintenance allowances that Ofwat has made over previous price reviews. It sets out that the PR09 approach considering asset management capability and triangulating data from past and forward assessments provided an important incentive for companies to improve their asset management approaches. It criticises the PR14 cost modelling approach, basing its assessment of it on the CMA's determination of Bristol Water's prices. It summarises the CMA's approach as recognising the limitations of top down modelling and complementing it with more granular analysis.

We agree it is appropriate to focus on a forward looking risk based approach to maintenance planning. If that reveals a company has markedly different requirements that increase maintenance costs materially due to particular issues that clearly need to be addressed in one five year period, we would expect it to make a well evidence case through the cost adjustment claim process. Otherwise we assume that variations in total allowance required can be accommodated within a long term approach. We note that any spend on "atypical lumps" of investment in historical expenditure is included in the econometric model input data. We also note that our base models explain capex and opex together well, and that the model cost drivers relating to the asset base, such as length of main, increase over time. Hence there is a forward looking aspect to our modelled allowances.

Our approach at PR19 is a more appropriate than the approach we used in PR04 and PR09. At PR04/PR09 there was no reference to volumes of work, so a company with a low volume of work but inefficiently high spend could have a relatively low spend overall. It could then be classed as efficient and be given an allowance to sustain this activity.

Our base modelling approach at PR19 benchmarks the costs of operating and maintaining assets and service, using industry historical spend data from 2011-12 to 2017-18.

We agree that capital maintenance is “lumpy” and in some periods companies may need to spend more than in others. To address the issue of lumpy expenditure and ensure that we are setting an efficient allowance for the long term, we use eight years of data, which is the longest historical data set we have ever used in models, to ensure that our input data includes a wide range of company peaks, troughs and atypical lumps.

We note that our sample includes only two of the traditionally low expenditure years in each investment period (years 1 and 5) and the other six years are the traditionally high cost years (2-4). In that respect, our model may be making a relatively high base and therefore capital maintenance spend.

To make any addition to our allowance, we expect Anglian Water to demonstrate that our allowance is insufficient, taking into consideration the long term. While there may be periods when a company has higher investment requirements, it will have periods with lower investment requirements. Companies should take a long-term view of our allowance and balance expenditure requirements between multiple regulatory periods. This is particularly true for large companies like Anglian that can manage their maintenance programmes over price controls.

No evidence that our baselines lock lower quartile maintenance activity

We have assessed peaks and troughs in our model input data to assess whether the efficient cost companies are found to be so because they are currently in a capital maintenance trough.

For wholesale water, of the top four efficient companies two indicate evidence of a ‘peak’ in expenditure in the 2011-19 period and for the other two there is no clear trend. In the bottom four efficient companies for wholesale water, three indicate

evidence of a peak and for the remaining one there is no clear trend. For wholesale wastewater of the top three efficient companies two indicate evidence of a 'trough' in expenditure in the 2011-19 period and for the remaining one there is evidence of a 'peak'. In the bottom three least efficient companies for wholesale water, all three indicate no clear trend. We therefore consider that we do not need to adjust the modelling approach in this respect in the final determination.

Age-based assessment of capital maintenance

The supporting paper sets out the approach of other regulators in assessing maintenance costs, including in the rail and energy sector where there are examples of age-based replacement assumptions.

We do not use age-based assessment of capital maintenance since asset age does not directly correlate to asset performance or service to customers in the water sector. We have had a number of old age related claims from companies all choosing the age cohort that best benefits them. We did not find sufficient evidence from these claims that older assets require higher costs to maintain them. Indeed, part of Anglian Water's claim relates to relatively young assets – plastic pipes installed in the 1960s and 1970s. Any age-based approach which assumes older assets require more costs to maintain would not make additional allowance for replacing such assets, and it is appropriate that we take a more evidence based approach to asset management.

Impact of the move to a totex approach and accounting changes on capital maintenance costs

Anglian Water sets out that the move to a totex approach may transfer costs from what would have been classified as capital maintenance, for example replacing its own IT systems, to operating costs, such as paying for cloud based IT systems. It also suggests that a change in accounting standards will change how it accounts for capital maintenance.

We consider that our approach to assessing base costs, both capital maintenance and opex together, mitigates the concern that Anglian Water expresses. We expect five years of an opex solution substituting medium life or long life assets to cost less than the one off replacement capital maintenance costs. The historical data we use to derive our models includes both years before and after the totex and outcomes

approach was introduced at PR14. We do not find our models are less able to explain base costs from later years when compared to earlier years.

We assess capital maintenance on a totex basis as the choices between interventions are for companies to make according to their particular circumstances.

Our understanding of the difference in accounting standards means a change from opex for operating leases for which we make an appropriate change to our cost allowance. The company provides no evidence that the accounting change will mean it requires more capital maintenance allowance in 2020-25 than its historical allowance.

If there are any other accounting differences we would expect them to change costs between capex and opex that we model together, making no difference to our overall allowance.

Impact of innovation on capital maintenance costs

The company states in its representation that we should view its investment summaries “in the context of the reduction in capital maintenance over the past AMPs through efficiency, the implementation of predictive and prescriptive analytics, innovation, and our sector leading performance, as outlined in the main body of our September 2018 plan.” And “We are extending the operational life of our assets through innovation”.

It makes not specific points that such innovation is the basis of the additional costs is seeks in the cost adjustment claim.

What maintenance investment has delivered: Setting costs and performance targets separately

In its June 2019 claim submission, Anglian Water pulls out from its September 2018 plan information to demonstrate that it is the top performing company in a self-selected range of metrics. It states that “to sustain these performance levels, which are not factored into the Botex Modelling, requires us to maintain the current levels of expenditure.”

We assess the historical evidence on cost efficiency and a broader range of performance outcomes in the ‘Overall stretch appendix’ and find this shows that

some companies currently achieve good performance on both outcomes and cost efficiency. We therefore do not conclude that good performance will necessarily drive higher costs and consider it is possible to achieve upper quartile performance in both, with efficient and well managed companies able to improve cost and outcomes.

Our assessment of the specific elements of the claim

We set out below why we do not make an adjustment to our allowance for each element of the claim. We respond by price control which is consistent with the way company's representation framed the claim. We also respond to any additional points which the company raised in its June submission.

The company requests the following adjustments by price control:

- Water resources, £15 million;
- Water network plus, £132 million;
- Wastewater network plus, £28 million; and,
- Bioresources, £63 million.

We summarise the general and price control/investment area specific comments that the company raises in its claim in Table 1.1 below and provide our response. We use the information the company provides in the narrative of its claim and in its investment summaries to identify where the company considers there is a change in 2020-25 period that drives its need for additional base allowance.

In summary we find that the company provides insufficiently good and robust evidence to demonstrate the need for an adjustment to our base model allowance. It does not present specific detail of the drivers and associated costs for the uplift which it claims in base expenditure from the 2015-2020 to 2020-25 period. In order to make an adjustment we require the company to present the activities associated with any increase in base expenditure from previous periods. We would also expect it to robustly identify the link to asset health and other relevant outcomes. It further needs to include persuasive evidence that supports this need, and which articulates the company's specific and unique factors that would support taking a different approach from the rest of the industry.

1.4 Our final decision

We do not make an additional allowance for base costs for Anglian Water. The evidence it provides in its late cost adjustment claim and its representation to the draft determination does not quantify the effects it describes.

We also do not consider that the company clearly identifies, within its claim, the activities and associated efficient costs that would justify an increase to our base allowance. For us to be able to make an adjustment to our allowance we would need detail accounting for the difference between the company's requested costs and our modelled allowance showing which activities and costs are not adequately captured within our base modelling. We consider that the base allowance we make in our final determination is sufficient for an efficient company to maintain the health of its asset base, and to deliver its outcomes for customers and the environment.

Table 1.1: Summary of general and price control specific representations for the 'Botex allowance – capital maintenance' cost adjustment claim

Assessment gates	Company claim	Ofwat response
Need for adjustment (General)	The company identifies that consideration of the following is necessary in order to determine an appropriate base allowance 1. the historical levels of expenditure and what they have delivered; 2. the period over which the expenditure is reviewed; 3. any changes in accounting standards – e.g. UKGAAP to IFRS; 4. the interaction with past or future enhancement expenditure; 5. new legal or regulatory obligations that require maintaining to retain benefits; 6. future predicted asset deterioration; 7. the impacts of innovation and efficiencies; 8. the growth of short-life assets leading to increased demand for capital maintenance 9. demand for capital maintenance from assets that are not represented in historical costs.	As we discuss in the sections above, we would expect a company to consider all of these areas in order to determine its base allowance request and to develop an appropriate business plan. We discuss our response to the overarching points Anglian Water makes in the sections above but include a brief response below. For 1 to 3, we consider that modelling a base allowance including costs of maintaining assets and services, using the longest historical data set we have ever used in models, provides a sufficient basis to account for variations in companies' delivery cycles. We consider that modelling base costs removes the risk of accounting changes resulting in a perverse output. For 4, if we assume a simple 20 year asset life for enhancements installed since privatisation we expect a decline in asset maintenance in the 2020-25 period. We accept there will be variation between companies for which cost adjustment claims could be submitted. However, Anglian Water does not make out its case supported by sufficiently robust evidence. For 4 to 7, we allow companies to submitting a cost adjustment claim to present evidence of unique operating circumstances, legal requirements or atypical expenditure which drive higher efficient costs for the company relative to its peers. For further information see Securing cost efficiency technical appendix. However, Anglian Water does not make out its case supported by sufficiently robust evidence, For 8 to 9, we discuss the specific points raised by the company later in this table.

Assessment gates	Company claim	Ofwat response
Management Control (General)	The company states the following factors, which it considers as being outside of management control, as influencing the costs for asset maintenance 1. the scale, age and condition of the inherited pre-privatisation asset base; 2. historical capital maintenance levels; 3. the scale and nature of investment post-privatisation in service enhancement; 4. the scale, age and condition of transferred and adopted assets; and 5. the demands on the assets from the geological, topographical, meteorological and demographic characteristics of the region served.	For factors 1 to 3, we consider that the company has opportunity to control and mitigate the legacy of the pre-privatisation asset base through its post-privatisation maintenance and enhancement investment. We further consider that it does not provide sufficient specific evidence of significant asset investment required, identified as an exceptional item requiring base investment. For factors 4 and 5, we consider that the company provides insufficient evidence to describe how these both specifically influence the maintenance costs within this price control, and represent factors that are specific and unique to the company. We discuss private sewers and pumping stations further below.
Growth (General)	The company references significant housing growth within its region and considers the maintenance needs of assets serving this extra housing growth must be funded	We make allowances for growth within our base model and we provide Anglian Water with an uplift to our base model allowance based on a symmetrical adjustment for high growth rate companies. For further details of this adjustment see the 'Securing cost efficiency technical appendix". We therefore consider that we make sufficient allowances for growth, noting that we have explanatory variables within our modelling such as length of sewers and mains that will be impacted by the outputs from previous growth investment.
Raw water distribution element of the claim	The company states it is targeting investment to reduce losses in the raw water network to drive down leakage	We make an enhancement allowance for the company to meet its supply demand balance based on the company's water resources management plan (WRMP) submission. This totals £437 million. We consider that the company should undertake maintenance necessary to support its WRMP through its base allowance, and we do not consider that it provides sufficient evidence to demonstrate that it faces unique or company specific challenges in this area. For further details see 'Securing cost efficiency

Assessment gates	Company claim	Ofwat response
		technical appendix', 'Anglian water final determination', and the Wholesale water enhancement feeder model: Supply demand balance.
Water treatment works element of the claim	The company identifies that it does not need to undertake full site refurbishments in this period and there is a reduction in shorter term asset maintenance (which will increase in the following period).	The company forecasts a decrease in expenditure and therefore we do not consider this supports an increase in allowance through this claim. It is important to note that we do not make a reduction in capital maintenance allowance where a company identifies a reduced need in a 5-year investment period, due to its position in the investment cycle. We expect a company effectively to use the allowance we make in each period, so as to ensure long term asset health and provision of service. It provides evidence of declining performance at different levels of investment, but we note that the rate of deterioration over 2020-25 appears to be constant no matter what the level of investment is, but with different starting points in 2020. This is not credible evidence to justify an increase in maintenance costs.
Treated distribution network element of the clam	The company identifies that it needs to maintain industry leading leakage levels achieved in 2015-20 in the next period.	We make an adjustment, increasing base allowance based on our consideration of alternative base model specifications, which includes consideration of leakage driven explanatory variables. We therefore do not consider the company provides evidence to support further base allowance through the claim it makes in this area.
Treated distribution network element of the claim	Within its representation the company presents an example of its in-depth analysis for the water network plus price control relating to £15m (11%) of the requested amount. The company considers that it has a significant proportion of early vintage PVC pipework within its region which increases its maintenance requirements due to its burst frequency. The company previously identifies that the use of this material within third generation new town and 'London overspill areas ' developments is driving increasing burst rates.	From our review of company data, we identify that Anglian Water has a relatively low percentage of length of main installed in the period 1961-1980 in comparison to other companies, less than the industry median. Therefore we would expect other companies to face similar or greater challenges with PVC pipes installed in this era within developments in their regions. We do not consider that the company provides evidence to support the argument that the challenge of PVC pipes is unique to its region, or sufficiently demonstrates why the PVC failure issue becomes specifically prevalent in the 2020-25 period. We therefore do not consider it appropriate to make a base adjustment in this area. For further details see Anglian Water's Cost adjustment claim feeder model.

Assessment gates	Company claim	Ofwat response
Sewerage collection services element of the claim	Expenditure associated with transferred assets was previously accounted for as enhancement and now is classed as maintenance. The company identifies £58 million of maintenance expenditure associated with private sewer and pumping station maintenance. The company identifies that sewer blockages relating to pitch fibre sewers installed in the 1940-1970 period are a particular issue.	As we stated at the stage of initial assessment of plans and the draft determination, we include the recent enhancement expenditure associated with the newly transferred private sewers and pumping stations in our base model input data. We also include the relevant changes in asset-related cost drivers for the period 2011-19 within our base model input data. Since our base models include explanatory variables relating to sewer length and pumping capacity per sewer length, we consider that efficient expenditure associated with these transferred assets is included within our base allowance and no further adjustment is necessary. We consider there is insufficient evidence that pitch fibre sewers are unusually prevalent for Anglian Water and therefore would expect all companies to face similar challenges and that this will be represented in the historical expenditure for the 2011-19 period we use in deriving the base models. We also review the sewer data by age submitted at PR14 and do not find evidence that Anglian Water has a sewer age profile that is significantly different from its peers. For further details see Anglian Water's Cost adjustment claim feeder model
Water recycling centres element of the claim	Increased maintenance requirements relating to shorter life assets as a result of the installation of more technologically advanced treatment process to meet more stringent environmental standards in the 1990-2005 period. The company identifies a bow-wave of investment in its forecast profile.	We consider that this will be a challenge faced by companies across the industry and that Anglian Water does not demonstrate sufficient evidence to support its situation being unusual. We also consider that the historical period we used to inform our models, 2011-19 includes peaks of investment relating to the renewal of shorter life assets installed across the industry in the 1990-2005 period. In some cases this may include multiple further refurbishments/replacements that companies have undertaken since their first installation. As discussed above we expect large companies to be able to manage long term investment plans within their allowance which includes room for an element of lumpiness. We therefore do not consider the company provides sufficient evidence to support further base allowance through this claim in this area.
Bioresources	Targeting greater efficiency and greater than 90% utilisation of assets. The company also identifies that its	We consider that the company's chosen utilisation strategy to deliver its bioresources service is not sufficient evidence to support making an

Assessment gates	Company claim	Ofwat response
	technologically advanced assets in the aggressive digestion environment have short service lives. Therefore refurbishment or replacement is required frequently.	allowance in this area, because it is very much in management control. We also do not consider that the challenges of maintaining complex assets in aggressive environments is one that is particular to Anglian Water. We therefore do not consider the company provides sufficient evidence to support further base allowance through this claim in this area.
Interruptions to supply (included within the June claim)	The company claims it requires additional investment of £29m to support meeting its outcomes delivery incentive target in for this common performance commitment.	We consider that our package of common performance commitments with stretching performance commitment levels, represents a base level of service. We expect an efficient company to be able to deliver our performance commitments levels through our base allowance. For further details see Securing cost efficiency technical appendix
Information technology	The company provides its own evidence of cyclical maintenance linked to prior enhancement expenditure in IT. The claim is based on comparison with 2011-18 expenditure requirements. The main component of the £60 million claim is the replacement of the company's enterprise-wide SAP system at £35 million.	We consider that our models are based on actual costs for all companies over an eight year period, including any lumpy investments. We expect large companies to be able to manage long term investment plans within their allowance which includes room for an element of lumpiness. We also consider that the selection of IT strategy is within management control, and companies will implement changes in order to achieve efficiencies and improvements to deliver to their service targets. Anglian Water does not provide sufficient evidence of unusual or company specific circumstances to support an adjustment to the base allowance in this area.

2 Maintain frontier leakage performance cost adjustment claim

2.1 Background

Anglian Water claims additional base expenditure to maintain leakage at frontier performance levels because it considers the base modelled allowance will only fund industry average leakage performance. The company considers these additional costs are £136.9 million on top of the base allowance, and are necessary to maintain its 2019-20 forecast level of leakage, 184 Ml/d (as a three-year average), throughout the 2020-25 period.

The company has calculated the value of the claim by estimating a relationship between the annual costs of maintaining leakage and different levels of leakage based on its historical data. It then uses this to determine the variance in cost across a five year period between maintaining leakage at the sustainable economic level of leakage (SELL), of 211 Ml/d, and its forecast level of performance at 2019-20 (ie 184 Ml/d).

2.2 Our draft determinations

At the draft determination stage, we revised our approach to funding leakage reduction allowances based on the industry responses to our initial assessment of plans. Following this revised approach, Anglian Water's need for adjustment for this claim was refused. This was despite the fact that it had previously been accepted at the initial assessment of plans stage. We considered the company did not present evidence of unique circumstances that would justify taking a different approach to assessing its leakage reduction allowance to that of the rest of the industry.

We said that we expect companies to maintain their leakage levels through our base costs allowance, without an additional allowance.

Anglian Water was one of three companies at draft determination to receive an enhancement leakage allowance. It was the only company that received an enhancement allowance for the total volume of leakage reduction it proposed.

We considered that the company's frontier performance was recognised through the allowance we made for leakage enhancement.

2.3 Stakeholder representations

It its representation, Anglian Water states that the draft determination approach does not recognise the additional costs it incurs in maintaining its current frontier performance on leakage. The company makes a minor revision to its claim, reducing its request to £136.9 million, to reflect its revised baseline (184 Ml/d updated from 172 Ml/d) and adding expenditure data from 2019-20 into its modelling. It considers that because the base models do not include explanatory variables associated with leakage and are derived from historical costs, the allowance is insufficient to maintain frontier levels of leakage performance. The company highlights evidence it provided in its previously submitted supporting information from NERA and UKWIR leakage studies[1], identifying an increase in marginal costs to maintain and reduce leakage as these levels decrease.

2.4 Our assessment, reasons and final determination

2.4.1 Decision summary

For final determination we make an adjustment of £50.2 million to our base allowance, based on evidence from alternative model specifications, including models with leakage as an explanatory variable.

We do not make an additional adjustment to our base allowance relating to this claim.

Anglian Water was funded to achieve its low leakage levels of 2019-20 through totex allowances and the outcomes delivery incentives framework in previous price reviews. We expect Anglian Water to maintain its low leakage levels through our base costs allowance, which includes the £50.2 million uplift, without additional

[1] NERA, Assessing Ofwat's Funding and Incentive Targets for Leakage Reduction, 26 March 2019; UKWIR, Long Term Leakage Goals, 21/03/2011

funds, in particular given the rest of the industry is required to reduce leakage without additional allowance.

At final determination we continue to make an enhancement allowance for Anglian Water based on its full leakage reduction request, with the total allowance increasing slightly since draft determinations.

2.4.2 Detailed comments on our assessment

We assess Anglian Water's cost adjustment claim and make the following observations:

- The company uses its own historical data to derive the company-specific costs of maintaining leakage at a given level. However, the company provides insufficient evidence to link these costs to specific activities, show that these represent industry efficient costs, explain how future costs may differ from the past, or demonstrate that it challenges its own costs against other sources of information. We also do not consider the company provides sufficient evidence to justify the identification of an historic industry average or the company's sustainable level of leakage (SELL) as the baseline funded by the base allowance for the claim. In the 'Securing cost efficiency technical appendix' we discuss further why we consider companies should be able to reduce leakage beyond recent historical rates at lower costs due to the scale of technological change over recent years. We additionally have concerns regarding the use of SELL as a variable in modelling because there are a number of uncertainties in estimating SELL, particularly the social and environmental costs, and it is also influenced by companies' own determinations of costs and benefits.

- We do not find evidence in the claim that the company has accounted for benefits from its proposed enhancement expenditure in the 2020-25 period that may help in maintaining the existing leakage level. For example, we make a significant allowance at final determination for the company to install smart meters, and we would expect smart metering information to assist in both maintaining and reducing the existing leakage level. We also note that in the figure which the company reproduces from the UKWIR report, metering is identified as a contributing cost to the increase in marginal costs for leakage management as leakage levels decrease. We therefore consider that there could be overlap

between the company's request and the base and enhancement allowances we make for metering.

Despite our concerns with the information provided by Anglian Water, we test the robustness of our modelling results for all companies, including for Anglian Water. We compare our models' results to the results from alternative models. The alternative models capture alternative costs drivers such as leakage, average pumping head, new connections and lengths of mains renewed or relined. From this comparison we conclude that there is some evidence to make a £50.2 million uplift to Anglian Water's wholesale water base allowance. We do not make an adjustment to any other company as a result of this analysis as we find our models to be robust. The models with leakage and average pumping head were relatively significant drivers of the uplift for the company (see 'Securing cost efficiency technical appendix' for further detail).

3 Growth related expenditure

3.1 Our draft determinations

At draft determination we assessed growth-related expenditure within our base econometric models. We considered this approach to be better than the use of stand-alone growth models or a bottom up assessment of company proposals. Including growth related costs in our econometric models is appropriate as they share similar characteristics, as set out in our 'PR19 final determinations: Securing cost efficiency technical appendix'.

We also deep dived Anglian Water's wholesale water growth costs at draft determination as a result of the company requesting £707.2 million in growth related expenditure, which was atypically high. However, we considered that the evidence provided was not sufficient and convincing enough to argue against our modelled base cost allowance and we did not make any additional allowance.

3.2 Stakeholder representations

Anglian Water does not agree with our approach to assessing growth costs at the draft determinations. It considers that:

- The base cost models do not include specific cost drivers that would enable the models to capture differences in growth related costs between different companies. As such the models treat new and existing customers as if they have the same impact on costs.
- The models do not contain other relevant cost drivers, capable of capturing variations in connection costs (eg type of property, growth intensity and/or remoteness).
- We should use its own forecast of connected properties rather than forecasts bsed on the of Office for National Statistics (ONS) household growth projections as the basis for our new connection forecasts. It argues ONS is not a reliable source.
- The Developer Services Reconciliation Adjustment (DSRA) does not sufficiently mitigate growth uncertainty, as it does not capture all the costs related to growth.

Anglian Water estimates a £352 million cost difference between our allowance for growth at the draft determination and its expenditure forecast to facilitate growth in its area in 2020-25.

Anglian Water proposes that we remove growth related costs from our base cost models and assess growth related costs through a deep dive assessment. It also proposes that we introduce three uncertainty mechanisms through the outcome delivery incentive (ODI) framework for growth related costs which the company considers are not included in the DSRA:

- water housing and estate mains costs;
- surface water drainage costs; and
- water recycling treatment costs.

Anglian Water submitted additional information on its growth costs through the official query process following the 30 August representation deadline, which we consider as part of our assessment. This additional evidence includes a breakdown of its offsite work, with 19 detailed case studies.

3.3 Our assessment and reasons

We consider Anglian Water's representation on our general approach to assessing growth-related expenditure among other representations we received in response to our draft determination. We provide our response to these representations in our 'PR19 final determination: Securing cost efficiency technical appendix'.

For final determinations, we retain our approach of including growth related expenditure in our base econometric models. We have also made an adjustment depending on whether the company operates in an area with a high or low forecast of population growth, relative to the historical average for the sector. This follows representations made at draft determinations that the models did not adequately compensate for companies with a high growth forecast. We also consider that the models overcompensate for companies that operate in an area with a low growth forecast. We consider that using the symmetrical adjustment approach set out in our PR19 methodology best accommodates for these factors.

As the population growth forecast in Anglian Water for the period 2020-25 is higher than the historical average growth rate in the sector, we make a positive adjustment

of approximately £11.5 million to the company's wholesale water base allowance, and a positive adjustment of approximately £29.1 million to its wholesale wastewater base allowance.

In respect of the representations on the lack of cost drivers that capture variations in onsite and offsite connection costs, Anglian Water makes a number of arguments to explain why its costs are high:

- For onsite costs, it argues that it has one of the highest proportion of detached new properties, which require a longer communication pipe, leading to higher onsite costs.
- For offsite costs, it argues the high growth in its area is more likely to cause the design capacity of assets along the value chain to be exceeded, thus necessitating offsite reinforcements. It also argues that it requires more offsite reinforcements to accommodate new developments further away from existing assets.

We consider that Anglian Water fails to provide convincing arguments and evidence that it has exceptional circumstances, or that our base cost models do not provide a sufficient allowance. We therefore do not make an adjustment to our base allowance above the adjustment for high growth rates.

For onsite costs, we are not convinced that a relatively high proportion of detached houses as a percentage of total new connections, is a material factor that requires an adjustment. Just as there are factors that may increase a company's unit costs, there are factors that can offset it and we expect companies to take a balanced approach. Anglian Water does not provide quantitative evidence that suggests our modelled allowance does not capture this specific factor. Anglian Water also makes no attempt to quantify the impact of surface type and self-lay penetration on its onsite development costs. We are not convinced that Anglian Water develops on harder surfaces relative to other companies given the rural area it operates in. Moreover, Anglian Water says that it tends to build on larger development sites. Large development sites are more attractive to self-lay providers, which may reduce onsite costs as self-lay providers will conduct the work rather than Anglian Water. Overall, we are not convinced that Anglian Water has materially higher onsite costs than other companies.

In terms of Anglian Water's argument that high growth in its area is more likely to cause the design capacity of assets along the value chain to be exceeded, we

consider that the upward adjustment that we make at final determination, to recognise that our models are likely to undercompensate companies with a high forecasts of population growth, addresses this issue. In addition, the DSRA significantly reduces Anglian Water's risk exposure relating to growth allowing it to recover additional revenues if its outturn growth is higher than forecast.

In relation to the remoteness of its new developments, Anglian Water fails to consider whether this factor is already captured in the econometric base models. For example, through population density, number of booster pumping stations, pumping capacity and/or length of mains. It also fails to quantify the economies of scale associated with working on large developments, which are also associated with its area, and which might mitigate any increase in costs for distance from existing assets.

We note that we make an additional adjustment of £50.2 million to Anglian Water's base costs in light of evidence from alternative model specifications. Two of the alternative specifications included growth related variables, such as new connections and the proportion of new mains (mains relined or renewed).

Anglian Water's proposals for uncertainty mechanisms

We reject Anglian Water's proposals for uncertainty mechanisms for growth related costs:

Water housing and estate mains – Anglian Water considers that a separate mechanism is needed for the recovery of these costs, as these are not included in the calculation of the DSRA. Its proposed ODI unit rate is based on the total value of the income offset2 for wholesale water divided by the number of connections multiplied by the totex sharing factor. However, the company specific unit cost for the DSRA is calculated using 'gross' grants and contributions, and hence include the income offset. This removes the need for the water housing and estate mains ODI.

[2] The 'income offset' is a sum of money offset against the charges that would otherwise be applied for the provision of a Sewer or Water Main in recognition of revenue likely to be received by the relevant undertaker in future years for the provision of: (i) supplies of water to premises connected to the new Water Main; or (ii) sewerage services to premises connected to the new Sewer.

Surface water drainage – Anglian Water considers that the DSRA does not capture expenditure on Sustainable Drainage System (SuDS) solutions. Its proposed ODI unit rate is based on the total value of expenditure on surface water drainage and other assets including network reinforcement for wastewater divided by the capacity in population equivalent. Anglian Water describes the proposed expenditure and sets out legal arguments as to why some SuDS cannot be charged to developers. However, we consider it does not demonstrate why developers would not install SuDS themselves. The provision of SuDS could, for example, be a planning condition for development in the same way that planning conditions may limit development until additional sewerage capacity has been provided in certain locations. In these cases it seems reasonable to expect that developers would provide, or at least pay for, SuDS for new developments. In addition, other companies did not propose a SuDS uncertainty mechanism despite arguably facing the same issue. For these reasons, the need for the surface water drainage ODI is rejected.

Water recycling treatment – Anglian Water considers that they cannot charge developers for capacity enhancements to their sewage treatment works. It proposes that we introduce a volume adjustment, based on population equivalent treatment capacity, to our allowed costs for enhancement to sewage treatment capacity.

Introducing a volume adjustment to our price controls is appropriate in certain cases. It protects customer and companies from forecasting error of future volumes. For example,

- We have a volume driver adjustment for retail (number of households), where the majority of costs are “marginal costs” that vary one-to-one with customers.
- We have a volume driver adjustment in bioresources (volume of sludge). However, we listened to companies and the bioresources price control is a hybrid of fixed and variable revenue, where the fixed revenue reflects the proportion of fixed costs.
- We introduced a volume driver adjustment for new development costs, that is for onsite and closely related offsite costs that vary one-to-one with housing growth.

However, we reject the Anglian Water’s proposed uncertainty mechanism in respect of costs related to enhancements to sewage treatment works.

Enhancement to sewage treatment capacity is a lumpy investment that does not respond one to one to growth. A reconciliation mechanism that is based on

population growth is therefore not appropriate (for the same reason that the bioresources control has a fixed component). Enhancements to sewage treatment capacity is a long term investment. Introducing an uncertainty mechanism can distort company decision-making by diverting focus to short term gains rather than efficient planning and design of network capacity in the long term. While regional growth is outside the company control, the solutions to address surface water drainage and the cost implications are under management control. The mechanism may therefore inadvertantly incentivise the company to adopt the short term lowest cost solution, which may not be optimal for the long term.

Companies need to proactively plan for the long term when investing in treatment capacity and therefore they are best suited to bear the short term risk of population growth. This is in contrast to onsite and offsite costs under the DSRA, which respond more immediately to growth, and where a company may have less control and a more reactive strategy.

In respect of all the uncertainty proposals above we also note:

- Companies have sufficient protection against high growth:
  - through the cost sharing mechanism;
  - through the resetting of price control determinations every five years, which provides an opportunity to adjust for high growth rates; and
  - through the DSRA of PR19.
- Other companies also operate in relatively high growth areas but have not asked for additional protection.
- All proposed mechanisms are not trivial to implement and can have unintended consequences.

3.4 Our final decision

For final determinations, we continue to assess growth expenditure in our base econometric models, and continue to base our new connections forecasts on household growth projections from the Office for National Statistics.

We apply an upward adjustment to Anglian Water's base allowance due to high expected growth in 2020-25. This results in a £11.5 million adjustment to our wholesale water base allowance, and a £29.1 million adjustment to our wholesale wastewater allowance. We also make an adjustment of £50.2 million due to evidence

from alternative model specifications, part of which related to specifications with a growth related variable. We consider that Anglian Water does not provide sufficiently convincing evidence that an additional adjustment is required in respect of its arguments for high onsite and offsite unit costs.

We reject Anglian Water's proposals for uncertainty mechanisms. We consider that companies are sufficiently protected against high growth at PR19.

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

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December 2019

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