Water Redeterminations 2020 Working paper –

Leakage Enhancement Totex Allowances

15 January 2021

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Introduction

1. This working paper provides an update to our provisional enhancement totex allowances for leakage and sets out updated determinations of these allowances. We are issuing this paper for consultation with interested Parties. We will carefully consider responses to this consultation before reaching our final decisions on these allowances.

2. When the CMA issued its Provisional Findings (PFs) on 29 September 2020, we noted that for leakage, the enhancement totex allowances would be reviewed and we would consider further evidence.[1] At that time, we provisionally found that we had insufficient information available to come to a firm view on this issue.

3. We have now received further evidence from the four Disputing Companies and Ofwat. We also discussed the proposed leakage enhancement programmes during the recent Main Party hearings following PFs. We are now able to assess the efficient costs needed to reach the new leakage PCs.

4. As set out in this paper, we have considered two ways of setting enhancement allowances:

   a. by applying a 'top-down' estimate of the efficient costs of achieving given leakage reductions, using an estimated unit cost of leakage reduction; and

   b. using a 'bottom-up' estimate of efficient costs, looking at the specific activities each company proposes to undertake to meet its leakage performance commitment.

5. These approaches, and factors determining their relative usefulness for determining the allowance for each company, are discussed in the enhancement assessment sections of this consultation paper.[2]

6. Our review of the bottom-up evidence has focused on whether the companies have demonstrated the need for their proposed levels of investment, including assessments of efficiency and whether adequate optioneering has been undertaken. The quality of evidence available, the companies' existing leakage position, the type of activities proposed and other factors including

[1] Provisional findings report, section 8, paragraphs 8.74 and 8.100 (c)
[2] CMA Assessment – enhancement totex; Overall leakage enhancement assessment; and the Individual Company assessments.

comparability with other Disputing Companies or the wider sector are all relevant factors which we have considered in making our proposals.

7. As these factors vary between the Disputing Companies, we have found that it is not appropriate to adopt a single approach to the updated determination of these leakage enhancement allowances. Instead, we have taken an approach which is tailored to the relevant individual circumstances of each of the companies and the available evidence on their proposed enhancements, and our assessments are based on either bottom-up or top-down assessments or a combination as explained in the individual company assessment sections.

8. In summary, we propose to reduce the levels of the enhancement allowances from the indicative levels in our PFs for Anglian and Yorkshire, while slightly increasing the allowance for Bristol. These allowances represent reductions in the allowances for Anglian and Bristol compared to the levels in Ofwat's FD. This reflects the additional review that we have performed of the company submissions, including through follow-up questions to the companies. We have determined the following updated leakage enhancement totex allowances:

    - an allowance of £64.1m for Anglian, based on our bottom-up assessment of its costs to achieve the PC that is based on a leakage reduction of 23 Ml/d;

    - an allowance of £4.69m for Bristol, based on an average of our top-down and bottom-up assessments, and an assumption that 8.7 Ml/d of leakage reductions during AMP7 should be eligible for enhancement funding;

    - no allowance for Northumbrian;

    - an allowance of £28.2m for Yorkshire, based on a top-down assessment of unit costs, and an assumption that 47 Ml/d leakage reduction should be assumed eligible for enhancement funding.

9. The focus of this paper is on the appropriate level of enhancement expenditure for the four Disputing Companies to meet the PR19 Performance Commitments for leakage. We are not proposing any revisions to the level of the Performance Commitments as set out in the PFs and we have not received representations to suggest that we should. Also, we are not consulting further on the base expenditure. However, in Annex 1 we have provided an update on the assessment of relative levels of leakage and our proposed approach to base totex where we propose to make some minor refinements following the responses to our PFs.

CMA Position at PFs Stage

10. We first set out the CMA's position at PFs in respect of leakage.

Leakage targets/Performance Commitment (PCs)

11. We did not alter the leakage targets set by Ofwat at the Final Determination, and the Disputing Companies have not suggested that we should. The leakage levels envisaged in 2024/25 should the companies meet their targets are shown in Table 1.

Table 1: Recent leakage levels and AMP7 PCs

	Past leakage				*AMP7 targets*	
	2017-18 Annual Ml/d	*2018-19 Annual Ml/d*	*2019-20 Annual Ml/d*	*2019-20 3-year rolling average Ml/d*	*2024-25 PC Ml/d 3-year rolling average*	*Reduction relative to 3-year rolling average*
Anglian	191.3	199.9	191.0	194.1	162.2	16.4%
Bristol	43.9	41.1	37.0	40.7	32.0	21.3%
Northumbrian	202.7	199.9	197.5	200.0	174.7	12.7%
Yorkshire	327	318	295.2	313.4	266.4	15.0%

Source: Ofwat Final Determinations, CMA analysis for Northumbrian (combined)

Totex allowances

12. At the time of the PFs, the CMA assessed the approach taken by Ofwat at PR19 and took into consideration evidence from the four Disputing Companies, Ofwat, and from third parties. We provisionally determined that some of the Disputing Companies may require an additional allowance to achieve the required level of performance. We provisionally concluded that there is a link between maintaining higher performance on leakage and costs such that the base cost model we used will not adequately compensate companies that are required to maintain performance above the upper quartile. We therefore provisionally adjusted the base cost allowance for the two Disputing Companies that are higher performers on leakage, Anglian and Bristol, to allow for this. We provisionally concluded that the Disputing Companies which identified that they required enhancement cost funding for achieving the leakage reductions they committed to should be allowed the efficient cost of doing so. In particular, we provisionally considered that companies should be allowed to recover at least some of the costs of achieving leakage reductions even though they are not an upper quartile performer.[3]

[3] Provisional findings report, summary paragraph 74

13. The CMA's PFs set out preliminary estimates of the base and enhancement allowances for the four Disputing Companies, based on the information we had at the time, and a provisional approach, to assist the Parties and other stakeholders to respond. However, the enhancement allowances were indicative based on applying their company-specific efficiency factor, frontier shift and RPE adjustment to their requested allowances. We acknowledged at PFs that we considered there was insufficient information available to assess the efficient costs of meeting the large reductions in leakage required during AMP7. We also indicated that we would seek further evidence to allow us to review the enhancement expenditure plans.[4]

14. The allowances provisionally calculated in our PFs are shown in Table 2, with a comparison to Ofwat's Final Determination.

Table 2: Totex Allowances in CMA PFs and Ofwat FDs

£m

	Adjustment to Base	*Enhancement*	*CMA PFs Total*	*Difference from Ofwat FD*
Anglian	25.7	68.0	93.7	-2.2
Bristol	0.5	4.3	4.8	0
Northumbrian	0.0	0.0	0.0	0
Yorkshire	0.0	93.3	93.3	93.3

Source: PFs tables 8.2, 8.3 and 8.4

15. This led to a significant increase in totex allowance for Yorkshire compared to Ofwat's FD. Yorkshire did not qualify for additional enhancement expenditure under Ofwat's approach as it was outside the upper quartile.[5]

Evidence provided following PFs

16. We have asked the Parties for further information to allow us to come to a revised determination. Shortly after the PFs we issued information requests to the Parties. We asked the Disputing Companies to provide further detail on the specific leakage activities planned, as this information was not previously available to us in a comparable form. We also asked the companies for evidence that the planned spend would be delivered efficiently and for evidence that companies had determined least cost plans by adequate consideration of the options available to reduce leakage. Optioneering, as this is known, is important to determine that companies are open to innovation, to

[4] Provisional findings report, paragraphs 8.66-8.67
[5] Provisional findings report, paragraph 8.71

consideration of different techniques and to different mixes of opex and capex solutions.

17. It is also important for companies to demonstrate that they have exhausted the least cost options, such as pressure management, which may be a reason why their costs differ from those presented by other companies. There may also be local operating conditions that are favourable, reducing costs in certain parts of the country, or unfavourable, making leakage activities more expensive. The CMA offered companies the opportunity to explain how these apply in their cases, rather than assume that the least cost and lowest leakage position can be replicated nationally.

18. Ofwat has additionally commented on the Disputing Companies' responses to these requests.[6]

19. In addition, the Main Parties, and some third parties, have responded to our approach to leakage issues in the PFs.

20. Below, we summarise the positions taken in these submissions on the CMA's general approach and specifically on our provisional determination to allow an enhancement allowance for Yorkshire.

Views on general approach

Ofwat

21. Ofwat supported our provisional allowances for Anglian and Bristol, and considered that there was no case to change our provisional decision on the allowance for Northumbrian. It disagreed with our provisional allowance for Yorkshire.[7]

22. Ofwat did not agree with our proposal to allow significant additional totex allowances for Yorkshire, and noted that other non-disputing companies had confirmed that they could rise to the new leakage challenge without additional allowances.

23. Ofwat noted that Yorkshire and Northumbrian had relatively high levels of leakage and said that this might reflect past under-investment. Ofwat said that Northumbrian's post-PFs request for leakage enhancement spend (see paragraph 29) was not credible as it had not previously requested this.

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[6] Ofwat's reply to responses to the provisional findings – costs and outcomes
[7] Ofwat's response to the provisional findings – costs and outcomes, paragraphs A3.1-A3.3

24. Ofwat noted that the CMA was suggesting totex allowances for Anglian and Bristol that were broadly in line with its Final Determinations, albeit the approach taken to estimate these was slightly different. Ofwat did not ask for any reductions to our proposed allowances for these companies and said it did not consider there was evidence for any additional allowances.[8]

25. Ofwat said that the companies had secured performance improvements in year 5 of AMP6 which represented a large part of the 15% AMP7 challenge. It said that the delivered leakage reductions of around 7% for the sector in 2019/20 represented new evidence that we should now consider. It considered that this showed that companies can rise to the regulatory challenges set without needing additional funding.[9]

26. It said that the sector had not taken leakage seriously enough, and that some companies have 'simply not stepped up'.[10] It also argued that previous performance assessments against SELL did not indicate that companies were efficient, as there were recognised flaws in the SELL methodology, and Ofwat had moved away from it as a measure.[11]

27. Ofwat suggested that there were technological advances now available to companies to drive down leakage that the sector could adopt at no or very little additional cost.

Disputing Companies

28. The four Disputing Companies broadly welcomed our approach to leakage and expressed a willingness to provide further evidence to confirm the need for the additional totex allowances and to demonstrate that their proposals represented efficient expenditure. They suggested that the industry progress in 2019/20 in reducing leakage was reflective of favourable weather conditions, recovery from the 2018 'Beast from the East' which had caused exceptional leakage impacts, and that it was normal for companies to make an early start to meeting high profile regulatory targets, which was good for customers and the environment.

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[8] Ofwat's response to the provisional findings – cost and outcomes, paragraph 2.23
[9] Ofwat's response to the provisional findings – cost and outcomes, paragraphs 2.20 and A3.8
[10] Ofwat's response to the provisional findings – cost and outcomes, paragraphs A3.8 and A3.10-A3.13. See also, for example, the results from the SMC 2012 review set out in Ofwat's Cost efficiency – response to common issues in companies' statements of case p56.
[11] SELL: sustainable economic level of leakage – an assessment of the economics of reducing leakage compared with other demand management options or resource increments considering a Company's supply demand balance position as per WRMPs.

29. Northumbrian responded to the PFs by making a new request for the CMA to allow it enhancement totex for leakage in our Final Determinations. It explained that this funding request was not previously made due to the wider context of PR19 and said that it was important that the CMA took a consistent approach for all Disputing Companies.[12]

Third Parties

30. CCWater supported the CMA's position of retaining the leakage PCs as set out in Ofwat's Final Determinations[13] but challenged the allowance made for Yorkshire in the PFs.[14] Water UK welcomed the CMA's approach as it said a step change in performance will result in additional costs that should be reflected in the determinations.[15]

Specific views on Yorkshire's allowance for leakage enhancement

Ofwat

31. Ofwat said that if the CMA concluded that Yorkshire should be provided with a leakage enhancement allowance for AMP7, then that allowance should be set at a maximum of £28.7m. This figure is the average of Ofwat's top-down (£29.5m) and bottom-up (£27.9m) estimates, based on its assessment of Yorkshire's proposed leakage totex allowance requirements.[16]

32. Ofwat's top-down assessment was that, at most, the unfunded element of Yorkshire's leakage improvement is 23.9 Ml/d, 51% of the total reduction in leakage required to meeting the company's performance commitment levels,[17] because:

    a. Yorkshire would achieve a 16.1 Ml/d reduction in leakage (when compared with its three-year average performance from 2017-18 to 2019-20) if it simply maintained its 2019/20 performance level. [18]

    b. A further reduction of at least 5 Ml/d could be delivered through base funding, given the ongoing benefits resulting from Yorkshire's late AMP6

[12] Northumbrian's response to the provisional findings, paragraph 252
[13] The Consumer Council for Water's response to the provisional findings, paragraph 7.2
[14] The Consumer Council for Water's response to the provisional findings, paragraphs 2.14, 7.6-7.14
[15] Water UK response to the provisional findings page 2
[16] Ofwat's response to the provisional findings – costs and outcomes, paragraphs A3.50-A3.51
[17] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.50
[18] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.27

investment in loggers and support equipment that would not need to be replaced in the 2020-25 period.[19]

33. Ofwat's top-down estimate of £29.5m was calculated by multiplying the identified improvement of 23.9 Ml/d by Ofwat's view of the maximum unit cost of leakage reduction, which is £1.2m per Ml/d.[20] Ofwat's £1.2m unit cost figure was calculated as the average of:[21]

a. The industry PR19 requested unit cost for leakage enhancement upper quartile (£0.6m per Ml/d); and,

b. The average of Yorkshire's view of its unit costs for leakage enhancement in:

- its April 2019 business plan (£1.7m per Ml/d); and,
- its CMA submissions (£2.0m per Ml/d).

34. In proposing this top-down estimate for Yorkshire, Ofwat noted that Northumbrian's overall forecast unit cost for leakage reduction was £0.5m per Ml/d, and that Northumbrian's identified unit cost for active leakage control as being between £1.0m and £1.2m per Ml/d.[22]

35. Ofwat's bottom-up assessment presented several reasons why it considered that Yorkshire's enhancement allowance – if one was to be provided – should be significantly lower than that requested by Yorkshire, including that:[23]

- Customers should not be expected to fund the £13.7m of productivity improvements Yorkshire has identified, given the limited detail provided and that other companies are already providing better performance.
- The £45m of additional capital maintenance expenditure should be considered to be included in base.
- An optioneering challenge of 20% should be applied as limited evidence of optioneering and innovation have been provided within the company's plan.

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[19] Ofwat's response to the provisional findings – costs and outcomes, paragraphs A3.28 and A3.31
[20] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.50
[21] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.48 and Table A3.3
[22] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.46.
[23] Ofwat's response to the provisional findings – costs and outcomes, paragraphs A3.33 – A3.43, and A3.50

Yorkshire

36. Yorkshire said that it did not consider there to be any basis for the reductions that Ofwat made to its proposed enhancement allowance.[24] Yorkshire said that Ofwat's top-down and bottom-up challenges to its cost forecast had not been undertaken in a rational and reasonable manner, and that Ofwat had selected assumptions and methods that appear to have been designed to deliver an implausibly low enhancement allowance.[25]

37. Yorkshire said that this included:[26]

- The claim that Yorkshire's leakage strategy was inappropriate due to a lack of innovation.
- Ofwat's use of an untested and incorrect assumption that Yorkshire's base funding would allow it to substantially reduce leakage.
- A flawed application of an efficiency challenge based on a unit cost reported by an individual company without due regard to the accuracy or comparability of that cost.

Additional Leakage Totex proposed to achieve Leakage PCs

38. All four Disputing Companies have, in their post-PFs submissions, requested that the CMA allow enhancement totex allowances to meet the additional leakage reduction included in the AMP7 leakage PCs. The requests vary considerably, as shown in Table 3, and in Figure 1, which presents the information normalised on a per property basis to allow for comparisons.

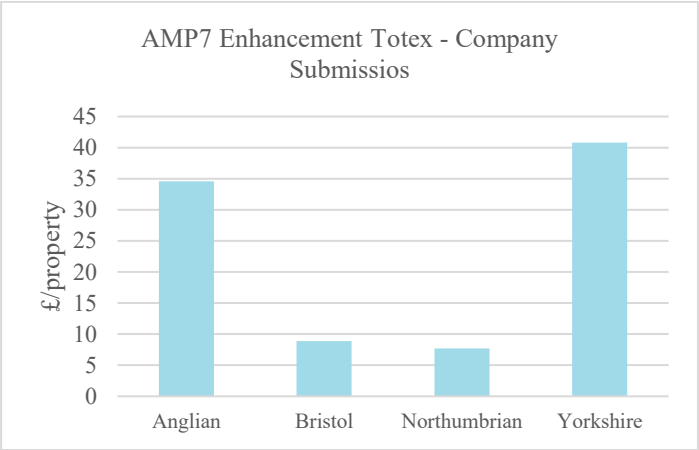
Table 3: Company leakage enhancement allowances requested

	£m	*£ per property*	*£ per km of mains*
Anglian	76.7	34.6	1,989
Bristol	4.8	8.9	701
Northumbrian	15.6	7.7	599
Yorkshire	94.7	40.8	2,979

Source: CMA analysis based on companies' responses to the PFs.

[24] Yorkshire's reply to responses to the provisional findings, paragraph 5.4.3
[25] Yorkshire's reply to responses to the provisional findings, paragraph 5.4.2
[26] Yorkshire's reply to responses to the provisional findings, paragraph 5.4.2

Figure 1: Enhancement totex, Company submissions, £/property



Source: CMA analysis based on companies' responses to the PFs.

Revised CMA assessment of enhancement totex allowances

39. With the additional evidence now received from the Disputing Companies and from the various responses to our PFs, we have re-examined the evidence relating to the proposed enhancement allowances to assess the efficient costs needed to reach the new leakage PCs. We retain the same view as in the PFs, that it is reasonable that some of the companies may need to incur additional enhancement spend to move from the AMP6 targets based on SELL assessments, to the new targets of 15% or more below previous levels.[27] Therefore, we consider that companies whose business plans identified that further enhancement allowances were needed to meet the ambitious leakage PCs, should be allocated an allowance for the efficient costs of these enhancements.

40. We have found that because of differences in the individual circumstances and the evidence available for the four Disputing Companies, rather than a 'one size fits all' approach, it is appropriate to tailor our approach to reflect their very different positions. The relevant differences between the four Disputing companies include:

- the strategies they have adopted to achieve the leakage reduction. Some are proposing to focus on expanding the scope of existing Active Leakage Control (ALC)[28] activities as their main mechanism for achieving leakage reduction, whilst others are investing in assets and more innovative techniques which are intended to secure long term benefits;

[27] Provisional findings report, paragraphs 8.57 to 6.64
[28] ALC activities are ongoing leak detection and repair techniques traditionally used in the water sector

- the level of enhancement totex they consider necessary;
- current levels of leakage, PCs and varying local conditions;
- early start (2019/20) leakage reduction and investment;
- their explanations of whether all leakage options have been adequately considered (optioneering), and extent of assurance that least cost options have been identified; and
- the efficiency assurance and external scrutiny of the unit costs of activities aimed at reducing leakage.

41. We propose to follow an overall structure of assessment as outlined below, employing both top-down and bottom-up approaches, and then to tailor the application of that assessment to each of the four Disputing Companies according to their individual circumstances and the company-specific analysis.

42. The top-down approach is based on:

a. The target leakage reduction applicable, in Ml/d; multiplied by

b. A measure of the unit cost of leakage reduction expressed in £m per Ml/d of leakage reduction.

43. The product of these two variables determines a top-down leakage enhancement allowance. By comparing the unit cost across companies, we can cross-check whether the proposed investment programme looks expensive compared to other companies.

44. The bottom-up approach to determining allowances first identifies the types of leakage enhancement planned, together with their submitted costs, adjusted as appropriate to give an efficient cost for each. Combining this activity cost with estimates of the leakage savings anticipated from each specific activity, it is possible to arrive at a 'bottom-up' assessment of the correct allowance.

45. The top-down approach has the advantage that it does not require a detailed individual assessment of the appropriateness and efficiency of all the elements in the companies' business plans. This is problematic where the evidence required may not be fully available. It is simpler to apply, but it can be challenging to identify the appropriate unit cost. The bottom-up approach has the benefit over a top-down assessment that it allows more effective assessment of the companies' individual proposals for the right category of investment, for example where different types of spend have different cost/benefit considerations beyond AMP7.

46. Generally, we consider that a bottom-up approach, where feasible and if the required information is available, will give a better result. But depending on the specific evidence available and circumstances prevailing, we sometimes find that we need to use a combined approach or need to rely on the top-down approach.

47. In the remainder of this section we describe first the general top-down and bottom-up methodologies. We then go on to the individual assessments applying them to each of the Disputing Companies.

Top-down

48. In this section we consider how the top-down approach could be applied to the four Disputing Companies. We do not conclude on our approach here as our decisions are best addressed on a company by company basis, and so are set out in the individual company assessments. We first consider the measure of applicable leakage reduction, and then the measure of unit cost.

Applicable leakage reduction

49. Although the PC target for leakage is not in dispute, we received different submissions on what level of leakage reduction towards that PC target should be reflected in enhancement expenditure. We have therefore compared below different measures for the level of leakage reduction.

50. Ofwat's approach was to consider enhancement allowances only for companies with a level of leakage better than AMP6 upper quartile industry levels. In our PFs we provisionally concluded that this was not our preferred approach, as the PR19 PCs represented a change in the nature of the challenge (in other words, moving from a SELL approach to reduction targets of around 15%) for companies below the upper quartile as well. Therefore, this would require more of all companies than the practices that had met the AMP6 targets.[29] We set out below potential approaches to measuring the applicable leakage reduction.

51. **Option 1: the full reduction in the AMP7 PC**. This is the leakage reduction specified in the Performance Commitments of the four Disputing Companies, namely, the full leakage reduction planned from 2019/20 to 2024/25 based on 3-year rolling averages. These are the values in the right-hand column of Table 4.

[29] Provisional findings report, paragraphs 8.57 and 8.64

Table 4: Full leakage reduction in AMP7, Option 1

	2019/20 3yr rolling level Ml/d	*Performance Commitment*	*2024/25 3yr rolling level Ml/d*	*Full leakage reduction in AMP7 Ml/d*
Anglian	194.1	16.4%	162.2	31.8[30]
Bristol	40.7	21.3%	32.0	8.7
Northumbrian	200.0	12.7%	174.7	25.3
Yorkshire	313.4	15.0%	266.4	47.0

Source: CMA analysis based on Ofwat (2019), PR19 final determinations, Yorkshire Water – Outcomes performance commitment appendix Ofwat (2019), PR19 final determinations, Anglian Water – Outcomes performance commitment appendix Ofwat (2019), PR19 final determinations, Northumbrian Water – Outcomes performance commitment appendix Ofwat (2019), PR19 final determinations, Bristol Water – Outcomes performance commitment appendix.

52. **Option 2: the reduction from 2019/20 (if lower than the reduction in the AMP7 PC), to remove the need for customers to pay for improvements already made.** This is the reduction from the annual level of leakage in 2019/20, rather than the 3-year rolling average. This approach would account for the early progress in leakage reduction made by companies (notably in 2019/20), recognising that the remaining levels of leakage reduction needed are lower than the headline PR19 PC. However, we recognise that there is a possibility that some reductions in leakage in 2019/20 could have arisen because companies brought forward expenditure from AMP7 in order to improve their performance. The remaining percentage reductions are: Anglian 15.1%; Bristol 13.5%; Northumbrian 11.5%; Yorkshire 9.8%. With this approach, the values in the right-hand column of Table 5 would be used:

Table 5: Partial leakage reduction in AMP7, Option 2

	2019/20 level Ml/d	*2024/25 3yr rolling level Ml/d*	*Partial leakage reduction in AMP7 Ml/d*
Anglian	191.0	162.2	28.8[31]
Bristol	37.0	32.0	5.0
Northumbrian	197.5	174.7	22.8
Yorkshire	295.2	266.4	28.8

Source: CMA analysis

53. **Option 3: the reduction from the best performance year to date (if lower than the reduction in the AMP7 PC), to remove the need for customers to pay for performance improvements that the company has shown it can achieve in the past**. This is the reduction from the lowest level of leakage in any AMP6 year. In most cases (Anglian, Bristol and Yorkshire) this would be from 2019/20, as the previous year (2018/19) included the effects of the 'Beast from the East' weather event. If companies previously had leakage levels lower than in 2019/20, there is an argument that customers should not pay again for the leakage reduction back to this level. This option would

[30] 8.7 Ml/d of savings at Anglian are from smart meters, which are subject to a separate totex allowance. Hence the full leakage reduction we are considering for the potential enhancement allowance is 23.1 Ml/d.
[31] 8.7 Ml/d savings are from smart meters, which are subject to a separate totex allowance. Hence the partial leakage reduction is 20.1 Ml/d.

potentially affect Northumbrian, which had leakage levels of 189.7 Ml/d in 2013-14[32], and would take the leakage reduction for which enhancement expenditure could be considered in AMP7 down to 15 Ml/d (from 189.7 Ml/d to 174.7 Ml/d). Northumbrian's full reduction could be adjusted to 17.5 Ml/d (rather than 25.3 Ml/d) given that its leakage was previously 7.8 Ml/d lower.

54. **Option 4: the reduction from the AMP6 PC (if lower than the 2019/20 level), as achieving the AMP6 PC has potentially already been funded in AMP6 allowances.** This option takes, as the starting point, the 2019/20 Performance Commitment made at PR14, if any companies had failed to meet this target. Ofwat has supplied a conversion of the PR14 leakage targets for 2019/20, adjusted for the new leakage reporting method now adopted. It acknowledged that this conversion could be made in other ways, so the data may not be completely reliable. This approach would affect Bristol compared with Option 1, as Bristol's performance in the last three years, while strong by industry standards, was still above its PC targets as shown in Table 6:

Table 6: Bristol's partial leakage reduction if it met the 2019/20 target, Option 4

	PR14 PC level for 2019/20 3yr rolling level Ml/d	*2024/25 3yr rolling level Ml/d*	*Partial leakage reduction in AMP7 Ml/d*
Bristol	39.5	32.0	3.8[33]

Source: CMA analysis

55. Table 7 summarises our options for the leakage reduction to apply:

Table 7: Summary of leakage reductions that could be applied in top-down method

	Option 1 Ml/d	*Option 2 Ml/d*	*Option 3 Ml/d*	*Option 4 Ml/d*
Anglian	23.1	20.1	n/a	n/a
Bristol	8.7	5.0	n/a	3.8
Northumbrian	25.3	22.8	15/17.5	n/a
Yorkshire	47.0	28.8	n/a	n/a

Source: CMA analysis

56. In the individual company assessments below, we explain our updated view on which of these options would be most appropriate for each of the Disputing Companies.

Unit Cost

57. The next element is to identify the appropriate unit cost of achieving a target leakage reduction, measured in £ per Ml/day. This unit cost could be company

[32] Northumbrian's leakage level was 189.7 Ml/d in 2013-14 based on a three-year rolling assessment.
[33] Bristol outturned at 40.7 Ml/d, rather than its PR14 target of 39.5 Ml/d. Hence it was 1.2 Ml/d higher. This is taken off the 5.0 Ml/d shown within Option 2 in Table 4, to reach 3.8 Ml/d.

specific, an industry average, an estimate of efficient costs over all activities, or for specific activities. We now set out possible approaches (our decisions on which to use are set out in the individual company assessments).

58. In order to avoid funding inefficient investments, we can compare unit cost data across the industry to derive a reasonable unit cost, and challenge the higher cost companies to achieve that level of cost. Taking the upper quartile of Ofwat's PR19 leakage enhancement feeder model that reviewed the cost projections of the seventeen water companies, the unit cost is £0.6m per Ml/d.[34] This is broadly consistent with the unit costs associated with Bristol and Northumbrian.

59. In response to our PFs, Ofwat suggested an alternative unit cost measure for active leakage control (ALC) activities such as leak detection and repair; pressure management; deployment of sensors; main renewals and IT systems to improve the early identification of hidden leaks. Ofwat suggested that the CMA consider this unit cost in considering Yorkshire's allowance.

60. Ofwat estimated this ALC for Yorkshire at £1.2m per Ml/d.[35] It is based on a hybrid of factors, including:

a. Yorkshire's proposals are heavily based on more ALC and have a unit cost of £2.0m per Ml/d. Ofwat noted that this current estimate was higher than Yorkshire's September 2018 business plan proposals when a larger leakage reduction had been proposed.[36]

b. The upper quartile of implied unit costs in the PR19 enhancement requests was £0.6m per Ml/d.

c. Northumbrian, which has similar leakage levels to Yorkshire, proposed ALC costs of £1.0-£1.2m per Ml/d.

d. Given that Yorkshire has relatively high leakage levels, the marginal cost of leakage reductions should in theory be lower. However, Ofwat acknowledged Yorkshire's statement that it had largely exhausted use of further pressure management options, which are recognised as very low-cost solutions.

61. Use of an upper quartile-based unit cost measure may not allow for differences in circumstances between companies. We consider that this could be significant as companies are starting with different leakage levels and have

[34] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.46
[35] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.48
[36] Ofwat's response to the provisional findings – costs and outcomes, Table A3.3

different scope for pursuing low cost options. We have therefore looked at the company specific estimates of leakage reduction unit rates based on their requested enhancement allowances. This provides one way of comparing the efficiency of each company across the sector, or across the four Disputing Companies, in terms of the cost incurred to reduce leakage.

62. Table 8 summarises the implied unit rates of the four Disputing Companies from their submissions. The average value is £1.6m per Ml/d, but there is a wide variation between the companies.

Table 8: Implied unit rates from Company submissions

	Leakage Enhancement Spend – Company projection	*Leakage reduction in AMP7 to meet PC*	*Unit Rate*
Anglian	£76.7m	23.1 Ml/d[37]	£3.3m per Ml/d
Bristol	£4.8m	8.7 Ml/d	£0.6m per Ml//d
Northumbrian	£15.6m	25 Ml/d	£0.6m per Ml/d
Yorkshire	£94.7m	47 Ml/d	£2.0m per Ml/d

Source: CMA analysis.

63. In support of its approach to the determination, Ofwat compared the unit costs of leakage reduction across the 17 companies, and a similar pattern was observed with Anglian and Yorkshire being at the higher end of unit costs, and Bristol and Northumbrian towards the lower end.

64. In our view, some caution is needed in comparing the unit rates implied by company submissions, because of the differences in company specific circumstances. In our PFs we concluded that applying an average unit cost to adjust allowances was not the right approach. Our view was, and continues to be, that there is too wide a range of unit costs and of local conditions for a simple unit cost approach based on an average of the Disputing Companies or of the industry overall to be sufficient.[38]

65. However, the unit cost is useful as a starting point in understanding the relative costs of the different approaches taken by the companies. Our approach has been to compare our bottom-up analysis across different techniques for each company against the top-down cost which the companies might incur based on a unit cost comparison with other firms. In particular, it is useful to start with the unit cost analysis in testing whether the high unit cost approaches taken by Anglian and Yorkshire are justified by differences between their efficient costs and those of other companies.

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[37] Whilst Anglian's PC is to reduce leakage by 31.8 Ml/d in AMP7, 8.7 Ml/d of this will arise from its investment in smart metering. This figure excludes that as the smart metering costs are not included in their leakage enhancement totex request.
[38] Provisional findings report, paragraph 8.65

66. At Annex 2 we present four tables showing the various permutations of leakage reduction and unit rate estimates which could be applied for each company to generate top-down allowance estimates. Our assessment of the appropriate leakage reductions, unit rates and hence top-down estimate of enhancement allowances to be used is set out in the company-specific assessments where relevant.

67. We have also considered whether we can and should split costs into categories and derive efficient unit rates for each of these. The reason for this approach would be:

a. that the scope for some low-cost activities, such as pressure management, differs amongst the companies;

b. that we have concerns i) that firms have chosen an appropriate mix of approaches and ii) that unit costs are efficient for each different activity proposed;

c. that investments in assets or new and potentially innovative systems which may reduce the whole life cost of leakage reduction should be considered separately to ongoing costs.

68. This would effectively be a form of bottom-up approach with benchmarked costs used in the assessment of individual categories of spend. However, the evidence available was not in a form that would have allowed this approach.

Bottom-up

69. Following the PFs, the CMA issued two information requests to companies to identify the types of leakage enhancement planned and to provide estimates of the leakage savings anticipated from each specific activity. The Disputing Companies were also asked for evidence that their cost projections were efficient and for reassurance that least cost plans had been identified through sufficient consideration of all available options, not just those in their revised business plans. The Disputing Companies were given the opportunity to explain whether they had needed to adopt more expensive leakage management options because they had already exhausted the adoption of lower cost options. They were also asked if any innovation was planned.

70. This evidence allowed us to compare and contrast each Disputing Company's proposals. The types of expenditure included ALC activities (to detect and repair leaks); deployment of pressure or noise sensors; new or optimisation of pressure management options; mains replacements and various IT system and software upgrades to support more advanced leakage management techniques. The responses showed that the different companies had different

leakage control options planned and available. This affected the cost of achieving them, including depending on whether low cost options had already been pursued extensively.

71. In reviewing companies' evidence and Ofwat's response, we consider that there are a variety of reasons why we might make changes to what the parties' submitted by way of a bottom-up assessment of enhancement requirements. These changes may arise from:

- poor explanations of efficiency assurance, for examples where companies compare their costs internally to historic levels and not to any external benchmarks;
- inclusion of activities that appear likely to be already covered by base expenditure allowances rather than a genuine enhancement cost: examples include maintenance of existing assets;
- where there is evidence that an activity had been allowed for in previous price reviews and where the company had failed to progress it; and
- poor evidence that companies had properly considered all available options. If companies appear to be focused on existing activities rather than open to innovation or adoption of best practice adopted by others, this does not provide comfort that a least cost plan has been identified.

72. We have reviewed the individual plans from the four Disputing Companies by considering if any adjustments to the allowed expenditure should apply from a review of these potential weaknesses in the evidence presented, supported by advice received from our Engineering Advisors, WRc. The headline results are summarised in Table 9. The CMA bottom-up column sets out our provisional calculation of an appropriate bottom-up enhancement allowance. Our reasoning for these adjustments to the calculation and our decision on whether to use this to determine allowances is explained in the Company Specific sections of this Working Paper.

Table 9: Assessments of Leakage Totex Enhancement by Bottom-up Approach

	Company Request	*Ofwat bottom-up*	*CMA bottom-up*
Anglian	£76.7m	£54.1m-£58.1m	£64.1m
Bristol	£4.8m	£4.59m	£4.59m
Northumbrian	£15.7m	£6.27m	£6.27m
Yorkshire	£94.7m	£27.9m	£27.9m

Source: CMA analysis.

Overall Leakage Enhancement assessment

73. A bottom-up assessment is in theory more accurate, as it allows the company's individual plans to be reviewed in depth, and therefore is a better assessment approach than the top-down option. However, it is difficult to implement effectively if companies provide only a limited breakdown of the activities associated with reducing leakage. Some companies grouped activities together into general headings and did not provide detail around the activities and how they would drive leakage reduction. Yorkshire's submission was the most limited in terms of the information provided about the link between activities and leakage reduction. A bottom-up approach alone may also result in allowances being too high for companies that choose leakage reduction techniques which are equally effective in reducing leakage, but inefficient in that they are more expensive than appropriate alternatives.

74. By contrast, a top-down assessment may not work well where it is very difficult to identify an appropriate unit cost to utilise for that company. This was the case for Anglian. Whilst it has a higher submitted unit cost rate than the other three Disputing Companies, this may be justified by its low leakage position already, which suggests it may already have exhausted low-cost leakage control options. At the same time, Anglian's rate was very different to others and this was also highlighted by Ofwat's comparison of the total unit costs of each of the firms. Anglian did not fully explain this to us or demonstrate that it had fully reflected on the scale of its unit costs. For example, Anglian's submission included a number of investment categories which appeared to be technically justified, but where Anglian had not provided an assessment of the link between the AMP7 spend and the AMP7 leakage reduction. Specifically, Anglian's presentation of evidence had categories of spend that had no leakage benefit assigned.

75. As a result, we consider in the assessment below both the bottom-up and the top-down approaches, and we give more weight for each of the companies to the assessment which appears to be more reliable given their particular circumstances during AMP7 and the specific evidence available.

Individual Company Assessments

Anglian

76. Anglian has already achieved relatively low levels of leakage, being 10% better than the upper quartile of the industry and 27% better than the median. Anglian has requested a high leakage enhancement totex allowance compared with two of the other Disputing Companies, Bristol and Northumbrian.

Top-down assessment

77. We do not consider it appropriate to apply a top-down approach in Anglian's case, largely due to the challenges in finding an appropriate unit rate to use in a top-down assessment for Anglian. This is because:

a. Anglian's rate is much higher than others, but this does not necessarily mean there are major inefficiencies. Comparing this with companies with higher levels of leakage and/or less challenging conditions is not always appropriate, for example if there are increasing marginal costs to leakage reduction.

b. As a frontier company, it may need to make investments and explore innovation that others do not need to meet their higher leakage PCs. We recognise that an appropriate unit rate for Anglian may be higher than others because it may already have exhausted low-cost options.

c. However, Anglian has not fully justified the efficiency of its proposed unit rate of £3.32m per Ml/d, so we do not have reasonable certainty that it represents an efficient unit cost.

78. Point (a) also suggests using an upper quartile unit cost rate or Ofwat's suggested unit rate for Yorkshire would not be appropriate.

79. We are therefore proposing to base our assessment for Anglian solely on the bottom-up assessment, as the top-down approach would not be reliable. This is discussed below.

Bottom-up assessment

80. For the bottom-up assessment, we have followed a similar approach to Ofwat.[39] We have carefully considered detailed Anglian's evidence on its intended investment proposals, option evaluations and cost assessments.

81. It appears that Anglian is seeking to invest in new assets that are intended to lower leakage from an already low position. This investment should bring long-term benefits. Our view is that it is not feasible to precisely assess the extent to which proposed expenditure would already be covered by base totex allowances. There is no precise distinction as base allowances cover a multitude of factors and leakage spend is not ring-fenced in the regulatory

[39] Ofwat's bottom-up position for Anglian is shown in Ofwat's response to the provisional findings – costs and outcomes, Table A3.3 on page 69

regime that Ofwat uses. Hence, we have made an adjustment based on judgement from the descriptions of the expenditure provided.

82. Our proposed allowance of £64.1m is slightly higher than Ofwat's latest recommendation of £54.2m - £58.1m, [40] due to two adjustments compared with Ofwat's bottom-up assessment:

- For pressure sensors, we assumed 20% base and 80% enhancement allocation. Ofwat had assumed 25-50% was already in base.
- For five other components, we assumed 50% of the projected spend was enhancement, with the other 50% covered by base allowances. For these same five categories, Ofwat had assumed it was all covered by base spend. The applicable categories of planned expenditure are:
  - Intelligent Network Systems - automated network assets;
  - DMA splits;
  - Intelligent Network Systems - advanced flow sensing;
  - ILPM leakage reporting software; and
  - MADB/config log DMA and meter management software.

83. Given that Anglian has a 16.4% leakage PC to achieve from an already low level of leakage, it seems reasonable that some of its future activities will be to a much higher specification than would otherwise be the case. So even if the spend may appear to 'business as usual' activities, the sophistication of these is likely to be greater given the change to a significant leakage reduction now needed. On balance, we have accepted that some of this investment would not be covered by existing base allowances, and therefore have allowed 50% within the enhancement allowances.

84. Our updated determination of an enhancement allowance of £64.1m is lower than the allowance Ofwat made in its final determination. This reflects the further evidence now available to us and our critical review of Anglian's proposals.

85. As noted in our PFs, Anglian will also qualify for a base totex leakage allowance in the Final Determination as it is ahead of the upper quartile

[40] Ofwat's bottom-up position for Anglian is shown in Ofwat's response to the provisional findings – costs and outcomes, Table A3.3 on page 69

position. As a frontier company, there are industry benefits as well as company area benefits if it is able to reduce leakage to lower levels.

Bristol

86. Bristol has already achieved relatively low levels of leakage, being 10% better than the upper quartile of the industry and 26% better than the median. Bristol has requested a low leakage enhancement totex allowance compared with two of other Disputing Companies, Anglian and Yorkshire.

Top-down assessment

87. For the top-down assessment, we have used Bristol's own rate of £0.55m per Ml/d. This is similar to the upper quartile from Ofwat's PR19 feeder model containing data for all seventeen water companies. We have therefore accepted this as an efficient unit cost estimate in making our updated determination.

88. For the leakage reduction we have used the AMP7 PC leakage reduction of 8.7 Ml/d (consistent with option 1 identified in paragraph 51). While Bristol has already made a strong start to achieving the AMP7 leakage PC through its 10% leakage reduction in 2019/20, we believe that the 3-year rolling average PC is the appropriate measurement to base decisions on. This 3-year approach was introduced to account for varying weather impacts. Whilst 2019/20 leakage performance was strong, there is a risk that this is not permanent and at least partly results from favourable weather influences in that single year. When a Company knows it will face a challenging regulatory target, it makes good business sense to make early efforts to make progress rather than wait until a new regulatory cycle is effective. Further, some of the improvements in leakage in 2019/20 across the Disputing Companies may have arisen from the companies bringing forward some investment from AMP7 to address the leakage targets in advance. We are mindful to be consistent with our provisional decision not to use 2019/20 data in modelling base expenditure. As such, it would be inappropriate for us then to include the benefits of that expenditure in determining appropriate enhancement allowances for AMP7. This is consistent with our approach for Yorkshire.[41]

89. The top-down calculation is hence £0.55m x 8.7 Ml/d = £4.8m.

[41] Option 2 would have led to an allowance of £2.8m, but this is provisionally rejected.

90. We are not using Option 4 which would further lower Bristol's top-down assessment by £0.7m to £2.1m. While Bristol may have missed its AMP6 leakage target set at PR14 for 2019/20, it is relevant that:

- Bristol is a frontier company on leakage so its targets are already challenging, and it would seem perverse to further penalise a Company that has shown ambition and has made good strides to lower leakage.
- There are existing ODI arrangements to address underperformance.
- The conversion of the PR14 PC to the new leakage reporting method is, as Ofwat acknowledged in its RFI 020 response, not precise.

Bottom-up assessment

91. For Bristol's bottom-up assessment, we have mirrored Ofwat's analysis,[42] applying a 5% efficiency that yields an allowance of £4.59m.[43] This was the only adjustment applied.

Overall enhancement assessment

92. We therefore have two different allowance estimates. Without reason to believe one approach is significantly more robust than the other in this case, we have taken an average of the top-down and bottom-up assessments. This produces an updated leakage enhancement totex value of £4.694m for Bristol.

93. This is slightly lower than Ofwat's FD allowance of £4.8m, reflecting Bristol's latest evidence. Ofwat estimated an allowance of £4.6m having seen Bristol's further submissions. [44]

94. As noted in the CMA's PFs, Bristol will also qualify for a base totex leakage allowance in the CMA Final Determination as it is ahead of the upper quartile position. As a frontier company, there are industry benefits as well as company area benefits if it is able to reduce leakage to lower levels.

[42] Ofwat's bottom-up position for Bristol is shown in Ofwat's response to the provisional findings – costs and outcomes, Table A3.5 on page 74
[43] CMA latest allowances are currently expressed pre any adjustments that may be made for RPE adjustments and frontier shift.
[44] Ofwat's bottom-up position for Bristol is shown in Ofwat's response to the provisional findings – costs and outcomes, Table A3.5 on page 74

Northumbrian

95. Unlike the other Disputing Companies, Northumbrian submitted a business plan at PR19 that did not require any leakage enhancement totex allowance. Nor did it put forward a need for an allowance for leakage enhancement totex in its Statement of Case for this redetermination. It later confirmed this in response to an information request from the CMA. It was only after the CMA issued its PFs, with allowances made for the other three companies, that Northumbrian suggested an allowance was needed. At its post PFs hearing with the CMA, Northumbrian confirmed it had changed its position in response to the methodology adopted by the CMA in its PFs.

96. Our view is that it is not appropriate for Northumbrian to now be allocated specific leakage enhancement totex. This is for two reasons:

- The request is inconsistent with the business plan process that requires companies to identify a single and internally coherent business plan.

- Northumbrian's leakage levels are also relatively high as they are 17% above the upper quartile in 2019/20 and its PC is lower than that indicated in the PR19 methodology at 12.9%. In that context, we consider that Northumbrian's original view that it could fund the PC improvements from base expenditure is realistic, and it is not compelling that Northumbrian needs to reclassify some of this expenditure as enhancement. The fact that Northumbrian's level of proposed costs are low by comparison to the other companies is also consistent with its original view that it would be able to meet these performance targets from base.

97. Northumbrian had the opportunity during the business plan process to identify a need for any enhancement expenditure to enable it to meet the targets for leakage which Ofwat was proposing to set. But it did not identify any such need, indicating its Board did not believe this allowance was needed. This might have been because Northumbrian believed that the allowances it would receive would be sufficient, in the round, to address its leakage targets. However, following sight of Ofwat's final determination, we would have expected it to have identified in its statement of case that it would now need an explicit leakage enhancement allowance as the 'in the round' outcome was no longer sufficient. It did not do this. While we recognise that Northumbrian may subsequently change its view on this during a redetermination, we believe that if it is to do so it needs to put forward cogent evidence and reasoning for doing so, and are not persuaded it has done so. Northumbrian's late request for leakage enhancement totex appears to be a change in position in response to the CMA's PFs and their concern that there is an

overall general totex gap.[45] Whilst our FD will consider the overall level of totex for Northumbrian in the round, we are rejecting their arguments to now allow leakage enhancement totex.

98. We therefore propose that no allowance is appropriate for Northumbrian.

Yorkshire

99. Yorkshire has relatively high leakage levels. It's leakage levels in 2019/20 were 55% above the industry upper quartile level and 26% above the industry mean.

100. Yorkshire's requested totex implies a unit cost for leakage reduction (of £2.0m per Ml/d) that is more than three times higher than the industry upper quartile level Ofwat identified on the basis of PR19 requested totex for leakage enhancement.

101. In our PFs, we noted that the wide range of unit costs identified by Ofwat's leakage model raised concerns over its reliability in predicting unit costs for the Disputing Companies. Nevertheless, we consider that this high-level comparison is relevant. That is, where the level of requested totex implies a relatively high unit cost – as it does for Yorkshire – we consider that a compelling explanation of why this should be regarded as appropriate should be provided for it to be allowed.

102. We consider this particularly relevant for Yorkshire, given its start – and planned end – position in AMP7, relative to other companies. That is, even after delivering its planned 15% leakage reduction, Yorkshire's 2024-25 leakage level would still be higher than the 2019-20 industry median level, on a normalised basis. This is relevant because a range of submissions – including from Yorkshire[46] – have emphasised the extent to which the costs of additional leakage reduction increase as the level of leakage reduces. This implies that the unit costs of Yorkshire's planned leakage reduction should be expected to be 'low' relative to most other companies, other things being equal.

103. We are not satisfied – in the light of these points – that Yorkshire has provided sufficient evidence to justify its requested totex of £93.3m, and the unit cost of £2.0m per Ml/d this implies. We share a number of the concerns Ofwat highlighted in its bottom-up assessment of Yorkshire's cost forecast, including, in particular, over the extent to which Yorkshire's forecasts have

[45] Northumbrian's response to the provisional findings, paragraphs 10 and 11
[46] Yorkshire's reply to responses to the provisional Findings, p72

been based on sufficient consideration of the scope for alternative lower cost options and approaches, and have taken sufficient account of its productivity improving investments in AMP6. We do not consider that Yorkshire have provided a compelling explanation why the unit cost of meeting its leakage reduction targets should be so much higher than the upper quartile level. In line with this, we are not satisfied that Yorkshire's cost forecast provides an appropriate starting point for determining its leakage enhancement allowance. The evidence from Yorkshire was not sufficiently detailed to allow us to undertake a robust bottom-up assessment. Despite being allowed repeated opportunities to do so, it failed to provide convincing evidence that the proposed expenditure was efficient, and there was insufficient detail to indicate that adequate optioneering had been considered by Yorkshire to identify a least cost delivery plan. The fact that leakage activities have been tendered for the AMP7 period is not sufficient evidence in itself that the approach taken to identify the mix of leakage reduction activities and the approach to tendering for the overall leakage reduction strategy is efficient.

104. We have therefore adopted a top-down approach only for calculating the updated enhancement allowance for Yorkshire.

105. We considered whether Ofwat's (top-down) proposal of applying a unit cost of £1.2m per Ml/d should be used. As noted in paragraph 60, this figure takes account of both Yorkshire's own cost forecasts, and the upper quartile level (which both Northumbrian and Bristol's forecast costs are consistent with). It also provides for a unit cost level that is broadly consistent with Northumbrian's forecast costs for active leakage control measures.

106. We note Yorkshire's comments (see paragraph 37) that Ofwat's use of this approach involved basing an efficiency challenge on a unit cost reported by an individual company without due regard to accuracy or comparability.[47] However, we consider that it was for Yorkshire to demonstrate why its forecast costs should be regarded as efficient, notwithstanding the relatively high unit costs that were implied, and Yorkshire's relative starting position in terms of leakage performance. We are not satisfied that Yorkshire has done this sufficiently. Ofwat had taken account of Yorkshire's own cost forecasts in determining the unit cost estimate of £1.2m. We do not think this is appropriate given the poor evidence from Yorkshire, which has had numerous opportunities to provide robust evidence that its expenditure plans were efficient but has not done so.

[47] Yorkshire's reply to responses to the provisional findings, paragraph 5.4.2

107. Given the limited evidence to support other approaches, this led us to consider applying a unit cost of £0.6m per Ml/d for Yorkshire, which is the upper quartile of cost submissions for the AMP7 leakage PC from the business plans of the seventeen water companies at PR19. In many circumstances it is a reasonable approach to base regulatory decisions on a upper quartile benchmark. We would expect that Yorkshire should have relatively low leakage costs given its starting position of having high leakage levels. The Company has failed to justify its projected expenditure and hence unit cost. Hence we feel it is appropriate here to use the upper quartile unit cost of £0.6m per Ml/d. This is also broadly consistent with the company implied rates of Bristol and Northumbrian in their latest submissions for the four redeterminations, which is a useful cross-check, but not the basis of our decision. Given that Yorkshire has failed to demonstrate why a company with relatively high leakage would need a larger allowance than this, we consider that this is the appropriate rate to use.

108. We then considered the leakage reduction that should be subject to the top-down assessment. Yorkshire proposed the full 47 Ml/d reduction (option 1). An alternative option would be a level of 28.8 Ml/d (option 2) that accounts for progress in leakage reduction made in 2019/20.

109. Ofwat, in presenting its view that, at most, 23.9 Ml/d of the reduction should be funded as enhancement, as well as noting Yorkshire's 2019-20 performance, pointed to statements Yorkshire had made in its September 2018 business plan that it intended to reduce leakage by 62 Ml/d over 2018-20 through investing £119m from PR14 outperformance.[48] Ofwat noted Yorkshire's comment in its business plan that this would ensure that the full cost of improving its position to future upper quartile performance did not fall on customers in AMP7.[49]

110. Yorkshire confirmed to us that it had indeed invested significantly in leakage reduction late in AMP6, including, in particular, through the installation of acoustic loggers, and has noted that these investments have the effect of increasing the productivity of leakage reduction activity.[50] Yorkshire said, though, that Ofwat was incorrect to reduce the amount of leakage reduction to be funded as enhancement because:[51]

- The base cost models used by Ofwat and the CMA do not include 2019-20 expenditure data, and so Yorkshire's base cost allowances cannot take

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[48] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.29
[49] Ofwat's response to the provisional findings – costs and outcomes, paragraph A3.29
[50] For example, Yorkshire's reply to responses to the provisional findings, p74.
[51] Yorkshire's reply to responses to the provisional findings, p74-5. Yorkshire also said that base models would reflect average expenditure even if 2019-20 data was included.

account of the expenditure that it has incurred in 2019-20 to deliver its current level of performance; and,

- Yorkshire's proposed enhancement allowance already accounts for productivity improvements associated with its AMP6 investments through its use of historical data and modelling assumptions.

111. For the leakage reduction our updated decision is to use the AMP7 PC leakage reduction of 47 Ml/d (consistent with option 1 identified in paragraph 51). Whilst Yorkshire has already made a strong start to achieving the AMP7 leakage PC through its 7.2% leakage reduction in 2019/20, we believe that the 3-year rolling-average PC is the appropriate measurement to base decisions on. This 3-year approach was introduced to account for varying weather impacts. Whilst 2019/20 leakage performance was strong, there is a risk that this is not permanent and at least partly results from favourable weather influences in that single year. As noted in paragraph 88, it is possible that there was some degree of leakage reduction expenditure brought forward by the Disputing Companies from AMP7 to 2019/20. When a Company knows it will face a challenging regulatory target, it makes good business sense to make early efforts to make progress rather than wait until a new regulatory cycle is effective. Despite the evidence referred to in paragraphs 109 and 110, we think this could apply to some extent, distorting outcomes in that year, and we are mindful to be consistent with our provisional decision not to use 2019/20 data in modelling base expenditure. This use of option 1 is consistent with our approach for Bristol.

112. We consider that applying 47 Ml/d to a unit cost of £0.6m is the most balanced and appropriate approach to adopt for Yorkshire, noting that the poor Company evidence prevents us from using a detailed bottom-up assessment. In line with this, our updated view is that Yorkshire's AMP7 leakage enhancement allowance should be £28.2m. This is lower than our PF allowance and reflects the quality of evidence submitted since this early view. It compares to Ofwat's FD enhancement allowance of zero.

Summary of Revised CMA Enhancement Allowances

113. This working paper sets out the updated analysis of the CMA on the appropriate leakage enhancement totex allowances. These are summarised in Table 10.

Table 10: Headline leakage enhancement totex allowances

£m

	Company Submissions	*Ofwat FD*	*Ofwat response to PFs*	*CMA*[52]
Anglian	76.7	71.4	54.2-58.1	64.1
Bristol	4.8	4.8	4.6	4.7
Northumbrian	15.7	0	0 - 6.3	0
Yorkshire	94.7	0	0 - 29	28.2

Source: CMA analysis

114. The updated CMA allowances expressed on a per property basis and per km of water mains for comparison are shown in Table 11.

Table 11: Updated leakage enhancement totex allowances, normalised

	CMA, £ per property	*CMA, £ per km of mains*
Anglian	28.87	1,661
Bristol	8.68	685
Northumbrian	0	0
Yorkshire	12.15	887

Source: CMA analysis

Consultation Questions

115. Respondents are welcome to comment on any aspects of this Working Paper that relate to leakage enhancement totex. To help focus responses, we are particularly interested in comments on the following questions:

a. Is the assessment approach used by the CMA, using a tailored mixture of top-down and bottom-up assessments where applicable, a suitable approach?

b. Are there alternative approaches or amendments to this approach that should be considered?

c. Are there company-specific points that the CMA should consider in coming to a final determination?

116. The deadline for responses to this Working Paper is noon on Monday 25 January 2021. Please send responses to waterdetermination2020@cma.gov.uk

117. This consultation necessarily addresses a single issue. In the final determinations, we will consider all aspects of our determinations in the round, including all aspects of the matters we have consulted on after our PFs.

[52] CMA latest allowances are currently expressed pre any adjustments that may be made for RPE adjustments and frontier shift.

118. We will carefully consider responses to this consultation before reaching our final decisions. The final decisions will be included the CMA's Final Determinations for the four Disputing Companies.

Annex 1

Relative levels of leakage and update on approach to base totex allowances

119. In this annex we set out some updated observations on relative levels of leakage, and an update on approaches to calculating base totex where there are minor revisions under consideration arising from points raised in the responses to our Provisional Findings.

Relative Levels of Leakage

120. The four Disputing Companies have very different levels of leakage, when normalised for length of mains or per connected property. This will reflect a number of factors, including:

a. Assessments of the Sustainable Economic Level of Leakage (SELL), which seeks to balance the costs and benefits of reducing leakage, identifying a least cost plan that accounts for the fact that leakage is one of several options to balance supply and demand in the long term;

b. Customers' reported willingness to pay for leakage improvements;

c. Resource positions, with those companies facing a threat of water shortages likely to take further steps to reduce leakage than those with surplus water;

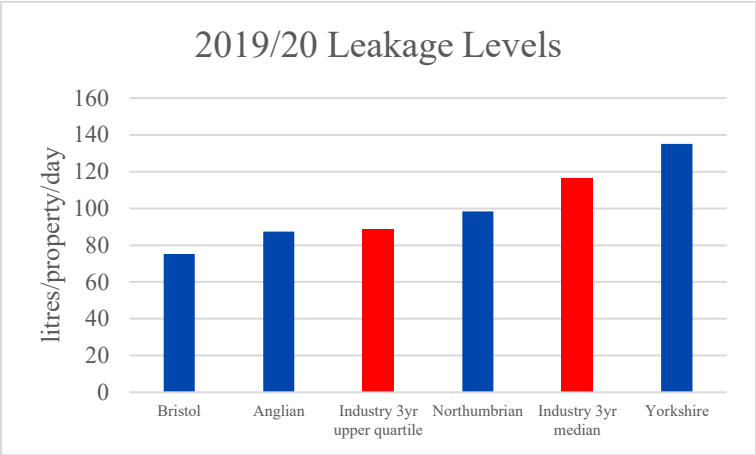
d. Local operating conditions, that may be favourable or not. Examples include the age of pipes; topography that may influence pressure levels; property density that affects the number of connections; soil conditions; local climatic variances, extent of traffic load;

e. Quality of the distribution network inherited by the 10 WASCs at the time of privatisation 30 years ago, which is hence applicable to Anglian, Northumbrian and Yorkshire;

f. Management efficiency in relation to factors such as productivity of workforce, choice of materials, skill in laying pipes, ability to renew mains prone to leaks, and appetite for innovation.

121. Figure 2 shows the relative position of the four Disputing Companies in 2019/20 compared with the industry upper quartile and median levels, based on leakage expressed as litres/property/day.

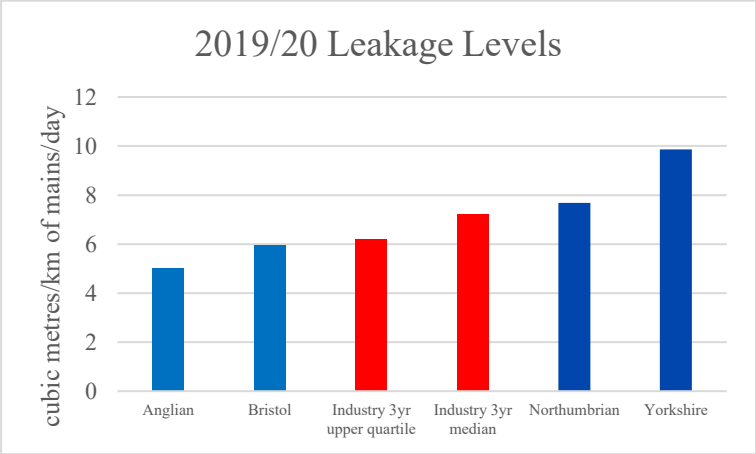
Figure 2: Leakage levels normalised by property numbers



Source: CMA analysis based on data supplied by Ofwat in response to RFI020.

122. Figure 3 is the same analysis but expresses leakage on cubic metres per km of mains per day. We used only the data in Figure 4 in our PFs, but following submissions we agree that both are relevant measures. This change will have implications for the level of the base allowances for Anglian and Bristol calculated using the approach in our PFs, but does not directly affect any enhancement allowances.[53]

Figure 3: Leakage levels normalised by length of main



Source: CMA analysis based on data supplied by Ofwat in response to RFI013.

123. Taking the geometric mean of these two measurements, the relative position of the four Disputing Companies is as follows:

- Anglian's leakage levels are 10.3% lower than the industry upper quartile position.

[53] Anglian's distance from upper quartile reduces from -19% to around -10%, whereas Bristol's increases from -4% to -10% in 2019/20.

- Bristol's leakage levels are 9.8% lower than the industry upper quartile position.

- Northumbrian's leakage levels are 17% higher than the upper quartile position, but 4% lower than the industry median level.

- Yorkshire's leakage levels are 55% higher than the upper quartile position, and 26% higher than the industry median level.

Update on approach to base totex in the CMA's Final Determination

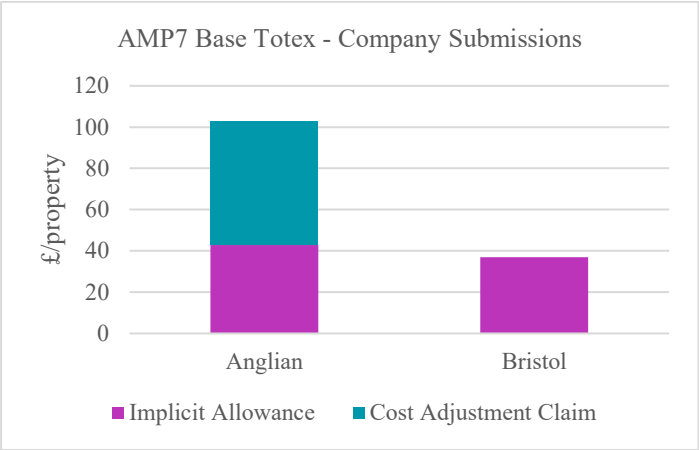
124. We are not consulting in this document on the base cost allowances for leakage. We plan to reach Final Determinations on the base cost allowances having had regard to the basis of the responses to our PFs.

125. We are separately considering the specific submissions from Anglian and Bristol on the level of base totex. In this section we summarise what changes we are considering to the base allowances based on the analysis used in determining enhancement allowances.

126. In line with our PFs that only those companies with leakage levels below the upper quartile level of the industry should qualify for additional base totex allowances, only Anglian and Bristol have requested additional base totex allowances. The two requests are however quite different.

127. Bristol has said that it calculates that within overall base funding its current leakage allowance is £20m, hence it requests an adjustment to base totex allowances for leakage based on this impact allowance. Anglian has an implicit allowance figure of £95m, but additionally requests consideration of a cost adjustment claim of £132.5m for the challenges it faces with pipe and soil conditions in its operating area. These figures are normalised on a per property basis and presented in Figure 4.

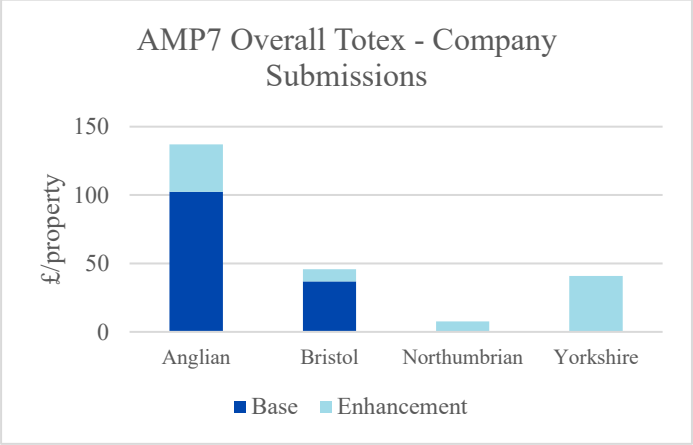
Figure 4: Base totex – company submissions



Source: CMA analysis based on companies' responses to the PFs.

128. Figure 5 summarises the aggregation of the Company submissions for base cost adjustments and enhancement totex allowances in AMP7, presented on a per property basis for comparison purposes.

Figure 5: Total totex (base and enhancement) – Company submissions



Source: CMA analysis based on companies' responses to the PFs.

129. In setting the level of base allowances, we propose to take a similar approach for Anglian and Bristol at the Final Determinations, with some minor refinements following the responses to our PFs. The proposed refinements that will be considered include:

- Upper quartile assessments may be made with consideration of both leakage per property and leakage per km of mains. The PFs had been based on only the latter and this could skew the relative position of companies depending on their property density.

- The assessment may consider the upper quartile three year rolling position in 2024/25, based on the varying ambition in leakage PCs in

AMP7, rather than in 2019/20 which had been the approach taken at PFs. Ofwat has suggested this change.

- Further consideration of the updated base cost allowances submitted by Anglian and Bristol, including Anglian's cost adjustment claim. Both companies have updated their calculations of these values and given reasons why our proposed allowance should be expanded to include a greater level of underlying spend.

Annex 2

Options for top-down assessment for the four Disputing Companies

130. The following tables seeks to summarise some of the options, noting that there are many permutations.

Anglian

Table 12: Example permutations of top-down allowances for Anglian

Applicable leakage reduction Ml/d	*Unit Rate £m per Ml/d*	*Top-down Totex Leakage Allowance*	*Notes*
Option 1: 23.1 Ml/d	3.32	£76.7m	This is the company request
Option 1: 23.1	0.6	£13.9m	£0.6m is the upper quartile
Option 1: 23.1	2.0	£45.2m	£2.0m would be a half way position
Option 2: 20.1	0.6	£12m	Other option 2 options would be similar to option 1 values, given the Ml/d variance is small

Source: CMA analysis

131. We do not propose to use a top-down assessment for Anglian. The wide range of valuations in the above table demonstrates this is problematic. A review of the detailed evidence from Anglian using the bottom-up approach is more reliable.

Bristol

Table 13: Example permutations of top-down allowances for Bristol

Applicable leakage reduction Ml/d	*Unit Rate £m per Ml/d*	*Top-down Totex Leakage Allowance*	*Notes*
Option 1: 8.7 Ml/d	0.55	£4.8m	This is the company request and our proposed option to use
Option 2: 5.0	0.55	£2.8m	This accounts for progress in 2019/20
Option 4: 3.8	0.55	£2.1m	This recognises the AMP6 target may have been missed.

Source: CMA analysis

132. We propose to use the first of these three options for Bristol.

Northumbrian

Table 14: Example permutations of top-down allowances for Northumbrian

Applicable leakage reduction Ml/d	*Unit Rate £m per Ml/d*	*Top-down Totex Leakage Allowance*	*Notes*
Option 1: 25.3 Ml/d	0.62	£15.5m	This is the company request.
Option 2: 22.8	0.62	£14.0m	This accounts for progress in 2019/20
Option 3a: 17.5	0.62	£10.8m	7.8 Ml/d is taken from option 1 to reflect lower leakage in 2013-14
Option 3b: 15.0	0.62	£9.2m	7.8 Ml/d is taken from option 2 to reflect lower leakage in 2013-14

Source: CMA analysis

133. The unit rate of £0.62 per Ml/d is from Northumbrian's latest request for totex allowances to now be considered[54]. We do not propose to use a top-down allowance for Northumbrian.

Yorkshire

Table 15: Example permutations of top-down allowances for Yorkshire

Applicable leakage reduction Ml/d	**Unit Rate £m per Ml/d**	**Top-down Totex Leakage Allowance**	**Notes**
Option 1: 47 Ml/d	2.0	£94.7m	This is the company request.
Option 1: 47	1.2	£56.4m	This unit rate was used by Ofwat in a recent top-down calc. for Yorkshire. Ofwat used a much lower eligible leakage reduction.
Option 1: 47	0.6	£28.2m	This is the option we intend to use.
Option 2: 28.8	2.0	£57.6m	
Option 2: 28.8	1.2	£34.6m	
Option 2 28.8	0.6	£17.3m	
One of Ofwat's options: 23.9 Ml/d	1.2	£29.5m	See para 33

Source: CMA analysis

134. We propose to use option 1, the full reduction in AMP7. Option 2 was considered carefully. Our updated assessment for YRK is based on the top-down approach only. The evidence from Yorkshire was not sufficiently detailed to allow us to undertake a robust bottom-up assessment. With this in mind, we propose to use the upper quartile unit rate as the applicable metric in the top-down assessment as Yorkshire has not provided reliable evidence to demonstrate its costs are efficient nor that sufficient optioneering has been adequately considered to identify a least cost plan.

[54] Northumbrian identified a need for £15.6m of enhancement spend to reduce leakage by 25.3 Ml/d in AMP7.